SUPER◗®

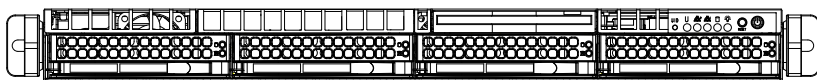## SUPERSERVER

5017C-URF

USER'S MANUAL

1.0

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Release Date: June 7, 2012

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 5017C-URF. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 5017C-URF is a 1U rackmount server based on the SC815TQ-R500B chassis and the X9SPU-F motherboard.

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 X9SPU-F motherboard and the SC815TQ-R500B chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the 5017C-URF into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

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

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 5017C-URF.

Chapter 5: Advanced Motherboard Setup

Chapter 5 provides detailed information on the X9SPU-F motherboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the motherboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC815TQ-R500B server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

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

Appendix A: BIOS Error Beep Codes

Appendix B: System Specifications

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Chapter 7 BIOS

Appendix A BIOS Error Beep Codes

Appendix B System Specifications

Chapter 1

Introduction

1-1   Overview

The SuperServer 5017C-URF is a 1U server comprised of two main subsystems: the SC815TQ-R500B chassis and the X9SPU-F motherboard. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

In addition to the motherboard and chassis, various hardware components have been included with the 5017C-URF, as listed below:

- Four 4-cm counter-rotating fans (FAN-0086L4)

- One passive CPU heatsink (SNK-P0046P)

- Two riser cards (RSC-R1UU-E8R+ and RSC-R1UU-UE16)

- SATA Accessories
  One hard drive backplane (BPN-SAS-815TQ)
  Four drive carriers (MCP-220-00075-0B)

- One CD containing drivers and utilities

- SuperServer 5017C-URF User's Manual

Optional

- One rackmount kit (PT51L)

1-2   Motherboard Features

At the heart of the SuperServer 5017C-URF lies the X9SPU-F, a single processor motherboard based on the Intel® C216 Express chipset. Below are the main features of the X9SPU-F. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X9SPU-F supports a single Intel® Xeon E3-1200 Gen 2 Core i3 processor in an LGA 1155 socket. Please refer to our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X9SPU-F has four DIMM sockets that can support up to 32 GB of DDR3-1600/1333/1066 ECC/non-ECC unbuffered UDIMMs memory. Please refer to Chapter 5 for installing memory.

SATA

A SATA controller is integrated into the chipset to provide a six-port, SATA subsystem, which is RAID 0, 1, 5 and 10 supported. The SATA drives are hot-swappable units. Two of the ports support SATA 3.0 (6 Gb/s) while the other four are SATA 2.0 (3 Gb/s) ports.

Note: You must have RAID set up to enable the hot-swap capability of the SATA drives. Documentation on RAID setup guidelines can be found on our web site.

UIO

The X9SPU-F+ is a specially-designed serverboard that features Supermicro's UIO (Universal I/O) technology. UIO serverboards have a PCI Express 2.0 x8 slot that can support any one of several types of UIO card types to add SAS ports, SATA ports, additional LAN ports or other additional functions to the serverboard. This allows the user to tailor the serverboard to their own needs.

Note: the server does not come with a UIO card installed.

Onboard Controllers/Ports

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

1-3   Server Chassis Features

The 5017C-URF is built upon the SC815TQ-R500B chassis. Details on the chassis and on servicing procedures can be found in Chapter 6. The following is a general outline of the main features of the chassis.

System Power

The SC815TQ-R500B features a redundant 500W power supply consisting of two power modules. The system does not need to be shut down when replacing or removing a single power supply module.

Hard Drive Subsystem

The SC815TQ-R500B chassis was designed to support four hot-swap SATA hard drives.

Front Control Panel

The chassis' control panel provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity (two) and UID/overheat/fan fail/power fail. A main power button and system reset button is also included.

Cooling System

The SC815TQ-R500B chassis has an innovative cooling design that features four sets of 4-cm counter-rotating fans located in the middle section of the chassis. Chassis fan speed to be determined by system temperature via IPMI. The power supply module also includes a cooling fan.

Figure 1-1. Intel C216 Express Chipset:
System Block Diagram

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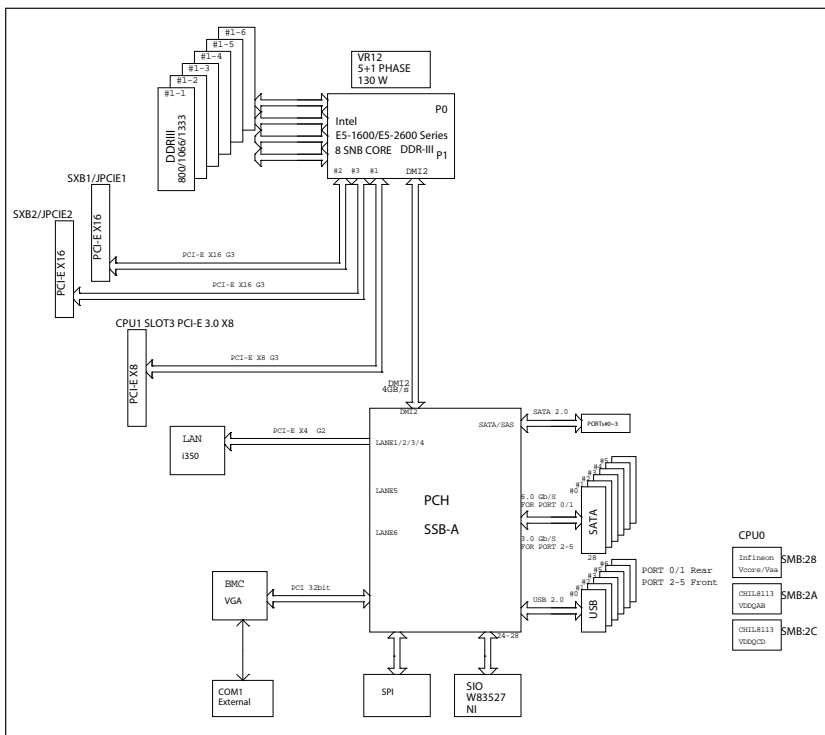
1-4   Contacting Supermicro

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 Dist., New Taipei City 235
	Taiwan
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

Notes

Chapter 2

Server Installation

2-1   Overview

This chapter provides a quick setup checklist to get your SuperServer 5017C-URF 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 motherboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2   Unpacking the System

You should inspect the box the SuperServer 5017C-URF 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 5017C-URF. 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 SuperServer 5017C-URF 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 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 5017C-URF 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 (see Figure 2-1). 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.

**Figure 2-1. Identifying the Sections of the Rack Rails
(right side rail shown)**

Outer Rail (attaches to rack)

Inner Rail (pre-installed)

Locking Tab
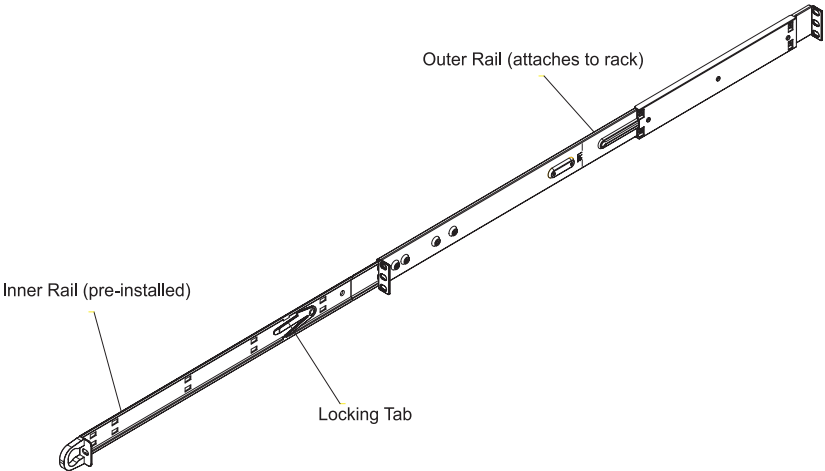
Installing the Outer Rails

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 screws and the long bracket to the rear side of the outer rail with three screws. Repeat these steps for the left outer rail.

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

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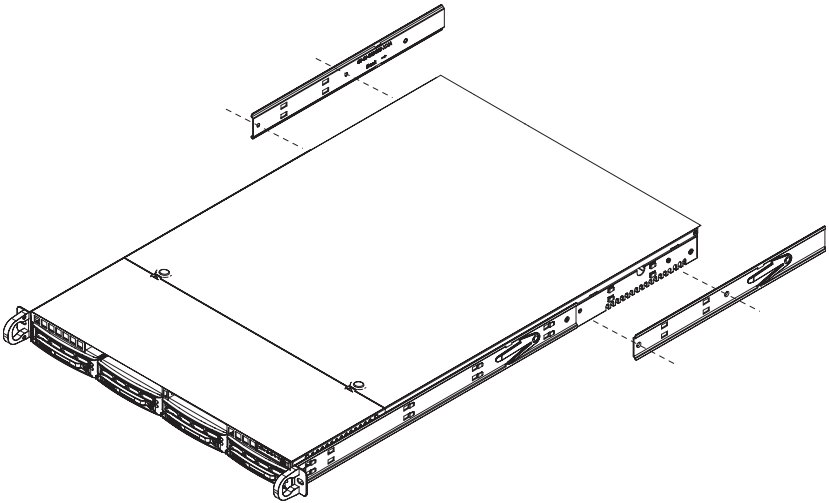
Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-3.

When the server has been pushed completely into the rack, you should hear the locking tabs "click".

Figure 2-3. Installing the Server into a Rack
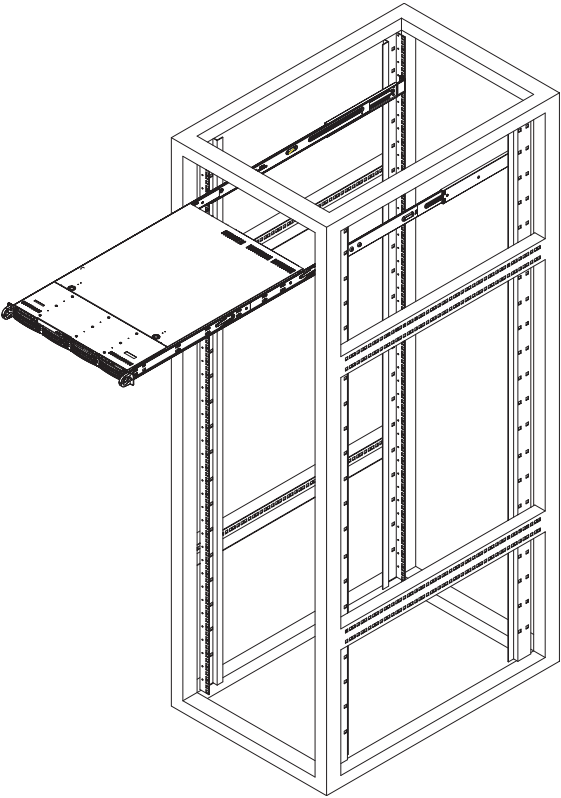
Installing the Server into a Telco Rack

To install the 5017C-URF into a Telco type rack, use two L-shaped brackets on either side of the chassis (four total). First, determine how far follow the server will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on your server, remove it. Then attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the telco rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack.

Figure 2-4. Installing the Server into a Telco Rack
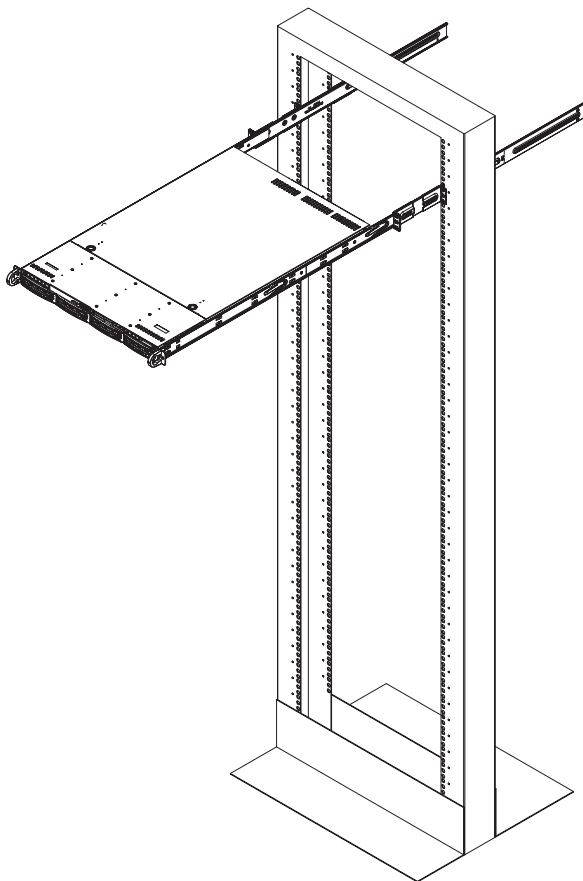
Notes

Chapter 3

System Interface

3-1   Overview

There are several LEDs on the control panel as well as others on the SATA 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 three push-buttons located on the front of the chassis: a reset button, a UID button and a power on/off button.

UID

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

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 SC815TQ-R500B 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.

Universal Information LED

When this LED blinks red quickly, it indicates a fan failure and when blinking red slowly a power failure. The LED will be blue when used for UID (Unit Identifier). When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists. See the table below for descriptions of the LED states.

Figure 3-1. Universal Information LED States

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

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

NIC2

Indicates network activity on LAN2 when flashing.

NIC1

Indicates network activity on LAN1 when flashing.

HDD

Indicates IDE channel activity. On the SuperServer 5017C-URF, this light indicates SATA 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   Hard Drive Carrier LEDs

Each hard drive carrier has two LEDs.

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

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

Chapter 4

System Safety

4-1   Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 5017C-URF 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 motherboard, 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.

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

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

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

4-2   General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the system clean and free of clutter.

- The 5017C-URF weighs approximately 43/41 lbs (19.5/18.6 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

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

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

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

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

4-3   ESD Precautions

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

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

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

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

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

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

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

- Put the motherboard 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 motherboard.

4-4   Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 5017C-URF is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery

LITHIUM BATTERY

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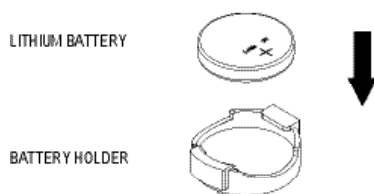
Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency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

Chapter 5

Advanced Motherboard Setup

This chapter covers the steps required to install processors and heatsinks to the X9SPU-F motherboard, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the motherboard to protect and cool the system sufficiently.

5-1 Handling the Motherboard

Static electrical discharge can damage electronic components. To prevent damage to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the motherboard can cause it to bend if handled improperly, which may result in damage. To prevent the motherboard from bending, keep one hand under the center of the board to support it when handling.

The following measures are generally sufficient to protect your equipment from static discharge.

Precautions

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

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

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

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

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

Unpacking

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

5-2   Processor and Heatsink Installation

Notes:

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

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

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

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

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

Installing the LGA1155 Processor

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

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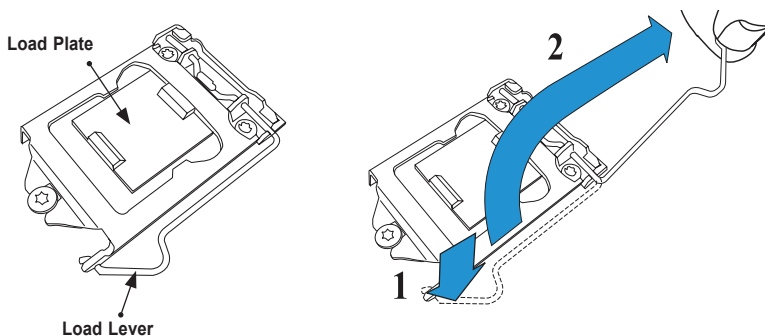
3. Use your thumb and your index finger to hold the CPU at the top center edge and the bottom center edge of the CPU.
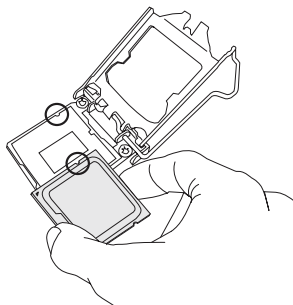
4. Align the CPU key (the semi-circle cutouts) against the socket keys. Once aligned, carefully lower the CPU straight down to the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically.

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

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

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

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

Pin 1
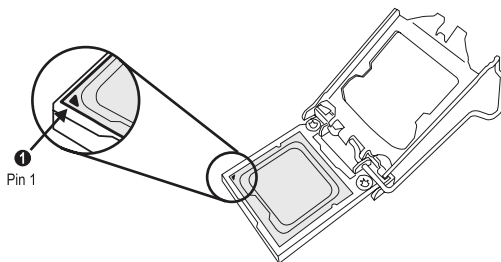
Warning: The CPU will only seat inside the socket in one direction. Make sure it is properly inserted before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is aligned properly.

CPU properly installed

Load lever locked into place.

A
B

Make sure "A" points are under B
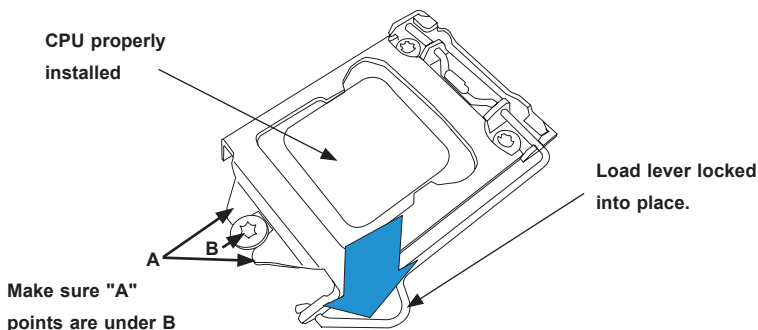
Installing a Passive CPU Heatsink

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

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the motherboard and the heatsink bracket underneath.

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

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

Figure 5-1. Installing the Heatsink
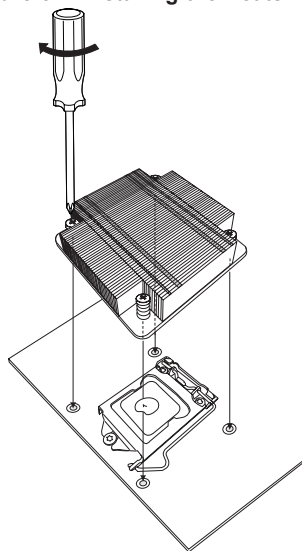
Removing the Heatsink

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

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

2. <u>Gently</u> wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!)

3. Once the CPU is loose, remove the it from the CPU socket.

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

Figure 5-1. Removing the Heatsink
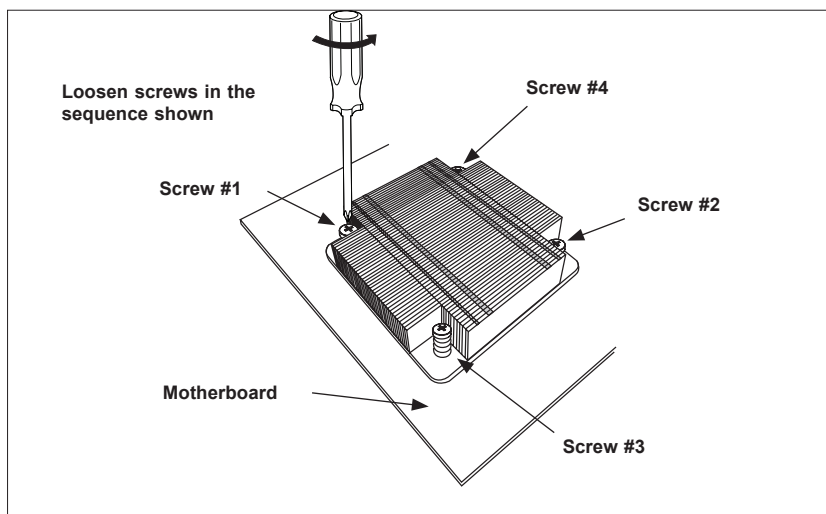
5-3   Connecting Cables

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

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed in preconfigured systems to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to reroute them as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the system, keep the airflow in mind when routing the cables.

The following data cables (with their connector locations noted) should be connected. See the motherboard layout diagram in this chapter for connector locations.

- Control Panel cable (JF1, see next page)

- SATA cables (I-SATA0 ~ I-SATA3)

Connecting Power Cables

The X9SPU-F has a 24-pin primary power supply connector designated "JPW1" for connection to the ATX power supply. Connect the appropriate connector from the power supply to JPW1 to supply power to the motherboard. See the Connector Definitions section in this chapter for power connector pin definitions.

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

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-2 for the pin locations of the various front control panel buttons and LED indicators. Even and odd numbered pins are on opposite sides of each header.

All JF1 wires have been bundled into single keyed ribbon cable to simplify their connection. The red wire in the ribbon cable plugs into pin 1 of JF1. Connect the other end of the cable to the Control Panel printed circuit board, located just behind the system status LEDs in the chassis.

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

Figure 5-2. Front Control Panel Header Pins (JF1)

	20	19	
Ground	○	○	NMI
X	○	○	X
Power LED	○	○	Vcc
HDD LED	○	○	Vcc
NIC1 LED	○	○	Vcc
NIC2 LED	○	○	Vcc
Unit ID LED	○	○	OH/Fan Fail
Power Fail LED	○	○	Vcc
Ground	○	○	#3~4 Reset Button
Ground	○	○	#1~2 Power Button
	2	1	
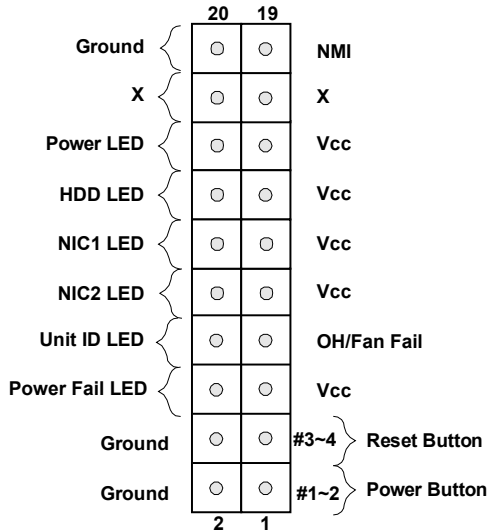
5-4   I/O Ports

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

Figure 5-3. Rear Panel I/O Ports
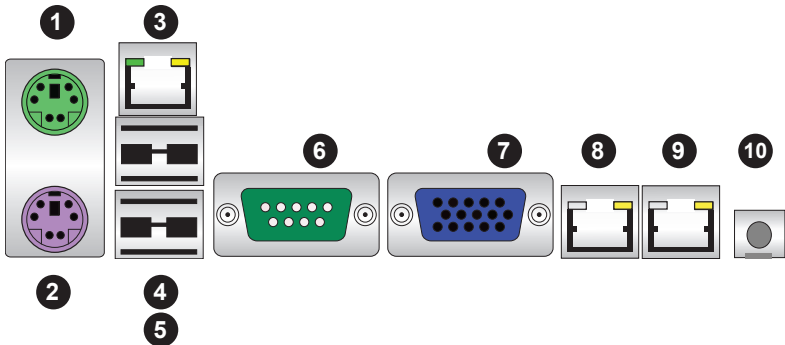
Motherboard I/O Backpanel	
1. PS/2 Keyboard Port	6. COM1
2. PS/2 Mouse Port	7. VGA
3. IPMI LAN	8. LAN 1
4. USB 3	9. LAN 2
5. USB 4	10. UID Switch

5-5   Installing Memory

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

CAUTION

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

Installing DIMMs

1. Insert the desired number of DIMMs into the memory slots, starting with slot DIMMA1.

2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.

3. Align the key on the DIMM module with the receptive point on the slot.

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

5. Press the release tabs to the lock positions to secure the DIMM module into the slot. See Figure 5-4.

Figure 5-4. Installing DIMM into Slot

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

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

Notch

Notch

Front View

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

Release Tab

Release Tab

Top View of DDR3 Slot

Memory Support

The X9SPU-F motherboard supports up to 32GB of 1600/1333 MHz ECC/Non-ECC DDR3 DIMMs in four (4) memory slots (UDIMM). Please refer to the illustration and table below.

DIMMA1 (Blue Slot)
DIMMA2

DIMMB1 (Blue Slot)
DIMMB2
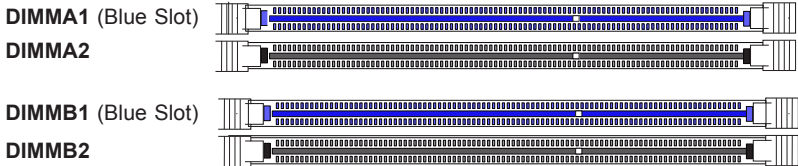
Memory Population Guidelines

When installing memory modules, the DIMM slots should be populated in the following order: DIMMA1, DIMMB1 then DIMMA2, DIMMB2

- Always use DDR3 DIMM modules of the same size, type and speed.

- Mixed DIMM speeds can be installed. However, all DIMMs will run at the speed of the slowest DIMM.

- The motherboard will support odd-numbered modules (1 or 3 modules installed). However, for best memory performance, install DIMM modules in pairs to activate memory interleaving.

Recommended Population (Balanced)				
DIMMA1	DIMMB1	DIMMA2	DIMMB2	Total System Memory
2GB	2GB			4GB
2GB	2GB	2GB	2GB	8GB
4GB	4GB			8GB
4GB	4GB	4GB	4GB	16GB
8GB	8GB			16GB
8GB	8GB	8GB	8GB	32GB

Note: Up to 32GB of memory are supported using ECC or non-ECC UDIMMs.

5-6 Adding PCI Expansion Cards

PCI Expansion Slots

Two riser cards are used to support PCI expansion cards in the system. The RSC-R1UU-E8R+ riser card can support a PCI-E x8 card and the RSC-R1UU-UE16 can support one PCI-E 3.0 x16 and one PCI-E x8 (or one UIO) cards.

Installing a PCI Add-on Card

1. Release the locking tab that corresponds to the slot you wish to populate.

2. Insert the expansion card into the riser card, pushing down with your thumbs evenly on both sides of the card.

5-7 Motherboard Details

X9SPU-F Quick Reference

Jumper	Description	Default
JPG1	Onboard VGA Enable	Pins 1-2 (Enabled)
JI2C1~JI2C2	SMB to PCI Slots	Pins 1-2 (Enabled)
JWD	Watch Dog Timer Reset	Pins 1-2 (Reset)
JRF1	x16 PCIe Setting, Force to x8+x8	Pins 1-2 (Auto)
JPL1/JPL2	LAN1/LAN2 Enable/Disable	Pins 1-2 (Enabled)
JPB	BMC Enable	Pins 1-2 (Enabled)
JPME1	ME Recovery Mode Select	Pins 2-3 (Disabled)
JPME2	ME Manufacture Mode	Pins 2-3 (Disabled)
JUSB1	USB Wake-up Enable (Rear USB Ports)	Pins 1-2 (Enabled)
JBT1	CMOS Clear	See Section 5-9

LED	Description	Color/State	Status
LE7	IPMI Heartbeart	Green: Blinking	IPMI Normal
LE4	Standby Power LED	Green: Solid On	Standby Power On
LE5	Unit ID LED	Blue: Solid On	Unit ID Switch is On

Figure 5-5. SUPER X9SPU-F Layout
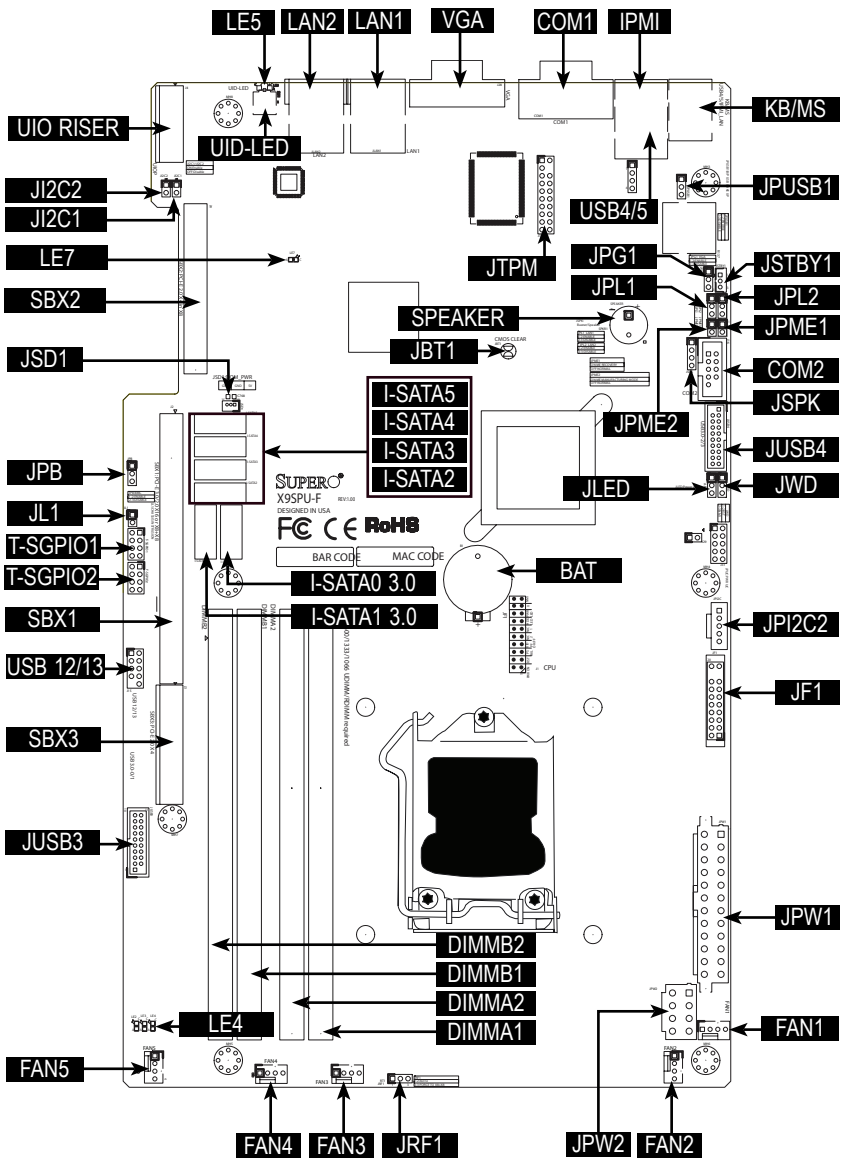
Connector/Switch	Description
UID-LED	Unit ID Switch
SBX2	Slot for Supemicro riser card P/N RSC-R1UW-E8R
SBX1, SBX3, UIO-RISER	Slots for Supermicro riser card
T-SGPIO1~T-SGPIO2	Serial Link General Purpose I/O Headers (5V Gen1/ Gen 2)
I-SATA0, I-SATA1	SATA 3.0 Connectors via PCH (6Gb/s)
I-SATA2~I-SATA5	SATA 2.0 Connectors via PCH (3Gb/s)
KB/MS	PS/2 Keyboard and Mouse Ports
FAN1~FAN5	System/CPU Fan Headers
SPEAKER	Internal Speaker (Leave jumper on JSPK installed, pins 1-2)
JSD1	SATA Disk On Module (DOM) Power Connector
JSTBY1	Legacy Wake On LAN Header
JPW1	24-pin Main ATX Power Connector
JPW2	8-pin Secondary Power Connector for the GPU
JPI2C2	Power Supply SMBus I2C Header
JF1	Front Panel Control Header
JL1	Chassis Intrusion Header
JLED	3-pin Power LED Header
JSPK	Internal Speaker/Buzzer Select or External Speaker Header
USB4/5	Rear USB Ports
JUSB4, JUSB3	Internal USB 3.0 Headers USB0/1, USB2/3
USB12/13	Internal USB 2.0 Headers USB12/13
BAT	Onboard Battery
JTPM	Trusted Platform Module (TPM) Header
LAN1/LAN2	Rear LAN Connectors (1Gb)
COM1, COM2	Rear Serial Port (COM1), Serial Port Header (COM2)
VGA	Rear VGA Port
DIMMA1~DIMMB2	DIMM Memory Slots
IPMI	Rear IPMI LAN Port

5-8   Connector Definitions

ATX Power Connector

The 24-pin main power connector (JPW1) is used to provide power to the motherboard. The 8-pin power connector (JPW2) is also required for the processor. These power connectors meet the SSI EPS 12V specification. See the table on the right for pin definitions.

ATX Power 24-pin Connector Pin Definitions (JPW1)			
Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Processor Power Connectors

JPW2 and JPW3 must also be connected to the power supply to provide power for the processor(s). See the table on the right for pin definitions.

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

Warning: To prevent damage to your power supply or motherboard, please use a power supply that contains a 20-pin and two 8-pin power connectors. Be sure to connect these power connectors to the 20-pin and the two 8-pin power connectors on your motherboard for adequate power supply to your system. Failure to do so will void the manufacturer warranty on your power supply and motherboard.

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

Power LED

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

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	Vcc
16	Control

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a hard drive LED cable to display SATA/IDE disk activity. Refer to the table on the right for pin definitions.

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

NIC1 LED

The NIC1 (Network Interface Controller) LED connection is located on pins 11 and 12 of JF1. Attach the NIC1 LED cable to display network activity. Refer to the table on the right for pin definitions.

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

NIC2 LED

The NIC2 (Network Interface Controller) LED connection is located on pins 9 and 10 of JF1. Attach the NIC2 LED cable to display network activity. Refer to the table on the right for pin definitions.

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

UID/Overheat/Fan Fail LED

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

Unit ID LED / OH / FF Pin Definitions (JF1)	
Pin#	Definition
7	OH/Fan Fail
8	UID LED

Unit ID LED Status	
State	Definition
Off	UID Off
Solid On	UID On
Blinking	System Overheat / Fan Failure

Power Fail LED

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

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

Reset Button

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

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

Power Button

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

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

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

Universal Serial Bus Ports

Two (2) Universal Serial Bus (USB) 2.0 ports are located on the I/O back panel. There are also four (4) USB 3.0 ports on two headers, and two (2) USB 2.0 ports on one header on the motherboard that may be used to provide front chassis access using USB cables (not included). See the tables on the right for pin definitions.

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

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

Speaker

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

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

Serial Port

Two COM ports (COM1/COM2) are provided, with one located on the motherboard (COM2) and one on the I/O backpanel (COM1). 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

Note: NC indicates no connection.

Fan Headers

The X9SPU-F has five headers, designated Fan1 through Fan5. Pins 1-3 of the fan headers are backward compatible with traditional 3-pin fans, but will only run at full speed. Use 4-pin fans to allow IPMI to automatically set fan speed based on the system temperature. See the table on the right for pin definitions.

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

Legacy Wake-On-LAN Header

The onboard LAN ports do not need a WOL header to support their Wake-On-LAN function. Instead, the legacy WOL header was preserved (JSTBY) to provide convenience for some embedded customers who need an internal power source from the board. See the table on the right for pin definitions.

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

Ethernet Ports

Two Ethernet ports (LAN1/LAN2) are located next to the VGA port on the rear I/O. A dedicated IPMI LAN is also located above the USB 0/1 ports to provide a dedicated network connection for IPMI 2.0. These ports accept RJ45 type cables. Please refer to Section 5-10 for LAN LED information.

LAN Ports Pin Definition			
Pin#	Definition		
1	TD0-	10	SGND
2	TD0+	11	P3V3SB
3	TD1-	12	Act LED
4	TD1+	13	Link 100 LED (Green, +3V3SB)
5	TD2-	14	Link 1000 LED (Yellow, +3V3SB)
6	TD2+	15	Ground
7	TD3-	16	Ground
8	TD3+	17	Ground
9	P2V5SB	18	Ground

Power Supply I2C

The Power Supply I2C Connector, located at JI2C1, monitors the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

PWR Supply I2C Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	3.3V

DOM PWR Connector

The Disk-On-Module (DOM) power connector, located at JSD1, provides 5V (Gen1/Gen) power to a solid-state DOM storage device connected to one of the SATA ports. See the table on the right for pin definitions.

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

Unit Identifier Switch (UID)

The Unit ID Switch is located on the I/O backpanel. When the Unit ID Switch is turned on, both the blue rear Unit ID LED and front panel Unit LED on JF1 (if attached to the front Unit ID LED on the chassis) will activate. Push the Unit ID Switch again to turn off both Indicators. These Unit ID LED Indicators provide easy identification of the system unit, when installed in a server cabinet for instance. See also Unit ID LED later this chapter.

IPMB I²C

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

IPMB I²C Pin Definitions (IPMB)	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

T-SGPIO 1/2 & 3-SGPIO 1/2 Headers

Two T-SGPIO (Serial-Link General Purpose Input/Output) headers are located next to the I-SATA ports on the motherboard. Additionally, two 3-SGPIO ports are also located next to USB 8/9. These headers are used to communicate with the enclosure management chip in the system. See the table on the right for pin definitions.

Serial_Link-SGPIO Pin Definitions			
Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	NC

Note: NC indicates no connection.

TPM Header

This header is used to connect to a Trusted Platform Module (TPM), which is available from third-party vendors. A TPM is a security device that supports encryption and authentication in hard drives. It enables the motherboard to deny access if the TPM associated with the hard drive is not installed in the system. See the table on the right for pin definitions.

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

Chassis Intrusion

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

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

5-9   Jumper Settings

Explanation of Jumpers

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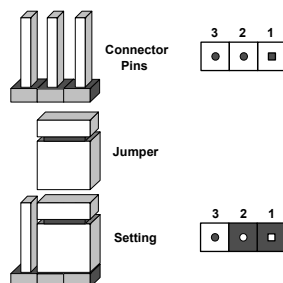
Note: On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

CMOS Clear

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

To clear CMOS

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

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

3.   Remove the screwdriver (or shorting device).

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

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

VGA Enable/Disable

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

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

LAN Enable/Disable

Change the setting of jumper JPL1 or JPL2 to enable or disable the onboard Ethernet (RJ45) ports LAN1 and LAN2. See the table on the right for jumper settings. The default setting is enabled.

LAN Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 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". Pins 1-2 will cause WD to reset the system if an application hangs. Pins 2-3 will generate a non-maskable interrupt signal for the application that has hung. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

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

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

PCI Slot SMB Enable

Use jumpers JI^{2}C2/JI^{2}C3 to enable PCI SMB (System Management Bus) support to improve system management for the PCI slots. See the table on the right for jumper settings.

PCI Slot SMB Enable Jumper Settings	
Jumper Setting	Definition
Short (Default)	Enabled
Open	Disabled

ME Recovery

ME Recovery (JPME1) is used to en-
able or disable the ME Recovery fea-
ture of the motherboard. This jumper
will reset Intel ME values back to their
default settings.

ME Recovery (JPME1) Jumper Settings	
Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	Force Update

BMC Enable/Disable

JPB is used to enable or disable
the BMC (Baseboard Management
Control) chip and the onboard IPMI
connection. This jumper is used to-
gether with the IPMI settings in the
BIOS. See the table on the right for
jumper settings.

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

USB Wake-Up (JPUSB1)

Use the jumper JPUSB1 to "wake-up"
your system by pressing a key on a
USB keyboard or clicking the USB
mouse connected to the backpanel
USB Ports 4/5. JPUSB1 is used to-
gether with a USB Wake-Up feature in
the BIOS. Enable this jumper and the
USB support in the BIOS to wake up
your system via USB devices.

JPUSB1 (Backplane USB 0/1 Wake-up Enable)	
Pin#	Definition
1-2	Enabled (Default)
2-3	Disabled

Note: When the USB is set to Enabled
in the BIOS, and JPUSB1 is set to Dis-
abled, remove the USB devices from
backpanel USB Ports 0/1 before the
system goes into the standby mode.

x16 PCI Setting (JRF1)

JRF1 is used to configure the x16
PCIe slot on the motherboard to func-
tion as x16 or split the bus to x8 +
x8. See the table on the right for the
jumper settings.

x16 PCI Setting (JRF1) Jumper Settings	
Setting	Definition
Pins 1-2	Auto (Default)
Pins 2-3	Force x8 + x8

5-10 Onboard Indicators

LAN Port LEDs

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

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

Link LED Activity LED

IPMI_Dedicated LAN LEDs

In addition to LAN1 and LAN2, the X9SPU-F has a dedicated IPMI LAN located on the IO backpanel. The amber LED indicates activity, while the Link LED may be green, amber or off to indicate the speed of the connection. See the table above for more information.

IPMI Heartbeat LED (LE7)

An IPMI Heartbeat LED is located at LE7. When LE7 blinks, it means that IPMI is enabled and functioning properly.

IPMI Heartbeat LED (LE7) LED Settings	
Green: Blinking	IPMI is ready for use
Off	IPMI Disabled

Unit ID LED (LE5)

The Unit ID LED is used to indicate that the Unit ID switch has been activated.

Unit ID LED (LE5) LED Settings	
Blue: Steady	Unit ID Switch is On
Off	Unit ID Switch is Off

Standby Power (LE4)

The Standby Power LED is located at LE4 on the motherboard. When LE4 is on, it means that the AC power cable is connected and the power supply hard switch is on, indicating that power is flowing through the power supply and into the motherboard. The system may or may not be running.

Standby PWR LED (LE4) LED Status	
Status	Definition
Off	System unplugged or power supply is switched off
On	Standby Power On

5-11 SATA Ports

SATA Ports

The X9SPU-F includes a total of six SATA ports. I-SATA0 /1 aew SATA 3.0 ports while I-SATA2-5 are SATA 2.0 ports. Please see the pin definitions on the right table.

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

5-12 Installing Software

After the hardware has been installed, you should first install the operating system and then the drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard.
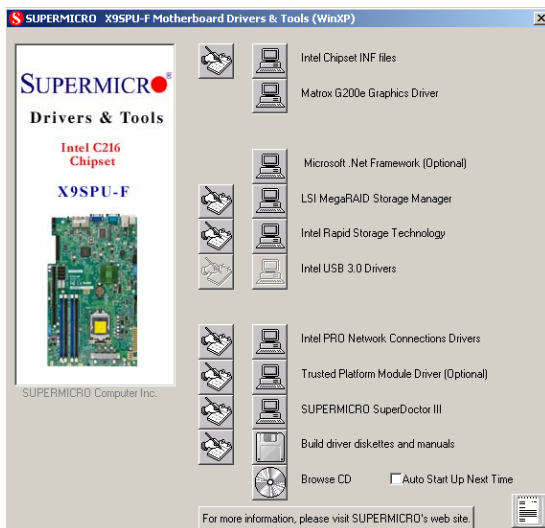
Driver/Tool Installation Display Screen

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

SuperDoctor III

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

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

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

SuperDoctor III Interface Display Screen (Health Information)
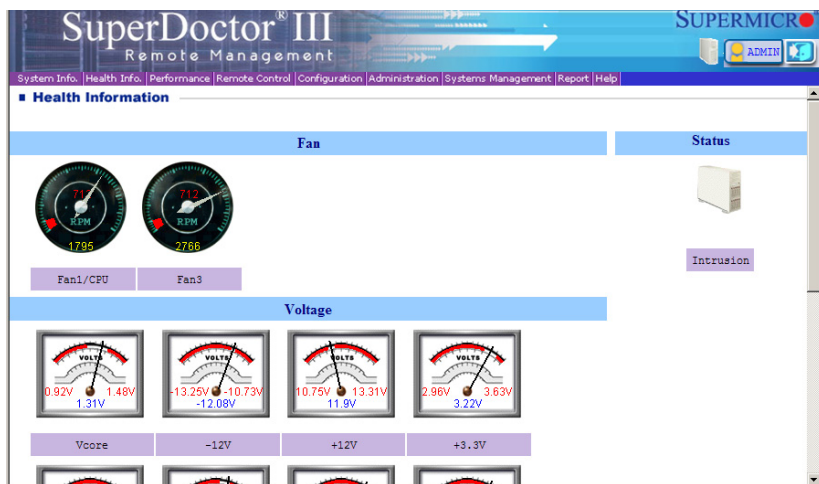
SuperDoctor III Interface Display Screen (Remote Control)

Graceful power control (cancelable)

Supero Doctor III allows a user to inform the OS to reboot or shut down the system within 30 seconds. On the system console, a pop-up window will appear with a message telling the local user to save his working files. Before the system reboots or shuts down, it's allowed to cancel the action either locally or remotely.

Power control (noncancelable)

Supero Doctor III allows a user to inform the OS to reboot or shut down the system right away. The system will reboot or shut down without any warning messages. It's not allowed to cancel the action.

Note: The SuperDoctor III program and User's Manual can be downloaded from the Supermicro web site at http://www.supermicro.com/products/accessories/software/ SuperDoctorIII.cfm.

For Linux, we recommend using SuperDoctor II.

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC815TQ-R500B chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the next step.

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

6-1   Static-Sensitive Devices

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

Precautions

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

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

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

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

- Put the motherboard, 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 motherboard.

Figure 6-1. Chassis: Front and Rear Views

Slim Floppy Drive (optional)   System LEDs   Control Panel

Drive Bays   System Reset   Main Power

Power Supply Module   PCI Expansion Slots (w/ riser cards)

I/O Backpanel
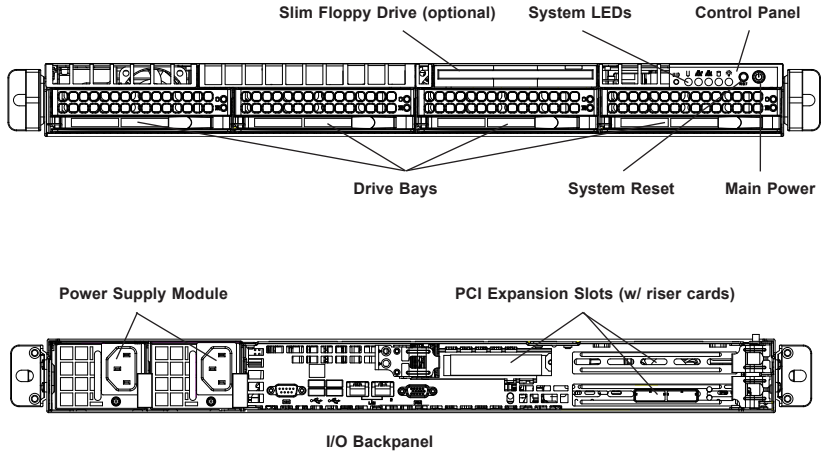
6-2   Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the motherboard to provide you with system status indications. These wires have been bundled together as a ribbon cable to simplify the connection.

Connect the cable from JF1 on the motherboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

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

6-3   System Fans

Four 4-cm heavy duty counter-rotating fans provide the cooling for the SuperServer 5017C-URF. Each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels. It is very important that the chassis top cover is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.

System Fan Failure

Fan speed is controlled by system temperature via IPMI. If a fan fails, the remaining fan 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 two fans has failed. Then power down the system before replacing a fan. Removing the power cords is also recommended as a safety precaution.

Replacing System Fans

1.   After determining which fan has failed, turn off the power to the system.

2.   Unplug the fan cable from the motherboard and remove the failed blower fan from the chassis.

3.   Replace the failed fan with an identical 4-cm, 12 volt fan (available from Supermicro).

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

5.   Reposition the fan housing back over the two mounting posts in the chassis, then reconnect the fan wires to the same chassis fan headers you removed them from.

6.   Power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the chassis cover.

Figure 6-2. System Cooling Fans
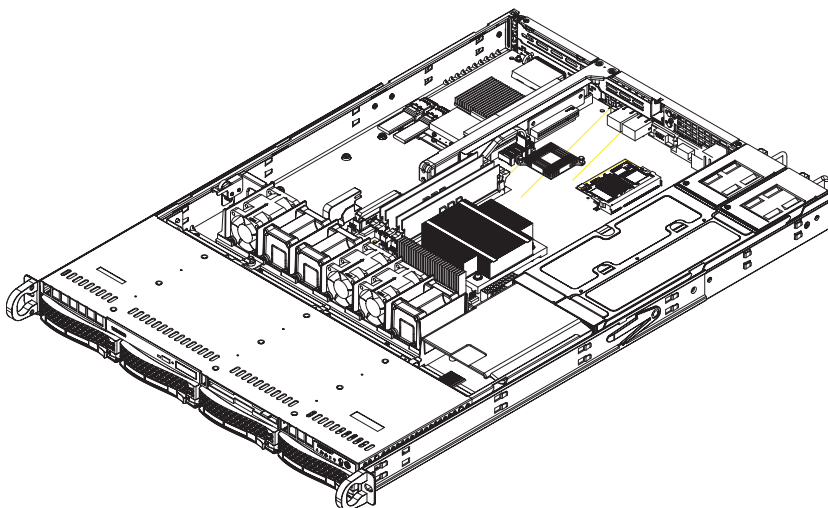
6-4   Drive Bay Installation/Removal

Removing the Front Bezel

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

Figure 6-3. Removing the Front Bezel

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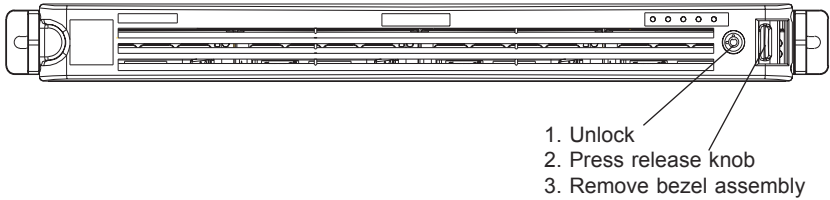
Accessing the Drive Bays

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

DVD-ROM/Floppy Disk Drives: For installing/removing a DVD-ROM or floppy disk drive, you will need to gain access to the inside of the 5017C-URF by removing the top cover of the chassis. Proceed to the "DVD-ROM and Floppy Drive Installation" section later in this chapter for instructions.

Note: Only "slim" DVD-ROM and floppy drives will fit into the 5017C-URF.

Hard Drive Installation

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

Mounting a Hard Drive in a Drive Carrier

1. Insert 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 6-4.
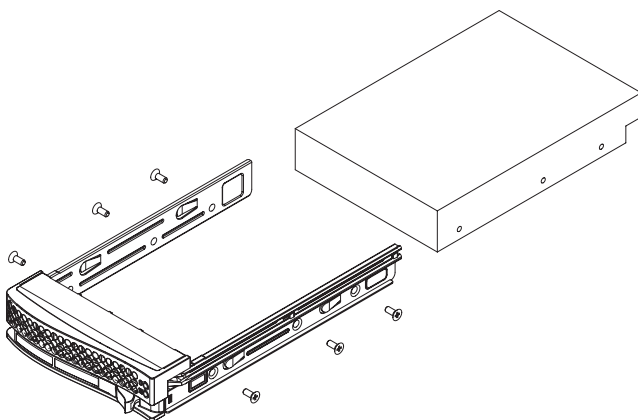
Figure 6-4. Mounting a Hard Drive in a Carrier

> ⚠ Use caution when working around the SATA 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.

> ⚠ **Warning!** 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

Installing/Removing a Hard Drive

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

2. Swing the colored handle fully out and use it to pull the unit straight out (see Figure 6-5).

Note: Your operating system must have RAID support to enable the hot-plug capability of the hard drives.
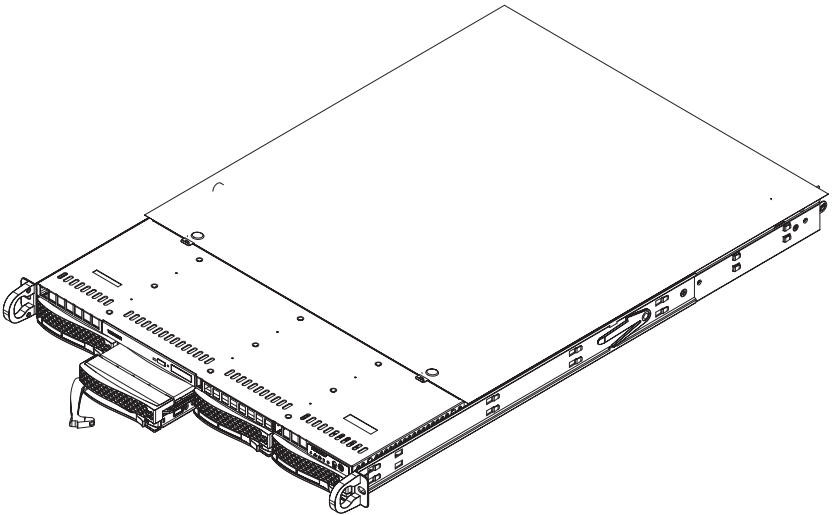
Figure 6-5. Removing a Hard Drive from the Server

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

DVD-ROM and Floppy Drive Installation

The top cover of the chassis must be opened to gain full access to the DVD-ROM and floppy drive bays. The 5017C-URF accomodates only slim-line DVD-ROM drives. Side mounting brackets are needed to mount a slim-line DVD-ROM drive in the 5017C-URF server. You must power down the system before installing or removing a floppy or DVD-ROM drive.

Removing the Chassis Cover

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

2. Depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

Removing/Installing a Drive

1. With the chassis cover removed, unplug the power and data cables from the drive you want to remove.

2. Locate the locking tab at the rear of the drive. It will be on the left side of the drive when viewed from the front of the chassis.

3. Pull the tab away from the drive and push the drive unit out the front of the chassis.

4. Add a new drive by following this procedure in reverse order. You may hear a faint *click* of the locking tab when the drive is fully inserted.

5. Remember to reconnect the data and power cables to the drive before replacing the chassis cover and restoring power to the system.

Please be aware of the following:

*   The floppy disk drive cable has seven twisted wires.

*   A color mark on a cable typically designates the location of pin 1.

*   A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always

connects to drive A, and the connector that does not have twisted wires always connects to drive B.

6-5   Power Supply

The SuperServer 5017C-URF has a 500 watt redundant power supply configuration consisting of two hot-swap power modules. The power supply modules have an auto-switching capability, which enables them to automatically sense and operate with 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 Universal Information LED on the control panel will blink slowly and remain so until the failed module has been replaced. Replacement modules can be ordered directly from Supermicro (see contact information in the Preface). The power supply modules have a hot-swap capability, meaning you can replace the failed module without powering down the system.

Replacing the Power Supply

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

1. First unplug the power cord from the failed power supply module.

2. To remove the failed power module, push the release tab (on the back of the power supply) to the side and then pull the module straight out (see Figure 6-6).

3. The power supply wiring was designed to detach automatically when the module is pulled from the chassis.

4. Replace the failed power module with another PWS-651-1R power supply module.

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

6. Finish by plugging the AC power cord back into the new power module.

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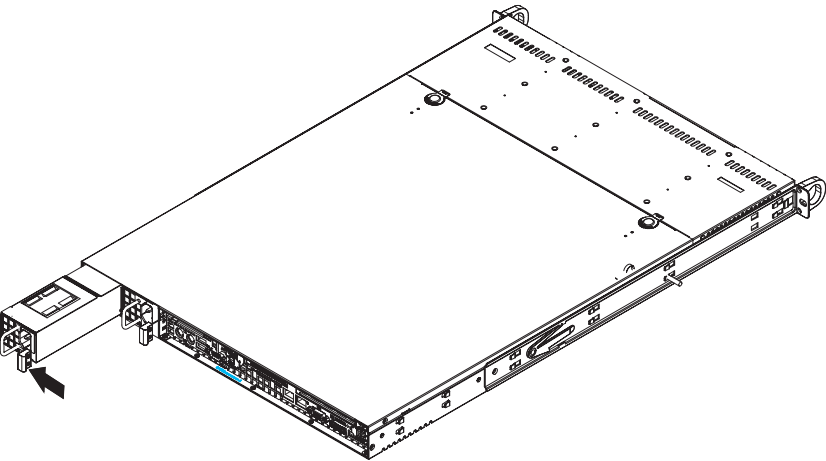
Chapter 7

BIOS

7-1　Introduction

This chapter describes the AMI BIOS Setup Utility for the X9SPU-F Motherboard. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

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

Starting BIOS Setup Utility

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

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

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

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

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

How To Change the Configuration Data

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

How to Start the Setup Utility

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

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

7-2   Main Setup

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

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Main  Advanced  Event Logs  IPMI  Boot  Security  Save & Exit

                                                          Set the Date. Use
                                                          Tab to switch
  System Date                      [Mon 04/30/2012]       between Date
  System Time                      [10:13:23]             elements.

  Supermicro X9SPU-F
  Version                          2.00
  Build Date                       04/27/2012


  Processor
      Intel(R) Xeon(R) CPU E3-1275 V2 @ 3.50GHz
  Speed                            3500 MHz
  Physical Count                   1                      ++: Select Screen
  Logical Count                    8                      ↑↓: Select Item
                                                          Enter: Select
  System Memory                                           +/-: Change Opt.
  Size                             4096 MB                F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit



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

System Overview: The following BIOS information will be displayed:

System Time/System Date

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

Supermicro X9SPU-F

Version: This item displays the version of the BIOS used in the system.

Build Date: This item displays the day this version of BIOS was built.

Processor

This displays the processor type, speed, physical count, and logical count.

System Memory

This displays the size of memory available in the system.

7-3 Advanced Setup Configurations

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

```
               Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
      Main  Advanced  Event Logs  IPMI  Boot  Security  Save & Exit

                                                                  Integrated Clock
                                                                  Control options
  ▶ Boot Feature
  ▶ Processor & Clock Options
  ▶ Chipset Configuration
  ▶ IDE/SATA Configuration
  ▶ PCIe/PCI/PnP Configuration
  ▶ Super IO Configuration
  ▶ Serial Port Console Redirection
  ▶ Hardware Health Configuration
  ▶ ACPI Settings
  ▶ PCH-FW Configuration
  ▶ Intel ICC

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

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

▶BOOT Feature

Quiet Boot

This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

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

Bootup Num-Lock

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

Wait For 'F1' If Error

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

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Immediate, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at boot and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Postponed, 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 **Immediate** and Postponed.

Watch Dog Function

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

Power Button Function

This feature controls how the system shuts down when the power button is pressed. Select 4-Seconds Override to force the user to press and hold the Power Button for 4 seconds before the system turns off. Select Instant Off if you want the system to instantly power off when the Power Button is pressed. The options are 4 Seconds Override and **Instant Off.**

Restore on AC Power Loss

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

DeepSx Power Policies

Select Enabled to enable Deep Sleep State support. The settings are Enabled and **Disabled.**

▶Processor and Clock Options

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

CPU Configuration

This item is for informational purposes only and displays CPU configuration information including type, frequency, data cache, etc.

Clock Spread Spectrum

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

Hardware Prefetcher (Available when supported by the CPU)

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

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

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

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

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

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

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

Intel® AES-NI

Set to Enabled to use the processor's Advanced Encryption Standard (AES) feature. The options are Enabled and **Disabled**.

Intel® Hyper Threading Technology

Set to Enabled to use the processor's Hyper Threading Technology feature. The options are **Enabled** and Disabled.

Active Processor Cores

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

Power Technology

This feature determines what power-saving scheme the motherboard uses. The options are Disable, **Energy Efficient** and Custom. If Custom is selected, the following options become available:

EIST

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

CPU C3 Report, CPU C6, Report, CPU C7 Report

This BIOS feature enables or disables C3 (ACPI C2), C6 (ACPI C3) and C7 (ACPI C3) reporting to the operating system. The options are Disabled and **Enabled**.

C1E

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

▶**Turbo Boost Technology**

Turbo Mode

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

Long duration power limit - this is the processor power consumption limit (in Watts) during a long duration time window.

Long duration maintained - this is the time in milliseconds where the Long Duration Power Limit is maintained.

Short duration power limit - during Turbo Mode, the system may exceed the processor's default power setting and exceed the Short Duration Power limit. By increasing this value, the processor can provide better performance for a short duration.

▶**Chipset Configuration**

⚠ **WARNING:** Setting the wrong values in the following sections may cause the system to malfunction.

▶**CPU Bridge Configuration**

This item displays the current processor configuration, including the frequency and memory type.

Memory Frequency

Use this option to force the system memory to run at a different frequency than the default frequency. The available options are **Auto**, Force DDR-1066, Force DDR-1333, and Force DDR3-1600.

▶**Integrated IO Configuration**

This item displays the current IO chipset Revision.

Intel® VT-d

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

Active State Power Management

Set this item to the desired ASPM (Active State Power Management) level. The options are **Disabled,** Auto, and Force L0s.

PCIe Maximum Read Request

This feature selects the setting for the PCIE maximum Read Request size. The options are **Auto,** 128 Bytes**,** 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes**.**

PCI Express Port

This feature enables or disables the PCI Express port. The options are Disabled, Enabled and **Auto.**

PCI Express Port - Gen X

This feature selects the speed of the PCI Express port. The options are **Auto**, Gen1, Gen2, and Gen3.

▶**South Bridge Configuration**

This item displays the current South Bridge Revision.

USB Functions

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

USB 3.0 Functions

This feature allows the user to decide the number of onboard USB 3.0 ports to be enabled. The Options are: Disabled and **Enabled**.

Legacy USB Support

This feature enables support for legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disable to have USB devices available only for EFI applications. The options are **Enabled,** Disabled and Auto.

Port 60/64 Emulation

This feature enables I/O port 60h/64h emulation support. This should be enabled for complete USB keyboard legacy support for non-USB aware Operating Systems. The options are **Enabled,** and Disabled.

BIOS EHCI Hand-Off

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

▶**IDE/SATA Configuration**

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

SATA Mode

This item selects the mode for the installed drives. The options are Disabled, IDE Mode, **AHCI Mode** and RAID Mode. The following are displayed depending on your selection:

IDE Mode

The following items are displayed when IDE Mode is selected:

Serial ATA Port 0~5

This item displays the information detected on the installed SATA drives on the particular SATA port.

AHCI Mode

The following items are displayed when AHCI Mode is selected:

Aggressive Link Power Management

This feature Enables or Disables Aggressive Link Power Management support for Cougar Point B0 stepping and later. The options are **Enabled** and Disabled.

Serial ATA Port 0~5 Hot Plug

Set this item to Enabled to enable hot-plugging for the particular port. The options are **Enabled** and Disabled.

Serial ATA Port 0~5 Staggered Spin Up

Set this item to Enabled to enable Staggered Spin-up support. The options are Enabled and **Disabled**.

RAID Mode

The following items are displayed when RAID Mode is selected:

Serial ATA Port 0~5 Hot Plug

Set this item to Enabled to enable hot-plugging for the particular port. The options are **Enabled** and Disabled.

▶PCIe/PCI/PnP Configuration

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

PCI Latency Timer

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

Above 4G Decoding

Set this item to Enabled to activate 64-bit capable devices to be decoded above the 4G address space. This works only if the system supports 64-bit PCI decoding. The options are Enabled and **Disabled**.

Onboard LAN Option ROM Select

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

Load Onboard LAN1 Option ROM / Load Onboard LAN2 Option ROM

This feature is to enable or disable the onboard option ROMs. The default for LAN 1 is **Enabled**. The default for LAN 2 is **Disabled**.

Boots Graphic Adapter Priority

This option allows the user to specify which graphics controller to be used as the primary boot device. The options are Onboard and **Offboard**.

▶Super IO Configuration

Serial Port 1

Select Enabled to enable the onboard serial port. The options are **Enabled** and Disabled.

Serial Port 1 Settings

This option specifies the base I/O port address and the Interrupt Request address of the serial port. The options for Serial Port 1 are listed below.

Auto,

IO=3F8h; IRQ=4;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

Serial Port 2

Select Enabled to enable the onboard serial port. The options are **Enabled** and Disabled.

Serial Port 2 Settings

This option specifies the base I/O port address and the Interrupt Request address of the serial port. The options for Serial Port 2 are listed below.

Auto,

IO=2F8h; IRQ=3;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

▶Serial Port Console Redirection

These submenus allow the user to configure Console Redirection settings.

COM 1, COM2, SOL

Console Redirection

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and Disabled. (The default setting for COM1 and COM2 is **Disabled**. The default setting for SOL is **Enabled**.)

▶Console Redirection Settings

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

Terminal Type

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

Bits Per Second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

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

Putty Keypad

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

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

This item allows the user to configure Console Redirection settings to support Out-of-Band Serial Port management.

Console Redirection (for EMS)

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

▶Console Redirection Settings (for EMS)

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

Out-of-Band-Mgmt Port

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

Terminal Type

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

Bits Per Second

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

Flow Control

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

▶Hardware Health Configuration

Fan Speed Control Mode

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select "Full Speed" to allow the onboard fans to run at full speed (of 100% Pulse Width Modulation Duty Cycle) for maximum cooling. This setting is recommended for special system configuration or debugging. Select "Standard" for the onboard fans to run at 50% of the Initial PWM Cycle in order to balance the needs between system cooling and power saving. This setting is recommended for regular systems with normal hardware configurations. The options are Full Speed (@100% of PWM Cycle), and **Standard** (@50% of PWM Cycle).

CPU Temperature

The CPU temperature status displays as follows:

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

User intervention: No action required.

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

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

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

The 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 / Peripheral Temperature

This feature displays the system and peripheral device temperatures, as detected by the motherboard sensors.

Fan 1 ~ Fan 5 Speed

This feature displays the fan speed readings from fan interfaces Fan1 through Fan5.

VCORE, 12V, VDIMM, 5VCC, -12V, AVCC, 3.3VCC, VSB, VBAT

This feature displays the current voltages of the above voltage monitors.

▶ACPI Settings

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

High Precision Event Timers

Select Enabled to activate the High Performance Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the de-

pendency 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.

Suspend Mode

This setting allows you to configure the ACPI (Advanced Configuration and Power Interface) sleep state for your system when it is in the Suspend mode. The options are Suspend Disabled, and **S1 (POS)**.

WHEA Support

This feature Enables the Windows Hardware Error Architecture (WHEA) support for the Windows 2008 operating system (and later versions). The options are **Enabled** and Disabled.

▶PCH-FW Configuration

This item displays the Management Engine subsystem information and parameters.

MDES BIOS Status Code

This item enables the MDES BIOS status code. The options are **Disabled** and Enabled.

▶Firmware Update Configuration

Me FW Image Re-Flash

Use this item to enable the ME image re-flash function. The options are **Disabled** and Enabled.

▶Intel ICC

Use this feature to configure Integrated Clock Control (ICC) options.

Use Watchdog Timer for ICC

This feature enables watchdog timer operation for ICC. If set to Enabled, watchdog timer will be started after ICC-related changes. This watchdog timer will detect platform instability caused by wrong clock settings. The options are **Disabled** and Enabled.

Turn off unused PCI/PCIe clocks

When set to Disabled, all unused PCI/PCIe clocks will remain turned on. When set to Enabled, clocks for empty PCI/PCIe slots will be turned off to save power. Changes will take effect at next system boot. The options are **Enabled** and Disabled.

Lock ICC registers

When set to All registers, all ICC registers will be locked. When set to Static only, only static ICC registers will be locked. The options are All registers and **Static only**.

7-4   Event Logs

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Main  Advanced  Event Logs  IPMI  Boot  Security  Save & Exit

▶ Change Smbios Event Log Settings                    Press <Enter> to change the
                                                      Smbios Event Log configuration.
  View Smbios Event Log




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



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```

▶Change SmBIOS Event Log Settings

Smbios Event Log

Change this item to enable or disable all features of the Smbios Event Logging during boot. The options are **Enabled** and Disabled.

Erase Event Log

This option erases all logged events. The options are **No**, Yes, Next reset and Yes, Every reset.

When Log is Full

This option automatically clears the Event Log memory of all messages when it is full. The options are **Do Nothing** and Erase Immediately.

Log System Boot Event

This option toggles the System Boot Event logging to enabled or disabled. The options are **Disabled** and Enabled.

MECI

The Multiple Event Count Increment (MECI) counter counts the number of times a duplicate event must happen before the MECI counter is incremented. This is a numeric value. The default value is **1**.

METW

The Multiple Event Time Window (METW) defines number of minutes must pass between duplicate log events before MECI is incremented. This is in minutes, from 0 to 99. The default value is **60**.

Log OEM Codes

Use this item to enable the logging of EFI Status Codes as OEM Codes. The options are Disabled and **Enabled**.

Convert OEM Codes

Set this item to enabled to convert EFI Status Codes to standard Smbios Types. The options are **Disabled** and Enabled.

View SmBIOS Event Log

This feature displays the contents of the SmBIOS Event Log.

7-5   IPMI Settings

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

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
      Main  Advanced  Event Logs  IPMI  Boot  Security  Save & Exit

   IPMI Firmware Revision          1.61                      Press <Enter> to
   IPMI STATUS                     Working                   change the SEL event
 ▶ System Event Log                                          log configuration.
 ▶ BMC network configuration




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



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```

▶**System Event Log**

This feature is used to change the System Event Log (SEL) configuration.

SEL Components - Change this item to enable or disable all features of System Event Logging. The options are Enabled and **Disabled**. When Enabled, the following can be configured:

Erase SEL - This option erases all logged SEL events. The options are **No**, Yes, On Next reset and Yes, On Every reset.

When SEL Full

This option automatically clears the System Event Log memory of all messages when it is full. The options are **Do Nothing** and Erase Immediately.

Log EFI Status Codes

This option enables or disables the logging of Extensible Firmware Interface (EFI) status codes. The options are Disabled, **Both**, Error code, and Progress code.

▶**BMC Network Configuration**

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

Update IPMI LAN Configuration

This feature allows the user to decide if the BIOS should configure the IPMI setting at next system boot. The options are **No** and Yes. If the option is set to Yes, the user is allowed to configure the IPMI settings at next system boot.

Configuration Source

This feature selects whether the IP address, Subnet Mask and Gateway Address are automatically assigned by the network's DHCP server (Dynamic Host and Configuration Protocol) "Dynamic" or manually entered by the user "Static". When Dynamic is selected, all the options below are automatically assigned to the system by itself or by an external DHCP server. If Static is selected, the IP Address, Subnet Mask and Gateway Address must be manually entered below. The options are Static, Dynamic, and **Do Nothing**.

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

Current Subnet Mask - Subnet masks tell the network which subnet this machine belongs to. The value of each three-digit number separated by dots should not exceed 255.

Current MAC Address - 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).

Current Gateway IP Address - Enter the Gateway or Router address (i.e., 192.168.10.1).

7-6   Boot Settings

Use this feature to configure Boot Settings.

```
             Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
      Main  Advanced  Event Logs  IPMI  Boot  Security  Save & Exit

    Setup Prompt Timeout                    1                          Number of seconds to
    Retry Boot Devices                      [Disabled]                 wait for setup
    Boot option filter                      [UEFI and Legacy]          activation key.
    Fast Boot                               [Disabled]                 65535(0xFFFF) means
                                                                       indefinite waiting.
    Boot Option Priorities
    Boot Option #1                          [IBA GE Slot 0200 v1365]
    Boot Option #2                          [UEFI: Built-in EFI Shell ]

    Network Device BBS Priorities

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

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```

Setup Prompt Timeout

Use this feature to enter the number of seconds to wait for setup activation key. The default setting is **1** second.

Retry Boot Devices

When set to Enabled, the BIOS will continuously retry to boot from a legacy device. The options are **Disabled** and Enabled.

Boot Option Filter

Use this feature to determine which items the system can boot to. The options are **UEFI and Legacy**, UEFI only, and Legacy only.

Fast Boot

This feature enables boot with initialization of a minimal set of devices required to launch active boot option. The options are **Disabled** and Enabled.

Boot Options Priorities

This feature allows the user to specify which devices are boot devices and the order of priority from which the systems boots during startup.

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

The settings are [**any detected boot device**] and Disabled.

Network Device BBS Priorities

This option sets the order of the legacy network devices detected by the motherboard.

7-7   Security Settings

```
                    Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
    Main   Advanced   Event Logs  IPMI  Boot  Security  Save & Exit

    Password Description                                          Setup: Check
                                                                  password while
    If ONLY the Administrator's password is set,                 invoking setup.
    then this only limits access to Setup and is                 Always: Check
    only asked for when entering Setup.                          password while
    If ONLY the User's password is set, then this                invoking setup as
    is a power on password and must be entered to                well as on each boot.
    boot or enter Setup. In Setup the User will
    have Administrator rights.
    The password length must be
    in the following range:
    Minimum length                      3
    Maximum length                      20
                                                                 ↔: Select Screen
                                                                 ↑↓: Select Item
    Password Check                      [Setup]                  Enter: Select
    Administrator Password                                       +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
    UEFI Secure Boot Management                                  F3: Optimized Defaults
    Secure Boot control                 [Enabled]                F4: Save & Exit
  ▶ Secure Boot Policy                                           ESC: Exit
  ▶ Key Management


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```

- If the Administrator password is defined ONLY - this controls access to the BIOS setup ONLY.

- If the User's password is defined ONLY - this password will need to be entered during each system startup or boot, and will also have Administrator rights in the setup.

- Passwords must be at least 3 and up to 20 characters long.

Password Check

Use this feature to determine when a password entry is required. Select Setup to require the password only when entering setup. Select Always to require the password when entering setup and on each boot. The options are **Setup** and Always.

Administrator Password

Press Enter to create a new, or change an existing Administrator password.

Secure Boot Control

Use this item to secure boot flow control. Secure boot is possible only if the system runs in User Mode. The options are **Enabled** and Disabled.

▶Secure Boot Policy

Use this feature to configure the extended options for Secure Boot mode.

Internal FV

Use this item to determine whether or not to load an image from the above device path in the event of a security violation. The current available option is **Always Execute**.

Option ROM, Removable Media, Fixed Media

Use this item to determine whether or not to load an image from the above device paths in the event of a security violation. The options are Always Execute, Always Deny, Allow Execute, Defer Execute, **Deny Execute**, and Query User.

▶Key Management

Use this feature to configure key management options for the following items:

Platform Key (PK)

Set PK from File: This item launches the Filebrowser to set the Platform Key from file.

Get PK to File: This item stores the existing Platform key to file name PK in selected filesystem's root.

Delete the PK: Deletes the Platform Key

Key Exchange Key Database (KEK)

Set KEK from File: This item launches the Filebrowser to set the Key Exchange Key Signature Database from file.

Get KEK to File: This item stores the existing Key Exchange Key Signature Database to file name KEK in selected filesystem's root.

Delete the KEK: Deletes the Key Exchange Key Signature Database.

Append an entry to KEK: This item launches the Filebrowser to append the Key Exchange Key Signature Database entry from file.

Authorized Signature Database (DB)

Set DB from File: This item launches the Filebrowser to set the Authorized Signature Database from file.

Get DB to File: This item stores the existing Authorized Signature Database to file name DB in selected filesystem's root.

Delete the DB: Deletes the Authorized Signature Database.

Append an entry to DB: This item launches the Filebrowser to append the Authorized Signature Database entry from file.

Forbidden Signature Database (DBX)

Set DBX from File: This item launches the Filebrowser to set the Forbidden Signature Database from file.

Get DBX to File: This item stores the existing Forbidden Signature Database to file name DB in selected filesystem's root.

Delete the DBX: Deletes the Forbidden Signature Database.

Append an entry to DBX: This item launches the Filebrowser to append the Forbidden Signature Database entry from file.
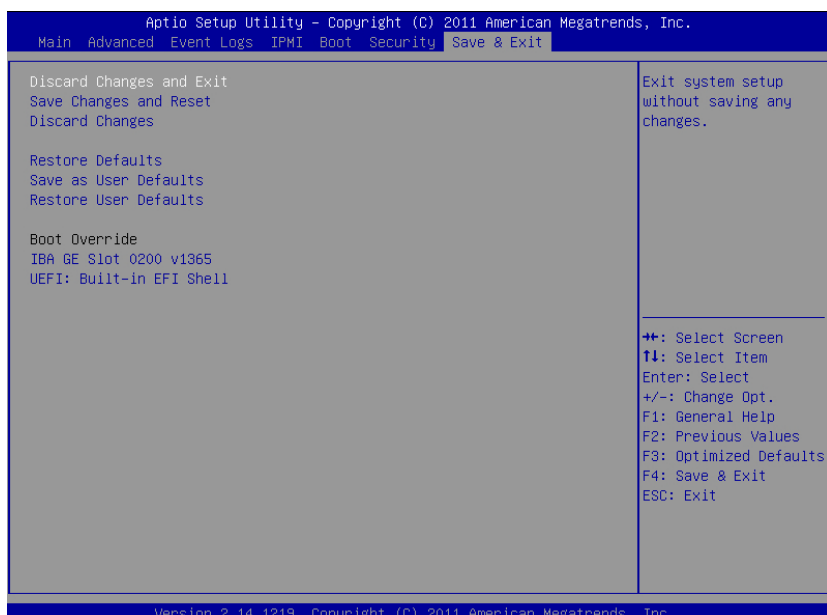
Manage All Factory Keys (PK, KEK, DB, DBX)

Install Factory Defaults

This item restores all Secure Boot Mode options to the factory defaults.

7-8   Save & Exit

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

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Main  Advanced  Event Logs  IPMI  Boot  Security  Save & Exit

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

  Restore Defaults
  Save as User Defaults
  Restore User Defaults

  Boot Override
  IBA GE Slot 0200 v1365
  UEFI: Built-in EFI Shell

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

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```

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>.

Save Changes and Reset

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

Discard Changes

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

Restore Defaults

To set this feature, select Restore Defaults from the Exit menu and press <Enter>. These are factory settings designed for maximum system stability, but not for maximum performance.

Save As User Defaults

To set this feature, select Save as User Defaults from the Exit menu and press <Enter>. This enables the user to save any changes to the BIOS setup for future use.

Restore User Defaults

To set this feature, select Restore User Defaults from the Exit menu and press <Enter>. Use this feature to retrieve user-defined settings that were saved previously.

Boot Override

Listed on this section are other boot options for the system (i.e., Built-in EFI shell). Select an option and press <Enter>. Your system will boot to the selected boot option. This is a one-time override.

Notes

Appendix A

BIOS Error Beep 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 with bootup. The error messages normally appear on the screen.

Fatal errors will not allow the system to continue to bootup. 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.

A-1   BIOS Error Beep Codes

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
5 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
Single Intel Xeon E3-1200 Gen 2 Core i3 processor in an LGA 1155 socket
Note: Please refer to our web site for a complete listing of supported processors.

Chipset
Intel C216 chipset

BIOS
32 Mb Award® SPI Flash ROM

Memory Capacity
Eight DIMM sockets support up to 32GB of 1600/1333 MHz ECC/Non-ECC DDR3 DIMMs in four memory slots (UDIMMs)
See the memory section in Chapter 5 for details.

SATA
Intel on-chip controllers support six SATA ports (two SATA 3.0 ports and four SATA 2.0 ports) (RAID 0, 1 5 and 10 supported)

Drive Bays
Four hot-swap drive bays to house four SATA drives

Serverboard
X9SPU-F (WIO form factor)
Dimensions: 8.15" x 13.05" in (207 x 331 mm)

Chassis
SC815TQ-R500B Form Factor: 1U rackmount
Dimensions: (WxHxD) 17 x 1.7 x 25.6 in. (432 x 43 x 650 mm)

Weight
43 lbs. (19.5 kg.)

System Cooling
Four 4-cm heavy-duty counter-rotating fans

System Input Requirements
AC Input Voltage: 100-240V AC auto-range
Rated Input Current: 6.1A - 2.6A
Rated Input Frequency: 50 to 60 Hz

Power Supply
Rated Output Power: 500W (Part# PWS-501P-1R)
Rated Output Voltages: +12V (41.7A), +5Vsb (4A)

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: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

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

Notes

(continued from front)

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