# SUPER●®

## SUPERSERVER

## 5017P-TLN4F
## 5017P-TF

## USER'S MANUAL

1.0

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# Preface

## About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 5017P-TLN4F/TF. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 5017P-TLN4F/TF is a high-end server based on the SC504-203B rackmountable chassis and the X9SPV-LN4F/F-3610ME single processor serverboard.

## Manual Organization

### Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X9SPV-LN4F/F-3610ME serverboard and the SC504-203B chassis.

### Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 5017P-TLN4F/TF 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 5017P-TLN4F/TF.

**Chapter 5:  Advanced Serverboard Setup**

Chapter 5 provides detailed information on the X9SPV-LN4F/F-3610ME serverboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

**Chapter 6:  Advanced Chassis Setup**

Refer to Chapter 6 for detailed information on the SC504-203B server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SAS/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**

**Notes**

# Table of Contents

# Chapter 1

# Introduction

## 1-1   Overview

The SuperServer 5017P-TLN4F/TF is a mini server comprised of two main sub-systems: the SC504-203B 1U chassis and the X9SPV-LN4F/F-3610ME single processor motherboard. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

In addition to the motherboard and chassis, various hardware components have been included with the 5017P-TLN4F/TF, as listed below:

- One riser card bracket (MCP-120-00063-0N)

- One riser card (RSC-RR1U-E16)

- One CD containing drivers and utilities

- One rackmount kit (MCP-290-00053-0N)

- SuperServer 5017P-TLN4F/TF User's Manual

## 1-2    Motherboard Features

The SuperServer 5017P-TLN4F/TF is built around the X9SPV-LN4F/F-3610ME, a single processor motherboard based on the Intel QM77 chipset and designed to provide maximum performance. Below are the main features of the X9SPV-LN4F/F-3610ME. (See Figure 1-1 for a block diagram of the chipset).

### Processors

The X9SPV-LN4F/F-3610ME supports a single Intel® Core i7 Mobile ECC processor. Please refer to the motherboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

### Memory

The X9SPV-LN4F/F-3610ME has two SO-DIMM slots that can support up to 16 GB of unbuffered DDR3-1333/1066/800 memory. See Chapter 5 for details.

### Serial ATA

A SATA controller is also integrated into the chipset to provide two SATA 3.0 (6/Gbps) and four SATA 2.0 (3 Gbps) ports. That SATA 3.0 ports are RAID 0 and 1 supported and the SATA 2.0 ports are RAID 0, 1, 5 and 10 supported. The SATA drives are hot-swappable units.

### PCI Expansion Slots

The X9SPV-LN4F/F-3610ME has one PCI-E 3.0 x16 slot.

### Rear I/O Ports

The color-coded I/O ports include one COM port, a combination mouse/keyboard port, a VGA port, two USB 2.0 ports, four 1 Gb Ethernet ports and a dedicated IPMI LAN port. In addition, the X9SPV-LN4F includes two extra Gb LAN ports.

# 1-3    Server Chassis Features

The SC504-203B is an ATX form factor chassis designed to be used in a 1U rack-mount configuration. The following is a general outline of the main features of the SC504-203B server chassis.

### System Power

The SC504-203B features a single 200W power supply. Power must be removed from the system and the AC power cord removed when replacing. See Chapter 6 for details.

### Hard Drive Subsystem

Either two 3.5" internal drive or four 2.5" internal drives (with a 2.5" HDD bracket) are supported by the system. These are not hot-swap drives.

### Front Control Panel

The control panel on the SC504-203B  provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity, system information and power supply failure. A main power button and a system reset button are also included.

**Figure 1-1. Intel QM77 Chipset:
System Block Diagram**

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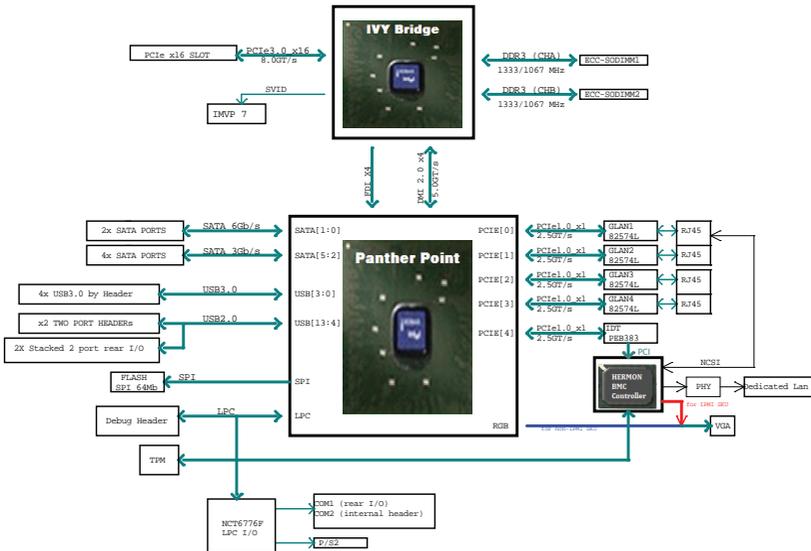
## 1-4   Contacting Supermicro

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**Notes**

# Chapter 2

# Server Installation

## 2-1    Overview

This chapter provides a quick setup checklist to get your SuperServer 5017P-TLN4F/TF  up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

## 2-2    Unpacking the System

You should inspect the box the SuperServer 5017P-TLN4F/TF 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 SuperServer 5017P-TLN4F/TF. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

## 2-3    Preparing for Setup

The box the SuperServer 5017P-TLN4F/TF  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 any hot plug drives and power supply modules to cool before touching them.

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

## Rack Mounting Considerations

### *Ambient Operating Temperature*

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

### *Reduced Airflow*

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

### *Mechanical Loading*

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

### *Circuit Overloading*

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

### *Reliable Ground*

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

## 2-4    Installing the System into a Rack

This section provides information on installing the SC504 chassis into a rack unit. 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.

### Installing the Chassis into a Standard Rack

1.  Confirm that chassis includes the four mounting screws required to mount the chassis into a rack

2.  Align the thru holes of the chassis with the thru holes of the rack.

3.  Insert the mounting screws into the thru holes in the front of the chassis and through the thru holes in the rack and secure.

**Figure 2-1.  Installing the Chassis into a Rack**
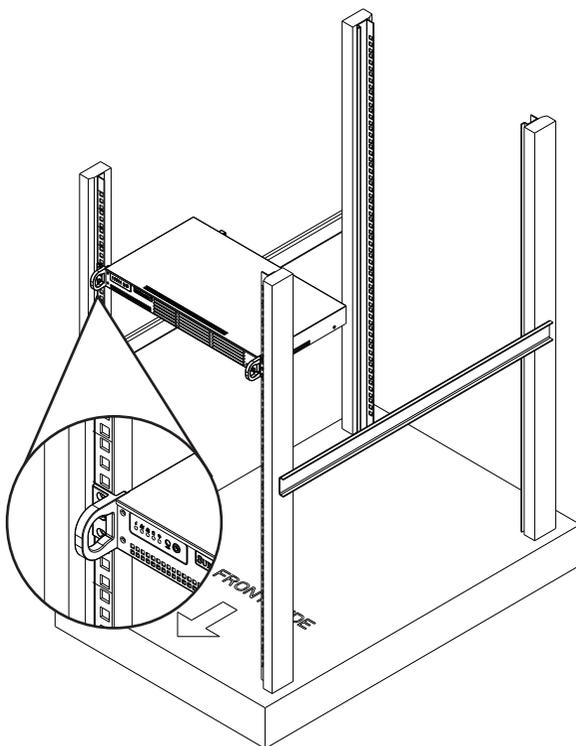
### Telco Rack

The SC504 supports Telco Rack installation. The SC504 chassis' compact design allows the it to be installed into a Telco rack without the use of rails.
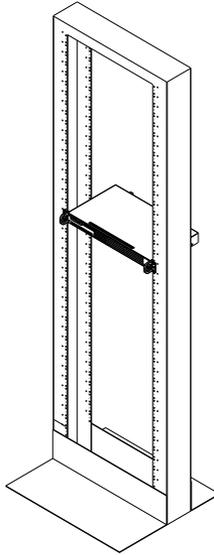


**Figure 2-2.  Installing the Chassis into a Telco Rack**

### Installing the Chassis into a Telco Rack

1.  To install the chassis into a Telco style two-post rack, use two L-shaped brackets on either side of the chassis (four total).

2.  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.

3.  If a bezel is included on your chassis, 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.

4.  Finish by sliding the chassis into the rack and tightening the brackets to the rack.

**Note:** the figures are for illustrative purposes only. Always install chassis starting from the bottom of the rack and working up.

# Notes

# Chapter 3

# System Interface

## 3-1   Overview

There are several LEDs on the control panel as well as others on the drive carriers to keep you constantly informed of the overall status of the system and the activity and health of specific components. There are also two buttons on the chassis control panel.

## 3-2   Control Panel Buttons

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

RESET



**Reset**

Use the reset button to reboot the system.



**Power**

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

## 3-3   Control Panel LEDs

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

### Power Fail

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

| Informational LED | |
|---|---|
| **Status** | **Description** |
| Continuously on and red | An overheat condition has occured. (This may be caused by cable congestion.) |
| Blinking red (1Hz) | Fan failure, check for an inoperative fan. |
| Blinking red (0.25Hz) | Power failure, check for a non-operational power supply. |
| Solid blue | Local UID has been activated. Use this function to locate the server in a rack mount environment. |
| Blinking blue (300 m/s) | Remote UID is on. Use this function to identify the server from a remote location. |

### NIC1

Indicates network activity on the LAN1 port when flashing.

### NIC2

Indicates network activity on the LAN2 port when flashing.

**HDD**

On the SuperServer 5017P-TLN4F/TF, this LED indicates SATA drive activity when flashing.

**Power**

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

## 3-4    Drive Carrier LEDs

Each drive carrier has two LEDs:

- **Green:** When illuminated, the green LED on the SATA 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. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

- **Red:** When this LED flashes it indicates the drive is rebuilding. When solid on it indicates a SATA 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.

# Notes

# Chapter 4

# System Safety

## 4-1    Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 5017P-TLN4F/TF  from damage:

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

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

- Power should always be disconnected from the system when removing or install-ing main system components, such as the serverboard and memory modules. 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 neces-sary.

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

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

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

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

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

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

## 4-2    General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the 5017P-TLN4F/TF  clean and free of clutter.

- The 5017P-TLN4F/TF weighs approximately 12 lbs (5.4 kg.) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

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

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

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

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

## 4-3    ESD Precautions



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

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

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

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

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

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

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

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

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

## 4-4    Operating Precautions



Care must be taken to assure that the chassis cover is in place when the 5017P-TLN4F/TF  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
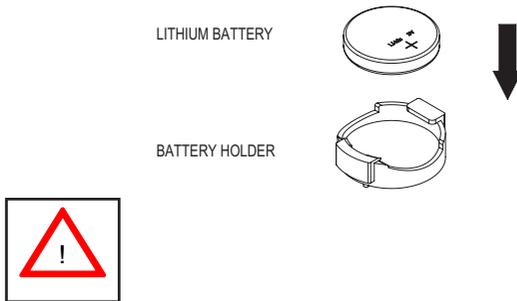


Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency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

# Chapter 5

# Advanced Motherboard Setup

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

## 5-1  Handling the Motherboard

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the 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 electric static discharge.

### Precautions

- Use a grounded wrist strap designed to prevent ESD.

- Touch a grounded metal object before removing boards from antistatic bags.

- 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.

### Unpacking

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

## 5-2    Connecting Cables

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

### Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-10 for connector locations.)

- SATA drive data cables (I-SATA1 ~ I-SATA3)

- Control Panel cable (JF1)

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

### Connecting Power Cables

The X9SPV-LN4F/F-3610ME has a 24-pin primary power supply connector (JPW1) for connection to the ATX power supply. See Section 5-8 for power connector pin definitions.

### Connecting the Control Panel

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

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

**Figure 5-1. Control Panel Header Pins**

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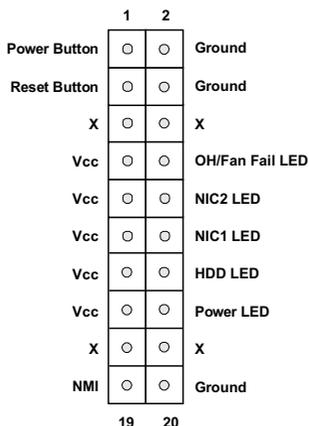
## 5-3    Rear I/O Ports

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

**Figure 5-2. Rear I/O Ports**
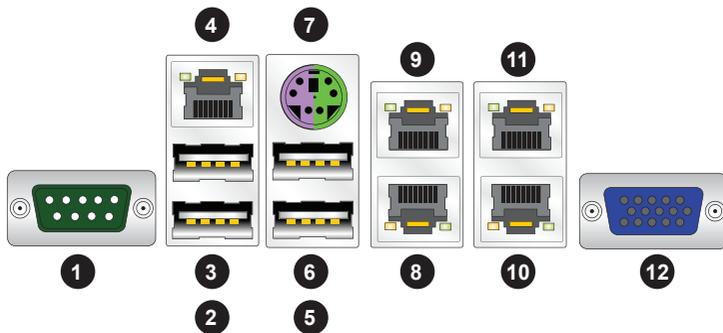
| Rear I/O Ports | | | |
|---|---|---|---|
| 1 | COM Port 1 | 7 | PS/2 Keyboard/Mouse |
| 2 | USB Port 5 | 8 | Gb LAN Port 2 |
| 3 | USB Port 4 | 9 | Gb LAN Port 1 |
| 4 | Dedicated IPMI LAN Port | 10 | Gb LAN Port 4 (X9SPV-LN4F only) |
| 5 | USB Port 9 | 11 | Gb LAN Port 3 (X9SPV-LN4F only) |
| 6 | USB Port 8 | 12 | VGA Port |

5-3

## 5-4    Onboard Processor and Heatsink

The X9SPV-LN4F/F-3610ME features an embedded Intel Core i7 Mobile ECC processor with an FCBGA 1023 package.

## 5-5    Installing Memory

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

**Note**: Check the Supermicro website for a list of memory modules that have been validated with the X9SPV-LN4F/F-3610ME motherboard.

### How to Install SO DIMMs

1.   Insert the desired number of SO DIMMs into the memory slots, starting with DIMMA1, then DIMMB1. Pay attention to the notch along the bottom of the module to prevent incorrect DIMM module installation.

2.   Insert each SO DIMM module vertically and snap it into place. Repeat step 1 to install DIMMB1 if needed. See instructions on the next page.

### Memory Support

The X9SPV-LN4F/F-3610ME motherboard supports up to 16GB of DDR3 ECC SODIMMs (1333/1066/800 MHz in 2 SODIMM slots).

## 5-6    Adding PCI Add-On Cards

The 5017P-TLN4F/TF can accommodate a single full-height, half-length add-on (expansion) card.

*Installing an Add-on Card*

1.   Begin by removing the shield for the PCI slot where the riser card is located.

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

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

## The SO DIMM Socket

Position the SO DIMM module's bottom key so it aligns with the receptive point on the slot. Take note of the module's side notches and the locking clips on the socket.

**Align**
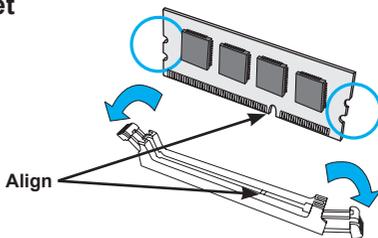
Insert the SO DIMM module straight down.
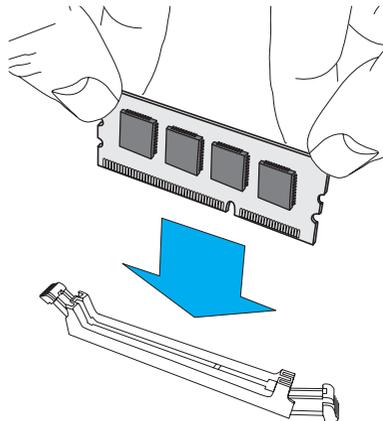
Press down until the module locks into place. The side clips will automatically secure the SO DIMM module, locking it into place.
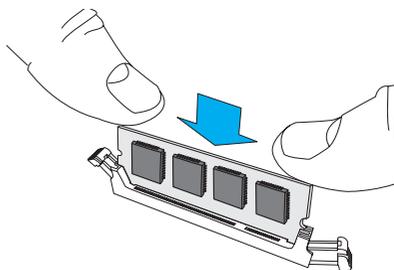
**To Remove:**
Use your thumbs to gently push the side clips near both ends away from the module. This should release it from the slot. Pull the SO DIMM module upwards.
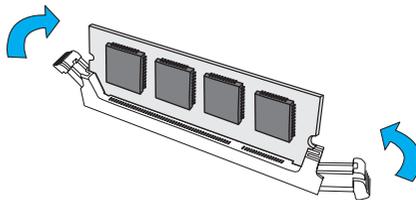
# 5-7   Motherboard Details

**Figure 5-4. X9SPV-LN4F/F-3610ME Layout**
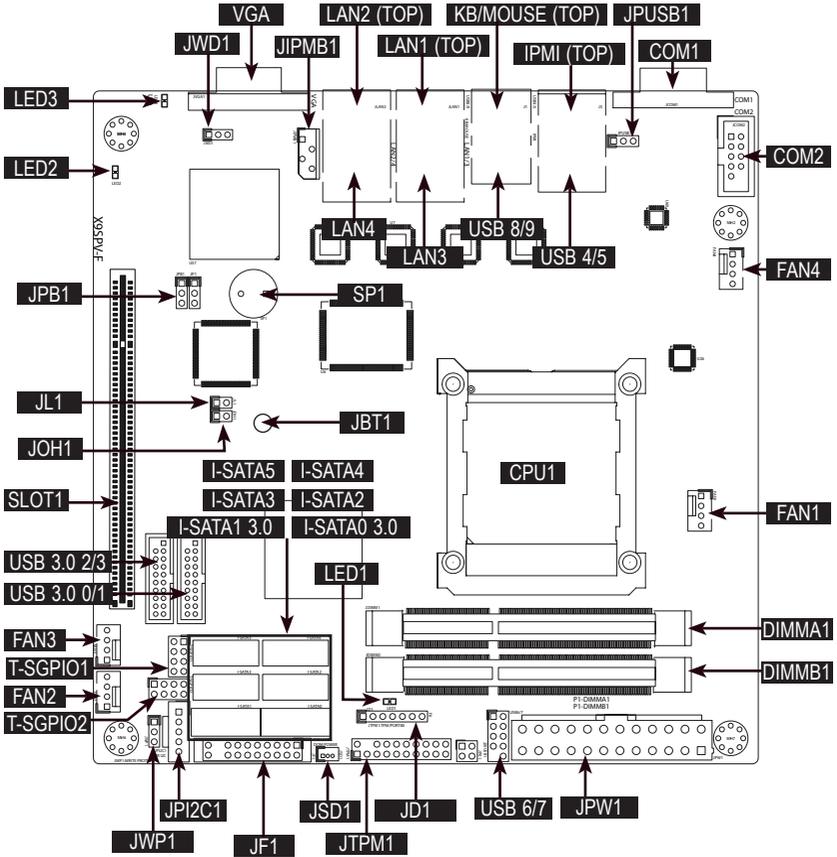


**Notes**

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

- Jumpers not indicated are for test purposes only.

## X9SPV-LN4F/F-3610ME Quick Reference

| Connector | Description |
|---|---|
| LED1 | Standby Power LED |
| LED2 | IPMI Heartbeat LED (X9SPV-F only) |
| LED3 | Unsupported Memory LED |
| SLOT1 | PCI-E x16 Gen 2 Slot |
| JL1 | Chassis Intrusion Header |
| JOH1 | Overheat LED |
| USB 0/1, USB 2/3 | USB 3.0 Headers |
| USB 6/7 | USB 2.0 Header |
| USB 4/5, USB 8/9 | Backpanel USB Ports |
| FAN1~4 | CPU Fan, System Fan and Auxilliary Fan Headers |
| T-SGPIO1, T-SGPIO2 | Serial General Purpose I/O Headers |
| JPI2C1 | JPI2C, PWR supply (I2C) System Management Bus |
| JF1 | Front Panel Control Header |
| JSD1 | DOM (Disk on Module) Power Connector |
| JTPM1 | TPM Header |
| SP1 | Onboard Speaker/Buzzer |
| JD1 | Power LED/Speaker Header |
| I-SATA1~I-SATA6 | SATA Ports (White connectors: SATA 3, Black: SATA 2) |
| JPW1 | 24-Pin ATX Power Connector |
| DIMMA1, DIMMB1 | SODIMM Memory Sockets |
| COM1, COM2 | Serial Ports (COM1: Backpanel, COM2 Onboard Header) |
| IPMI | IPMI Port (X9SPV-F only) |
| KB/MOUSE | Combination PS/2 Keyboard or Mouse Port |
| LAN1, LAN2 | LAN1, LAN2 Gb Ethernet Ports |
| LAN3, LAN4 | LAN3, LAN4 Gb Ethernet Ports (X9SPV-LN4 only) |
| VGA | VGA Port |
| JIPMB1 | 4-pin External BMC I2C Header (for an IPMI card) |
| CPU1 | CPU / Processor |

| Jumper | Description | Default Setting |
|---|---|---|
| JPB1 | BMC (IPMI) Enable/Disable | Pins 1-2 (Enabled) |
| JBT1 | CMOS Clear | See Section 5-9 |
| JWD1 | Watch Dog Timer | Pins 1-2 (Reset) |
| JWP1 | BIOS Write Protect | Pins 1-2 (Enabled) |
| JPUSB1 | USB Wake-up | Pins 1-2 (Enabled) |

## 5-8  Connector Definitions

### Power Connectors

The 24-pin power connector is used to provide power to the motherboard. This connector meets the SSI EPS 12V specification. See the tables on the right for pin definitions.

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

**NC = No Connection**

### Power Button

The Power On connection is on pins 1 and 2 of JF1. These should be connected to the chassis power button. See p. 5-4 and the table on the right for pin definitions.

| Power Button Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 1 | Power Signal |
| 2 | Ground |

### Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See p. 5-4 and the table on the right for pin definitions.

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

### Overheat (OH)/Fan Fail LED

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

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

**NIC2 LED**

The LED connections for LAN2 are on pins 9 and 10 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

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

**NIC1 LED**

The LED connections for LAN1 are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

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

**HDD LED**

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a hard drive LED cable here to display disk activity (for any hard drive activities on the system, including Serial ATA and IDE). See the table on the right for pin definitions.

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

**Power On LED**

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

| Power LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 15 | +3.3V |
| 16 | Control |

**NMI Button**

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

| NMI Button Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 19 | Control |
| 20 | Ground |

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

**Ethernet Ports**

Four Ethernet ports are located on the I/O backplane. A dedicated IPMI LAN port is also included to provide KVM support for IPMI 2.0. These ports accept RJ45 type cables.

**Fan Headers**

There are three fan headers on the motherboard, all of which are 4-pin fans (Fan 1-Fan 8). Pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans. (Fan speed control is supported with 4-pin fans only.) See the table on the right for pin definitions. The onboard fan speeds are controlled by IPMI.

| Fan Header Pin Definitions | |
|---|---|
| Pin# | Definition |
| 1 | Ground (Black) |
| 2 | +12V (Red) |
| 3 | Tachometer |
| 4 | PWR Modulation |

**Chassis Intrusion**

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

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

**Serial Ports**

Two serial ports are included on the motherboard. COM1 is a backpanel port and COM2 is a header located just behind COM1 to provide front access support. See the table on the right for pin definitions.

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

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

**Internal Speaker**

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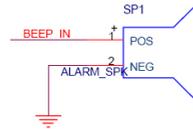


**Universal Serial Bus (USB)**

Four Universal Serial Bus ports (USB 4/5, 8/9) are located on the I/O back-panel. Additionally, one USB 2.0 header (USB 6/7) and two USB 3.0 headers (USB 0/1, 2/3) are also located on the motherboard to provide front chassis access (cables are not included.) See the tables on the right for pin definitions.

| Back Panel USB Type A USB 10 Pin Definitions | | | |
|---|---|---|---|
| Pin# | Definition | Pin# | Definition |
| 1 | +5V | 5 | +5V |
| 2 | USB_PN | 6 | USB_PN |
| 3 | USB_PP | 7 | USB_PP |
| 4 | Ground | 8 | Ground |

| Front Panel USB 2.0 Pin Definitions | | | |
|---|---|---|---|
| Pin # | Definition | Pin # | Definition |
| 1 | +5V | 6 | +5V |
| 2 | USB_PN | 7 | USB_PN |
| 3 | USB_PP | 8 | USB_PP |
| 4 | Ground | 9 | Ground |
| 5 | NA | 10 | Key |

**LAN Ports (LAN1~LAN4)**

Two gigabit LAN ports are located on the I/O back panel (four on the X9SPV-LN4F). These ports accept RJ45 type cables. These are used to connect the motherboard to a network.  On product models X9SPV-F and X9SPV-LN4F, an IPMI port is also provided for remote management through a TCP/IP network.

| RJ45/LAN Pin Definitions | | | |
|---|---|---|---|
| Pin # | Definition | Pin # | Definition |
| 1 | TX_D1+ | 5 | BI_D3- |
| 2 | TX_D1- | 6 | RX_D2- |
| 3 | RX_D2+ | 7 | BI_D4+ |
| 4 | BI_D3+ | 8 | BI_D4- |

**Power LED/Speaker**

On the JD1 header, pins 1-3 are for a power LED and pins 4-7 are for the speaker. Close pins 4-7 with a jumper to use an external speaker. If you wish to use the onboard speaker, please close pins 6-7. See the table on the right for speaker pin definitions.

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

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

**T-SGPIO Headers**

The SGPIO (Serial General Purpose Input/Output) headers are used to communicate with the enclosure management chip on the backplane. See the table on the right for pin definitions.

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

**Overheat/Fan Fail LED**

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

| Overheat LED Pin Definitions | |
|---|---|
| Pin# | Definition |
| 1 | 5VDC |
| 2 | OH Active |

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

**DOM Power Connector**

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

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

**Power Supply SMBus I²C Header**

The power System Management Bus header at JPI²C2 is used to monitor the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

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

**IPMB**

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

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

## 5-9    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 motherboard layout pages for
jumper locations.

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

Connector
Pins

Jumper

Setting
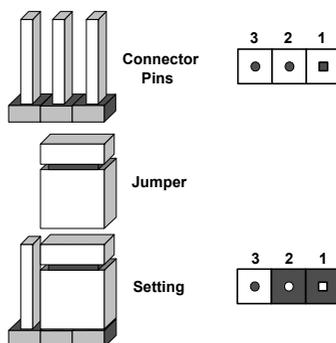
### CMOS Clear

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

### *To clear CMOS,*

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

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

3.  Remove the screwdriver (or shorting device).

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

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

### BIOS Write Protect (JWP1)

The BIOS Write-Protect jumper (JWP1)
is used to protect the BIOS firmware from
accidentally being erased. Close pins 2-3
before reprogramming the firmware. Oth-
erwise, this jumper should be enabled
(pins 1-2) during normal operation.

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

**Watch Dog Enable/Disable**

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

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

**BMC Enable/Disable**

JPB1 is used to enable or disable the BMC (Baseboard Management Control) chip and the onboard IPMI connection. This jumper is used together with the IPMI settings in the BIOS. See the table on the right for jumper settings.

| BMC Enable Jumper Settings | |
|---|---|
| Setting | Definition |
| Pins 1-2 | BMC Enabled |
| Pins 2-3 | Disabled |

**USB Wake-Up (JPUSB1)**

Use the JPUSB1 jumper to enable system "wake-up" via a USB device. This jumper allows you to "wake-up" the system by pressing a key on the USB keyboard or by clicking the USB mouse of your system. The JPUSB1 jumper is used together with the USB Wake-Up function in the BIOS. Enable both the jumper and the BIOS setting to activate this function. See the table on the right for jumper settings and jumper connections.

**Note**: The default jumper setting is "Disabled". When the "USB Wake-Up" function is enabled, it will be active on all USB ports.

| USB Wake-Up Jumper Settings | |
|---|---|
| Jumper Setting | Definition |
| Pins 1-2 | Enabled |
| Pins 2-3 | Disabled (Default) |

## 5-10  Onboard Indicators

### LAN LEDs

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

| LAN1/2 LED (Connection Speed Indicator) | |
|---|---|
| LED Color | Definition |
| Off | NC or 10 Mbps |
| Green | 100 Mbps |
| Amber | 1 Gbps |

### Standby Power LED (LED1)

An Onboard Power LED is located at LED1 on the motherboard. When LED1 is on, the AC power cable is connected  and the power supply hard switch is on.  The system may be on standby or running.

| Onboard PWR LED (LED1) LED Status | |
|---|---|
| Status | Definition |
| Off | System Off (Soft Switch) |
| On | Power is Detected |

### IPMI Heartbeat LED (LED2)

An IPMI Heartbeat LED is located at LED2. When LED2 blinks, it means that IPMI is enabled and functioning properly.  For the X9SPV-F and X9SPV-LN4F only.

| IPMI Heartbeat LED (LED2) LED Settings | |
|---|---|
| Status | Definition |
| Green: Blinking | IPMI is ready for use |
| Off | IPMI Disabled |

### Overheat / Fan Fail (LED3)

LED3 is located next to the VGA port. This indicator alerts of either a Fan Failure, or System Overheat.

| OH/Fan Fail LED Indicator (LED3) LED Settings | |
|---|---|
| Status | Definition |
| Yellow: Blinking with continuous beep | Fan Failure |
| Yellow: Solid with continuous beep | System Overheat |
| Off | Normal |

# 5-11  SATA and SAS Ports

**Serial ATA Ports**

Two Serial ATA (SATA) 3.0 connec-
tors (I-SATA 0/1) are located on the
motherboard. In addition, four SATA
2.0 (I-SATA 2~5) connectors are also
located on the board.  The SATA 3.0
ports support RAID 0, 1 while the
SATA 2.0 ports support RAID 0, 1, 5
&10See the table on the right for pin
definitions.

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

## 5-12  Installing Software

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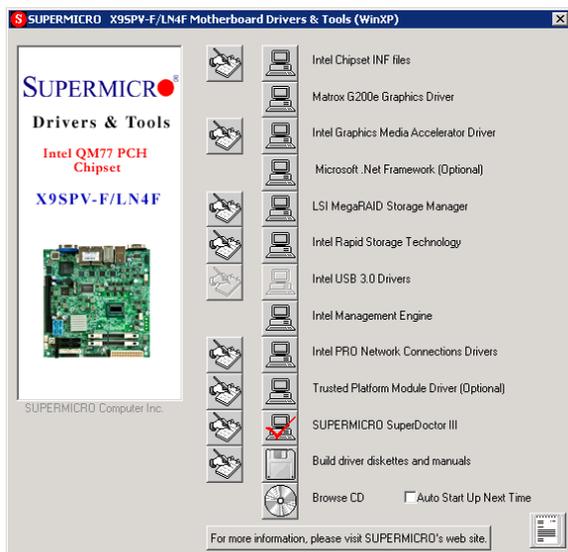


**Driver/Tool Installation Display Screen**

**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.

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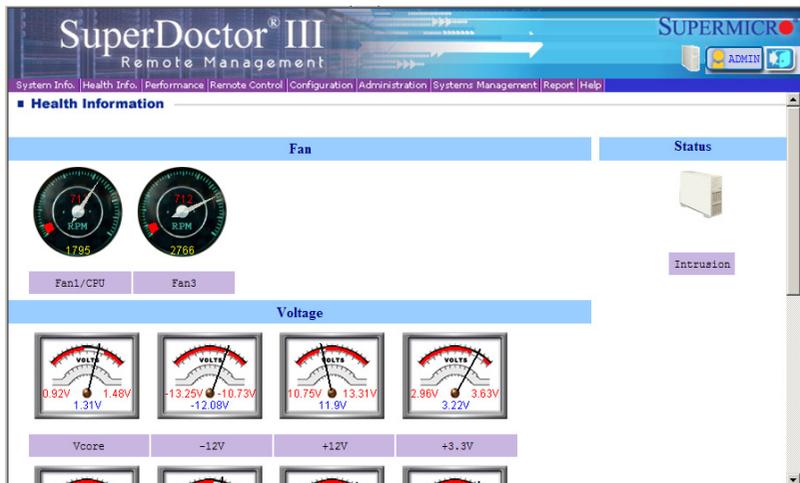
**Supero Doctor III Interface Display Screen (Remote Control)**
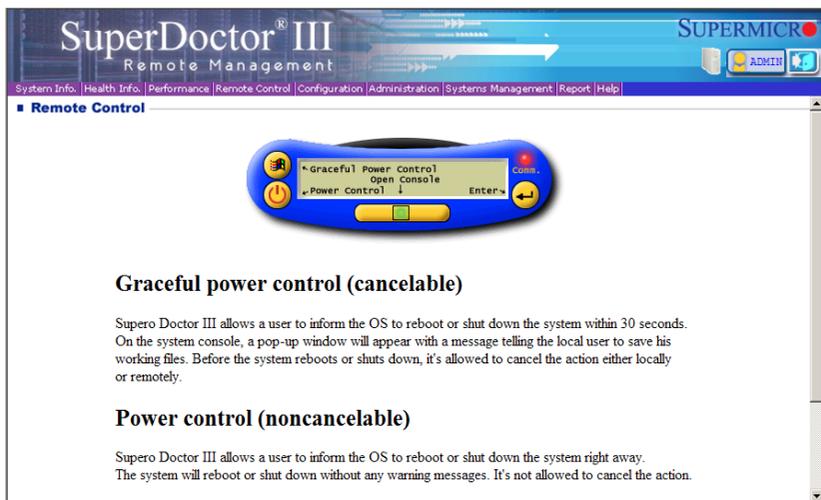


Note: The SuperDoctor III program and User's Manual can be downloaded from the Supermicro web site at http://www.supermicro.com/products/accessories/software/SuperDoctorIII.cfm.

For Linux, we recommend using SuperDoctor II.

# Chapter 6

# Advanced Chassis Setup

This chapter covers the steps required to install components and perform mainte-nance on the SC504-203B chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

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

## 6-1 Static-Sensitive Devices

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

### Precautions

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

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

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

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

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

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

### Unpacking

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

**Figure 6-1.  Front and Rear Chassis Views**

Control Panel



Power Supply                                    Low-profile PCI Slot



**Rear I/O Ports (see Figure 5-2)**
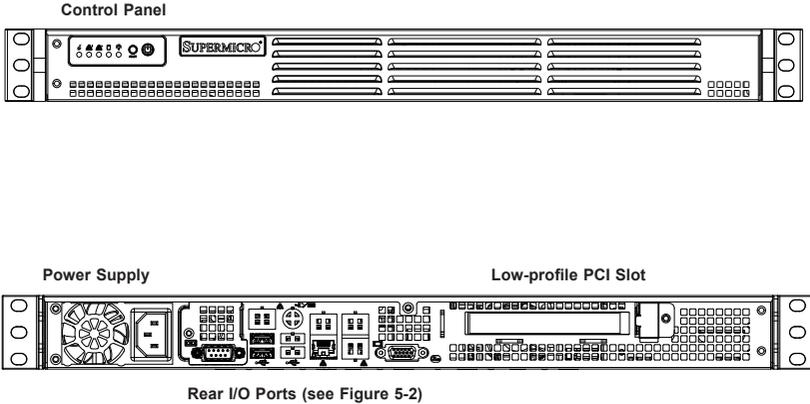
## 6-2    Control Panel

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

See Chapter 3 for details on the LEDs and the control panel buttons. Details on JF1 can be found in Chapter 5.

## 6-3    Removing the Chassis Cover
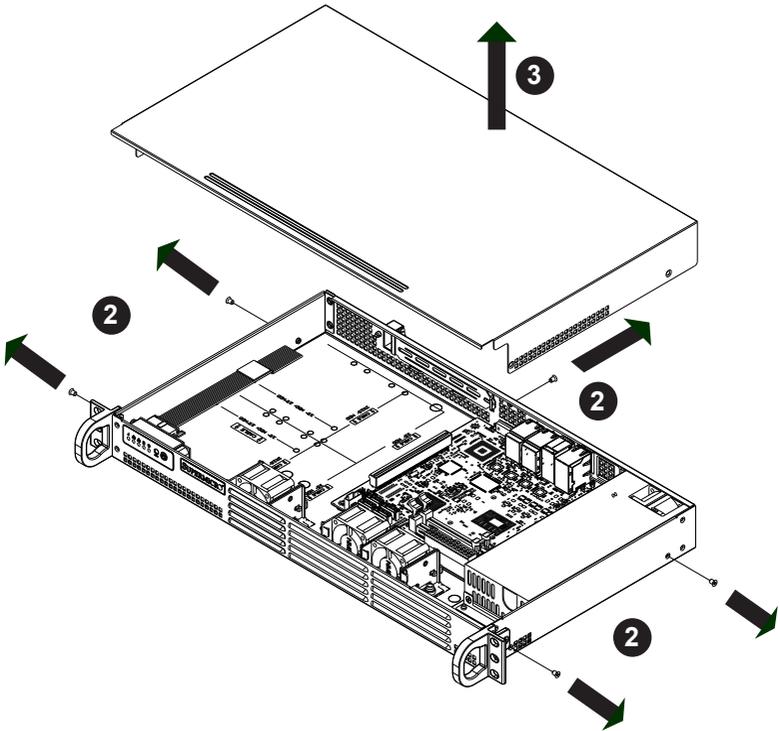


**Figure 6-2.  Removing the Chassis Cover**

### *Removing the Chassis Cover*

1.  Power down the system and disconnect the power cord from the back of the power supply.

2.  Remove the five screws that hold the chassis cover in place. There are two screws on each side of the chassis, and one screw on the back.

3.  Once the screws have been removed, lift the cover upward to remove it from the chassis.

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

## 6-4    System Fans (Optional)

Up to three optional system fans may be installed in the SC504 chassis.

*Installing Optional System Fans*

1.  Position the dual system fan housing in the front of the chassis, facing for-
    ward as illustrated above, in front of the motherboard.

2.  Align the mounting holes in the fan housing with the holes in the floor of the
    chassis.

3.  Secure the dual fan housing to the chassis with the screws provided.

4.  Position the single system fan to the left of the dual system fans.

5.  Align the mounting holes in the single fan housing with the holes in the floor
    of the chassis.

6.  Secure the single fan housing to the floor of the chassis.

7.  Connect the fan cables to the motherboard and put the cover back on the
    chassis.

## 6-5    Installing Hard Drives

Follow the instructions that follow to install either four 2.5" or two 3.5" hard drives.

*Installing 3.5" Hard Drives*

1.  Power down the server, disconnect the power cord from the power supply and
    remove the cover.

2.  Place the 3.5" hard drive into the chassis as illustrated above.

3.  Secure the hard drive to the chassis floor by inserting four screws up through
    the underside of the chassis.

4.  Connect the hard drive wiring, reinstall the chassis cover and power cord,
    then power up the server.

### Installing 2.5" Hard Drives

2.5" hard drives may be installed in several different configurations. Review the supported configuration options on page 6-6.

1.  Power down the server, disconnect the power cord from the power supply and remove the cover.

2.  Install up to four 2.5" hard drive(s) into the hard drive bracket(s) and secure them to the bracket with the screws provided. (See page 6-6 for supported configuration options.)

3.  Place the hard drive and bracket into the chassis as illustrated in Figure 6-3. If up to four 2.5" hard drives are desired, rotate the hard drive brackets ninety degrees and place them side by side before attaching them to the chassis.

4.  Secure the hard drive bracket(s) to the chassis floor by inserting the screws up through the underside of the chassis.

5.  Expansion cards must be installed after installing the 2.5" hard drives.

6.  Connect the hard drive wiring, reinstall the chassis cover and power cord, then power up the server

Note: bracket part number is MCP-220-000440N

## Hard Drive Configuration Options

2.5" and 3.5" hard drives are supported in the following configurations:

**Figure 6-3.  Installing Hard Drives**



**Two 2.5" HDDs
In a Double Bracket, Four HDD's Total,
No Expansion Card**

**One 3.5" Hard Drive and one Low Profile
Expansion Card**

**Two 2.5" Hard Drives and One Full-Height, Half-
Length Expansion Card**

**Two 3.5" Hard Drives and No
Expansion Card**
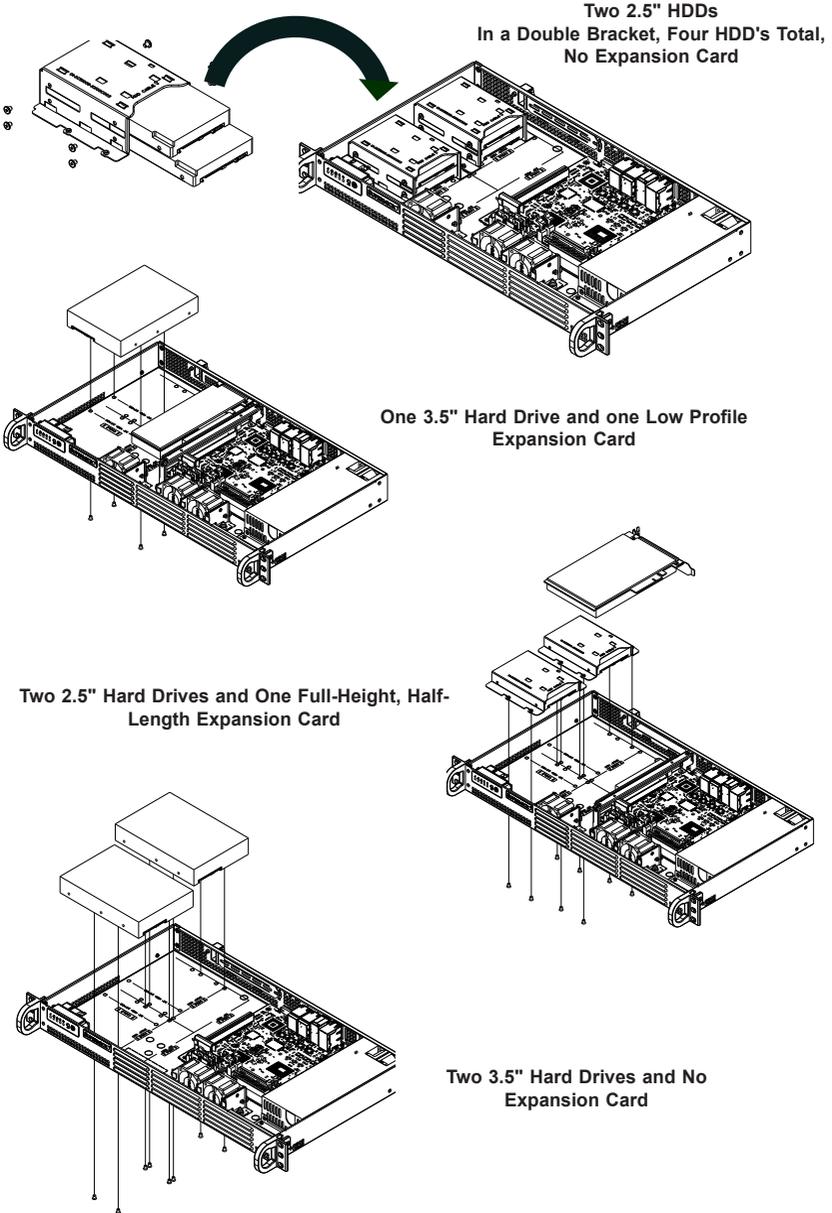
## 6-6    Installing an Expansion Card

The SC504 chassis includes a PCI slot for an optional full-height, half-length expansion card. A riser card is required in order to connect the expansion card to the motherboard. For further information on expansionon cards and risers cards, visit the Supermicro website at www.supermicro.com

**Expansion Card Clip**
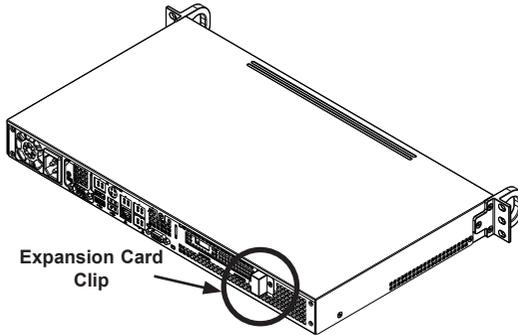
**Figure 6-4.  Locating the Expansion Card Clip**

*Installing the Expansion Card*

1.  Power down the server, disconnect the power cord from the power supply and remove the cover. Locate the expansion card clip on the back of the chassis

2.  Remove the screws holding the expansion card clip and the PCI slot cover which covers the PCI slot opening in the back of the chassis.

3.  Remove the expansion card clip and the PCI slot cover from the chassis.

**Expansion Card Clip**

**PCI Slot Cover**
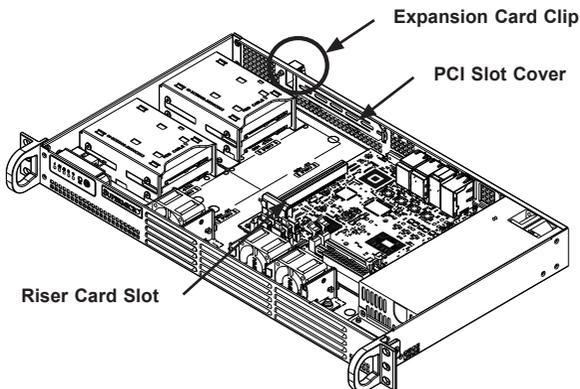
**Riser Card Slot**

**Figure 6-5.  Installing the Expansion Card and Riser Card**

4.  Outside of the chassis, put the expansion card and the riser card together by inserting the expansion card into the riser card.

5.  Simultaneously insert the PCI slot bracket of the expansion card into the open PCI slot and insert the riser card in to the riser card slot on the motherboard.
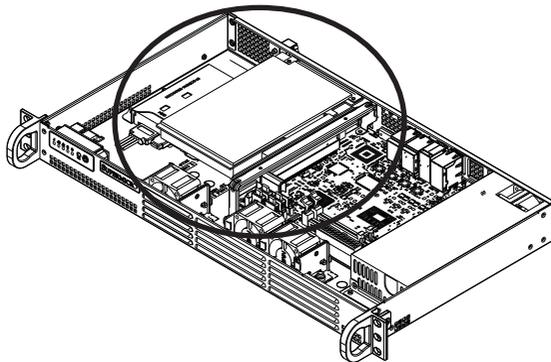


**Figure 6-6.  Installing the Expansion Card**

6.  Replace the expansion card clip and screw it onto the chassis to hold the expansion card in place.

7.  Replace the cover onto the chassis, reconnect the power cord and power up the server.
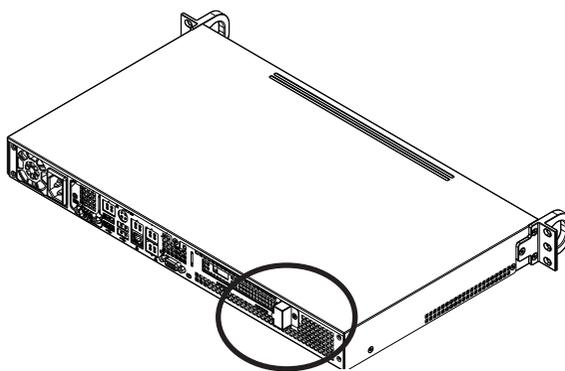


**Figure 6-7.  Replacing the Expansion Card Clip**

## 6-7 Power Supply

The SC504 chassis has a 200 Watt power supply. This power supply is auto-switching capable. This enables it to automatically sense and operate at a 100v to 240v input voltage.In the unlikely event that the power supply module fails, the system will shut down and you will need to replace the power supply module. New units can be ordered directly from Supermicro (see contact information in the Preface).

### Replacing the Power Supply

***Replacing the Power Supply***

1.  Power down the system, disconnect the power cord and remove the chassis cover.

2.  Disconnect all wiring from the power supply.

3.  Remove the four screws which hold the power supply in the chassis. Two rear mounting screws are located on the rear of the power supply. Two bottom mounting screws are accessed on the underside of the chassis and extend upwards through the mounting thru holes, to hold the power supply in place. Set the screws aside for later use.
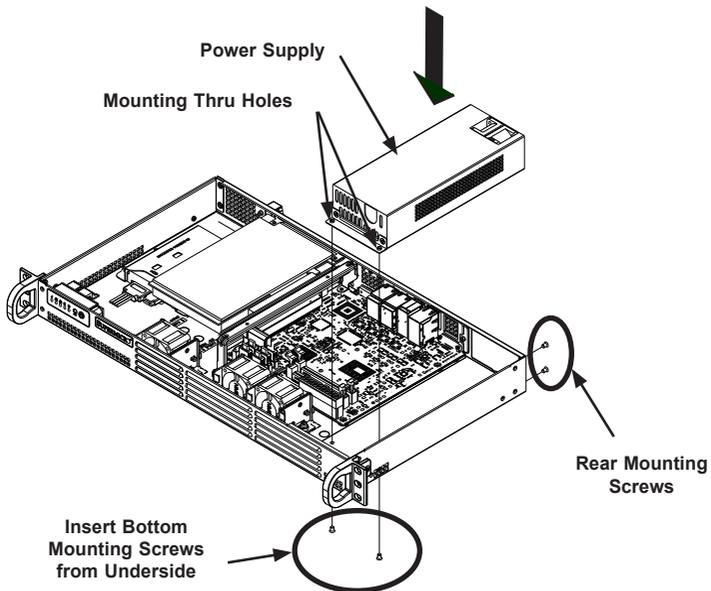


**Figure 6-8. Installing the Power Supply**

4. Remove the power supply from the chassis.

5. Align the mounting thru holes on the power supply with the mounting holes in the chassis and reattach the power supply to the chassis using the four screws which were previously set aside

6. Reconnect the wiring and the power cord to the power supply, replace the cover and power up the server.

# Chapter 7

# BIOS

## 7-1    Introduction

This chapter describes the AMI BIOS Setup Utility for the X9SPV-F/LN4F moth-
erboard. 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>, ar-
row 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  Exit

                                                    Set the Date. Use Tab to
                                                    switch between Date elements.
  System Date                   [Thu 01/01/2009]
  System Time                   [04:35:57]


  Supermicro X9SPV-F/LN4F
  Version                       2.00
  Build Date                    06/01/2012


  Processor
  Intel(R) Core(TM) i7-3612QE CPU @ 2.10GHz
  Speed                         2100 MHz
  Physical Count                1                   →←: Select Screen
  Logical Count                 8                   ↑↓: Select Item
                                                    Enter: Select
  System Memory                                     +/-: Change Opt.
  Size                          2048 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 X9SPV-F/LN4F

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   Exit

                                                              System Boot Feature Setting.
 ▶ Boot Feature
 ▶ Processor & Clock Options
 ▶ Advanced Chipset Control
 ▶ IDE/SATA Configuration
 ▶ PCIe/PCI/PnP Configuration
 ▶ Super I/O Configuration
 ▶ Remote Access Configuration
 ▶ ACPI Configuration

   iSCSI Configuration
   Intel(R) 82574L Gigabit Network Connectio - 00:25:90:...
   Intel(R) 82574L Gigabit Network Connectio - 00:25:90:...
   Intel(R) 82574L Gigabit Network Connectio - 00:25:90:...    ↔: Select Screen
   Intel(R) 82574L Gigabit Network Connectio - 00:25:90:...    ↑↓: 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.

**Option ROM Display Messages**

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**.

**INT19 Trap Response**

The Interrupt 19 (INT19) feature determines how the BIOS will react to INT19 trapping by Option ROM. If set to Immediate, BIOS will execute the trap right away. If set to Postponed, BIOS will execute the trap during legacy boot. 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**.

## ▶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.

The top section is for informational purposes only and displays CPU information including type, speed, number of cores, etc.

**Hyper Threading**

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, and 3.

**Limit CPUID Maximum**

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

**Execute-Disable Bit (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® 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.

**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**.

**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.

▶**CPU PPM Configuration**

**Power Technology**

This feature determines what power-saving scheme the motherboard uses. The options are Disabled, **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**.
>
> **Turbo Mode**
>
> This feature allows processor cores to run faster than marked frequency in specific conditions. The options are Disabled and **Enabled.**
>
> **CPU C3 Report, CPU C6 Report**
>
> This BIOS feature enables or disables C3 (ACPI C2) and C6 (ACPI C3) reporting to the operating system. The options are Disabled and **Enabled**.

**Config TDP LOCK**

Use this feature to lock the Config TDP Control register. 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. The default setting is **0**.

**Long Duration Maintained**

This is the time in milliseconds where the Long Duration Power Limit is maintained. The default setting is **1**.

**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. The default setting is **0**.

**ACPI T State**

Select enabled for ACPI throttling state support. The options are Enabled and **Disabled**.

▶**Advanced Chipset Control**

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

▶**System Agent (SA) Configuration**

This submenu allows you to configure System Agent Parameters.

▶**Memory Configuration**

This section displays memory status such as memory speed and total memory.

**Memory Frequency Limiter**

Use this item to select the maximum memory frequency (in Mhz). The options are **Auto**, 1067, 1333, 1600, 1867, 2133, 2400, and 2667.

**DDR Selection**

Use this item to select the type of DDR. The options are DDR3, DDR3L, and **Auto**.

**DDR Reset Wait Time**

Enter the amount of time (in nano seconds) to wait for switch DDR voltage. The minimum value is 20ns. The default value is **2000000**.

**ECC Support**

Select Enabled to support ECC. The options are **Enabled** and Disabled.

**Memory Scrambler**

Select Enabled to support Memory Scrambler. The options are **Enabled** and Disabled.

**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.

**PEG0 - Gen X**

This feature selects the speed of the PEG0 port. The options are **Auto**, Gen1, Gen2, and Gen3.

**PEG0 ASPM**

Set this item to control ASPM (Active State Power Management) support for PEG: Device 1 Function 0. The options are Disabled, **Auto**, ASPM L0s, ASPM L1, and ASPM L0sL1.

**Enable PEG**

Use this feature to enable the PEG. The options are Disabled, Enabled, and **Auto**.

**De-emphasis Control**

This item sets the De-emphasis control on PEG. The options are -6 dB and **-3.5 dB**.

**Initiate Graphic Adapter**

Use this feature to select which device will operate as the primary display. The options are **Auto**, IGFX/PEG, PEG/On Board, and On Board/PEG. Note: selecting IGFX/PEG will enable the Intel HD 4000 GPU.

## ▶PCH-IO Configuration

This submenu allows you to configure PCH Parameters.

### ▶USB Configuration

**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.

**USB3.0 Support**

This feature enables controller support for USB 3.0 (XHCI) in the BIOS. The options are **Enabled** and Disabled.

**XHCI Hand-Off**

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

**EHCI Hand-Off**

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

**XHCI Pre-Boot Driver**

This feature enables support for the xHCI pre-boot driver. The options are **Enabled** and Disabled.

**XHCI Mode**

Use this feature to select the xHCI controller mode of operation. The options are **Smart Auto**, Auto, Enabled, and Disabled.

**HS Port #1~#4 Switchable**

This feature allows for HS port switching between xHCI and EHCI. When set to Disabled, the specified port is routed to EHCI. The options are **Enabled** and Disabled.

**Note**: If HS port is routed to xHCI, the corresponding SS port is enabled.

**XHCI Streams**

Use this feature to enable the maximum primary stream array size for xHCI. The options are **Enabled** and Disabled.

**EHCI1, EHCI2**

This feature enables the EHCI interface (USB 2.0). At least one EHCI controller must always be enabled. The options are **Enabled** and Disabled.

**USB Ports Per-Port Disable Control**

If set to Enabled, this feature allows deactivation of selected USB ports. The options are **Disabled** and Enabled. If set to Enabled, the following will appear:

**USB Port #0~#13 Disable**

Select which USB ports to disable. The settings are Enabled and **Disabled.**

**Deep Sx (EUP)**

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

**SLP_S4 Assertion Width**

Use this feature to select a minimum assertion width of the SLP_S4 signal. The options are Disabled, 1-2 Seconds, 2-3 Seconds, 3-4 Seconds, and **4-5 Seconds**.

## ▶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 Controllers**

This item enables or disables the on board SATA controller. The options are **Enabled** and Disabled:

**SATA Mode Selection**

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 LPM Support

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 Spin Up Device

Set this item to Enabled to enable device 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**.

**Serial ATA Port 0~5 Spin Up Device**

Set this item to Enabled to enable device spin-up support. 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:

**Launch PXE, Storage, Video OpROM Policy**

In case of multiple Option ROMs (Legacy and UEFI-compatible), this feature speci-fies what ROM to launch. The options are Do not launch, UEFI only, and **Legacy only**.

**Other PCI device ROM priority**

This feature specifies what ROM to launch for PCI devices other than network, mass storage or video. The options are UEFI OpROM and **Legacy OpROM**.

**PCI Latency Timer**

This feature sets the latency Timer of each PCI device installed on a PCI bus. Se-lect 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.

**PERR# Generation**

Set this item to Enabled to allow PCI devices to generate PERR# error codes. The options are **Enabled** and Disabled.

**SERR# Generation**

Set this item to Enabled to allow PCI devices to generate SERR# error codes. The options are **Enabled** and Disabled.

**ASPM Support**

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

**Maximum Payload**

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

**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**.**

**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**.

**VGA Palette Snoop**

When enabled, this feature allows video add-on cards to borrow the color palette from the system's video card. The options are Enabled and **Disabled**.

## ▶PCI Express Settings

**Relaxed Ordering**

Select Enabled to allow certain PCI-E transactions to violate the strict ordering rules of PCI-E so that a transaction can be completed before other transactions that have already been queued in order to enhance PCI-E performance. The options are **Disabled** and Enabled.

**Extended Tag**

Select Enabled to allow a PCI Express device to use 8-bit tag field as a requester. The options are **Disabled** and Enabled.

**No Snoop**

Select Enabled to activate the PCI Express no snoop option. The options are Disabled and **Enabled**.

**Maximum Payload**

This feature selects the setting for the PCI Express maximum payload size. The options are **Auto,** 128 Bytes**,** and 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

**Maximum Read Request**

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

**ASPM Support**

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

**Extended Synch**

Select Enabled for Extended Synchronization support, which will extend the same synchronization patterns for the PCI-E device. The options are **Disabled** and Enabled.

**Link Training Retry**

This feature allows the user to decide how many attempts a software program can make before time-out for the program. The default setting is 5. The options are Disabled, 2, 3, and **5**.

**Link Training Timeout (US)**

This feature allows the user to decide how many microseconds a software pro-gram should wait before polling the 'Link Training' bit in the Link Status Register. The range is between 10 to 1000. The default setting is **500**.

**Unpopulated Links**

Select Disable Link to disable the unpopulated PCI-E links (connections) to save power. The options are **Keep Link ON** and Disable.

## ▶PCI Express GEN 2 Settings

**Completion Timeout**

For device functions that support completion timeout programmability, this fea-ture allows system software to modify the completion timeout value. If Default is selected, the timeout value is 50us to 50ms. If Shorter is selected, the software will use shorter timeout ranges supported by the hardware. If Longer is selected, software will use longer ranges supported by the hardware. The options are **Default**, Shorter, Longer, and Disabled.

**ARI Forwarding (Available when supported by the hardware)**

If set to Enabled, the downstream port disables it's traditional Device Number field (0 enforcement) when turning a Type1 Configuration Request into a Type0

Configuration Request, permitting access to Extended Functions in an ARI device immediately below the port. The options are **Disabled** and Enabled.

**AtomicOp Requester Enable (Available when supported by the hardware)**

When set to Enabled, this feature initiates AtomicOp requests only if Bus Master Enable bit is in the Command Register set. The options are **Disabled** and Enabled.

**AtomicOp Egress Blocking (Available when supported by the hardware)**

When set to Enabled, this feature blocks outbound AtomicOp Requests via Egress ports. The options are **Disabled** and Enabled.

**IDO Request Enable (Available when supported by the hardware)**

When set to Enabled, this feature permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated. The options are **Disabled** and Enabled.

**IDO Completion Enable (Available when supported by the hardware)**

When set to Enabled, this feature permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated. The options are **Disabled** and Enabled.

**LTR Mechanism Enable (Available when supported by the hardware)**

When set to Enabled, this feature enables the Latency Tolerance Reporting mechanism. The options are **Disabled** and Enabled.

**End-End TLP Prefix Blocking (Available when supported by the hardware)**

When set to Enabled, this feature blocks forwarding of TLPs containing End-End TLP prefixes.

**Target Link Speed (Available when supported by the hardware)**

When set to Force to 2.5 or 5.0 GT/s, this feature sets an upper limit on the link operational speed of downstream ports by restricting the values advertised by the upstream component in its training sequences. When set to Auto, HW initialized data will be used. The options are **Auto**, Force to 2.5 GT/s, and Force to 5.0 GT/s.

**Clock Power management (Available when supported by the hardware)**

When set to Enabled, this feature permits the device to use CLKREQ# signal for power management of link clock in accordance to protocol defined in appropriate form factor specification. The options are **Disabled** and Enabled.

**Compliance SOS (Available when supported by the hardware)**

When set to Enabled, this feature will force LTSSM to send SKP ordered sets between sequences when sending compliance pattern or modified compliance pattern. The options are **Disabled** and Enabled.

**Hardware Autonomous Width (Available when supported by the hardware)**

When set to Disabled, this feature disables the hardware's ability to change link width (except width size reduction) for the purpose of correcting unstable link operation. The options are **Enabled** and Disabled.

**Hardware Autonomous Speed (Available when supported by the hardware)**

When set to Disabled, this feature disables the hardware's ability to change link speed (except speed size reduction) for the purpose of correcting unstable link operation. The options are **Enabled** and Disabled.

**PCI-E Slot 1 Option ROM**

Use this feature to enable or disable PCI-E slot 1 Option ROM. The options are Disabled and **Enabled.**

**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**.

**Onboard LAN 1 ~ LAN 4**

Use this item to enable or disable onboard LAN for the specified port. The options are **Enabled** and Disabled.

**Load Onboard LAN 1 ~ LAN 4 Option ROM**

This feature is to enable or disable the onboard option ROMs. The options are Disabled and Enabled. The default for LAN 1 is **Enabled**. Default for LAN 2 ~ LAN 4 is **Disabled**.

**Network Stack**

Set this item to Enabled to activate the Network Stack (PXE and UEFI). The options are Enabled and **Disabled**.  When enabled, the following options appear:

**Ipv4 PXE Support**

This feature enables Ipv4 boot support.  If disabled, an Ipv4 PXE boot option will not be created. The options are **Enabled** and Disabled.

**Ipv6 PXE Support**

This feature enables Ipv6 boot support.  If disabled, an Ipv6 PXE boot option will not be created. The options are Enabled and **Disabled**.

## ▶Super IO Device Configuration

### ▶Serial Port 1 Configuration / Serial Port 2 Configuration

**Serial Port 1 / Serial Port 2**

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

**Serial Port 1 Settings / Serial Port 2 Settings**

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

The options for Serial Port 1 are:

**Auto**,

IO=3F8h; IRQ=4;

IO=3F8h; IRQ=4, 10, 11;

IO=2F8h; IRQ=3, 10, 11;

IO=3E8h; IRQ=4, 10, 11;

IO=2E8h; IRQ=3, 10, 11;


The options for Serial Port 2 are:

**Auto**,

IO=2F8h; IRQ=3;

IO=3F8h; IRQ=4, 10, 11;

IO=2F8h; IRQ=3, 10, 11;

IO=3E8h; IRQ=4, 10, 11;

IO=2E8h; IRQ=3, 10, 11;

▶**Remote Access Configuration**

**COM1, COM2, SOL Console Redirection**

Use this feature to enable console redirection for COM1, and COM2 ports. The options are Enabled and Disabled. The default for COM1 and COM2 is **Disabled**. The default 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.

**Redirection After BIOS POST**

When set to BootLoader, legacy console redirection is disabled before booting to legacy OS. When set to Always Enable, legacy console redirection is enabled for legacy OS. The options are **Always Enable** and BootLoader.

**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.

## ▶ACPI Configuration

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

### High Precision Timer

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

**ACPI Sleep State**

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, S1 only (CPU Stop Clock), S3 only (Suspend to RAM), and **Both S1 and S3 available for OS to choose from**. S3 (Suspend to RAM) is the deepest sleep state in these options.

**PS2 KB/MS Wake up**

Use this feature to select the PS2 Keyboard/Mouse wake up setting. The options are **S1 (OS Control)**, S5 (OS Control), Force Enable, and Force Disable.

## ▶Trusted Computing Configuration

**Security Device Support**

This feature enables or disables the BIOS support for a security device. The options are Disable and **Enable**. Note that the OS will not reveal the security device. Also, the TCG EFI protocol and the INT1A interface will not be available.

## ▶Intel TXT(LT) Configuration

**Secure Mode Extensions (SMX)**

This feature can be configured if it is supported by the processor. Enable this feature to activate Intel TXT, below. The options are Enabled and **Disabled.**

**Intel TXT (LT) Support**

Intel TXT (Trusted Execution Technology) helps protect against software-based attacks and ensures protection, confidentiality and integrity of data stored or created on the system. The options are Enabled and **Disabled.**

## iSCSI Configuration

When sharing the iSCSI devices on this machine (iSCSI target), this section is used to enter the worldwide unique name of an iSCSI initiator. An iSCSI initiator application must be configured on the machine that will access the iSCSI drives in this machine.

**iSCSI Initiator Name**

Only IQN (iSCSI Qualified Names) names are accepted. For more information on iSCSI, research RFC 3720 and RFC 3721 at the Internet Engineering Task Force website (IETF -- www.ietf.org).

### Add an Attempt

The settings on this section are setup parameters to connect to a remote iSCSI device.

iSCSI Attempt Name - assigns a unique name to this attempt.

iSCSI Mode - select Enabled or **Disabled**

Connection Retry Count - if the initial connection fails or times out, this is how many times an attempt will be made to connect.

Connection Establishing Timeout - This is the time in milliseconds the system will wait for a connection until it times out.  The minimum is 100ms and the maximum is 20 secs.

ISID - This is the OUI-format ISID. The default value is taken from the device's MAC address.  Only the last 3 bytes are configurable.

Enable DHCP - Select Enabled to allow a DHCP server to assign the IP addresses for this attempt.  If this is set to **Disabled**, then you need to enter the Initiator IP Address, Subnet Mask and Gateway manually.

Target Name - Enter the qualified domain name of the target iSCSI device.

Target IP Address - Enter the IP Address of the target iSCSI device.

Target Port - Enter the port address of the target iSCSI device.

Boot LUN - This is the target's LU number in Hexadecimal format.

Authentication Type - Select **CHAP** or None.

If CHAP is selected above:

CHAP Type - Select **One Way** or Mutual.

CHAP Secret - Assign a secret word that is also defined in the target iSCSI device. Minimum length is 12 bytes and maximum is 16 bytes.

When finished, select Save Changes.

### Delete Attempts

This feature deletes previously defined attempts as above.

### Change Attempt Order

This feature changes the order in which several iSCSI connection attempts are made.

## Intel(R) 82579LM / Intel(R) 82574L Gigabit Network Connection

### ▶NIC Configuration

#### Link Speed

Use this feature to select the link speed to be used. The options are **AutoNeg**, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half and 100 Mbps Full.

#### Wake On LAN

Use this feature to activate the Wake On LAN (WOL) feature. The options are **Enabled**, and Disabled.

#### Blink LEDs (Range 0-15 seconds)

Please specifies the blink rate of the NIC LED.  Select from 1-15 second intervals.

#### Port Configuration Information

This section displays the current configuration of the Network Interface.

## 7-4   Event Logs
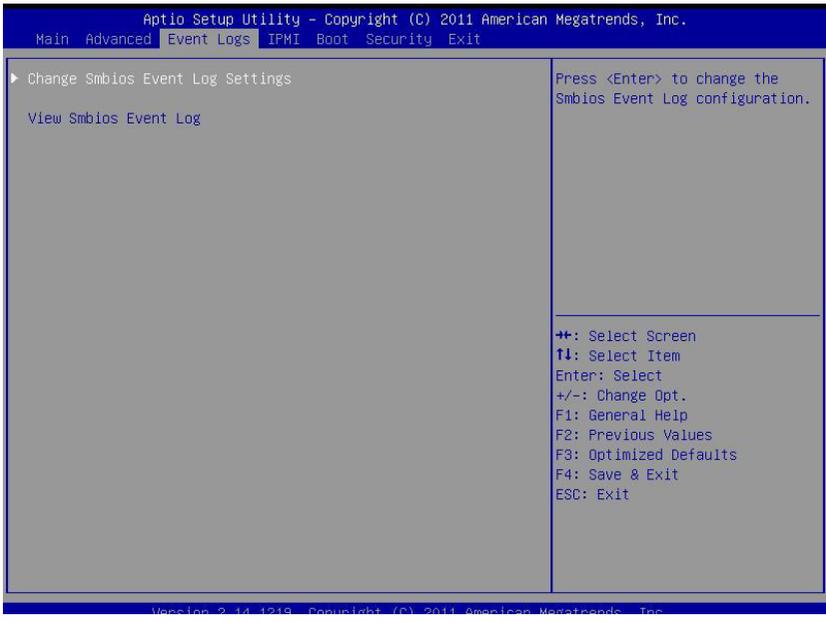
▶**Change SmBIOS Event Log Settings**

**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 occurences a duplicate event must happen before the MECI counter is incremented. This is a numeric value.

**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.

**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  Exit

   IPMI Firmware Revision          1.51              Configure BMC network
   IPMI STATUS                     Working           parameters
 ▶ System Event Log
 ▶ 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



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

▶**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, and **Enabled**.

►**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 (Dynamic Host and Configuration Protocol) server or manually entered by the user (Static). When DHCP 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 and **DHCP**.

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

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

**Station 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).

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

## 7-6    Boot

Use this feature to configure Boot Settings:

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

     Setup Prompt Timeout                    1                    Number of seconds to wait for
                                                                  setup activation key.
     Boot Option Priorities                                       65535(0xFFFF) means indefinite
     Boot Option #1                    [IBA GE Slot 0100 v...]    waiting.
     Boot Option #2                    [UEFI: Built-in EFI...]

     Network Devices

   ▶ Delete Boot Option


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



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```

**Setup Prompt Timeout**

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

**Boot Options Priorities**

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

**Boot Option #1, Boot option #2, Boot Option #3, etc**

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

**USB Device BBS Priorities**

**Network Devices**

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

▶**Delete Boot Option**

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

7-1

## 7-7    Security Settings

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

   Password Description                              Set Administrator Password

   If ONLY the Administrator's password is set,
   then this only limits access to Setup and is
   only asked for when entering Setup.
   If ONLY the User's password is set, then this
   is a power on password and must be entered to
   boot or enter Setup. In Setup the User will
   have Administrator rights.
   The password length must be
   in the following range:
   Minimum length              3
   Maximum length              20
                                                  →←: Select Screen
                                                  ↑↓: Select Item
                                                  Enter: Select
   Access Level                Administrator       +/-: Change Opt.
   Administrator Password                          F1: General Help
   User Password                                   F2: Previous Values
                                                   F3: Optimized Defaults
   HDD Password                [Disabled]          F4: Save & Exit
                                                   ESC: Exit



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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.

**Administrator Password**

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

**User Password:**

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

**HDD Password:**

Select Enable to activate Hard Disk Drive password support.  The options are Enabled and **Disabled**.

## 7-8    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   Exit

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

     Restore Defaults
     Save as User Defaults
     Restore User Defaults

     Boot Override
     IBA GE Slot 0100 v1381
     UEFI: Built-in EFI Shell
     Me FW Image Re-Flash                 [Disabled]

                                                           ↔: 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.
```

**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 con-figuration 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.

**IBA IGE Slot 0100 v1381**

This item will attempt to boot from the Network Boot Device.

**UEFI: Built-in EFI Shell**

This item at temps to launch EFI shell application (Shellx64.efi) from one of the available filesystem devices.

**Me FW Image Re-Flash**

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

# Appendix A

# POST Error Beep Codes

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

## Recoverable POST Error Beep Codes

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

1 long and two short beeps - video configuration error

1 repetitive long beep - no memory detected

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

1 continuous beep with the front panel Fan Fail LED blinking - fan failure

8 short beeps - display memory read/write error

# Notes

# Appendix B

# System Specifications

## Processors

Single or dual Intel® Xeon Core i7 Mobile ECC processor

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

## Chipset

Intel QM77 chipset

## BIOS

16 MB AMI® SPI Flash ROM

## Memory Capacity

Two SO-DIMM slots that can support up to 16 GB of unbuffered DDR3-1333/1066/800 memory

Note: see Section 5-6 for details.

## Drive Bays

Two 3.5" internal drives or four 2.5" internal drives (not hot-swappable)

## Serverboard

X9SPV-LN4F/X9SPV-F (Mini-ITX form factor)
Dimensions: 6.7 x 6.7 in (170.2 x 170.2 mm)

## Chassis

SC504-203B (1U rackmount)
Dimensions: (WxHxD) 17.2 x 1.7 x 9.8 in. (437 x 43 x 249 mm)

## Weight

8 lbs. (3.62 kg.)

## System Input Requirements

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

## Power Supply

Rated Output Power: 200W (Part# PWS-203-1H)
Rated Output Voltages: +5V (8A), +12V (16A), +3.3V (8A), +5Vsb (2A)

## Operating Environment

Operating Temperature: 10º to 35º C (32º to 95º F)
0º to 47º C (32º to 116º F) with certain configurations/workload environments
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5% to 95% (non-condensing)

## Regulatory Compliance

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

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

Safety: 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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[http://www.4manuals.cc](http://www.4manuals.cc)

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[http://www.404manual.com](http://www.404manual.com)

[http://www.luxmanual.com](http://www.luxmanual.com)

[http://aubethermostatmanual.com](http://aubethermostatmanual.com)

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TV manuals search

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