A+ SERVER
2042G-72RF4

USER’S MANUAL

Revision 1.0c
The information in this User’s Manual has been carefully reviewed and is believed to be accurate. The vendor assumes no responsibility for any inaccuracies that may be contained in this document, makes no commitment to update or to keep current the information in this manual, or to notify any person or organization of the updates. Please Note: For the most up-to-date version of this manual, please see our web site at www.supermicro.com.

Super Micro Computer, Inc. (“Supermicro”) reserves the right to make changes to the product described in this manual at any time and without notice. This product, including software and documentation, is the property of Supermicro and/or its licensors, and is supplied only under a license. Any use or reproduction of this product is not allowed, except as expressly permitted by the terms of said license.

IN NO EVENT WILL SUPERMICRO BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, SPECULATIVE OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OR INABILITY TO USE THIS PRODUCT OR DOCUMENTATION, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN PARTICULAR, SUPERMICRO SHALL NOT HAVE LIABILITY FOR ANY HARDWARE, SOFTWARE, OR DATA STORED OR USED WITH THE PRODUCT, INCLUDING THE COSTS OF REPAIRING, REPLACING, INTEGRATING, INSTALLING OR RECOVERING SUCH HARDWARE, SOFTWARE, OR DATA.

Any disputes arising between manufacturer and customer shall be governed by the laws of Santa Clara County in the State of California, USA. The State of California, County of Santa Clara shall be the exclusive venue for the resolution of any such disputes. Super Micro's total liability for all claims will not exceed the price paid for the hardware product.

FCC Statement: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer’s instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

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”

WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

Manual Revision 1.0c
Release Date: December 22, 2017

Unless you request and receive written permission from Super Micro Computer, Inc., you may not copy any part of this document.

Information in this document is subject to change without notice. Other products and companies referred to herein are trademarks or registered trademarks of their respective companies or mark holders.

Copyright © 2017 by Super Micro Computer, Inc. All rights reserved.
Printed in the United States of America
Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use. Installation and maintenance should be performed by experienced technicians only.
## Contents

### Chapter 1 Introduction

1-1 Overview ........................................................................................................ 1-1
1-2 Serverboard Features .................................................................................... 1-1
    Processors ...................................................................................................... 1-1
    Memory ........................................................................................................... 1-2
    SAS ................................................................................................................ 1-2
    Serial ATA....................................................................................................... 1-2
    PCI Expansion Slots ..................................................................................... 1-2
    Ethernet Ports ................................................................................................ 1-2
    Onboard Controllers/Ports ............................................................................. 1-3
    Graphics Controller ........................................................................................ 1-3
    IPMI ................................................................................................................ 1-3
    Other Features ............................................................................................... 1-3
1-3 Server Chassis Features ................................................................................ 1-4
    System Power ................................................................................................ 1-4
    SAS/SATA Subsystem .................................................................................... 1-4
    Front Control Panel ...................................................................................... 1-4
    I/O Backplane ............................................................................................... 1-4
    Cooling System ............................................................................................. 1-4
1-4 Contacting Supermicro ................................................................................ 1-5

### Chapter 2 Server Installation

2-1 Overview ........................................................................................................ 2-1
2-2 Unpacking the System .................................................................................. 2-1
2-3 Preparing for Setup ....................................................................................... 2-1
    Choosing a Setup Location ............................................................................. 2-1
2-4 Warnings and Precautions! .......................................................................... 2-2
    Rack Precautions .......................................................................................... 2-2
    Server Precautions ....................................................................................... 2-2
    Rack Mounting Considerations ..................................................................... 2-3
        Ambient Operating Temperature .............................................................. 2-3
        Reduced Airflow ....................................................................................... 2-3
        Mechanical Loading .................................................................................. 2-3
        Circuit Overloading ................................................................................... 2-3
        Reliable Ground ....................................................................................... 2-3
2-5 Installing the System into a Rack ................................................................. 2-4
  Identifying the Sections of the Rack Rails ...................................................... 2-4
  Locking Tabs ................................................................................................. 2-5
  Releasing the Inner Rail ............................................................................... 2-5
  Installing The Inner Rails on the Chassis ..................................................... 2-6
  Installing the Outer Rails on the Rack .......................................................... 2-7
  Standard Chassis Installation ....................................................................... 2-8

2-6 Checking the Serverboard Setup ................................................................. 2-9

2-7 Preparing to Power On .............................................................................. 2-10

Chapter 3 System Interface

3-1 Overview .................................................................................................... 3-1

3-2 Control Panel Buttons ............................................................................... 3-2
  Power ............................................................................................................ 3-2
  Reset ............................................................................................................. 3-2

3-3 Control Panel LEDs .................................................................................. 3-2
  Power Fail .................................................................................................... 3-2
  Information LED .......................................................................................... 3-3
  NIC2 ............................................................................................................... 3-3
  NIC1 ............................................................................................................... 3-3
  HDD ............................................................................................................... 3-3
  Power ............................................................................................................ 3-4

3-4 SAS Drive Carrier LEDs ............................................................................ 3-4

Chapter 4 Standardized Warning Statements for AC Systems

4-1 About Standardized Warning Statements .................................................. 4-1
  Warning Definition ....................................................................................... 4-1
  Installation Instructions ................................................................................. 4-4
  Circuit Breaker ............................................................................................ 4-5
  Power Disconnection Warning ..................................................................... 4-6
  Equipment Installation .................................................................................. 4-8
  Restricted Area ............................................................................................. 4-9
  Battery Handling ......................................................................................... 4-10
  Redundant Power Supplies ......................................................................... 4-12
  Backplane Voltage ...................................................................................... 4-13
  Comply with Local and National Electrical Codes ..................................... 4-14
  Product Disposal ......................................................................................... 4-15
  Hot Swap Fan Warning ............................................................................... 4-16
  Power Cable and AC Adapter ..................................................................... 4-18
Preface

6-4 SAS/SATA Drive Installation and Removal .......................................................... 6-4
SAS/SATA Drive Backplane .................................................................................. 6-6
6-5 Slim DVD Drive Installation ............................................................................. 6-7
6-6 Power Supply .................................................................................................. 6-7
Power Supply Failure .......................................................................................... 6-7
Removing/Replacing the Power Supply ............................................................... 6-7

Chapter 7 BIOS
7-1 Introduction ..................................................................................................... 7-1
7-2 Main Menu ..................................................................................................... 7-2
7-3 Advanced Settings Menu ................................................................................. 7-3
7-4 Security Settings Menu .................................................................................... 7-16
7-5 Boot Settings Menu ........................................................................................ 7-16
7-6 Exit Menu ........................................................................................................ 7-18

Appendix A BIOS Error Beep Codes
Appendix B System Specifications
Notes
Chapter 1

Introduction

1-1 Overview

The A+ SERVER 2042G-72RF4 is a high-end server that is comprised of two main subsystems: the SC828TQ+-R1K43LPB 2U server chassis and the H8QG7-LN4F quad processor motherboard. Please refer to our web site for information on operating systems that have been certified for use with the 2042G-72RF4 (www.supermicro.com).

In addition to the motherboard and chassis, various hardware components are included, as listed below:

- Four (4) 2U Passive CPU Heatsinks for AMD Socket G34 (SNK-P0043P)
- SAS/SATA Accessories:
  - One (1) SAS/SATA backplane (BPN-SAS-828TQ)
  - Six (6) hot-swap drive carriers (MCP-220-00001-01)

Note: For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user’s manual for your server.

- Product manuals: http://www.supermicro.com/support/manuals/
- Product safety information: http://super-dev/about/policies/safety_information.cfm

For support, email support@supermicro.com.

1-2 Motherboard Features

At the heart of the A+ SERVER 2042G-72RF4 is one H8QG7-LN4F quad processor motherboard based on the SR5690/SR5670/SP5100 chipset.

Processors

The H8QG7-LN4F supports four AMD Opteron 6000 series (Socket G34 type) processors. Please refer to our web site for a complete listing of supported processors (www.supermicro.com).
Memory

The H8QG7-LN4F has thirty-two (32) single/dual/tri/quad channel DIMM slots supporting up to 1 TB of DDR3-1333/1066/800 registered ECC or 256 GB of DDR3 Unbuffered ECC/non-ECC SDRAM. See Chapter 5 Section 6 for more details on installing memory into the system.

SAS

An LSI 2208 SAS2 controller is integrated into the H8QG7-LN4F to provide an eight port SAS (Serial Attached SCSI) subsystem, which is RAID 0, 1, 5, 6, 10, and 50 supported. The SAS drives are hot-swappable units. SR and IT modes are supported but not IR.

Note: Your operating system must have RAID support to enable the RAID function and hot-swap capability of the SAS drives.

Serial ATA

The South Bridge (SP5100) of the chipset includes a Serial ATA controller for six 3Gb/s SATA drives. The hot-swappable SATA drives are connected to a backplane that provides power, bus termination and configuration settings. RAID 0, 1, and 10 are supported. Refer to the support area of our web site for procedures on setting up RAID on your system.

PCI Expansion Slots

The H8QG7-LN4F board has two PCI Express 2.0 x16 slots and two PCI Express 2.0 x8 slots.

Ethernet Ports

An Intel® network controller is integrated into each of the motherboards to support four Gigabit LAN ports (100/1000Base-T/1000BaseTX, RJ45 output).

Onboard Controllers/Ports

Onboard I/O backpanel ports on the motherboard include one COM port, a VGA port, two USB ports, a dedicated IPMI LAN port and four Gigabit LAN (NIC) ports.

Graphics Controller

The H8QG7-LN4F features an integrated Matrox G200eW graphics chip, which includes 16 MB of DDR2 memory.
**IPMI**

IPMI (Intelligent Platform Management Interface) is a hardware-level interface specification that provides remote access, monitoring and administration for Supermicro server platforms. IPMI allows server administrators to view a server’s hardware status remotely, receive an alarm automatically if a failure occurs, and power cycle a system that is non-responsive.

**Other Features**

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

---

**Figure 1-1. SR5690/SR5670/SP5100 Chipset: System Block Diagram**

**Note:** This is a general block diagram. Please see Chapter 5 for details.
1-3 Server Chassis Features

The 2042G-72RF4 server is housed by the SC828TQ+-R1K43LPB chassis.

System Power

The SC828 chassis features a redundant (two separate power modules) 1400W high-efficiency power supply with I2C. This power redundancy feature allows you to replace a failed power supply without shutting down the system.

SAS/SATA Subsystem

The SC828 chassis was designed to support six hot-swappable SAS or SATA hard drives.

Front Control Panel

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

I/O Backplane

The I/O backplane includes one COM port, a VGA port, two USB 2.0 ports, PS/2 mouse and keyboard ports, four gigabit Ethernet ports and one dedicated Ethernet port for IPMI. Two x16 and two x8 low profile PCI-E expansion cards may be added to the system.

Cooling System

The SC828 chassis has an innovative cooling design that includes six 8-cm heavy-duty hot-swap fans located in the middle section of the chassis. The power supply module also includes a cooling fan. All chassis and power supply fans operate continuously. An air shroud channels the airflow from the system fans to efficiently cool the processors and memory.
1-4 Contacting Supermicro

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

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

Asia-Pacific
Address: Super Micro Computer, Inc.
3F, No. 150, Jian 1st Rd.
Zhonghe Dist., New Taipei City 23511
Taiwan (R.O.C)
Tel: +886-(2) 8226-3990
Fax: +886-(2) 8226-3992
Web Site: www.supermicro.com.tw
Technical Support:
Email: support@supermicro.com.tw
Tel: +886-(2)-8226-3990
Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your 2042G-72RF4 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

Inspect the box in which the system was shipped and note if it was damaged. If the server itself shows damage, file a damage claim with the carrier.

2-3 Preparing for Setup

The box the 2042G-72RF4 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 to complete the installation 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

Decide on a suitable location for the rack unit that will hold the 2042G-72RF4. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.
• 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 according to §2 of the German Ordinance for Work with Visual Display Units.

2-4 Warnings and Precautions!

Rack Precautions

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

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

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

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

Server Precautions

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

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

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

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

• Allow the hot plug SAS 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.).

Warning! To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

• This unit should be mounted at the bottom of the rack if it is the only unit in the rack.

• When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

• If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
2-5 Installing the System into a Rack

This section provides information on installing the chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean that the assembly procedure will differ slightly from the instructions provided. You should also refer to the installation instructions that came with the rack unit you are using. **Note:** This rail will fit a rack between 26.8” and 36.4” deep.

**Identifying the Sections of the Rack Rails**

The chassis package includes two rail assemblies in the rack mounting kit. Each assembly consists of three sections: An inner chassis rail which secures directly to the chassis, an outer rail that secures to the rack, and a middle rail which extends from the outer rail. These assemblies are specifically designed for the left and right side of the chassis.

![Figure 2-1. Identifying the Outer Rail, Middle Rail and Inner Rails (Left Rail Assembly Shown)](image-url)
Locking Tabs

Each inner rail has a locking tab. This tab locks the chassis into place when installed and pushed fully into the rack. These tabs also lock the chassis in place when fully extended from the rack. This prevents the server from coming completely out of the rack when the chassis is pulled out for servicing.

Releasing the Inner Rail

Use the procedure below to release the inner rails from the outer rails.

Releasing Inner Rail from the Outer Rails
1. Identify the left and right outer rail assemblies as described previously.
2. Pull the inner rail out of the outer rail until it is fully extended as illustrated below.
3. Press the locking tab down to release the inner rail.
4. Pull the inner rail all the way out.
5. Repeat for the other outer rail.

Figure 2-2. Extending and Releasing the Inner Rail
Installing The Inner Rails on the Chassis

**Installing the Inner Rails**

1. Confirm that the left and right inner rails have been correctly identified.

2. Place the inner rail firmly against the side of the chassis, aligning the hooks on the side of the chassis with the holes in the inner rail.

3. Slide the inner rail forward toward the front of the chassis until the rail clicks into the locked position, which secures the inner rail to the chassis.

4. Secure the inner rail to the chassis with the screws provided.

5. Repeat for the other inner rail.

![Figure 2-3. Installing the Inner Rails](image)

![Figure 2-4. Inner Rails Installed on the Chassis](image)
Installing the Outer Rails on the Rack

*Installing the Outer Rails*

1. Press upward on the locking tab at the rear end of the middle rail.
2. Push the middle rail back into the outer rail.
3. Hang the hooks of the front of the outer rail onto the slots on the front of the rack. If necessary, use screws to secure the outer rails to the rack, as illustrated above.
4. Pull out the rear of the outer rail, adjusting the length until it fits within the posts of the rack.
5. Hang the hooks of the rear portion of the outer rail onto the slots on the rear of the rack. If necessary, use screws to secure the rear of the outer rail to the rear of the rack.
6. Repeat for the other outer rail.
### Standard Chassis Installation

**Stability hazard.** The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.

### Installing the Chassis into a Rack

1. Extend the outer rails as illustrated above.
2. Align the inner rails of the chassis with the outer rails on the rack.
3. Slide the inner rails into the outer rails, keeping the pressure even on both sides. When the chassis has been pushed completely into the rack, it should click into the locked position.
4. Optional screws may be used to secure the to hold the front of the chassis to the rack.

---

**Figure 2-6. Installing into a Rack**

![Ball-Bearing Shuttle](image)

**Note:** The figure above is for illustrative purposes only. Always install servers to the bottom of the rack first.

**Caution:** Do not pick up the server with the front handles. They are designed to pull the system from a rack only.
Chapter 2: Server Installation

2-6 Checking the Serverboard Setup

After you install the 2042G-72RF4 in the rack, open the top cover to make sure the serverboard is properly installed and all the connections have been made.

Accessing the Inside of the System

1. Release the retention screws that secure the system to the rack.
2. Grasp the two handles on either side and pull the system straight out until it locks with a click.
3. Next, release the thumbscrew at the middle rear of the top cover. Then depress the two buttons on the top of the chassis to release the top cover.
4. Push the cover away from you (toward the rear of the chassis) until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.
5. To remove the system from the rack completely, depress the locking tabs in the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position.

Checking the Components and Setup

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

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

• If desired, you can install PCI extension cards to the system. See Chapter 5 for details.

• Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.
2-7 Preparing to Power On

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

Checking the Drives

- The SAS/SATA disk drives can be installed and removed from the front of the chassis without removing the top chassis cover. To install or service, refer to Chapter 6.

- An optional DVD or other drives may be preinstalled in your server. Refer to Chapter 6 if you need to add more or reinstall.

Checking the Airflow

- Airflow is provided by six 8cm fans and an air shroud. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

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

Providing Power

1. Plug the power cords from the power supplies unit into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

2. Depress the power on button on the front of the chassis.
Chapter 3

System Interface

3-1 Overview

The chassis includes:

- A control panel on the front that houses power buttons and status monitoring lights

- Status lights on externally accessible hard drives

- Status lights for the power supply visible from the back of the chassis

Figure 3-1. Control Panel
3-2 Control Panel Buttons

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

Power
The main power button is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

Reset
Use the reset button to reboot the system.

3-3 Control Panel LEDs

There are five LEDs that provide status information about the system.

Power Fail
Indicates a power supply module has failed. This LED should be off when the system is operating normally.

The second power supply module will take the load and keep the system running, but the failed module must be replaced. Refer to Chapter 6 for details.
Information LED

Alerts operator of several states, as noted in the table below.

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuously on and red</td>
<td>An overheat condition has occurred. (This may be caused by cable congestion.)</td>
</tr>
<tr>
<td>Blinking red (1Hz)</td>
<td>Fan failure, check for an inoperative fan.</td>
</tr>
<tr>
<td>Blinking red (0.25Hz)</td>
<td>Power failure, check for a non-operational power supply.</td>
</tr>
<tr>
<td>Solid blue</td>
<td>Local UID has been activated. Use this function to locate the server in a rack mount environment.</td>
</tr>
<tr>
<td>Blinking blue</td>
<td>Remote UID is on. Use this function to identify the server from a remote location.</td>
</tr>
</tbody>
</table>

NIC2

Indicates network activity on GLAN2 when flashing.

NIC1

Indicates network activity on GLAN1 when flashing.

HDD

Indicates IDE channel activity. This light indicates SAS or DVD-ROM drive activity when flashing.
Power

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

3-4 SAS Drive Tray LEDs

Each SAS drive tray has two LEDs:

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

- **Red**: The SES2 compliant backplane activates the red LED to indicate a drive failure. If one of the SAS drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SAS drives.
Chapter 4

Standardized Warning Statements for AC Systems

4-1 About Standardized Warning Statements

The following statements are industry standard warnings, provided to warn the user of situations which have the potential for bodily injury. Should you have questions or experience difficulty, contact Supermicro's Technical Support department for assistance. Only certified technicians should attempt to install or configure components.

Read this appendix in its entirety before installing or configuring components in the Supermicro chassis.

These warnings may also be found on our web site at http://www.supermicro.com/about/policies/safety_information.cfm.

Warning Definition

Warning!

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

警告の定義

この警告サインは危険を意味します。人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危险。

您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾的声明号码找到此设备的安全性警告说明的翻译文本。

此警告符号代表危险。

您目前所处的工作环境可能让您受伤。您使用任何设备之前，请注意触电的危险，并且要熟悉预防事故发生的标准工作程序。请依照每一注意事項後的號碼找到相關的翻譯說明內容。
Warnung

WICHTIGE SICHERHEITSHINWEISE


BEWAHREN SIE DIESE HINWEISE GUT AUF.

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES.

IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS.
Warning Statements for AC Systems

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwings symbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij een elektrische installatie betrokken risico’s en dient u op de hoogte te zijn van de standaard procedures om ongelukken te voorkomen. Gebruik de nummers aan het eind van elke waarschuwing om deze te herleiden naar de desbetreffende locatie.

BEWAAR DEZE INSTRUCTIES

BEWAAR DEZE INSTRUCTIES
Installation Instructions

Warning!
Read the installation instructions before connecting the system to the power source.

システムを電源に接続する前に、設置手順書をお読み下さい。

¡Advertencia!
Lea las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Attention
Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

システムを電源に接続する前に、設置手順書をお読み下さい。

Waarschuwing
Raadpleeg de installatie-instructies voordat u het systeem op de voedingsbron aansluit.
Circuit Breaker

**Warning!**

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 20 A.

**サーキット・ブレーカー**

この製品は、短絡(過電流)保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

**警告**

此产品的短路(过载电流)保护由建筑物的供电系统提供,确保短路保护设备的额定电流不大于250V, 20A。

**Warnung**


**¡Advertencia!**

Este equipo utiliza el sistema de protección contra cortocircuitos (o sobrecorrientes) del edificio. Asegúrese de que el dispositivo de protección no sea superior a: 250 V, 20 A.

**Attention**

Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifiez que le courant nominal du dispositif de protection n'est pas supérieur à :250 V, 20 A.

**警告**

此产品的短路(過載電流)保護由建築物的供電系統提供,確保短路保護設備的額定電流不大於250V, 20A。

**Warning**

Meeze de het motsteer op yon habe de motsegege wamke dei meen oet deer de commentar. Ye loet is 250VDC, 20A.
Power Disconnection Warning

Warning!

The system must be disconnected from all sources of power and the power cord removed from the power supply module(s) before accessing the chassis interior to install or remove system components.

경고!

이 제품은 전원의 단락(과전류)방지에 대해서 전적으로 건물의 관련 설비에 의존합니다. 보호장치의 정격이 반드시 250V(볼트), 20A(암페어)를 초과하지 않도록 해야 합니다.

Waarschuwing

Dit product is afhankelijk van de kortsluitbeveiliging (overspanning) van uw electrische installatie. Controleer of het beveiligde apparaat niet groter gedimensioneerd is dan 220V, 20A.

Warnung

Das System muss von allen Quellen der Energie und vom Netzanschlusskabel getrennt sein, das von den Spg.Versorgungsteilmodulen entfernt wird, bevor es auf den Chassisinnenraum zurückgreift, um Systemsbestandteile anzubringen oder zu entfernen.

警告

在你打开机箱并安装或移除内部器件前,必须将系统完全断电,并移除电源线。

警告

在您打開機殼安裝或移除內部元件前, 必須將系統完全斷電, 並移除電源線。

경고!

이 제품은 전원의 단락(과전류)방지에 대해서 전적으로 건물의 관련 설비에 의존합니다. 보호장치의 정격이 반드시 250V(볼트), 20A(암페어)를 초과하지 않도록 해야 합니다.
¡Advertencia!

El sistema debe ser disconnected de todas las fuentes de energía y del cable eléctrico quitado de los módulos de fuente de alimentación antes de tener acceso el interior del chasis para instalar o para quitar componentes de sistema.

Attention

Le système doit être débranché de toutes les sources de puissance ainsi que de son cordon d'alimentation secteur avant d'accéder à l'intérieur du chassis pour installer ou enlever des composants de système.

경고!

시스템에 부품들을 장착하거나 제거하기 위해서는 세시 내부에 접근하기 전에 반드시 전원 공급장치로부터 연결되어있는 모든 전원과 전기코드를 분리해주어야 합니다.

Waarschuwing

Voordat u toegang neemt tot het binnenwerk van de behuizing voor het installeren of verwijderen van systeem onderdelen, dient u alle spanningsbronnen en alle stroomkabels aangesloten op de voeding(en) van de behuizing te verwijderen.
Equipment Installation

Warning!
Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

¡Advertencia!
Solamente el personal calificado debe instalar, reemplazar o utilizar este equipo.

Attention
Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés.

경고!
훈련을 받고 공인된 기술자만이 이 장비의 설치, 교체 또는 서비스를 수행할 수 있습니다.
Chapter 4: Warning Statements for AC Systems

**Restricted Area**

**Warning!**

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. (This warning does not apply to workstations).

アクセス制限区域
このユニットは、アクセス制限区域に設置されることを想定しています。
アクセス制限区域は、特別なツール、鍵と錠前、その他のセキュリティの手段を用いてのみ出入りが可能です。

警告
此部件应安装在限制进出的场所，限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全手段进出的场所。

警告
此装置限安装於進出管制区域。進出管制区域係指僅能以特殊工具、鎖頭及鑰匙或其它安全方式才能進入的區域。

Warnung
Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Der Zutritt zu derartigen Bereichen ist nur mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer sonstigen Sicherheitsvorkehrung möglich.

¡Advertencia!
Esta unidad ha sido diseñada para instalación en áreas de acceso restringido. Sólo puede obtenerse acceso a una de estas áreas mediante la utilización de una herramienta especial, cerradura con llave u otro medio de seguridad.

Attention
Cet appareil doit être installée dans des zones d'accès réservés. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.
Battery Handling

Warning!

There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
Warnung

Attention
Danger d’explosion si la pile n’est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

¡Advertencia!
Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

경고!
배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조자에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조자의 안내에 따라 사용된 배터리를 처리하여 주십시오.

Waarschuwing
Er is ontploffingsgevaar indien de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type die door de fabrikant aanbevolen wordt. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften afgevoerd te worden.
Redundant Power Supplies

Warning!

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.

冗長電源装置
このユニットは複数の電源装置が接続されている場合があります。
ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

警告
此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。

警告
此装置连接的电源可能不只一个，必须切断所有电源才能停止对装置的供电。

Warnung
Dieses Gerät kann mehr als eine Stromzufuhr haben. Um sicherzustellen, dass der Einheit kein Strom zugeführt wird, müssen alle Verbindungen entfernt werden.

¡Advertencia!
Puede que esta unidad tenga más de una conexión para fuentes de alimentación. Para cortar por completo el suministro de energía, deben desconectarse todas las conexiones.

Attention
Cette unité peut avoir plus d'une connexion d'alimentation. Pour supprimer toute tension et tout courant électrique de l'unité, toutes les connexions d'alimentation doivent être débranchées.

أم كيم ويتر مسفم أتود
أذورتر!
ليتوه دى ويتر متيبر لود شة مسفم. يه لامغي أتود شة البوتريم على ماتي لودك
أذ هويحته.
Chapter 4: Warning Statements for AC Systems

Backplane Voltage

Warning!
Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.

Warning
System voltage is present on the backplane during operation. Use caution when servicing.

Warning
当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

Warning
システムの稼働中は危険な電圧または電力が、バックプレーン上にかかっています。
修理する際には注意ください。

Warning
Wenn das System in Betrieb ist, treten auf der Rückwandplatine gefährliche Spannungen oder Energien auf. Vorsicht bei der Wartung.

¡Advertencia!
Cuando el sistema está en funcionamiento, el voltaje del plano trasero es peligroso. Tenga cuidado cuando lo revise.

Attention
Lorsque le système est en fonctionnement, des tensions électriques circulent sur le fond de panier. Prendre des précautions lors de la maintenance.
Comply with Local and National Electrical Codes

**Warning!**

Installation of the equipment must comply with local and national electrical codes.

警告

設備安裝必須符合本地與本國電氣法規。

¡Advertencia!

La instalacion del equipo debe cumplir con las normas de electricidad locales y nacionales.
Chapter 4: Warning Statements for AC Systems

Attention
L’équipement doit être installé conformément aux normes électriques nationales et locales.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

Warning!
Ultimate disposal of this product should be handled according to all national laws and regulations.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

WARNING
Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!
Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.
Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

Hot Swap Fan Warning

Warning!

Hazardous moving parts. Keep away from moving fan blades. The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.
Chapter 4: Warning Statements for AC Systems

Warnung

¡Advertencia!
Riesgo de piezas móviles. Mantener alejado de las aspas del ventilador. Los ventiladores podran dar vuelta cuando usted quite ell montaje del ventilador del chasis. Mandtenga los dedos, los destornilladores y todos los objetos lejos de las aberturas del ventilador

Attention
Pieces mobiles dangereuses. Se tenir a l’ecart des lames du ventilateur Il est possible que les ventilateurs soient toujours en rotation lorsque vous retirerez le bloc ventilateur du châssis. Prenez garde à ce que doigts, tournevis et autres objets soient éloignés du logement du bloc ventilateur.

경고!
움직이는 위험한 부품. 회전하는 송풍 날개에 접근하지 마세요. 섀시로부터 팬 조립품을 제거할 때 팬은 여전히 회전하고 있을 수 있습니다. 팬 조립품 외관의 열려있는 부분들로부터 손가락 및 스크류드라이버, 다른 물체들이 가까이 하지 않도록 배치해 주십시오.

Waarschuwing
Gevaarlijk bewegende onderdelen. Houd voldoende afstand tot de bewegende ventilatorbladen. Het is mogelijk dat de ventilator nog draait tijdens het verwijderen van het ventilatorsamenstel uit het chassis. Houd uw vingers, schroevendraaiers en eventuele andere voorwerpen uit de buurt van de openingen in de ventilatorbehuizing.
Warning!

When installing the product, use the provided or designated connection or procure cables, power cables and AC adaptors complying with local codes and safety requirements including proper cord size and plug. Using any other cables and adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL or CSA-certified cables (that have UL/CSA shown on the code) for any other electrical devices than products designated by Supermicro only.

Power Cable and AC Adapter

Warning!

安装此产品时,请使用本身提供的或指定的或采购的连接线,电源线和电源适配器,包含遵照当地法规和安全要求的合规的电源线尺寸和插头,使用其它线材或适配器可能会引起故障或火灾。除了Supermicro所指定的产品,电气用品和材料安全法律规定禁止使用未经UL或CSA认证的线材。(线材上会显示UL/CSA符号)。

警告

安装此产品时,请使用本身提供的或指定的或采购的连接线,电源线和电源适配器,包含遵照当地法规和安全要求的合规的电源线尺寸和插头,使用其它线材或适配器可能会引起故障或火灾。除了Supermicro所指定的产品,电气用品和材料安全法律规定禁止使用未经UL或CSA认证的线材。(线材上会显示UL/CSA符号)。

Warnung

Nutzen Sie beim Installieren des Produkts ausschließlich die von uns zur Verfügung gestellten Verbindungskabeln, Stromkabeln und/or Adapter, die Ihre örtlichen Sicherheitsstandards einhalten. Der Gebrauch von anderen Kabeln und Adapter können Fehlfunktionen oder Feuer verursachen. Die Richtlinien untersagen das Nutzen von UL oder CAS zertifizierten Kabeln (mit UL/CSA gekennzeichnet), an Geräten oder Produkten die nicht mit Supermicro gekennzeichnet sind.
¡Advertencia!

Cuando instale el producto, utilice la conexión provista o designada o procure cables, Cables de alimentación y adaptadores de CA que cumplan con los códigos locales y los requisitos de seguridad, incluyendo el tamaño adecuado del cable y el enchufe. El uso de otros cables y adaptadores podría causar un mal funcionamiento o un incendio. La Ley de Seguridad de Aparatos Eléctricos y de Materiales prohíbe El uso de cables certificados por UL o CSA (que tienen el certificado UL / CSA en el código) para cualquier otros dispositivos eléctricos que los productos designados únicamente por Supermicro.

Attention

Lors de l’installation du produit, utilisez les cables de connection fournis ou désigné ou achetez des cables, cables de puissance et adaptateurs respectant les normes locales et les conditions de securité y compris les tailles de cables et les prises electriques appropries. L'utilisation d'autres cables et adaptateurs peut provoquer un dysfonctionnement ou un incendie. Appareils électroménagers et la Loi sur la Sécurité Matériel interdit l'utilisation de câbles certifies- UL ou CSA (qui ont UL ou CSA indiqué sur le code) pour tous les autres appareils électriques sauf les produits désignés par Supermicro seulement.

ברלים והתחומים
כבלים והתחומים AC
אזהרה!
אחרי רישום ואתחום AC
כבלים והתחומים יחלשו בשתיים, ספקי והתחומים
והתחומים יובילו את העזרה הבסייתית המוקפת, לכלל מידה נוכח
של נוכחות. שיתוף כל בולאי מאיתופי עוצר, עוצר ולוחק את
התחום. בחרו את התחום המבוסס על ההשתיות והעזרה, כימי אייר חלחולש
- בבלד UL/CSA (אך חלשו על התחום בסיסי) - וא buena
- בבלד בבלד מומנטים כ㍉ comprar את Supermicro את שף.

عند تركيب المنتج، قد يستخدم التوصيات المتوفرة أو المحددة أو قم بشراء الكابلات الكهربائية ومواد التيار المتضمدة بالالتزام بقوانين ومتطلبات السلامة المحلية بما في ذلك حجم الموصل والقباس السليم. استخدام أي كابلات ومواد أخرى قد يسبب في عطل أو حريق. يحظر قانون السلامة للأجهزة الكهربائية والمواد استخدام الكابلات الممتمدة من قبل UL أو CSA (والتي تحمل علامة UL/CSA) مع أي معدات أخرى غير المنتجات المعنية، والمحددة من قبل Supermicro.
전원 케이블 및 AC 어댑터

경고! 제품을 설치할 때 현지 코드 및 적절한 굴기의 코드와 플러그를 포함한 안전 요구 사항을 준수하여 제공되거나 지정된 연결 혹은 구매 케이블, 전원 케이블 및 AC 어댑터를 사용하십시오.

다른 케이블이나 어댑터를 사용하면 오작동이나 화재가 발생할 수 있습니다. 전기 용품 안전법은 UL 또는 CSA 인증 케이블 (코드에 UL / CSA가 표시된 케이블) 을 Supermicro가 지정한 제품 이외의 전기 장치에 사용하는 것을 금지합니다.

Stroomkabel en AC-Adapter

Chapter 5

Advanced Serverboard Setup

The H8QG7-LN4F serverboard comes installed. This chapter describes procedures for installation of processors and heatsinks, memory, and extension (add-on) cards. Serverboard cables, jumpers and connections are also described. A layout and quick reference chart are included for your reference. Further, this chapter discusses RAID and drivers.

5-1 Handling the Serverboard

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

Precautions

• Use a grounded wrist strap designed to prevent Electrostatic Discharge (ESD).
• Touch a grounded metal object before removing any board from its antistatic bag.
• Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
• When handling chips or modules, avoid touching their pins.
• Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
• For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.
5-2 Connecting Cables

Necessary cables include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed 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 in this chapter for connector locations.)

- SAS drive data cables (SAS0~5)
- Control Panel cable (JF1)
- Fan and fan extension cables (Fan1~Fan9)

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

Connecting Power Cables

The H8QG7-LN4F has a 24-pin primary power supply connector (JPW1) for connection to the ATX power supply. In addition, there are three 8-pin secondary power connectors (JPW2/3/4) that also must be connected to your power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

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

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

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power Button</td>
</tr>
<tr>
<td>20</td>
<td>Key</td>
</tr>
<tr>
<td>19</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Power LED</td>
</tr>
<tr>
<td>4</td>
<td>HDD LED</td>
</tr>
<tr>
<td>17</td>
<td>NIC1 (Link) LED</td>
</tr>
<tr>
<td>16</td>
<td>NIC2 (Link) LED</td>
</tr>
<tr>
<td>18</td>
<td>OH/Fan Fail/PWR Fail/UID LED</td>
</tr>
<tr>
<td>5</td>
<td>Power Fail LED</td>
</tr>
<tr>
<td>6</td>
<td>Ground</td>
</tr>
<tr>
<td>7</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Figure 5-2. I/O Port Locations and Definitions

5-3 I/O Ports

The I/O ports are color coded. See Figure 5-2 below for the colors and locations of the various I/O ports.

Rear I/O Ports

<table>
<thead>
<tr>
<th>Rear I/O Ports</th>
<th>1. Keyboard</th>
<th>6. LAN1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. PS/2 Mouse</td>
<td>7. LAN2</td>
<td></td>
</tr>
<tr>
<td>3. USB0/1</td>
<td>8. LAN3</td>
<td></td>
</tr>
<tr>
<td>4. IPMI LAN</td>
<td>9. LAN4</td>
<td></td>
</tr>
<tr>
<td>5. VGA Port</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5-4 Processor and Heatsink Installation

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

Notes:
- Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
- If you buy a CPU separately, make sure that you use the heatsink included with the server only.
- Make sure to install the serverboard into the chassis before you install the CPU heatsinks.
- When receiving a serverboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the Supermicro web site for updates on CPU support.

Installing the Processors

1. Begin by removing the cover plate that protects the CPU. Lift the lever on the CPU socket until it points straight up.

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

2. With the lever raised, lift open the silver CPU retention plate. Align the CPU keys with the socket keys.
3. Use your thumb and your index finger to hold the CPU. Locate and align pin 1 of the CPU socket with pin 1 of the CPU. Both are marked with a triangle.

4. Align pin 1 of the CPU with pin 1 of the socket. Once aligned, carefully place the CPU into the socket. Do not drop the CPU on the socket, move the CPU horizontally or vertically or rub the CPU against the socket or against any pins of the socket, which may damage the CPU and/or the socket.

5. With the CPU inserted into the socket, inspect the four corners of the CPU to make sure that it is properly installed and flush with the socket. Then, gently lower the silver CPU retention plate into place.

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

6. Carefully press the CPU socket lever down until it locks into its retention tab. For a dual-CPU system, repeat these steps to install another CPU into the CPU#2 socket.

**Note:** in single and dual-CPU configurations, memory must be installed in the DIMM slots associated with the installed CPU(s).

**Note:** see Chapter 6 for details on installing the air shroud.

**Caution:** Supermicro recommends that you utilize a Processor Installation/Removal tool to install or remove the processor from the serverboard without causing the processor or serverboard damage.
Installing a Passive CPU Heatsink

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

2. Place the heatsink directly on top of the CPU so that the heat sink screws are aligned with the mounting holes on the back plate.

3. Make sure the screwdriver torque setting is no more than 5.0 Kgf-cm (4.3 lbf-in) and keep the heat sink direction vertical.

4. Tighten each screw a few turns at a time while alternating between the two until fully tightened.

Removing the Heatsink

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

1. Unscrew the heatsink screws from the motherboard a few turns at a time, alternating between the two until the screws can be removed.

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

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

4. Clean the surface of the CPU and the heatsink, removing the used thermal grease. Reapply the proper amount of thermal grease on the surface before re-installing the CPU and the heatsink.
5-5 Installing Memory

**Caution:** Exercise extreme caution when installing or removing memory modules to prevent any possible damage.

**Installing Memory**

1. Insert each memory module vertically into its slot, paying attention to the notch along the bottom of the module to prevent inserting the module incorrectly (see Figure 2-1).

2. Install to slots CPU1/DIMM1A, CPU1/DIMM2A, CPU1/DIMM3A and CPU1/DIMM4A, etc. Always install in groups of four and in the numerical order of the DIMM slots. See support information below.

3. Gently press down on the memory module until it snaps into place.

4. With four DIMMs installed, repeat step 2 to populate the CPU2 DIMM slots. Always install four DIMMs to both CPU DIMM slots for more efficient operation.

**Note:** Memory modules of 1 GB, 2 GB, 4 GB, 8 GB, 16 GB or 32 GB size are supported. It is highly recommended that you remove the power cord from the system before installing or changing memory modules. Please refer to our web site for memory that has been tested on the H8QG7-LN4F serverboard.

**Memory Support**

The H8QG7-LN4F serverboard supports thirty-two (32) single/dual/tri/quad-channel, DDR3-1600/1333/1066 Mhz SDRAM memory modules.

Populating four adjacent slots at a time with memory modules of the same size and type will result in interleaved (128-bit) memory, which is faster than non-interleaved (64-bit) memory.

**Maximum Memory**

The H8QG7-LN4F serverboard supports a maximum memory of up to 256 GB of ECC/Non-ECC UDIMM or up to 1 TB of ECC RDIMM SDRAM.
To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

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

Memory Population for Optimal Performance
-For a Motherboard with One CPU (CPU1) Installed

<table>
<thead>
<tr>
<th># DIMMS</th>
<th>CPU</th>
<th>Channel 1</th>
<th>Channel 2</th>
<th>Channel 3</th>
<th>Channel 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 DIMMs</td>
<td>CPU1</td>
<td>P1-1A</td>
<td>P1-2A</td>
<td>P1-3A</td>
<td>P1-4A</td>
</tr>
<tr>
<td>8 DIMMs</td>
<td>CPU1</td>
<td>P1-1A</td>
<td>P1-1B</td>
<td>P1-2A</td>
<td>P1-3A</td>
</tr>
</tbody>
</table>

Memory Population for Optimal Performance
-For a Motherboard with Two CPUs (CPU1 & CPU2) Installed

<table>
<thead>
<tr>
<th># DIMMS</th>
<th>CPU</th>
<th>Channel 1</th>
<th>Channel 2</th>
<th>Channel 3</th>
<th>Channel 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 DIMMs</td>
<td>CPU1</td>
<td>P1-1A</td>
<td>P1-2A</td>
<td>P1-3A</td>
<td>P1-4A</td>
</tr>
<tr>
<td></td>
<td>CPU2</td>
<td>P2-1A</td>
<td>P2-2A</td>
<td>P2-3A</td>
<td>P2-4A</td>
</tr>
<tr>
<td>16 DIMMs</td>
<td>CPU1</td>
<td>P1-1A</td>
<td>P1-1B</td>
<td>P1-2A</td>
<td>P1-3A</td>
</tr>
<tr>
<td></td>
<td>CPU2</td>
<td>P2-1A</td>
<td>P2-1B</td>
<td>P2-2A</td>
<td>P2-3A</td>
</tr>
</tbody>
</table>

Memory Population for Optimal Performance – For a Motherboard with Four CPUs (CPU1, CPU2, CPU3 & CPU4) Installed

<table>
<thead>
<tr>
<th># DIMMS</th>
<th>CPU</th>
<th>Channel 1</th>
<th>Channel 2</th>
<th>Channel 3</th>
<th>Channel 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 DIMMs</td>
<td>CPU1</td>
<td>P1-1A</td>
<td>P1-2A</td>
<td>P1-3A</td>
<td>P1-4A</td>
</tr>
<tr>
<td></td>
<td>CPU2</td>
<td>P2-1A</td>
<td>P2-2A</td>
<td>P2-3A</td>
<td>P2-4A</td>
</tr>
<tr>
<td></td>
<td>CPU3</td>
<td>P3-1A</td>
<td>P3-2A</td>
<td>P3-3A</td>
<td>P3-4A</td>
</tr>
<tr>
<td></td>
<td>CPU4</td>
<td>P4-1A</td>
<td>P4-2A</td>
<td>P4-3A</td>
<td>P4-4A</td>
</tr>
<tr>
<td>32 DIMMs</td>
<td>CPU1</td>
<td>P1-1A</td>
<td>P1-1B</td>
<td>P1-2A</td>
<td>P1-3A</td>
</tr>
<tr>
<td></td>
<td>CPU2</td>
<td>P2-1A</td>
<td>P2-1B</td>
<td>P2-2A</td>
<td>P2-3A</td>
</tr>
<tr>
<td></td>
<td>CPU3</td>
<td>P3-1A</td>
<td>P3-2A</td>
<td>P3-3A</td>
<td>P3-3B</td>
</tr>
<tr>
<td></td>
<td>CPU4</td>
<td>P4-1A</td>
<td>P4-1B</td>
<td>P4-2A</td>
<td>P4-3A</td>
</tr>
</tbody>
</table>

Note: Notch should align with the receptive key point on the slot.
**DIMM Module Population Configuration**

For memory to work properly, follow the tables below for memory installation:

<table>
<thead>
<tr>
<th>Per Channel DIMM Populations Options</th>
<th>DIMM Type</th>
<th>DIMM A</th>
<th>DIMM B</th>
<th>Max. MHz, 1.5V DIMMs</th>
<th>Max. MHz, 1.35V DIMMs</th>
<th>Max. GB/Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UDIMM</td>
<td>SR or DR</td>
<td>Empty</td>
<td>1600 MHz</td>
<td>1333 MHz</td>
<td>8 GB</td>
</tr>
<tr>
<td></td>
<td>UDIMM</td>
<td>SR</td>
<td>SR</td>
<td>1600 MHz</td>
<td>1333 MHz</td>
<td>8 GB</td>
</tr>
<tr>
<td></td>
<td>UDIMM</td>
<td>DR</td>
<td>DR</td>
<td>1333 MHz</td>
<td></td>
<td>16 GB</td>
</tr>
<tr>
<td></td>
<td>RDIMM</td>
<td>SR or DR</td>
<td>Empty</td>
<td>1600 MHz</td>
<td>1333 MHz</td>
<td>16 GB</td>
</tr>
<tr>
<td></td>
<td>RDIMM</td>
<td>SR</td>
<td>SR</td>
<td>1600 MHz</td>
<td>1333 MHz</td>
<td>16 GB</td>
</tr>
<tr>
<td></td>
<td>RDIMM</td>
<td>DR</td>
<td>DR</td>
<td>1600 MHz</td>
<td>1333 MHz</td>
<td>32 GB</td>
</tr>
<tr>
<td></td>
<td>RDIMM</td>
<td>QR</td>
<td>Empty</td>
<td>1333 MHz</td>
<td>1066 MHz</td>
<td>32 GB</td>
</tr>
<tr>
<td></td>
<td>RDIMM</td>
<td>QR</td>
<td>QR</td>
<td>1066 MHz</td>
<td>800 MHz</td>
<td>64 GB</td>
</tr>
<tr>
<td></td>
<td>LRDIMM</td>
<td>QR</td>
<td>Empty</td>
<td>1333 MHz</td>
<td></td>
<td>32 GB</td>
</tr>
<tr>
<td></td>
<td>LRDIMM</td>
<td>QR</td>
<td>QR</td>
<td></td>
<td></td>
<td>64 GB</td>
</tr>
</tbody>
</table>

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

**Note 2:** Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional.

---

**Possible System Memory Allocation & Availability**

<table>
<thead>
<tr>
<th>System Device</th>
<th>Size</th>
<th>Physical Memory Available (4 GB Total System Memory)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firmware Hub flash memory (System BIOS)</td>
<td>1 MB</td>
<td>3.99 GB</td>
</tr>
<tr>
<td>Local APIC</td>
<td>4 KB</td>
<td>3.99 GB</td>
</tr>
<tr>
<td>Area Reserved for the chipset</td>
<td>2 MB</td>
<td>3.99 GB</td>
</tr>
<tr>
<td>I/O APIC (4 Kbytes)</td>
<td>4 KB</td>
<td>3.99 GB</td>
</tr>
<tr>
<td>PCI Enumeration Area 1</td>
<td>256 MB</td>
<td>3.76 GB</td>
</tr>
<tr>
<td>PCI Express (256 MB)</td>
<td>256 MB</td>
<td>3.51 GB</td>
</tr>
<tr>
<td>PCI Enumeration Area 2 (if needed) -Aligned on 256-M boundary-</td>
<td>512 MB</td>
<td>3.01 GB</td>
</tr>
<tr>
<td>VGA Memory</td>
<td>16 MB</td>
<td>2.85 GB</td>
</tr>
<tr>
<td>TSEG</td>
<td>1 MB</td>
<td>2.84 GB</td>
</tr>
<tr>
<td>Memory available for the OS &amp; other applications</td>
<td></td>
<td>2.84 GB</td>
</tr>
</tbody>
</table>
## 5-6 Serverboard Details

### H8QG7-LN4F Quick Reference

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Description</th>
<th>Default Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>JBT1</td>
<td>CMOS Clear</td>
<td>(See Section 5-8)</td>
</tr>
<tr>
<td>JI2C1/JI2C2</td>
<td>I2C to PCI-E Slot Enable/Disable</td>
<td>Pin 2-3 (Disabled)</td>
</tr>
<tr>
<td>JPB1</td>
<td>BMC Enable/Disable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JPG1</td>
<td>VGA Enable/Disable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JPL1</td>
<td>LAN 1/2/3/4 Enable/Disable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JPS1</td>
<td>SAS Controller Enable/Disable (only on H8QG7-LN4F)</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JWD1</td>
<td>Watch Dog</td>
<td>Pins 1-2 (Reset)</td>
</tr>
</tbody>
</table>

### LED

- **LAN Ports**
  - LEDs for the LAN Ethernet ports

- **Dedicated IPMI LAN**
  - LEDs for the dedicated IPMI LAN Ethernet port

- **LE1**
  - LED for UID Button

- **DP1**
  - LED for IPMI Heartbeat

- **DP3**
  - LED for Serverboard Power-On

- **LEDS1**
  - SAS Activity LED (H8QG7-LN4F only)

- **LEDS2**
  - SAS Fault LED (H8QG7-LN4F only)
<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM1</td>
<td>COM1 Serial Header</td>
</tr>
<tr>
<td>FAN 1-9</td>
<td>Chassis/CPU Fan Headers</td>
</tr>
<tr>
<td>IPMI LAN</td>
<td>Dedicated IPMI LAN Port</td>
</tr>
<tr>
<td>JD1</td>
<td>Speaker Header</td>
</tr>
<tr>
<td>JF1</td>
<td>Front Panel Connector</td>
</tr>
<tr>
<td>JF2</td>
<td>NIC3/NIC4 (LAN3/4) LED Connectors</td>
</tr>
<tr>
<td>JIPMB1</td>
<td>System Management Bus Header (SMBus)</td>
</tr>
<tr>
<td>J1</td>
<td>Chassis Intrusion Header</td>
</tr>
<tr>
<td>JOH1</td>
<td>Overheat Warning Header</td>
</tr>
<tr>
<td>JPI2C1</td>
<td>Power I2C Header</td>
</tr>
<tr>
<td>JPW1</td>
<td>24-pin Main ATX Power Connector</td>
</tr>
<tr>
<td>JPW2/3/4</td>
<td>+12V 8-pin CPU Power Connectors</td>
</tr>
<tr>
<td>JS3</td>
<td>SAS Battery Backup Cable Port</td>
</tr>
<tr>
<td>JSD1</td>
<td>SATA DOM (Device_On_Module) Power Connector</td>
</tr>
<tr>
<td>JTPM1</td>
<td>Trusted Platform Module Header</td>
</tr>
<tr>
<td>JWF1</td>
<td>Compact Flash Card Power Connector</td>
</tr>
<tr>
<td>JSTBY1</td>
<td>Standby Power Connection header</td>
</tr>
<tr>
<td>LAN1/2/3/4</td>
<td>Gigabit Ethernet (RJ45) Ports</td>
</tr>
<tr>
<td>PS2 Mouse/Keyboard</td>
<td>PS2 Mouse/Keyboard connectors</td>
</tr>
<tr>
<td>SAS0<del>3, SAS4</del>7</td>
<td>SAS Ports (only on H8QG7-LN4F)</td>
</tr>
<tr>
<td>SATA0 ~ SATA5</td>
<td>SATA Ports</td>
</tr>
<tr>
<td>T-SGPIO1/T-SGPIO2</td>
<td>Serial General Purpose Input/Output Header for SATA</td>
</tr>
<tr>
<td>UID</td>
<td>Unit Identifier Button</td>
</tr>
<tr>
<td>USB0/1, USB6, USB2/3, USB4/5</td>
<td>Universal Serial Bus (USB) Ports, Type-A Ports and Headers</td>
</tr>
<tr>
<td>VGA</td>
<td>VGA Connector</td>
</tr>
</tbody>
</table>
Figure 5-5. H8QG7-LN4F Layout
(not drawn to scale)

Notes:
Jumpers not indicated are for test purposes only.
Not all ports, jumpers or LED Indicators are available on all serverboards.
Chapter 5: Advanced Serverboard Setup

5-7 Connector Definitions

Power Connectors

A 24-pin main power supply connector (JPW1) and three 8-pin CPU PWR connectors (JPW2/JPW3/JPW4) on the motherboard. These power connectors meet the SSI EPS 12V specification. In addition to the 24-pin ATX power connector, the 12V 8-pin CPU PWR connectors at JPW2/JPW3/JPW4 must also be connected to your power supply. See the table on the right for pin definitions.

Warning: To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin and three 8-pin power connectors. Be sure to connect these connectors to the 24-pin (JPW1) and the three 8-pin (JPW2, JPW3 and JPW4) power connectors on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

<table>
<thead>
<tr>
<th>ATX Power 24-pin Connector Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td>17</td>
</tr>
<tr>
<td>18</td>
</tr>
<tr>
<td>19</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>21</td>
</tr>
<tr>
<td>22</td>
</tr>
<tr>
<td>23</td>
</tr>
<tr>
<td>24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12V 8-pin PWR Connector Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pins</td>
</tr>
<tr>
<td>1 through 4</td>
</tr>
<tr>
<td>5 through 8</td>
</tr>
</tbody>
</table>

Required Connection

Power Button

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

<table>
<thead>
<tr>
<th>Power Button Pin Definitions (JF1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

Reset Connector

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

<table>
<thead>
<tr>
<th>Reset Button Pin Definitions (JF1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>
Power Fail LED
The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

### Power Fail LED Pin Definitions (JF1)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>3.3V</td>
</tr>
<tr>
<td>6</td>
<td>Power Fail LED</td>
</tr>
</tbody>
</table>

Overheat (OH)/Fan Fail/PWR Fail/UID LED
Connect an LED cable to pins 7 and 8 of JF1 to use the Overheat/Fan Fail/Power Fail and UID LED connections. The Red LED on pin 8 provides warnings of an overheat, fan failure or power failure. The Blue LED on pin 7 works as the UID LED indicator for the front panel UID switch located on pins 8 of JF1. When Jumper J_UID_OW is set to off (default), the Red LED takes precedence over the Blue LED. (See Page 2-19 for details.) Refer to the table on the right for pin definitions.

### OH/Fan Fail/ PWR Fail/Blue_UID LED Pin Definitions (JF1)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Blue_LED-Cathode (UID)/5.5V.SB</td>
</tr>
<tr>
<td>8</td>
<td>OH/Fan Fail/PWR Fail/UID LED (Red)</td>
</tr>
</tbody>
</table>

### OH/Fan Fail/PWR Fail LED Status (Red LED)

<table>
<thead>
<tr>
<th>State</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Normal</td>
</tr>
<tr>
<td>On</td>
<td>Overheat</td>
</tr>
<tr>
<td>Flashing</td>
<td>Fan Fail</td>
</tr>
</tbody>
</table>

NIC1 (LAN1) LED Connections
The LED connections for LAN1 are on pins 9 and 10 of JF1. Attach LAN LED cables to display network activity. See the table on the right for pin definitions.

### NIC1 LED Pin Definitions (JF1)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Activity</td>
</tr>
<tr>
<td>12</td>
<td>Link</td>
</tr>
</tbody>
</table>

NIC2 (LAN2) LED Connections
The LED connections for LAN2 are on pins 11 and 12 of JF1. Attach LAN LED cables to display network activity. See the table on the right for pin definitions.

### NIC2 LED Pin Definitions (JF1)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Activity</td>
</tr>
<tr>
<td>10</td>
<td>Link</td>
</tr>
</tbody>
</table>
HDD/FP UID Switch

The HDD/UID Switch connections are located on pins 13/14 of JF1. Attach a hard-drive LED cable to display HDD or SATA activities. This connection can also be used as a front panel UID (Unit Identifier) switch. The UID LED on Pin 7 of JF1 works in conjunction with this UID Switch. When the user presses and releases the UID switch, the UID LED will be turned on or off to indicate the location of the unit. (Refer to Page 2-11 for more details.)

Power LED Connector

The Power LED connector is on pins 15 and 16 of JF1. See the table on the right for pin definitions.

JF2 NIC4 (LAN4) LED Connections

The LED connections for LAN2 are on pins 1 and 2 of JF2. Attach LAN LED cables to display network activity. See the table on the right for pin definitions.

JF2 NIC3 (LAN3) LED Connections

The LED connections for LAN2 are on pins 3 and 4 of JF2. Attach LAN LED cables to display network activity. See the table on the right for pin definitions.

Compact Flash Card PWR Connector

A Compact Flash Card Power Connector is located at JWF1.

HDD/UID Switch Pin Definitions (JF1)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>UID Signal/3.3V</td>
</tr>
<tr>
<td>14</td>
<td>HDD Active</td>
</tr>
</tbody>
</table>

Power LED Pin Definitions (JF1)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>PW_ON</td>
</tr>
<tr>
<td>16</td>
<td>Ground</td>
</tr>
</tbody>
</table>

NIC4 LED Pin Definitions (JF2)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Activity</td>
</tr>
<tr>
<td>2</td>
<td>Link</td>
</tr>
</tbody>
</table>

NIC3 LED Pin Definitions (JF2)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Activity</td>
</tr>
<tr>
<td>4</td>
<td>Link</td>
</tr>
</tbody>
</table>
Universal Serial Bus Ports

Two Universal Serial Bus ports (USB 2.0) are located beside the Keyboard and Mouse PS2 ports (USB0/1). One additional Type A port (USB6) is included on the motherboard. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V</td>
</tr>
<tr>
<td>2</td>
<td>PO-</td>
</tr>
<tr>
<td>3</td>
<td>PO+</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Note: NC indicates no connection.

Universal Serial Bus Headers Pin Definitions (USB2/3, USB4/5)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V</td>
</tr>
<tr>
<td>2</td>
<td>PO-</td>
</tr>
<tr>
<td>3</td>
<td>PO+</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>Key</td>
</tr>
<tr>
<td>6</td>
<td>NC</td>
</tr>
</tbody>
</table>

USB Headers

Four USB 2.0 headers (USB2/3 and USB4/5) are also included on the motherboard. These may be connected to provide front side access. A USB cable (not included) is needed for the connection. See the table on the right for pin definitions.

SGPIO

The T-SGPIO1/ T-SGPIO2 (Serial General Purpose Input/Output) headers provide a bus between the SATA controller and the backplane to provide SATA enclosure management functions. Connect the appropriate cable from the backplane to the T-SGPIO1 header to utilize SATA management functions on your system.

SGPIO Header Pin Definitions (T-SGPIO1/T-SGPIO2)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NC</td>
</tr>
<tr>
<td>2</td>
<td>Data</td>
</tr>
<tr>
<td>3</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>Load</td>
</tr>
<tr>
<td>7</td>
<td>CLK</td>
</tr>
<tr>
<td>2</td>
<td>Data</td>
</tr>
<tr>
<td>4</td>
<td>Data</td>
</tr>
<tr>
<td>6</td>
<td>Ground</td>
</tr>
<tr>
<td>8</td>
<td>NC</td>
</tr>
</tbody>
</table>

Fan Headers

This motherboard has nine fan headers (Fan1 to Fan9). These 4-pin fans headers are backward compatible with 3-pin fans. However, fan speed control is available for 4-pin fans only. The fan speeds are controlled by the BIOS. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground</td>
</tr>
<tr>
<td>2</td>
<td>+12V</td>
</tr>
<tr>
<td>3</td>
<td>Tachometer</td>
</tr>
<tr>
<td>4</td>
<td>PWR Modulation</td>
</tr>
</tbody>
</table>
ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse are located next to the Back Panel USB Ports 0/1 on the motherboard. See the table at right for pin definitions.

<table>
<thead>
<tr>
<th>PS/2 Keyboard/Mouse Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS2 Keyboard</td>
</tr>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

VCC: with 1.5A PTC (current limit)

LAN1/2/3/4 (Ethernet Ports)

Four Gigabit Ethernet ports (designated LAN1, LAN2, LAN3 and LAN4) are located beside the VGA port. Additionally, there is a dedicated LAN for IPMI on top of the two rear USB ports. These Ethernet ports accept RJ45 type cables.

<table>
<thead>
<tr>
<th>LAN Ports (LAN1/2/3/4) Pin Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
</tbody>
</table>

NC indicates no connection.

Power LED/Speaker

On the JD1 header, pins 1~3 are used for power LED indication, and pins 4~7 are for the speaker. See the tables on the right for pin definitions. If you wish to use the onboard speaker, you should close pins 6~7 with a jumper. Connect a cable to pins 4~7 of JD1 to use an external speaker.

<table>
<thead>
<tr>
<th>PWR LED Connector Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin Setting</td>
</tr>
<tr>
<td>Pin 1</td>
</tr>
<tr>
<td>Pin2</td>
</tr>
<tr>
<td>Pin3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speaker Connector Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin Setting</td>
</tr>
<tr>
<td>Pins 4~7</td>
</tr>
<tr>
<td>Pins 6~7</td>
</tr>
</tbody>
</table>
Unit Identifier Button

There is a Unit Identifier (UID) button on the rear I/O of the board. There is also another UID button located on the control panel. When you push either UID button, both Rear UID and Front Panel UID Indicators will illuminate. Push either button again to turn off both indicators. These UID indicators provide easy identification of a system unit that may be in need of service.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Button In</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Trusted Platform Module Header

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

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LCLK</td>
</tr>
<tr>
<td>3</td>
<td>LFRAME</td>
</tr>
<tr>
<td>5</td>
<td>LRESET</td>
</tr>
<tr>
<td>7</td>
<td>LAD3</td>
</tr>
<tr>
<td>9</td>
<td>VCC3</td>
</tr>
<tr>
<td>11</td>
<td>LAD0</td>
</tr>
<tr>
<td>13</td>
<td>RSV0</td>
</tr>
<tr>
<td>15</td>
<td>SB3V</td>
</tr>
<tr>
<td>17</td>
<td>GND</td>
</tr>
<tr>
<td>19</td>
<td>LPCPD</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chassis Intrusion

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

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Battery voltage</td>
</tr>
<tr>
<td>2</td>
<td>Intrusion signal</td>
</tr>
</tbody>
</table>

Standby Power Connector

The Standby Power connection header is located at JSTBY1 on the motherboard. See the table on the right for pin definitions. (You must also have a cable to use this feature.)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V Standby</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Wake-up</td>
</tr>
</tbody>
</table>
Power SMB (I²C)
The Power System Management Bus (I²C) connector (JPI2C1) monitors the power supply, fan and system temperatures. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clock</td>
</tr>
<tr>
<td>2</td>
<td>Data</td>
</tr>
<tr>
<td>3</td>
<td>PWR Fail</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>+3.3V</td>
</tr>
</tbody>
</table>

SMBus Header
The JIPMB1 header at SMBus is for the System Management Bus. Connect the appropriate cable here to utilize SMB on the system. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Data</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Clock</td>
</tr>
<tr>
<td>4</td>
<td>No Connection</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.3V</td>
</tr>
<tr>
<td>2</td>
<td>OH Active</td>
</tr>
</tbody>
</table>

SATA 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.

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Video Connector
A Video (VGA) connector is located on the IO backplane. This connector is used to provide video and CRT display.
SAS Battery Backup Connector

A SAS battery backup connector (JS3) provides power backup support for cache data of onboard SAS devices during a power outage. Cache data can be retained for up to 48-hours. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>INPLACE2</td>
<td>1</td>
<td>INPLACE1</td>
</tr>
<tr>
<td>4</td>
<td>BBSTATUS_3V3</td>
<td>3</td>
<td>Data</td>
</tr>
<tr>
<td>6</td>
<td>Ground</td>
<td>5</td>
<td>Ground</td>
</tr>
<tr>
<td>8</td>
<td>PFAIL_N</td>
<td>7</td>
<td>PWRGD_P1V5</td>
</tr>
<tr>
<td>10</td>
<td>BBE_3V3</td>
<td>9</td>
<td>Ground</td>
</tr>
<tr>
<td>12</td>
<td>BBSTROBE_3V3</td>
<td>11</td>
<td>Data</td>
</tr>
<tr>
<td>14</td>
<td>Ground</td>
<td>13</td>
<td>Data</td>
</tr>
<tr>
<td>16</td>
<td>BBU_SMDA_3V3</td>
<td>15</td>
<td>Ground</td>
</tr>
<tr>
<td>18</td>
<td>Ground</td>
<td>17</td>
<td>Data</td>
</tr>
<tr>
<td>20</td>
<td>BBU_SMBCL_3V3</td>
<td>19</td>
<td>Ground</td>
</tr>
</tbody>
</table>
5-8 Jumper Settings

Explanation of Jumpers

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

Note: On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

CMOS Clear

JBT1 is used to clear CMOS, 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). It is also recommended that you remove the onboard battery from the serverboard.
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 1. For an ATX power supply, you must completely shut down the system, remove the AC power cord, and then short JBT1 to clear CMOS.

Note 2. Be sure to remove the onboard CMOS Battery before you short JBT1 to clear CMOS.

Note 3. Clearing CMOS will also clear all passwords.

Note 4: Do not use the PW_ON connector to clear CMOS.
**I2C to PCI-Express Slot**

JI$^2$C1/JI$^2$C2 allows you to enable the I2C bus to communicate with the PCI-Express slot. For the jumpers to work properly, please set both jumpers to the same setting. If enabled, both jumpers must be enabled. If disabled, both jumpers must be disabled. See the table on the right for jumper settings.

<table>
<thead>
<tr>
<th>Jumper Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pins 1-2</td>
<td>Enabled</td>
</tr>
<tr>
<td>Pins 2-3</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

**Watch Dog Enable/Disable**

JWD1 enables the Watch Dog function, a system monitor that takes action when a software application freezes the system. Jumping pins 1-2 will have WD reboot the system if a program freezes. Jumping pins 2-3 will generate a non-maskable interrupt for the program that has frozen. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

**VGA Enable/Disable**

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

<table>
<thead>
<tr>
<th>Jumper Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pins 1-2</td>
<td>Enabled</td>
</tr>
<tr>
<td>Pins 2-3</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

**LAN1/2/3/4 Enable/Disable**

Change the setting of jumper JPL1 to enable or disable the LAN1/2/3/4 Ethernet ports. See the table on the right for jumper settings. The default setting is enabled.

<table>
<thead>
<tr>
<th>Jumper Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pins 1-2</td>
<td>Enabled</td>
</tr>
<tr>
<td>Pins 2-3</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

**SAS Enable/Disable**

JPS1 allows you to enable or disable the SAS controller. The default position is on pins 1 and 2 to enable SAS. See the table on the right for jumper settings.
BMC Jumper

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. The default position is on pins 1 and 2 to Enable BMC. See the table on the right for jumper settings.

<table>
<thead>
<tr>
<th>BMC Jumper Enable (JPB1) Jumper Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumper Setting</td>
</tr>
<tr>
<td>Pins 1-2</td>
</tr>
<tr>
<td>Pins 2-3</td>
</tr>
</tbody>
</table>

5-9 Onboard Indicators

LAN1/LAN2/LAN3/LAN4 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each Gb LAN port, one LED blinks to indicate activity while the other 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.

<table>
<thead>
<tr>
<th>LAN LED (Connection Speed Indicator)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED Color</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>Green</td>
</tr>
<tr>
<td>Amber</td>
</tr>
</tbody>
</table>

Dedicated IPMI LAN LEDs

A dedicated IPMI LAN is also included on the H8QG7-LN4F serverboard. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the table at right for more information.

<table>
<thead>
<tr>
<th>IPMI LAN Link LED (Left) &amp; Activity LED (Right)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
</tr>
<tr>
<td>Green: Solid</td>
</tr>
<tr>
<td>Amber: Blinking</td>
</tr>
</tbody>
</table>

Power LED

DP3 is an Onboard Power LED. When this LED is lit, it means power is present on the serverboard. Be sure to turn off the system and unplug the power cord(s) before removing or installing components.

<table>
<thead>
<tr>
<th>Power LED (DP3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
</tr>
<tr>
<td>On</td>
</tr>
<tr>
<td>Off</td>
</tr>
</tbody>
</table>
IPMI LED

The serverboard contains an IPMI LED (DP1) located near the corner above the PCI-E slots. When this LED is lit, it means a connection is active for the built-in IPMI on the serverboard.

Note: This LED is not installed on non-IPMI boards.

UID LED (LE1)

A rear UID LED Indicator, located at LE1, works in conjunction with the rear UID switch to provide easy identification for a unit that might be in need of service. Refer to Page 2-13 for further UID details.

5-10 SAS and SATA Drive Connections

SATA Ports

There are no jumpers to configure the SATA ports, which are designated SATA0 through SATA5. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground</td>
</tr>
<tr>
<td>2</td>
<td>TXP</td>
</tr>
<tr>
<td>3</td>
<td>TXN</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>RXN</td>
</tr>
<tr>
<td>6</td>
<td>RXP</td>
</tr>
<tr>
<td>7</td>
<td>Ground</td>
</tr>
</tbody>
</table>

SAS Ports

There are eight SAS ports included on the H8QG7-LN4F serverboard only. See the table on the right for pin definitions.

Note: JPS1 must be set correctly to enable the SAS controller.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground</td>
<td>2</td>
<td>TXP</td>
</tr>
<tr>
<td>3</td>
<td>TXN</td>
<td>4</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>RXN</td>
<td>6</td>
<td>RXP</td>
</tr>
<tr>
<td>7</td>
<td>Ground</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5-11 Enabling SATA RAID

Now that the hardware is set up, you must install the operating system and the SATA RAID drivers, if you wish to use RAID with your SATA drives. The installation procedure differs depending on whether you wish to have the operating system installed on a RAID array or on a separate non-RAID drive. See the instructions below for details.

**Serial ATA (SATA)**

Serial ATA (SATA) is a physical storage interface that employs a single cable with a minimum of four wires to create a point-to-point connection between devices. This connection is a serial link that supports a SATA transfer rate up to 300 MBps. The serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA) and can extend up to one meter in length, compared to only 40 cm for PATA cables. Overall, SATA provides better functionality than PATA.

**Installing the OS/SATA Driver**

Before installing the OS (operating system) and SATA RAID driver, you must decide if you wish to have the operating system installed as part of a bootable RAID array or installed to a separate non-RAID hard drive. If on a separate drive, you may install the driver either during or after the OS installation. If you wish to have the OS on a SATA RAID array, you must follow the procedure below and install the driver during the OS installation.

**Building a Driver Diskette**

You must first build a driver diskette from Supermicro drivers for your system. Drivers can be found at ftp://ftp.supermicro.com. (You will have to create this disk on a computer that is already running and with the OS installed.)

**Note:** Window’s Vista, Windows 2008 or later Windows OS systems can use a USB stick instead of a floppy. For older systems, you must have an external USB floppy when building the driver diskette.

**Building a Driver Diskette**

1. Install your system drives from the FTP website. A display as shown in Figure 5-9 will appear.

2. Click on the icon labeled “Build Driver Diskettes and Manuals” and follow the instructions to create a floppy disk with the drivers on it.

3. Once it’s been created, remove the floppy and insert the installation CD-ROM for the Windows Operating System you wish to install into the CD drive of the new system you are about to configure.
Enabling SATA RAID in the BIOS

Before installing the Windows operating system, you must change some settings in the BIOS. Boot up the system and hit the <Delete> key to enter the BIOS Setup Utility. After the setup utility loads,

1. Use the arrow keys to move to the "Exit" menu. Scroll down using the arrow keys to "Load Optimal Defaults" and press <Enter>. Select "OK" to confirm, then <Enter> to load the default settings.

2. Use the arrow keys to move to the "Advanced" menu, then scroll down to "IDE configuration". On this submenu, scroll down to "OnChip SATA Type" and choose the "RAID" option (Figure 5-6). "RAID Codebase" submenu appears. This setting allows you to select the codebase for your RAID setup. Options are either Adaptec or DotHill.

3. Press the <Esc> key twice and scroll to the "Exit" menu. Select "Save Changes and Exit" and press <Enter>, then press <Enter> again to verify.

4. After exiting the BIOS Setup Utility, the system reboots. When prompted during the startup, to use the DotHill RAID Utility program press <CTRL+R> (Figure 5-7), or to use the Adaptec RAID Utility program press <CTRL+A> (Figure 5-8).
Figure 5-7. DotHill RAID Utility Program Screen

Figure 5-8. Adaptec RAID Utility Program Screen

Using the DotHill and Adaptec RAID Utility

The RAID Utility program allows you to define the drives you want to include in the RAID array and the mode and type of RAID.
Installing the RAID Driver During OS Installation

You may also use the procedure below to install the RAID driver during the Windows OS installation:

1. With the Windows OS installation CD-ROM in the CD drive, restart the system.
2. Press <Enter> again to continue with the Windows setup.
3. When you see the prompt, hit the <F6> key to enter Windows setup.
4. Eventually a blue screen will appear with a message that begins “Windows could not determine the type of one or more storage devices . . .” When you see the screen, hit the <S> key to “Specify Additional Device”, then insert the driver diskette you just created into the floppy drive.
5. Highlight “Manufacturer Supplied Hardware Support Disk” and hit the <Enter> key.
6. Highlight the first “Adaptec RAID” driver shown and press the <Enter> key to install it.

5-12 Installing Software

The Supermicro ftp site contains drivers and utilities for your system at ftp://ftp.supermicro.com. Some of these must be installed, such as the chipset driver.

After accessing the ftp site, go into the CDR_Images directory and locate the ISO file for your motherboard. Download this file to create a CD/DVD of the drivers and utilities it contains. (You may also use a utility to extract the ISO file if preferred.)

Another option is to go to the Supermicro Website at http://www.supermicro.com/products/. Find the product page for your motherboard here, where you may download individual drivers and utilities.

After creating a CD/DVD with the ISO files, insert the disk into the CD/DVD drive on your system and the display shown in Figure 5-9 should appear.
Figure 5-9. 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 reboot 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.

SuperDoctor III

The SuperDoctor® III program is a web-based 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 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 figures below for examples of the SuperDoctor III interface.

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

Note: When SuperDoctor III is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within SuperDoctor III, as the SuperDoctor III settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor III.
Figure 5-10. SuperDoctor III Interface Display Screen  (Health Information)

Figure 5-11. SuperDoctor 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 that you use the SuperDoctor II application instead.
5-13 Serverboard Battery

**Caution:** There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites (see Figure 5-12). 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.

*Figure 5-12. Installing the Onboard Battery*

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 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC828TQ+-R1K43LPB 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. The only tool required to install components and perform maintenance is a Philips screwdriver.

6-1 Static-Sensitive Devices

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

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the 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.
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 JP4 on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both JF1 and JP4. Pull all excess cabling out of the airflow path. The LEDs inform you of system status. See Chapter 3 for details on the LEDs and the control panel buttons. Details on JF1 can be found in Chapter 5.

6-3 System Fans

Six 8-cm heavy-duty hot-swap fans provide the cooling for the server. The fans are configured as a set of three with two fans placed back to back to maximize airflow. It is very important that the chassis top cover is properly installed in order for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2 for details.
Figure 6-2. Removing System Cooling Fans

System Fan Failure

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

Replacing System Fans

Removing a fan

1. Remove the chassis cover.

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

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

1. Replace the failed fan with an identical 8cm, 12 volt fan (available from Supermicro, p/n FAN-0099L4).

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

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

4. Replace the chassis cover.

6-4 SAS/SATA Drive Installation and Removal

The SAS/SATA drive carriers can be installed and accessed from the front of the chassis. You do not need to open the chassis or power down the system. Note: Your operating system must have RAID support to enable the hot-plug capability of the SAS/SATA drives.

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

Installing/removing SAS/SATA drives

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

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

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

Note! Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro Web site at http://www.supermicro.com/products/nfo/files/storage/SAS-CompList.pdf.
Figure 6-3. Removing a SAS/SATA Drive Carrier

Mounting a SAS/SATA drive in a drive carrier

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

2. Secure the drive to the carrier with six screws.

Figure 6-4. Mounting a SAS/SATA Drive in a Carrier
SAS/SATA Drive Backplane

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

Figure 6-5. Backplane Connections

<table>
<thead>
<tr>
<th>SAS/SATA Backplane Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CD-ROM/Floppy Drive Power</td>
</tr>
<tr>
<td>2. Upgrade Connector</td>
</tr>
<tr>
<td>3. Sideband Connector #1</td>
</tr>
<tr>
<td>4. Sideband Connector #2</td>
</tr>
<tr>
<td>5. I2C Connector #1</td>
</tr>
<tr>
<td>6. I2C Connector #2</td>
</tr>
<tr>
<td>7. MG9072 Chip</td>
</tr>
<tr>
<td>8. ACT_IN</td>
</tr>
<tr>
<td>9. 4-pin Power Connectors</td>
</tr>
<tr>
<td>10. SAS/SATA Port #0</td>
</tr>
<tr>
<td>11. SAS/SATA Port #1</td>
</tr>
<tr>
<td>12. SAS/SATA Port #2</td>
</tr>
<tr>
<td>13. SAS/SATA Port #3</td>
</tr>
<tr>
<td>14. SAS/SATA Port #4</td>
</tr>
<tr>
<td>15. SAS/SATA Port #5</td>
</tr>
</tbody>
</table>

Use caution when working around the SAS/SATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.
6-5 Optional Slim DVD Drive Installation

The top cover of the chassis must be opened to gain full access to the DVD drive bay. The chassis accommodates only slim type DVD drives. Side mounting brackets are typically needed to mount a slim DVD drive in the server. You must power down the system before installing or removing IDE components.

6-6 Power Supply

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

Power Supply Failure

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

Removing/Replacing the Power Supply

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

1. First unplug the power cord from the failed power supply module. The top/bottom power socket corresponds to the top/bottom power module.

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

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

Installing a new power supply

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

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

3. Finish by plugging the AC power cord back into the socket.
Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMIBIOS™ Setup utility for the H8QG7-LN4F serverboard. The AMI BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of our web site for any changes to BIOS that may not be reflected in this manual.

Starting the Setup Utility

To enter the BIOS Setup Utility, hit the <Delete> key while the system is booting-up. (In most cases, the <Delete> key is used to invoke the BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.) Each main BIOS menu option is described in this manual.

The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note that BIOS has default text messages built in. We retain the option to include, omit, or change any of these text messages.) Settings printed in Bold are the default values.

A "►" indicates a submenu. Highlighting such an item and pressing the <Enter> key will open the list of settings within that submenu.

The BIOS setup utility uses a key-based navigation system called hot keys. Most of these hot keys (<F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.
When you first enter AMI BIOS Setup Utility, you will see the Main Menu screen. You can always return to this screen by selecting the **Main** tab on the top of the screen with the arrow keys.

The Main Menu screen provides you with a system overview, which includes the version, built date and ID of the AMIBIOS, the type, speed and number of the processors in the system and the amount of memory installed in the system.

### System Time/System Date

You can edit this field 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/YYYY format. The time is entered in HH:MM:SS format. Please note that time is in a 24-hour format. For example, 5:30 A.M. appears as 05:30:00 and 5:30 P.M. as 17:30:00.
Advanced Settings Menu

- **Boot Features**

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

  - **Quiet Boot**
    If Disabled, normal POST messages will be displayed on boot-up. If Enabled, this display the OEM logo instead of POST messages.

  - **Add On ROM Display Mode**
    This option sets the display mode for Option ROM. The options are Force BIOS or Keep Current.

  - **Bootup Num Lock**
    This option selects the power-on state for the NUM lock to either On or Off.

  - **Wait for F1 if Error**
    This setting controls the system response when an error is detected during the boot sequence. When enabled, BIOS will stop the boot sequence when an error is detected, at which point you will need to press the F1 button to re-enter the BIOS setup menu. The options are Enabled and Disabled.

  - **Hit 'DEL' Message Display**
    Use this option to Enable or Disable the "Press DEL to run setup" message in POST.

  - **Interrupt 19 Capture**
    Select Enabled to allow ROMs to trap Interrupt 19. The options are Enabled and Disabled.

  - **Power Button Function**
    This sets options for your system's power button. Options include 4 Seconds Override or Instant Off.

  - **Restore on AC Power Loss**
    This sets the action that occurs when an AC power loss occurs. Options include Power Off, Power On and Last State.
Watch Dog Timer
This sets the Watch Dog Timer. Options include Enabled or Disabled.

Resume On RTC Alarm
This Disables or Enables the RTC Alarm to generate a wake event for S4/S5 or Legacy Soft Off.

► Processor & Clock Options

CPU Configuration
This displays static information on the Module Version, Socket Count, Node Count, Core Count and HT Link Frequency for the system's processor(s) and clock.

CPU Information
This static information for the processor(s) includes Processor number, Revision, Cache L1/L2/L3, Speed, NB CLK, Able to Change Frequency and uCode Patch Level.

GART Error Reporting
This option should remain disabled for normal operation. The driver developer may enable this option for testing purposes. Options are Enabled or Disabled.

Microcode Update
This setting Enables or Disables microcode updating.

Secure Virtual Machine Mode
This setting Enables or Disables the Secure Virtual Mode (SVM) for your system.

Power Now
This setting is used to Enable or Disable the AMD Power Now feature.

C State Mode
This setting specifies the method of C-state enablement. Options include Disabled or C6.

PowerCap
This option can decide the highest performance P-state in the OS between P-state 0~4. Default is P-state 0.
**HPC Mode**
This setting Enables or **Disables** support for P-state HPC Mode.

**CPB Mode**
This setting specifies the method of core performance boost enablement to either **Auto** or Disabled.

**CPU DownCore Mode**
This option sets the CPU DownCore Mode for your system. If you change this option then a cold reset is required. Options include **Disabled**, Compute Unit, 1 Core, 2 Cores or 4 Cores.

**C1E Support**
This option configures the C1E Support for your system. Options include Disabled and **Auto**.

**Clock Spread Spectrum**
This option Enables or **Disables** spread spectrum modulation.

▶ **Advanced Chipset Control**

**Chipset Information**
Chipset Information is displayed at the top of this menu on the chipset CIMx version used.

▶ **NorthBridge Chipset Configuration**

▶ **Memory Configuration**

**Bank Interleaving**
This option allows you to enable Bank Interleaving in the system. Options include **Auto** and Disabled.

**Node Interleaving**
This option allows you to enable Node Interleaving in the system. Options include Auto and **Disabled**.
Channel Interleaving
This option allows you to enable Channel Interleaving in the system. The options are Auto and Disabled.

CS Sparing Enable
This option will reserve a spare memory rank in each node when enabled. Options are Enable and Disable.

Power Down Enable
This option Enables or Disables DDR power down mode for your system.

Bank Swizzle Mode
This sets the Bank Swizzle Mode to either Enabled or Disabled.

▶ ECC Configuration

ECC Mode
This submenu sets the level of ECC protection. Options include Disabled, Basic, Good, Super, Max and User. Selecting User activates the other option for user setting.

Note: The "Super" ECC mode dynamically sets the DRAM scrub rate so all of memory is scrubbed in 8-hours.

DRAM ECC Enable
This setting allows hardware to report and correct memory errors automatically, maintaining system integrity. Options are Enabled or Disabled.

▶ DRAM Timing Configuration

DRAM Timing Config
This setting specifies the DRAM timing configuration. Options are Auto and Manual.

HT Speed Support
This setting selects HT link frequency. Options include HT1 and Auto.

Note: A cold reset is needed after changing this option.
IOMMU
This setting is used to disable or set the GART size in systems without AGP. Options include Enabled and Disabled.

LRDIMM Enhancement
This setting Enables or Disables LRDIMM enhancement for your system.

Memory Performance Mode
This sets Memory Performance Mode to either Enabled or Disabled.

Memory Timing Parameters
This selects the which node’s timing parameters to display. The only selection for this option is CPU Node 0.

Clock Speed Information
Clock speed information for memory is also displayed under this Northbridge Chipset Configuration page.

SouthBridge Chipset Configuration

OHCI/EHCI HC Device Functions
These settings allow you to either Enable or Disable functions for OHCI or EHCI bus devices.

USB 2.0 Controller Mode
Use this setting to configure the USB 2.0 Controller in either Hi-Speed (480 Mps) or Full Speed (12 Mps) mode.

Legacy USB Support
This setting enables support for any legacy USB in your system. Options include Enabled, Disabled and Auto. The Auto option disables legacy support if no USB device are connected.

BIOS EHCI Hand-Off
This setting is a workaround for OS systems without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver. Options are Enabled or Disabled.

Port 64/60 Emulation
Use this setting to Enable or Disable Port 64/60 Emulation for your system.
IDE/SATA Configuration

OnChip SATA Channel
This setting allows you to Enable or Disable the OnChip SATA channel.

OnChip SATA Type
Use this setting to set the OnChip SATA type. Options include Native IDE, RAID, AHCI and Legacy IDE.

RAID Codebase
This submenu appears when you choose "RAID" from the "OnChip SATA Type" setting above. This setting allows you to select the codebase for your RAID setup. Options are either Adaptec or DotHill.

SATA IDE Combined Mode
This setting allows you to Enable or Disable the SATA IDE combined mode.

PATA Channel Configuration
This allows you to set PATA channel configuration. Options include SATA as Primary or SATA as secondary.

Primary/Secondary/Third IDE Master/Slave

LBA/Large Mode
LBA (Logical Block Addressing) is a method of addressing data on a disk drive. The options are Disabled and Auto.

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

PIO Mode
PIO (Programmable I/O) mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are Auto, 0, 1, 2, 3, and 4. Select Auto to allow BIOS to auto detect the PIO mode.
Use this value if the IDE disk drive support cannot be determined. Select 0 to allow BIOS to use PIO mode 0, which has a data transfer rate of 3.3 MBs. Select 1 to allow BIOS to use PIO mode 1, which has a data transfer rate of 5.2 MBs. Select 2 to allow BIOS to use PIO mode 2, which has a data transfer rate of 8.3 MBs. Select 3 to allow BIOS to use PIO mode 3, which has a data transfer rate of 11.1 MBs. Select 4 to allow BIOS to use PIO mode 4, which has a data transfer rate of 16.6 MBs. This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.

DMA Mode
Selects the DMA Mode. Options are Auto, SWDMA0, SWDMA1, SWDMA2, MWDMA0, MDWDMA1, MWDA2, UDMA0, UDMA1, UDMA2, UDMA3, UDMA4 and UDMA5. (SWDMA=Single Word DMA, MWDMA=Multi Word DMA, UDMA=UltraDMA.)

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

32-Bit Data Transfer
Select "Enabled" to activate the function of 32-Bit data transfer. Select "Disabled" to deactivate the function. The options are Enabled and Disabled.

IDE Detect Timeout (Sec)
Use the +/- keys to adjust and select the time out for detecting ATA/ATAPI devices. The default value is 35.

PCI/PNP Configuration

Clear NVRAM
Select Yes to clear NVRAM during boot-up. The options are Yes and No.

Plug & Play O/S
Select Yes to allow the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select No to allow AMIBIOS to configure all devices in the system.
PCI Latency Timer
This option sets the latency of all PCI devices on the PCI bus. Select a value to set the PCI latency in PCI clock cycles. Options are 32, 64, 96, 128, 160, 192, 224 and 248.

PCI IDE Busmaster
Use this setting to Enable or Disable BIOS enabled uses of PCI Busmastering for reading or writing to IDE drives.

SR-IOV Supported
Use this setting to Enable or Disable SR-IOV on your system.

ROM Scan Ordering
This setting determines which kind of option ROM activates prior to another. Options include Onboard First or Addon First.

Slot 1 ~ Slot 4 PCI-E Option ROM
These four settings (Slot 1 through Slot 4) allow you to enable or disable the numbered slot's Op ROM, except for the VGA card.

Onboard LSI SAS Option ROM
This setting allows you to Enable or Disable the onboard LSI SAS option ROM.

Load Onboard LAN 1~4 Option ROM
This setting allows you to enable or disable the Load Onboard LAN ROM for LAN 1 through 4. LAN 1 is Enabled, LAN 2~4 is Disabled by default.

Onboard LAN Option ROM Select
This setting allows you to select the onboard LAN option ROM for iSCSI or PXE. Note: You must enable ONLY LAN1 when the iSCSI support option is specified.

Boots Graphic Adapter Priority
This option specifies the graphic adapter priority for Onboard VGA or Offboard VGA.

➤ SuperI/O Configuration

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

**Serial 2 Address**

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

► Remote Access Configuration

**Remote Access**

Use this option to **Enable** or **Disable** Remote Access in your system. If enabled, the settings below will appear.

**Serial Port Number**

Use this setting to select the serial port for console redirection. Options include COM1, COM2 or COM3. The displayed base address and IRQ for the serial port changes to reflect the selection you make.

**Note:** Make sure the selected port is enabled.

**Serial Port Mode**

Selects the serial port settings to use. Options are (115200 8, n, 1), (57600 8, n, 1), (38400 8, n, 1), (19200 8, n, 1) and (9600 8, n, 1).

**Flow Control**

Selects the flow control to be used for console redirection. Options are **None**, Hardware and Software.

**Redirection After BIOS POST**

Options are **Disable** (no redirection after BIOS POST), **Boot Loader** (redirection during POST and during boot loader) and **Always** (redirection always active). Note that some OS's may not work with this set to Always.

**Terminal Type**

Selects the type of the target terminal. Options are **ANSI**, VT100 and VT-UTF8.
VT-UTF8 Combo Key Support

Allows you to **Enable** or **Disable** VT-UTF8 combination key support for ANSI/VT100 terminals.

Sredir Memory Display Delay

Use this setting to set the delay in seconds to display memory information. Options are **No Delay**, 1 sec, 2 secs and 4 secs.

### Hardware Health Configuration

**CPU Overheat Alarm**

This setting allows you to specify the type of alarm for CPU overheating. Options include **The Early Alarm** and **The Default Alarm**.

Other items in the submenu are systems monitor displays for the following information:

- CPU1 ~ CPU4 Temperature, System Temperature, Fan 1-9 Reading, Chipset FAN1-2, CPU1 ~ CPU4 VCore, CPU1~4 DIMM Voltage, SR56x0 1.1V, +5V, +12V, 3.3Vcc, 3.3Vsb, Vbat.

**CPU Temperature Display (CTD)**

CPU Temperature descriptions are defined as:

- Low → [Tctl Value = Lowest Value, Tctl Value = -45]
- Medium → [Tctl Value = -46, Tctl Value = 60]
- High → [Tctl Value = -61 and Above]

Note: Only CPU temperature (Low, Medium, High) and system temperature (RT1) are required to be displayed in BIOS and in-system monitoring software. Other Motherboard components such as memory, chipset, SAS and 10Gb controllers, and others are not required to display temperatures. For debugging and testing purposes, BIOS and system monitoring software can show motherboard components’ temperatures (such as memory, chipset, SAS and 10Gb controllers). However for SMCI standard release version BIOS and system monitoring software, motherboard components’ temperatures are NOT required to be displayed.

**CPU Overheating Alarm (COA)**

CPU Overheating Alarm (COA) has “Early Alarm” and “Default Alarm” (default) options in the BIOS, and is required to be implemented in all fan speed control modes.
The Early Alarm is enabled when the Tctl value = 65, and is disabled when the Tctl value drops from 65 to 62.

The Default Alarm (default setting) is enabled when the Tctl value = 70, and is disabled when the Tctl value drops from 70 to 67.

When COA (either Early or Default Alarm) is enabled, the following actions are required to be executed:

- System overheating LED is required to be ON and to solid red.
- Onboard buzzer or speaker is required to be ON and to be a continuous sound.
- All system fans are required to be operated at full speed.
- System monitoring software (such as Super Doctor and IPMI if available) is required to report and record CPU overheating events in the event logs.

When COA (either Early or Default Alarm) is disabled, the following actions are required to be executed:

- System overheating LED is required to be OFF.
- Onboard buzzer or speaker is required to be OFF.
- All system fans are required to be returned to a normal, non-CPU-overheating LFSC condition.

<table>
<thead>
<tr>
<th>Condition</th>
<th>When a CPU is overheating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front Panel Overheating LED</td>
<td>On and Solid Red</td>
</tr>
<tr>
<td>Onboard Buzzer or Speaker</td>
<td>On and Continuous Sound</td>
</tr>
<tr>
<td>System Fan Speed Controls</td>
<td>Full Speed</td>
</tr>
<tr>
<td>BMC</td>
<td>Report PROCHOT</td>
</tr>
<tr>
<td>BMC Event Log</td>
<td>Record PROCHOT</td>
</tr>
<tr>
<td>Super Doctor</td>
<td>Report PROCHOT</td>
</tr>
<tr>
<td>Super Doctor Event Log</td>
<td>Record PROCHOT</td>
</tr>
</tbody>
</table>

**ACPI Configuration**

**ACPI Aware O/S**

Use this setting to enable or disable ACPI support for the operating system if it supports ACPI. Options include Yes (enable ACPI support) or No (disable ACPI support).

**ACPI Version Features**

Use this setting to determine which ACPI version to use. Options are ACPI v1.0, ACPI v2.0 and ACPI v3.0.
ACPI APIC Support
Determines whether to include the ACPI APIC table pointer in the RSDT pointer list. The available options are Enabled and Disabled.

Headless Mode
Use this setting to enable or disable headless operation mode through ACPI.

WHEA Support
Use this setting to enable or disable Windows Hardware Error Architecture.

NUMA Support
This setting Enables or Disables the building of an ACPI SRAT Table.

IPMI Configuration
This menu shows static information about the IPMI firmware revision and status of the BMC, as well as options for IPMI configuration.

View BMC System Event Log
Pressing the Enter key will open the following settings. Use the "+" and "-" keys to navigate through the system event log.

Clear BMC System Event Log
Selecting this and pressing the Enter key will clear the BMC system event log.

Set LAN Configuration
Use the "+" and "-" keys to choose the desired channel number. This displays Channel Number and Channel Number Status information.

IP Address Source
This submenu sets the IP address source as either Static or DHCP. Selecting Static allows you to manually set the IP Address, Subnet Mask and Gateway Address.
In the field provided here enter the IP address in the decimal form of xxx.xxx.xxx.xxx with xxx having a value of less than 256 and in decimal form only.
Chapter 7: BIOS

- **IP Address**

  In the field provided here enter the IP address in the hex form of xx.xx.xx.xx. xx.xx with xx in hex form only. The current IP address in the BMC is shown.

- **Subnet Mask**

  In the field provided here enter the Subnet address in the decimal form of xxx.xxx.xxx.xxx with xxx having a value of less than 256 and in decimal form only. The current subnet address in the BMC is shown.

- **Gateway Address**

  In the field provided here enter the Gateway address in the decimal form of xxx.xxx.xxx.xxx with xxx having a value of less than 256 and in decimal form only. The current Gateway address in the BMC is shown.

  **Current MAC Address in BMC**

  This static information shows the current MAC address in the BMC.

- **Event Log Configuration**

  **View Event Log**

  Pressing the Enter key will open the event log. Use the "↑" and "↓" keys to navigate through the system event log.

  **Mark All Events as Read**

  Selecting this and pressing the Enter key marks all events as read in the event log.

  **Clear Event Log**

  Selecting this and pressing the Enter key clears the system event log.

  **SR56x0 (RD890S) PCIE Error Log**

  This setting allows you set an error log of PCIE errors. Options include Yes or No.
7-4 Security Settings Menu

AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.

Change Supervisor Password
Select this option and press <Enter> to access the sub menu, and then type in the password.

Change User Password
Select this option and press <Enter> to access the sub menu, and then type in the password.

Boot Sector Virus Protection
This option is near the bottom of the Security Setup screen. Select "Disabled" to deactivate the Boot Sector Virus Protection. Select "Enabled" to enable boot sector protection. When "Enabled", AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and Disabled.

7-5 Boot Settings Menu

▶ Boot Device Priority

This feature allows you to prioritize the boot sequence from the list of available devices. A device that is in parenthesis has been disabled in the corresponding type menu.

▶ Removable Drives

This feature allows you to specify the boot sequence from the list of available removable drives. A device that is in parenthesis has been disabled in the corresponding type menu.

▶ Hard Disk Drives

This feature allows you to specify the boot sequence from the list of available hard disk drives. A device that is in parenthesis has been disabled in the corresponding type menu.
Chapter 7: BIOS

► CD/DVD Drives

This feature allows you to specify the boot sequence from the list of available CD/DVD drives. A device that is in parenthesis has been disabled in the corresponding type menu.

► USB Drives

This feature allows you to specify the boot sequence from the list of available USB drives. A device that is in parenthesis has been disabled in the corresponding type menu.

► Network Drives

This feature allows you to specify the boot sequence from the list of available network drives. A device that is in parenthesis has been disabled in the corresponding type menu.

► Other Drives

This feature allows you to specify the boot sequence from the list of available other drives on your system. A device that is in parenthesis has been disabled in the corresponding type menu.

Retry Boot Device

This setting allows you to Enable or Disable auto retry of all boot devices.
7-6 Exit Menu

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

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

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

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

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

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

BIOS Error Beep Codes

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

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

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

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list (on the following page) correspond to the number of beeps for the corresponding error. All errors listed, with the exception of Beep Code 8, are fatal errors.

A-1 AMIBIOS Error Beep Codes

<table>
<thead>
<tr>
<th>Beep Code</th>
<th>Error Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 beep</td>
<td>Refresh</td>
<td>Circuits have been reset (Ready to power up)</td>
</tr>
<tr>
<td>5 short, 1 long</td>
<td>Memory error</td>
<td>No memory detected in system</td>
</tr>
<tr>
<td>1 long, 8 short</td>
<td>Video error</td>
<td>Video adapter disabled or missing</td>
</tr>
</tbody>
</table>
Appendix B

System Specifications

Processors
Quad AMD Opteron 6000 series (AMD Socket G34 type) processors

Note: please refer to our website for details on supported processors.

Chipset
One AMD SR5690 chipset, one AMD SR5670 chipset and one SP5100 Southbridge chipset

BIOS
16 Mb AMI BIOS® SPI Flash ROM

Memory Capacity
Thirty-Two (32) single/dual/tri/quad channel DIMM slots supporting up to 1 TB of registered ECC or 256 GB of Unbuffered ECC/non-ECC DDR3-1600/1333/1066 Mhz speed, 1 GB, 2 GB, 4 GB, 8 GB, 16 GB or 32 GB size SDRAM

Note: interleaved memory requires DIMMs to be installed in pairs - refer to Section 5-6 for details.

SATA Controller
AMD SR5690 on-chip controller to support six 3 Gb/s Serial ATA (RAID 0, 1 and 10 supported)

SAS Controller
Onboard LSI 2208 SAS2 controller for eight SAS drives (RAID 0, 1, 5, 6, 10, 50 and 60 supported).

Drive Bays
Six (6) hot-swap drive bays to house six (6) standard SAS/SATA drives

Expansion Slots
Supports the use of two (2) PCI-E 2.0 x16 slots and two (2) PCI-E 2.0 x8 slots
Motherboard
H8QG7-LN4F (proprietary SWTX form factor)
Dimensions: (LxW) 13" x 16.48" (330 x 419 mm)

Chassis
SC748TQ-R1K43B (4U rackmount)
Dimensions (both): (WxHxD) 17.2 x 7 x 25.5 in. (437 x 178 x 648 mm)

Weight
Gross (Bare Bone): 85 lbs. (38.6 kg.)

System Cooling
(fan speed controlled by BIOS setting, Chp 7)
Three (3) 9-cm chassis fans
Three (3) 8-cm exhaust fans

System Input Requirements
AC Input Voltage: 120-240 VAC
Rated Input Current: 15A (100V)
Rated Input Frequency: 50-60 Hz

Power Supply
Rated Output Power: 1400 Watts (Part# PWS-1K43F-1R)
Rated Output Voltages: +12V (117A), +5Vsb (6A)

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

Electromagnetic Emissions: FCC Class B, EN 55022 Class 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”
The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.