SUPERMICRO®

P9DSU-C

USER'S MANUAL

Revision 1.0

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Preface

This manual is written for system integrators, IT professionals, and knowledgeable end users. It provides information for the installation and use of the P9DSU-C motherboard.

About This Motherboard

The Super P9DSU-C motherboard supports dual IBM Power9 Sforza processors that utilize IBM's 14nm silicon-on-insulator technology with the X-Bus transfer rate of up to 16Gb/s. The Power9 processors come with two versions: SMT8 Core and SMT4 Core CPUs. The SMT8 version offers up to eight threads of simultaneous multithreading (SMT8) per CPU, while the SMT4 version offers up to four threads. With dual Power processors built-in, the P9DSU-C supports up to 1024 GB of Registered (RDIMM) DDR4 ECC memory of up to 2666 MHz (Note below), sixteen SAS/SATA ports, five USB 3.0 ports, and three PCI-E 4.0 riser card support. With the expandability offered by onboard I/O connections and the capability offered by the Power9 processors, the P9DSU-C motherboard provides the most dynamic, scalable solution to meet the diverse needs of data centers and Cloud service providers in today's market. This motherboard is optimized for memory-intensive applications and is ideal for GPU server platforms. Please refer to our website (http://www.supermicro.com) for processor and memory support updates.

> **Note**: DDR4 1866 MHz/2133 MHz/2400 MHz/ 2666 MHz memory modules are supported by this motherboard; however, the system will run at 1600 MHz.

Manual Organization

Chapter 1 describes the features, specifications, and performance of the motherboard.

Chapter 2 provides hardware installation instructions. Read this chapter when installing the processor, memory modules, and other hardware components into the system.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for video, memory, and system setup stored in the CMOS.

Chapter 4 includes an introduction to the Petitboot PNOR setup utility, and provides detailed information on running the utility.

Conventions Used in the Manual

Pay special attention to the following symbols for proper system installation and to prevent damage to the system or injury to yourself:

Warning: Important information given to ensure proper system installation or to prevent damage to the components

Note: Additional information given to differentiate between various models or provides information for proper system setup.

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Table of Contents

Chapter 1

Introduction

1-1   Introduction

Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance.

This motherboard is sold only as a system within the Hyper-Speed Ultra server platforms. Please refer to our website at http://www.supermicro.com for information on Hyper-Speed Ultra server products.

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

Supermicro product manuals: http://www.supermicro.com/support/manuals/

Product Drivers and utilities: http://www.supermicro.com/wftp

If you have any questions, please contact our support team at:

support@supermicro.com.

P9DSU-C Motherboard Image
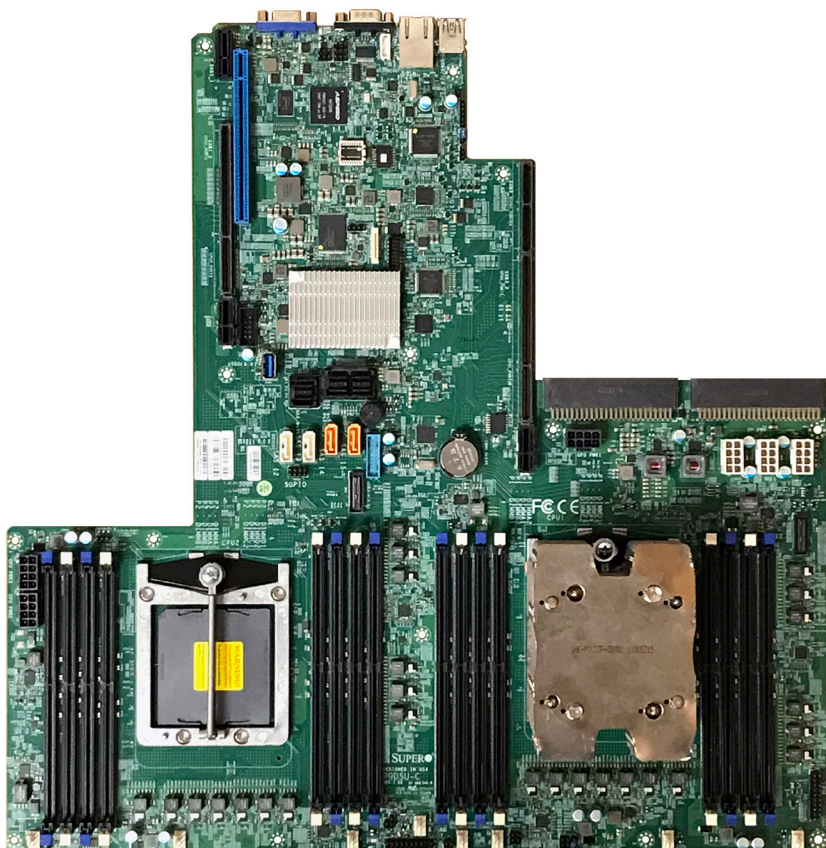
✏️ **Note**: All graphics shown in this manual were based upon the latest PCB revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in this manual.

P9DSU-C Motherboard Layout
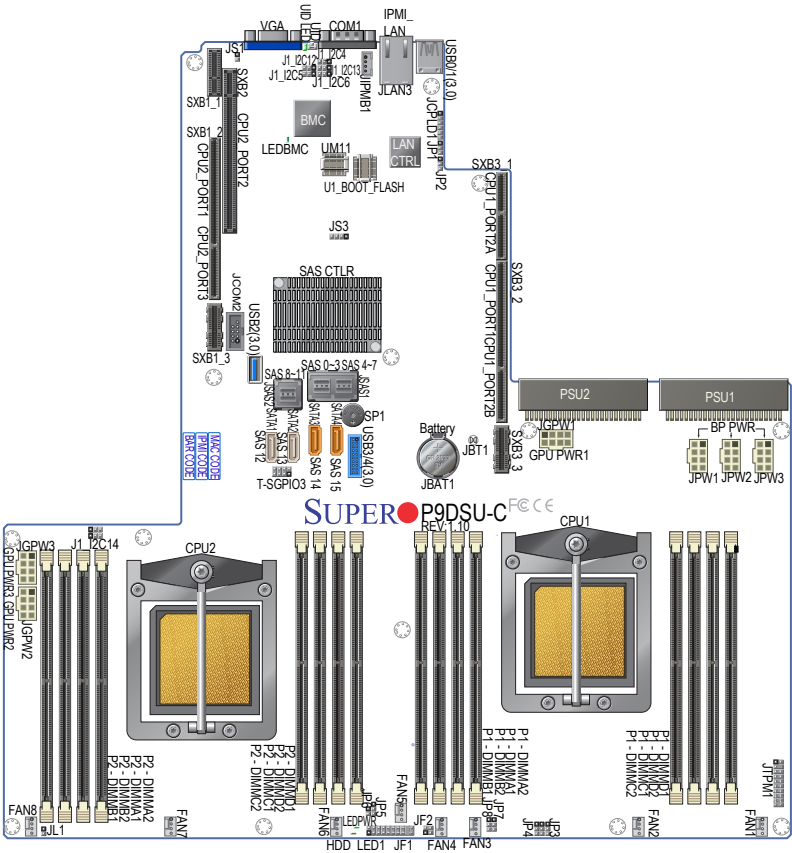
Notes:

1. For the latest processor/memory updates, please refer to our website at http://www.supermicro.com/products/motherboard/ for details.

2. Use only the correct type of onboard battery as specified by the manufacturer. To avoid possible explosion, do not install the onboard battery upside down.

Notes:

- See Chapter 2 for detailed information jumpers, I/O ports, connectors and expansion slots. "■" indicates the location of "Pin 1".

- Components/Jumpers/LED Indicators that are not documented in this manual are reserved for internal testing only.

P9DSU-C Quick Reference Table

Jumper	Description	Default Setting
J1_I^{2}C4	Power Supply PMBus	Open (no jumper)
J1_I^{2}C5	CPU0 VRM	Open (no jumper)
J1_I^{2}C6	CPU1 VRM	Open (no jumper)
J1_I^{2}C12	I^{2}C header for UCD 90160	Open (no jumper)
J1_I^{2}C13	IR38063 +2.5VA power	Open (no jumper)
J1_I^{2}C14	IP38063 +2.5VB power rail	Open (no jumper)
JP1	CPLD	Pins 1-2 (Enabled)
JP2	UCD 95160	Pins 1-2 (Enabled)
JP3, JP4	CP0 VRM I^{2}C	N/A
JP5, JP6	CP1 VRM I^{2}C	N/A
JP7, JP8	CP0 AVS Bus header for CP1	N/A
JS1	PM8069 HDA/Flash mode	N/A

LED	Description	State	Status
HDD_LED1	Hard Drive LED	Green: On	HDD Normal
LEDPWR	Power LED	Green: On	Power On
UID LED	UID LED	Blue: On	Unit Identified
LEDBMC	BMC Heartbeat LED	Green: Blinking	BMC Normal

Connectors	Description
JBAT1	Onboard battery (See the note on P. 1-3.)
JBT1	RTC
JS3	UART debug header for PM8069
COM1	Back panel COM Port 1
FAN1 - FAN8	System/CPU Fan Headers
JPW1 -JPW3	Backplane power connectors for hard drives
GPU PWR1 - GPU PWR3	8-pin GPU power connectors 1-3 (JGPW1-3)
IPMI LAN / JLAN1	Dedicated IPMI LAN Port supported by BMC controller
JCOM2	BMC debugging header
JCPLD1	Complex-Programmable Logical Device (CPLD) header
JF1	Front Panel Control header

JF2	LAN 3, LAN 4 activity LED
JIPMB1	GPU/PCI-E auxiliary power connects to I^2C7
JL1	Chassis Intrusion Detection header
JTPM1	Trusted Platform Module (TPM) header
PSU1/PSU2	System Power Supply Unit (PSU) 1/System Power Supply Unit 2
JSAS1	SAS 3.0 connections (SAS 0~3, SAS 4~7)
JSAS2	SAS 3.0 connections (SAS 8~11)
SAS12 - SAS15	SAS 3.0 connectors; SAS12 and SAS13 can be used as unpowered SATA ports (SATA1,2); SAS14 and SAS15 can be used as Supermicro SuperDOM SATA ports (SATA3,4) with built-in power connectors
T-SGPIO3	Serial General Purpose Input/Output Header (For SAS 12-15)
SP1	Internal Speaker/Buzzer
SXB1_1/1_2/1_3	PCI-E 4.0 (x16, x8+x8 or x8+x4+x4 or x16) left riser card slot supported by Processor2
SXB2	PCI-E 4.0 (x8, x8) center riser card slot supported by Processor2
SXB3_1/3_2/3_3	PCI-E 4.0 (x8, x16, x8) far right performance riser card slot supported by Processor1
USB0/1 (3.0)	Back panel USB ports 0/1 (USB 3.0)
USB2 (3.0)	Type A USB 2 (USB 3.0) for front access
USB3/4 (3.0)	Front panel accessible USB 3.0 ports 3/4
VGA / JVGA1	Back panel VGA port
JUIDB1 / UID	Unit Identification (UID) switch
U1_BOOT_FLASH	PNOR SPI Flash Chip
UM11	BMC SPI Flash Chip

Motherboard Features

Processor	• Dual Power9 Sforza processors; X-Bus up to 16 GT/s
Memory	• 8-memory buffer chip supports up to 1024 GB of Registered (RDIMM) ECC DDR4 2666 MHz (max.) in 16 memory slots
	✎ **Notes**: **1.** DDR4 1866 MHz/2133 MHz/2400 MHz/2666 MHz memory modules are supported by this motherboard; however, the system will run at 1600 MHz. **2.** For the latest Processor/ memory updates, please refer to our website at http://www.supermicro.com/products/motherboard.
	DIMM Sizes
	• Up to 64 GB at 1.2V
* Expansion Slots	***** • One (1) PCI-E 4.0 (x16, x8+x8 or x8+x4+x4 or x16) left riser card supported by Processor2 (SXB1_1/ SXB1_2/SXB1_3),
	• One (1) PCI-E 4.0 (x8, x8) center right hand riser card supported by PLX8725 (SXB2),
	• One (1) PCI-E 4.0 (x8, x16, x8) far right Performance Riser slot supported by Processor1 (SXB3_1/ SXB3_3)
Graphics	• AST2500 BMC Controller with integrated VGA/2D Graphics Controller 1920x1200 at 60Hz 32bpp
Network	• NIC integrated into Ultra Riser card (Ultra Mezzanine)
I/O Devices	**SATA Connections**
	• SATA Ports — Four (4) SAS 3.0 ports which can function as SATA ports (2 SATA DOM)
	• SAS — 3 MiniSAS HD (12 X SAS 3.0) MicroSemi PM8069 controller
	• RAID — RAID 0, 1, 5, 10 via SAS
	IPMI 2.0
	• IPMI 2.0 supported by the ASpeed 2500 BMC

I/O Devices	Serial (COM) Port	
(continued)	• One Fast UART 16550 port on I/O back panel (COM1)	
	VGA	
	• Rear VGA Port	
Peripheral Devices	USB Devices	
	• Two (2) USB 3.0 ports on the IO back panel (USB 0/1)	
	• One (1) USB 3.0 Type A header (USB 2)	
	• Two (2) USB 3.0 for front access (USB 3/4)	
	• 512 Mb Flash ROM	
PNOR	• APM 1.2, DMI 2.3, PCI 2.3, USB Keyboard, PNOR Rescue hot-key, Riser card auto detect, Plug & Play (PnP), UEFI 2.3.	
Power	• Power-on mode for AC power recovery	
	• PNOR doesn't have management engine	
	• Riser Card auto-detection	
System Health Monitoring	System Health Monitoring	
	• +1.8V, +3.3V, +5V, +/-12V, +3.3V Stdby, +5V Stdby, VBAT, and memory.	
	• Processor 6+1 Phase switching voltage regulator	
	• Processor Thermal Trip support	
	Fan Control	
	• 8 4-pin fan headers	
	• Fan speed control	
	LED Indicators	
	• CPU / system overheat LED	
	• Power / suspend-state indicator LED	
	• Fan Failed LED	
	• UID / remote UID	
	• HDD activity LED	
	• LAN activity LED	
System Management	• Chassis Intrusion header and detection (JL1)	
	• Watch Dog, NMI	
	• Power supply monitoring (JPI2C1)	
	• RoHS	
Dimensions	• 16.9" (L) x 17" (W) (429.26 mm x 431.8 mm)	

Note 1: The Processor maximum thermal design power (TDP) is subject to chassis and heatsink cooling restrictions. For proper thermal management, please check the chassis and heatsink specifications for proper Processor TDP sizing.

Note 2: For IPMI configuration instructions, please refer to the Embedded IPMI Configuration User's Guide available at http://www.supermicro.com/support/manuals/.

Note 3: It is strongly recommended that you change BMC log-in information upon initial system power-on. The manufacture default username is ADMIN and the password is ADMIN. For proper BMC configuration, please refer to https://www.supermicro.com/products/nfo/files/IPMI/Best_Practices_BMC_Security.pdf.
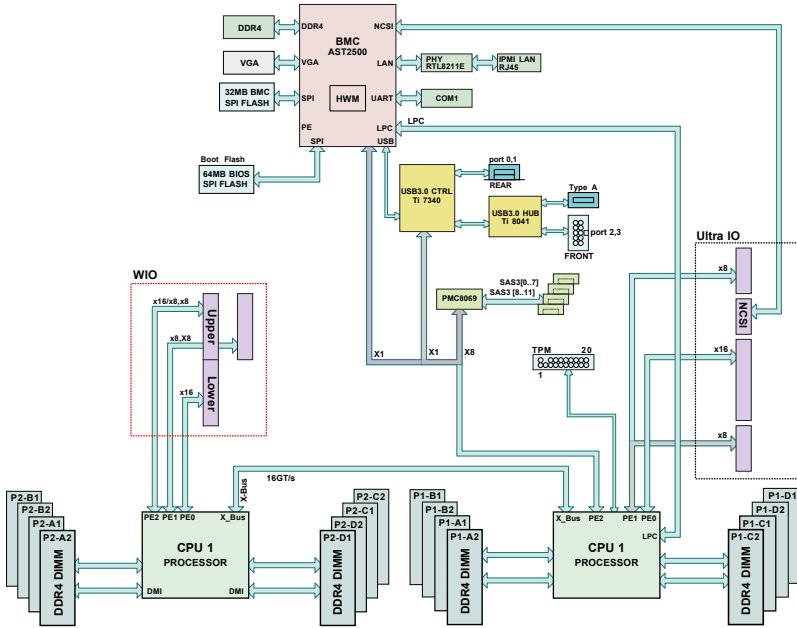
System Block Diagram

Notes: 1. This is a general block diagram and may not exactly represent the features on your motherboard. See the Motherboard Features pages for the actual specifications of each motherboard. **2.** This block diagram was provided for your reference only.

1-2   The Power9 Sforza Processor Overview

The P9DSU-C motherboard uses dual Power9 Sforza processors that support 12 or 24 cores per processor with each core running at 4GHz. The 12-core processor offers up to 8 threads per core (SMT8), and the 24-core processor offers up to 4 threads per core (SMT4). Utilizing IBM's 14 nm, 17 layer SOI technology, the Power9 processor dramatically reduces overhead associated with encryption. It greatly enhances system security, virtual media integration, and remote system management and monitoring. With the Power9 processor built in, the P9DSU-C motherboard provides the most dynamic, scalable solution to meet the diverse needs of large cluster server platforms. This motherboard is especially optimized for memory-intensive applications and is ideal for use in Cloud/HPC (High-Performance Computing) servers as well as in data centers. The Power9 processor supports the following features:

- Up to 24 POWER9 chiplets containing a POWER9 core

- 32+32KB L1 cache per core, 512KB L2 cache per core, 120MB L3 cache per chip and L4 chache via Centaur chip

- 12 Stage pipeline (5 cycles shorter than Power 8 Pipeline)

- Enhanced on-chip acceleration with support for Nvidia NVLink 2.0, CAPI 2.0 and OpenCAPI 3.0

- Direct Attach Memory (Scale Out) and Buffered Memory (Scale Up) options with 120GB/s bandwidth and 230GB/s bandwidths respectively

- Support for up to 48 PCI-E V.4 lanes

- Power ISA v3.0

1-3   Special Features

Recovery from AC Power Loss

The BMC (Baseboard Management Controller) firmware determines how the system will respond when AC power is lost and then restored to the system. The system will remain powered off if the previous power state was off before a power loss. The system power will be turned on automatically if the previous system power state was On before the power loss.

1-4   System Health Monitoring

This section describes the features of system health monitoring for the motherboard. This motherboard has an onboard Baseboard Management Controller (BMC) chip that supports system health monitoring. An onboard voltage monitor will scan the voltages of onboard chips, memory, processor, and battery continuously. Once a voltage becomes unstable, a warning is given, or an error message is sent to the screen.

Fan Status Monitor with Firmware Control

The system health monitor chip can check the rotation status of a cooling fan. The system fans are controlled by the Thermal Management Algorithm through BMC.

Environmental Temperature Control

System Health sensors monitor the temperatures and the voltage settings of on-board processors and the system in real time via IPMI 2.0 interface. Whenever the temperatures of the processors or the temperature of the system exceeds a system-defined threshold, the onboard system cooling fans will be turned on to prevent the processor or the system from overheating.

Note: To avoid possible system overheating, please be sure to provide ad-equate airflow to your system.

1-5   Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates. In areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

1-6 BMC Controller

The BMC Controller (ASpeed AST2500 chip) provides a high-speed, 16550 compatible serial communication port (UART), which supports serial infrared communication. The UART includes send/receive FIFO, a programmable baud rate generator, complete modem control capability, and a processor interrupt system. The UART provides legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, supporting higher speed modems.

The BMC Controller provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through a SMI or SCI function pin. It also features auto power management to reduce power consumption.

1-7 SAS/SATA I/O controller

The P9DSU-C motherboard integrates the Microsemi PM8069 SSCi SAS/SATA controller which supports RAID 0, 1, 5, 10. It supports up to 8 lanes of PCI-E 3.0 with each lane supporting transfer rates of up to 8.0Gbps. Furthermore, it can support up to 8 lanes of 1.5G/3G/6G SATA or 3G/6G/12G SAS. It has a flexible configuration for HBA and supports up to 238 SAS/SATA devices. Please visit the Microsemi website for more information.

1-8 Serial Port

The P9DSU-C motherboard supports one serial communication connection. COM Port 1 can be used for input/output. The UART provide legacy speed with baud rate of up to 115.2 kbps, which support system console message for the system status monitoring.

Chapter 2

Installation

2-1 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 section in its entirety before installing or configuring components.

These warnings may also be found on our website at:

http://www.supermicro.com/about/policies/safety_information.cfm

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

電池の取り扱い

電池交換が正しく行われなかった場合、破裂の危険性があります。交換する電池はメーカーが推奨する型、または同等のものを使用下さい。使用済電池は製造元の指示に従って処分して下さい。

警告

电池更换不当会有爆炸危险。请只使用同类电池或制造商推荐的功能相当的电池更换原有电池。请按制造商的说明处理废旧电池。

警告

電池更換不當會有爆炸危險。請使用製造商建議之相同或功能相當的電池更換原有電池。請按照製造商的說明指示處理廢棄舊電池。

Warnung

Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

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.

אזהרה!

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة اسحبذال البطارية بطريقة غير صحيحة فعليل اسحبذال البطارية

فقط بنفس النع أو ما يعادلها مما أوصث به الشرمة المصنعة

جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

경고!

배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 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.

Product Disposal

⚠️ **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。

警告
本产品的废弃处理应根据所有国家的法律和规章进行。

警告
本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

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.

2-2   Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To avoid possible damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

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

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

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

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

Unpacking

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

2-3   Motherboard Installation

All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both motherboard and chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure that the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray.

Tools Needed

- Phillips Screwdriver

- Pan head screws (14 pieces)

- Standoffs (14 pieces, if needed)
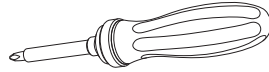
Location of Mounting Holes

There are thirteen (13) mounting holes on this motherboard indicated by the arrows.
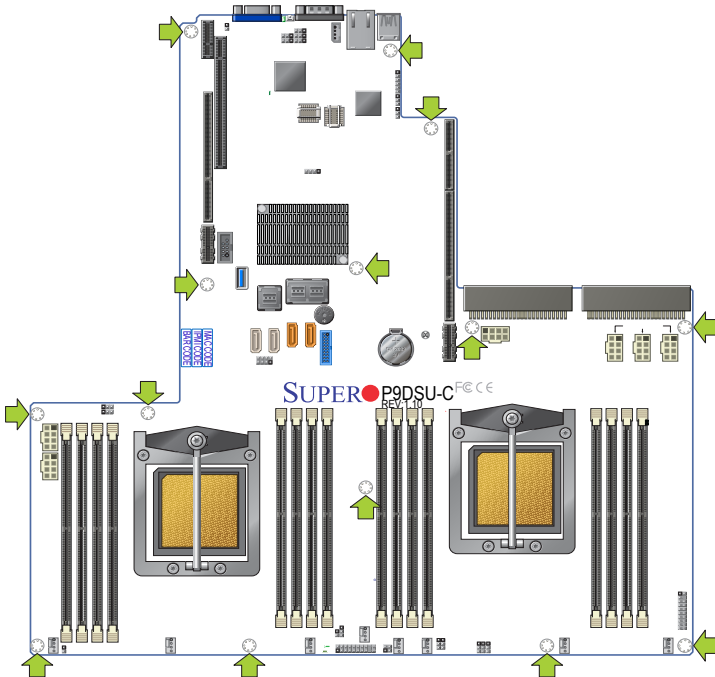
Notes: 1. To avoid damaging the motherboard and its components, please do not use a force greater than 8 lb/inch on each mounting screw during motherboard installation. 2. Some components are very close to the mounting holes. Please take precautionary measures to prevent damage to these components when installing the motherboard to the chassis.

Installing the Motherboard

1. If applicable, install the I/O shield into the chassis. The chassis you are us-ing may vary depending on the manufacturer, so please consult the chassis' documentation for the location of mounting holes, etc.

2. Locate the mounting holes on the motherboard.

3. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.
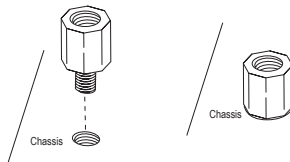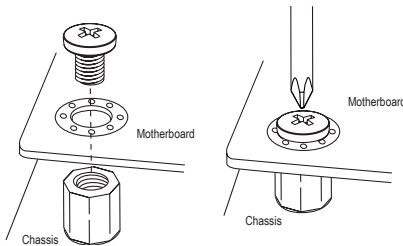
4. Install standoffs in the chassis as needed.

5. Install the motherboard into the chassis carefully to avoid damaging mother-board components.

6. Using the Phillips screwdriver, insert a Pan head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis.

7. Repeat Step 5 to insert #6 screws into all mounting holes.

8. Make sure that the motherboard is securely placed in the chassis.

> **Note:** Images displayed are for illustration only. Your chassis or compo-nents might look different from those shown in this manual.

2-4   Processor and Heatsink Installation

Warning: When handling the processor package, avoid placing direct pressure on the label area.

✏ **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 an IBM-certified multi-directional heatsink only.

- Make sure to install the system board into the chassis before you install the CPU heatsink.

- When receiving a motherboard 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 website for updates on CPU support.

Installing the Processor
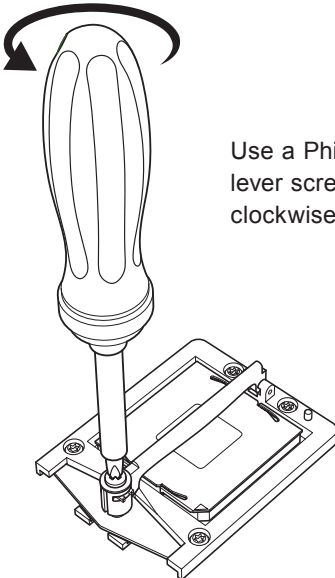
Use a Phillips screwdriver to loosen the lever screw. Turn the screwdriver counter clockwise as shown.

Pull the lever straight up to expose the plastic socket cover.
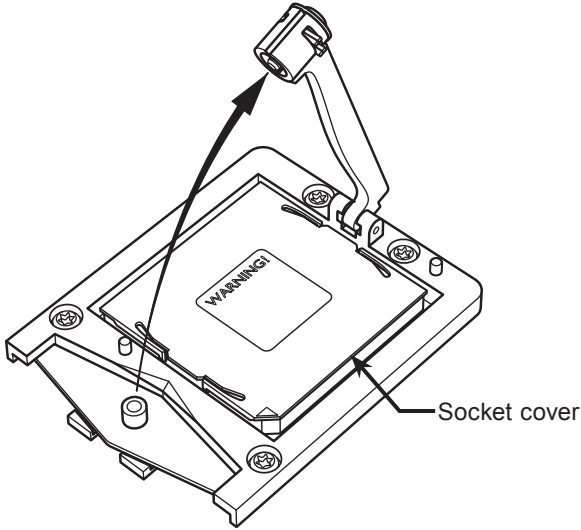
Socket cover

With your forefinger, carefully pry the plastic socket cover from the angled corner until it pops out. Then, lift the plastic socket cover upwards, exposing the socket pins. Be careful not to bend the socket pins as this may later cause problems with the CPU.

Lift plastic socket cover from here.
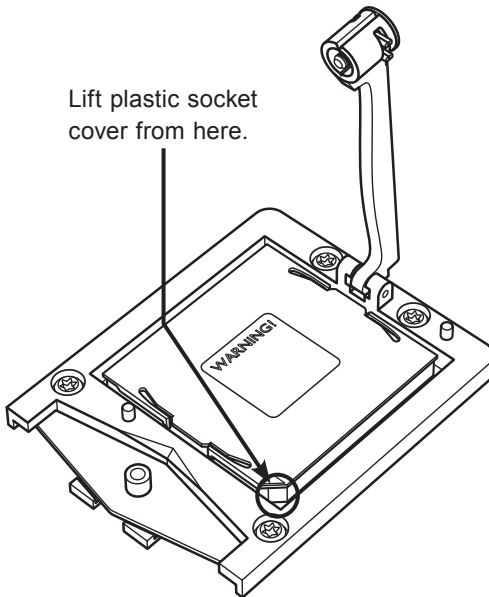
With the plastic socket cover removed, align the CPU keys, which are semi-circle cutouts, against the socket keys. Insert the CPU carefully as shown.

Lower CPU into socket carefully.

CPU

Do not touch socket pins in this area.

Align CPU key
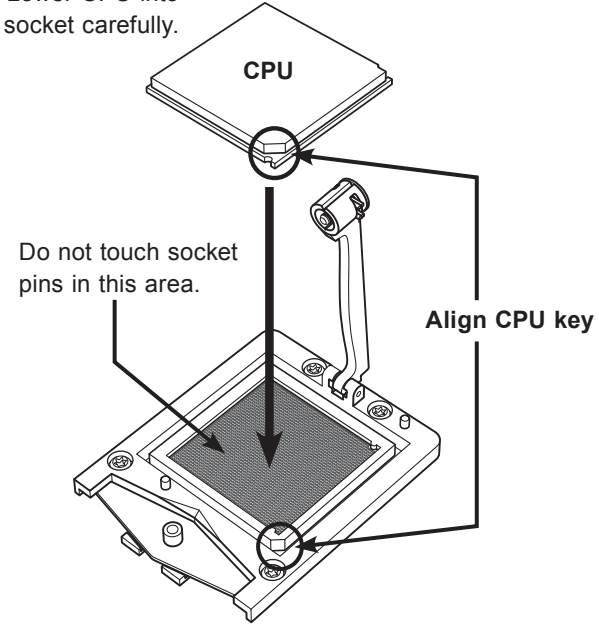
CPU inserted correctly with keys aligned
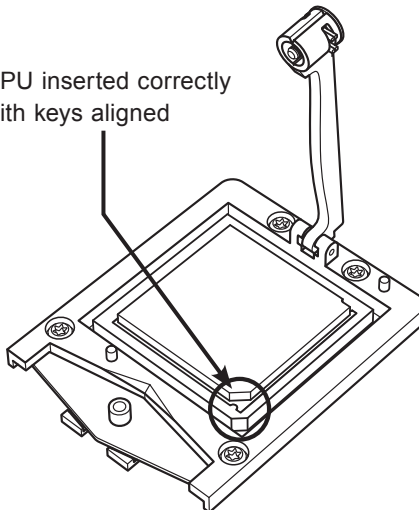
Installing the Heatsink

A heatsink such as the one shown below must be installed with the CPU to complete its installation.
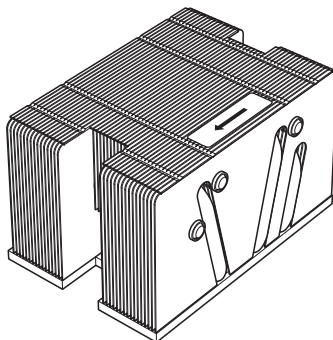
To install the heatsink, align the socket's two nubs with the corresponding nub holes under the heatsink.
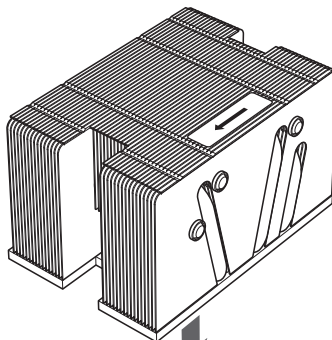
The heatsink will only mount one way. These two nubs will have matching holes under the heatsink. Make sure they are aligned properly.
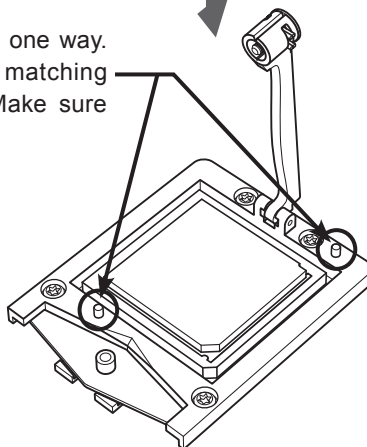
The illustration below shows the heatsink lowered into the socket and aligned properly, with the socket lever still raised up.
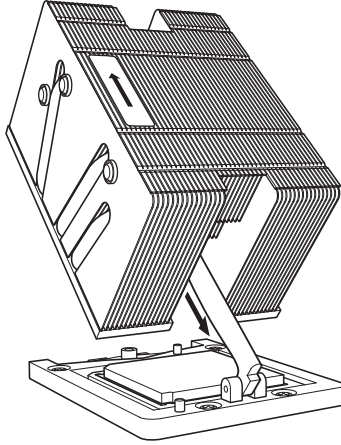
Lower the socket lever as shown above. With a Phillips screwdriver, hand tighten the lever screw clockwise to secure both the heatsink and CPU in place. Do not over tighten. Refer to the drawing below for proper installation.

Phillips Screw Driver
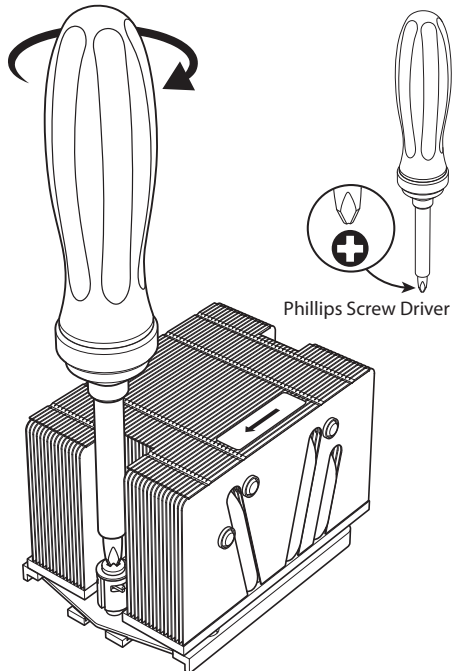
2-5 Installing and Removing the Memory Modules

✎ **Note**: Check Supermicro's website for recommended memory modules.

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

Installing & Removing DIMMs

1. Insert the desired number of DIMMs into the memory slots, starting with
    *P1-DIMMA1. (For best performance, please use the memory modules of the
    same type and speed in the same bank.)

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

Notches

Release Tabs
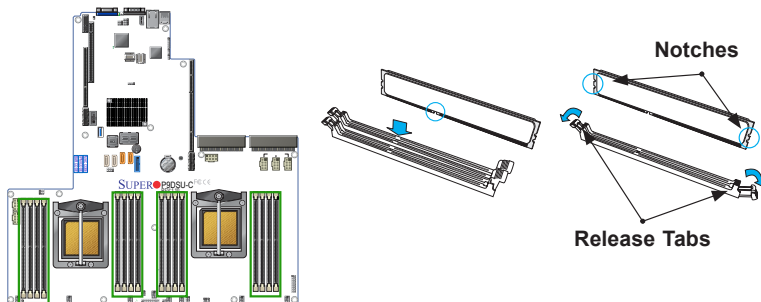
3. Align the key of the DIMM module with the receptive point on the memory
    slot.

4. Align the notches on both ends of the module against the receptive points on
    the ends of the slot.

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

6. Press the release tabs to the locking positions to secure the DIMM module
    into the slot.

> Press both ends straight
> down into the memory slot at
> the same time.
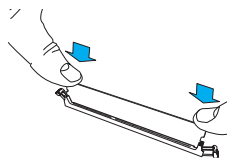
Removing Memory Modules

Press the release tabs on both ends of the memory module to unlock it. Once it is
loosened, remove the DIMM module from the memory slot.

Memory Support for the P9DSU-C Motherboard

The P9DSU-C motherboard supports up to 512 GB of Registered (RDIMM) ECC DDR4 1600 MHz (max.) memory modules in 16 DIMM slots. Please note that DDR4 1866 MHz/2133 MHz/2400 MHz memory modules are supported by this motherboard; however, the system will run at 1600 MHz. For the latest memory updates, please refer to our website at http://www.supermicro.com/products/motherboard.

Processor & Memory Module Population Configuration

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

Minimum boot up		
1CPU & 4DIMMs	CPU1 P1M1-DIMMA,P1M1-DIMMB P1M2-DIMMA,P1M2-DIMMB	CPU1 P1M1-DIMMC,P1M1-DIMMD P1M2-DIMMC,P1M2-DIMMD

Recommended Configurations		
1CPU & 8DIMMs	CPU1 P1M1-DIMMA,P1M1-DIMMB P1M2-DIMMA,P1M2-DIMMB P1M1-DIMMC,P1M1-DIMMD P1M2-DIMMC,P1M2-DIMMD	
2CPU & 8DIMMs	CPU1 P1M1-DIMMA,P1M1-DIMMB P1M2-DIMMA,P1M2-DIMMB CPU2 P2M1-DIMMA,P2M1-DIMMB P2M2-DIMMA,P2M2-DIMMB	CPU1 P1M1-DIMMC,P1M1-DIMMD P1M2-DIMMC,P1M2-DIMMD CPU2 P2M1-DIMMC,P2M1-DIMMD P2M2-DIMMC,P2M2-DIMMD
2CPU & 16DIMMs	CPU1 P1M1-DIMMA,P1M1-DIMMB P1M2-DIMMA,P1M2-DIMMB P1M1-DIMMC,P1M1-DIMMD P1M2-DIMMC,P1M2-DIMMD CPU2 P2M1-DIMMA,P2M1-DIMMB P2M2-DIMMA,P2M2-DIMMB P2M1-DIMMC,P2M1-DIMMD P2M2-DIMMC,P2M2-DIMMD	

Other Notes and Restrictions

- For the memory modules to work properly, please install DIMM modules in pairs (w/even number of DIMMs installed).

- All channels in a system will run at the fastest common frequency.

Minimum Boot Up

Recommended Configuration

```
xiting petitboot. Type 'exit' to return.
ou may run 'pb-sos' to gather diagnostic data
 # ipmitool fru | grep -i HMA41GR*
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 # _
```

```
xiting petitboot. Type 'exit' to return.
ou may run 'pb-sos' to gather diagnostic data
 # ipmitool fru | grep -i HMA41*
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
Unknown FRU header version 0x00
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 Product Part Number     : HMA41GR7AFR4N-UH
 #
```

```
Product Manufacturer  : ad00
Product Name          : 0c
Product Part Number   : HMA41GR7AFR4N-UH
Product Version       : 00
Product Serial        : 70fcZ5c7

RU Device Description : P2-DIMM1 (ID 26)
Product Manufacturer  : ad00
Product Name          : 0c
Product Part Number   : HMA41GR7AFR4N-UH
Product Version       : 00
Product Serial        : 80c3b4bd

RU Device Description : P2-DIMM2 (ID 27)
Product Manufacturer  : ad00
Product Name          : 0c
Product Part Number   : HMA41GR7AFR4N-UH
Product Version       : 00
Product Serial        : 80c46c79

RU Device Description : System Firmware (ID 47)
Product Name          : OpenPOWER Firmware
Product Version       : open-power-SUPERMICRO-P9DSU-V2.10-20190208-prod
Product Extra         :        op-build-6a0700c
Product Extra         :        buildroot-2018.05.1-9-gc99f2ee
Product Extra         :        skiboot-v6.0.16
Product Extra         :        hostboot-3c093dc-pc0ab4f8
Product Extra         :        occ-39d7745
Product Extra         :        linux-4.17.12-openpower1-ped131c9
Product Extra         :        petitboot-v1.7.5-p79ec4a8

RU Device Description : PSU 1 (ID 60)
Product Manufacturer  : SUPERMICRO
Product Name          : PWS-1K82A-1R
Product Part Number   : PWS-1K82A-1R
Product Version       : 1.3
Product Serial        : P1K8ACI06JN0022

RU Device Description : PSU 2 (ID 61)
Product Manufacturer  : SUPERMICRO
Product Name          : PWS-1K82A-1R
Product Part Number   : PWS-1K82A-1R
Product Version       : 1.2
Product Serial        : P1K8ACG07TB2B26


# ipmitool fru | grep -i HMA41*
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
Product Part Number   : HMA41GR7AFR4N-UH
# ipmitool fru | grep -i HMA41* | wc -l
6
#
```

2-6   Control Panel Connectors and I/O Ports

See the image below for the locations of I/O ports.

Back Panel Connectors and I/O Ports
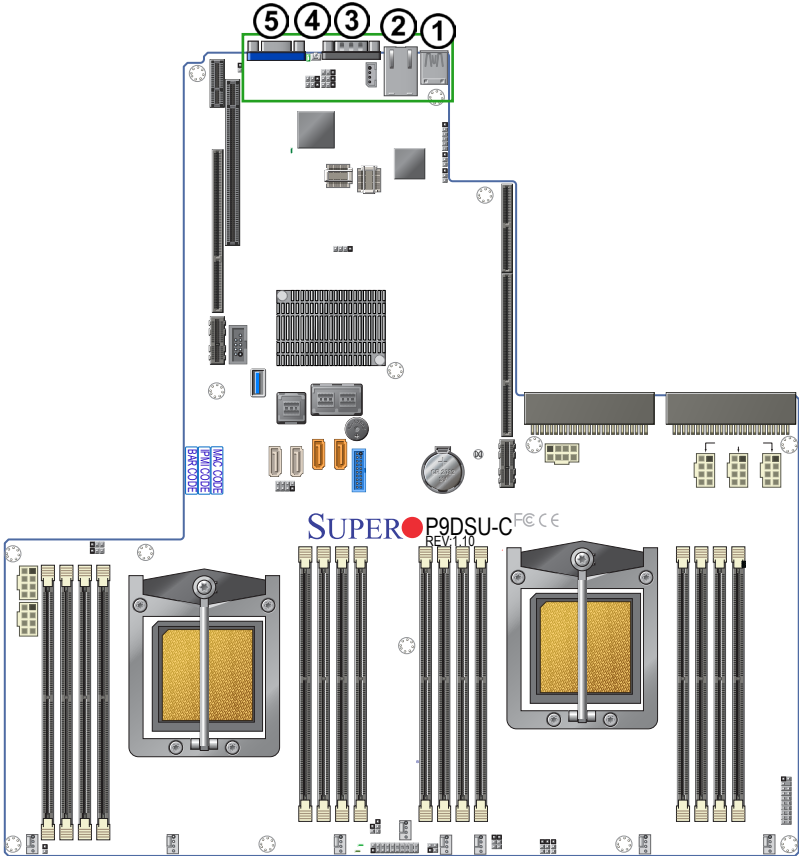
Back Panel I/O Port Locations and Definitions

1.	USB 3.0 Port0
2.	USB 3.0 Port1
3.	Dedicated IPMI LAN
4.	COM1
5.	UID Switch & UID LED
6.	VGA
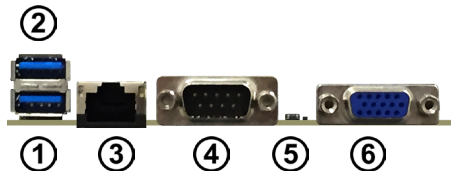
Universal Serial Bus (USB)

Two USB 3.0 ports (USB 0/1) are located on the I/O back panel. A USB header, which provides two USB 3.0 connections (USB3/4) for front access, is located next to GPU Power 3 connector on the motherboard. In addition, a Type A USB connector (USB2), located next to GPU Power 2 (GPUPWR2) connector, also provides front USB 3.0 support. Cables are not included. See the tables below for pin definitions.

USB (3.0) 0/1 Pin Definitions	
Pin#	Definition
1	+5V
2	D-
3	D+
4	Ground
5	RX-
6	RX+
7	Ground
8	TX-
9	TX+

Front Panel USB (3.0) 3/4 Pin Definitions			
Pin #	Definition	Pin #	Definition
1	+5V	6	+5V
2	USB_PN2	7	USB_PN3
3	USB_PP2	8	USB_PP3
4	Ground	9	Ground
5	No Connection	10	Key

1. USB 0 (USB 3.0)
2. USB 1 (USB 3.0)
3. USB 2 (Type A, USB 3.0)
4. USB 3/4 (USB 3.0)
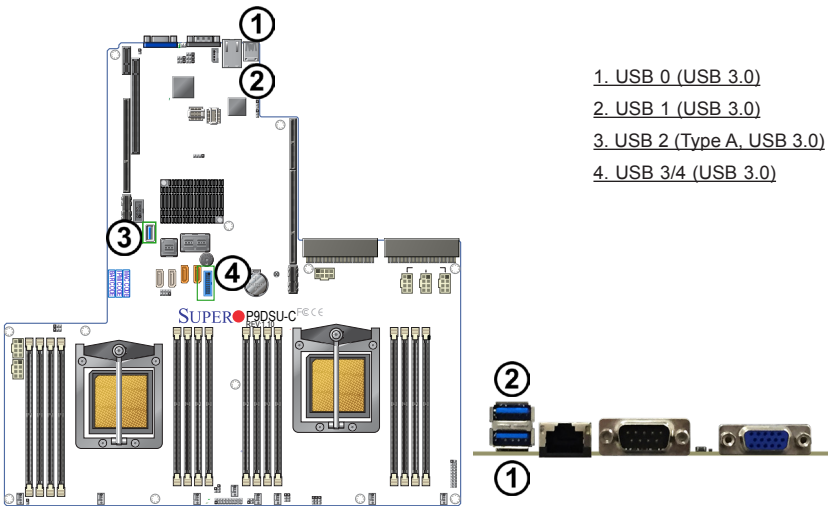
LAN Port

A Dedicated IPMI LAN is located on the back panel to provide KVM support for IPMI 2.0. (**Note**: Please refer to the LED Indicator Section for LAN LED information.)

COM1

The COM1 port, located on the I/O back panel, provides serial communication (RS-232) support for the motherboard. Refer to the board layout below for the location.

Serial COM Ports Pin Definitions			
Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	N/A
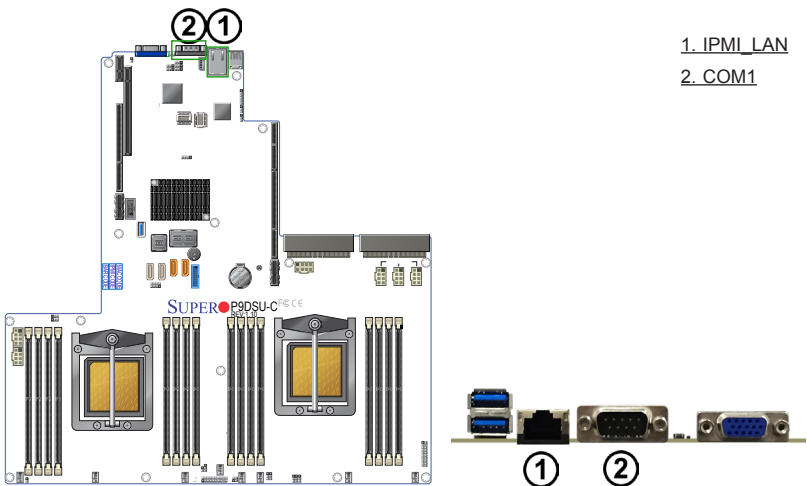
1. IPMI_LAN
2. COM1

BMC Debug Header

A BMC (Baseboard Management Controller) debug header is located on JCOM2 on the motherboard. Use this header for BMC debugging. Refer to the board layout below for the location.

Video Connector

A Video (VGA) connector is located on the I/O back panel. This connector is used to provide video and CRT display. Refer to the board layout below for the location.

1. VGA Connector
2. BMC Debug-JCOM2
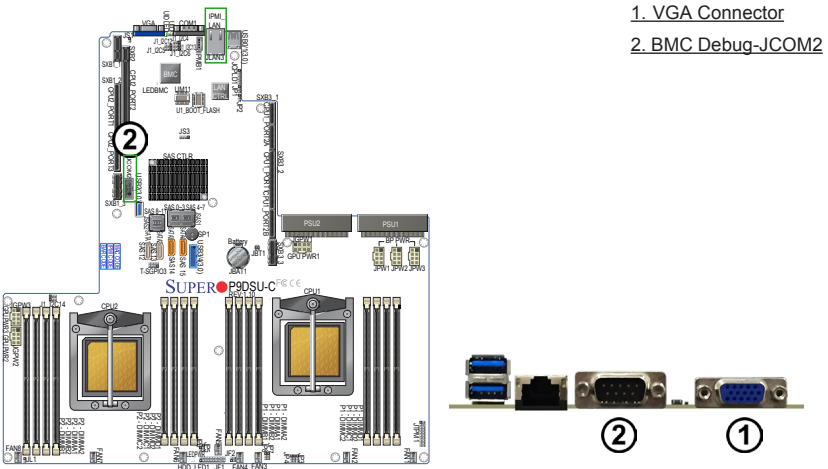
Unit Identifier Switches/UID LED Indicators

A Unit Identifier (UID) switch is located next to the VGA port on the motherboard. Located next to the UID switch is the rear UID LED (UID_LED). The front UID LED is located on pin 7 on the Front Control Panel (JF1). When you press the UID switch, both front and rear UID LEDs will be turned on. Press the UID switch again to turn off the LED indicators. The UID Indicators provide easy identification of a system unit that may be in need of service.

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

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

UID LED Status	
Color/State	Status
Blue: On	Unit Identified

	20	19	
Ground	○	○	NMI
X	○	○	X
FP PWRLED	○	○	3.3 V
HDD LED	○	○	3/3V Stby
NIC1 Link LED	○	○	NIC1 Activity LED
NIC2 Link LED	○	○	NIC2 Activity LED
OH/Fan Fail LED	○	○	UID LED Blue Cathode
Power Fail LED	○	○	3.3V
Ground	○	○	Reset — Reset Button
Ground	○	○	PWR — Power Button
	2	1	
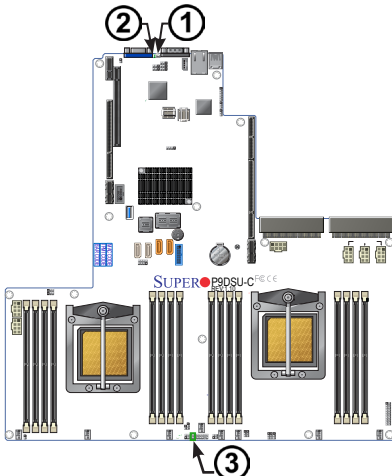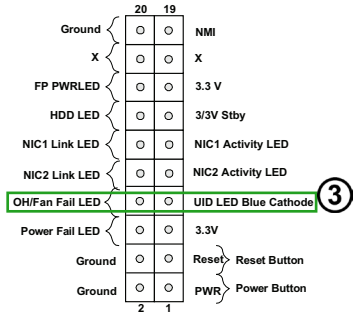
1. UID Switch
2. Rear UID LED
3. Front UID LED
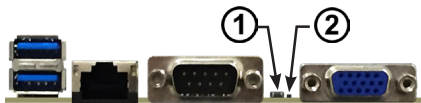
Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro's server chassis. See the figure below for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

1. JF1

	20	19	
Ground	○	○	NMI
X	○	○	X
FP PWRLED	○	○	3.3 V
HDD LED	○	○	3/3V Stby
NIC1 Link LED	○	○	NIC1 Activity LED
NIC2 Link LED	○	○	NIC2 Activity LED
OH/Fan Fail LED	○	○	UID LED Blue Cathode
Power Fail LED	○	○	3.3V
Ground	○	○	Reset Reset Button
Ground	○	○	PWR Power Button
	2	1	

Front Control Panel Pin Definitions

NMI Button

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

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

Power LED

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

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	3.3V
16	PWR LED

A. NMI
B. PWR LED
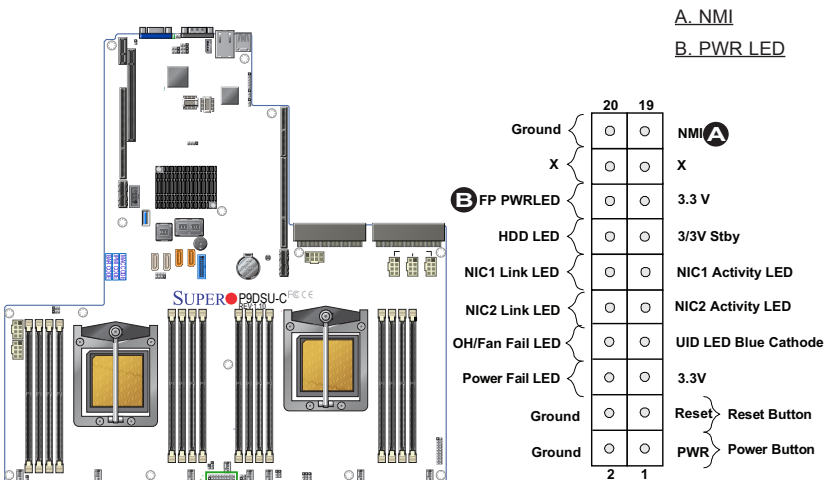
HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable here to show HDD activity status. See the table below for pin definitions.

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

NIC1/NIC2 LED Indicators

The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JF1, and the LED connection for LAN Port 2 is on pins 9 and 10. Attach the NIC LED cables here to display network activity. Refer to the table below for pin definitions.

GLAN1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9	NIC 2 Activity LED
10	NIC 2 Link LED
11	NIC 1 Activity LED
12	NIC 1 Link LED

A. HDD LED
B. NIC1 LED
C. NIC2 LED

	20	19	
Ground	O	O	NMI
X	O	O	X
FP PWRLED	O	O	3.3 V
A HDD LED	O	O	3/3V Stby
B NIC1 Link LED	O	O	NIC1 Activity LED
C NIC2 Link LED	O	O	NIC2 Activity LED
OH/Fan Fail LED	O	O	UID LED Blue Cathode
Power Fail LED	O	O	3.3V
Ground	O	O	Reset (Reset Button)
Ground	O	O	PWR (Power Button)
	2	1	
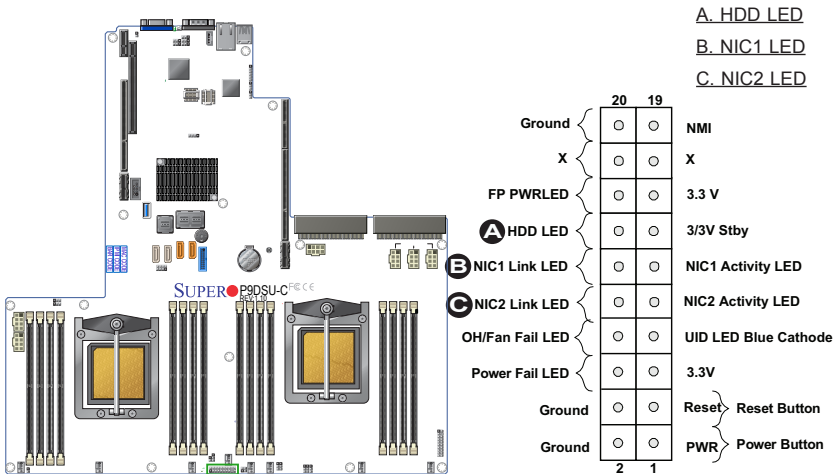
Overheat (OH)/Fan Fail/PWR Fail/UID LED

Connect an LED cable to pins 7 and 8 of Front Control Panel to use the Overheat/ Fan Fail/Power Fail and UID LED connections. The Red LED on pin 8 provides warnings of overheating, fan failure or power failure. The blue LED on pin 7 works as the front panel UID LED indicator. Refer to the tables below for pin definitions.

OH/Fan Fail/ PWR Fail/Blue_UID LED Pin Definitions (JF1)	
Pin#	Definition
7	Blue_UID LED
8	OH/Fan Fail/Power Fail

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

Power Fail LED

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

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

A. OH/Fail/PWR Fail LED

B. PWR Supply Fail

	20	19	
Ground	○	○	NMI
X	○	○	X
FP PWRLED	○	○	3.3 V
HDD LED	○	○	3/3V Stby
NIC1 Link LED	○	○	NIC1 Activity LED
NIC2 Link LED	○	○	NIC2 Activity LED
A OH/Fan Fail LED	○	○	UID LED Blue Cathode
B Power Fail LED	○	○	3.3V
Ground	○	○	Reset > Reset Button
Ground	○	○	PWR > Power Button
	2	1	
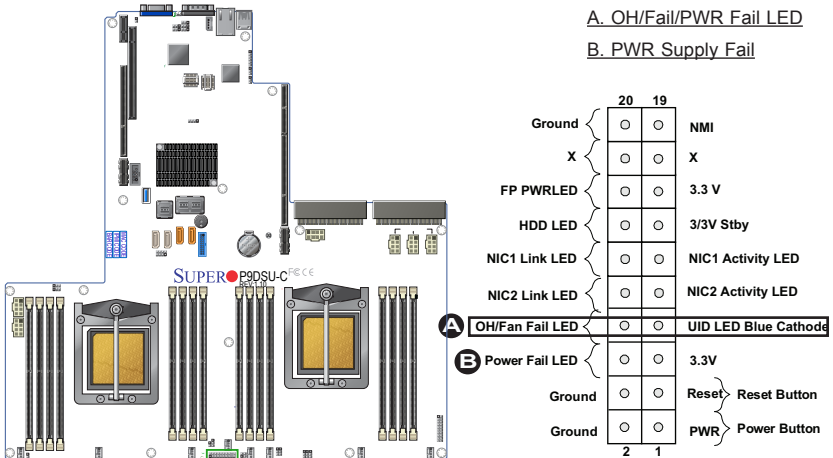
Reset Button

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

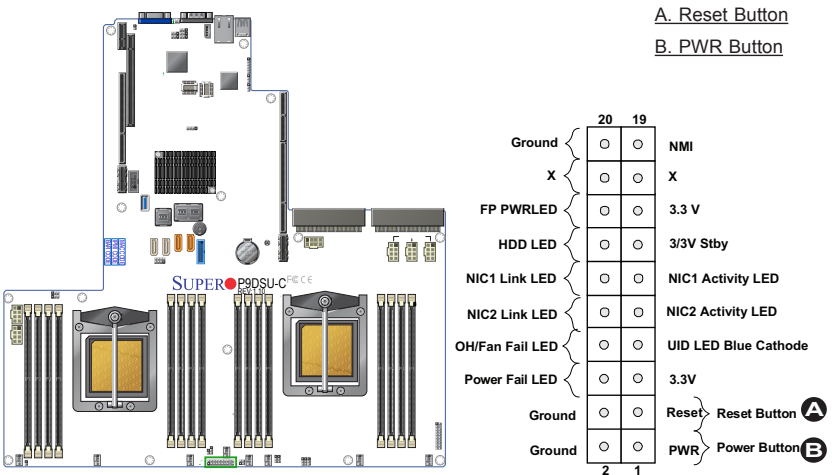| Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. To turn on or off the system power, press the button for 4 seconds or longer. Refer to the table below for pin definitions.

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

A. Reset Button
B. PWR Button

	20	19	
Ground	O	O	NMI
X	O	O	X
FP PWRLED	O	O	3.3 V
HDD LED	O	O	3/3V Stby
NIC1 Link LED	O	O	NIC1 Activity LED
NIC2 Link LED	O	O	NIC2 Activity LED
OH/Fan Fail LED	O	O	UID LED Blue Cathode
Power Fail LED	O	O	3.3V
Ground	O	O	Reset → Reset Button Ⓐ
Ground	O	O	PWR → Power Button Ⓑ
	2	1	

2-7   Connecting Cables

Power Connectors

Two SMCI-proprietary power supply units (PSU1/PSU2) are located on the moth-
erboard to provide main power supply to your system. Additionally, three 8-pin
backplane power connectors (JPW1/JPW2/JPW3) are used to provide power to
the backplane devices. See the table below for pin definitions.

12V 8-pin Backplane Power Connector Pin Definitions	
Pins	Definition
1 through 4	Ground
5/6	+12V
7/8	+5V

GPU Power Connectors

Three power connectors for GPU and VGA devices are located at JGPW1, JGPW2,
and JGPW3. Connect an appropriate cable to each GPU power connector to provide
power for your GPU/VGA devices.

8-pin GPU PWR Connector Pin Definitions	
Pins	Definition
1 through 3	+12V
4 through 8	Ground
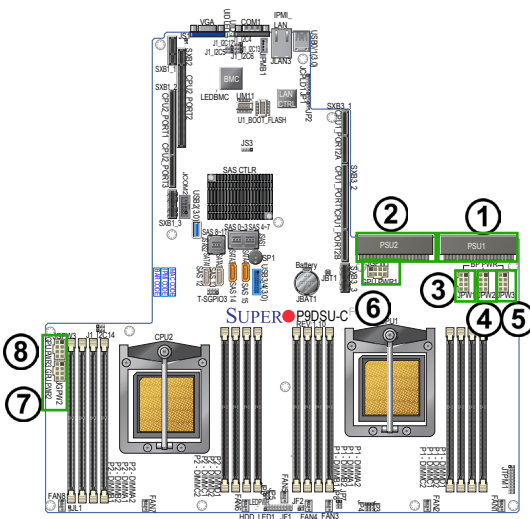
1. PWR Supply Unit 1
2. PWR Supply Unit 2
3. JPW1 (Backplane PWR1)
4. JPW2 (Backplane PWR2)
5. JPW3 (Backplane PWR3)
6. GPU PWR1
7. GPU PWR2
8. GPU PWR3

IPMB

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I²C connection on your system.

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

Chassis Intrusion (JL1)

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

| Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
4	Ground
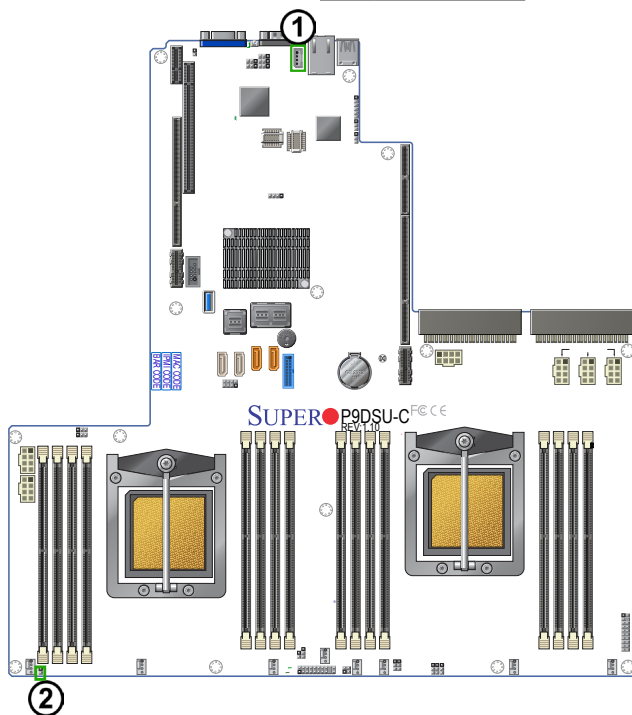
1. JIPMB1 (IPMB)
2. Chassis Intrusion

Fan Headers

This motherboard has eight cooling fan headers (FAN 1 ~ FAN 8) for system cooling. These 4-pin fan headers are backward compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only via IPMI 2.0 interface. See the table below for pin definitions.
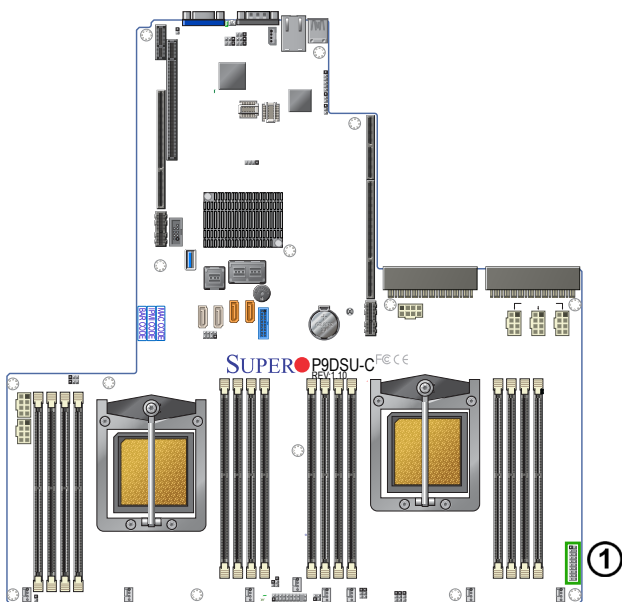
Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWR Modulation

1. FAN 1
2. FAN 2
3. FAN 3
4. FAN 4
5. FAN 5
6. FAN 6
7. FAN 7
8. FAN 8
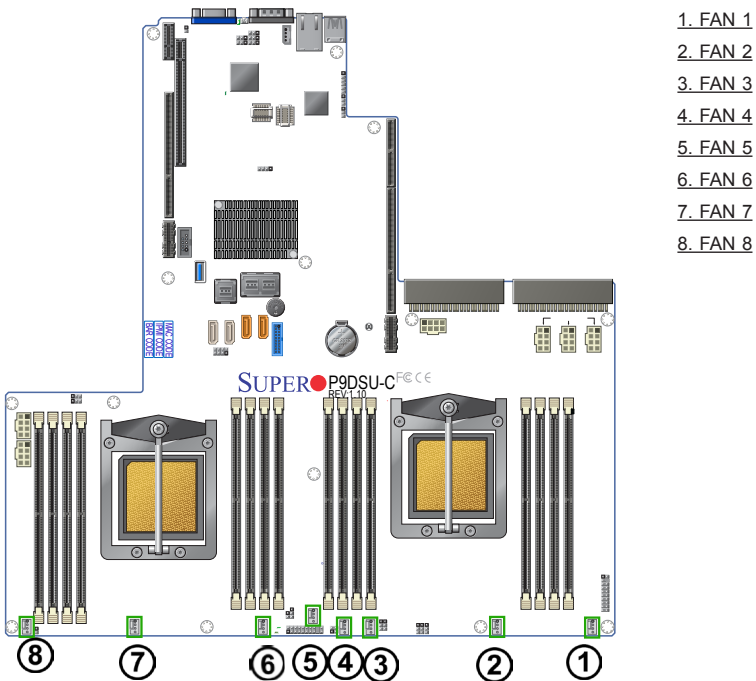
TPM Header

A Trusted Platform Module header is located at JTPM1 to provide TPM support. Use this header to enhance system performance and data security. See the table below for pin definitions.

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

1. TPM Header

SGPIO Header

A Serial-Link General Purpose Input/Output header is located at T-SGPIO3 on the motherboard. T-SPGIO3 supports SATA 1-4 connections. See the table below for pin definitions.

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

Note: NC= No Connection

Internal Speaker/Buzzer

The Internal Speaker/Buzzer (SP1) can be used to provide audible indications for various beep codes. See the table below for pin definitions. Refer to the layout below for the location of the Internal Buzzer.

Internal Buzzer Pin Definition		
Pin#		Definitions
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker
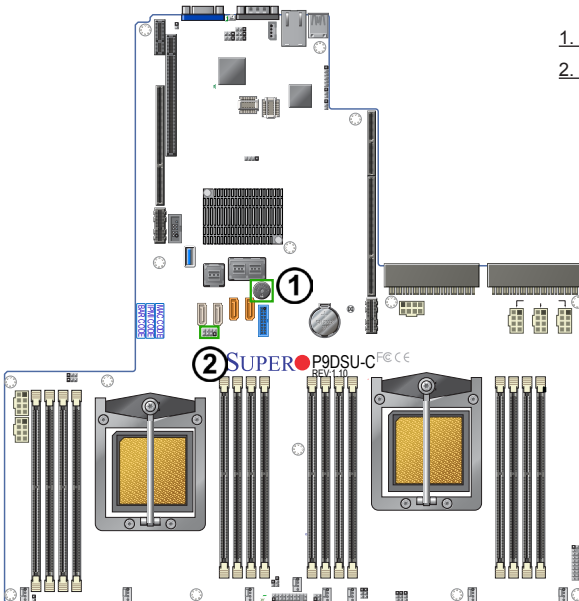
1. T-SGPIO3 (SGPIO Header)
2. Internal Speaker/Buzzer

2-8   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 motherboard layout pages for jumper locations.

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

TPM Module Jumpers

In order to use a TPM module, please the follow these jumper settings. Leave the jumper headers on J1_FSI_CP0 and J1_FSI_CP1 off when TPM devices are not installed. When a TPM module is not installed, place the header on pins 2-3. See the table below for more information.

| TPM Module Jumper Settings	
Pin#	Definitions
Off	With TPM Installed
2-3	Without TM Module
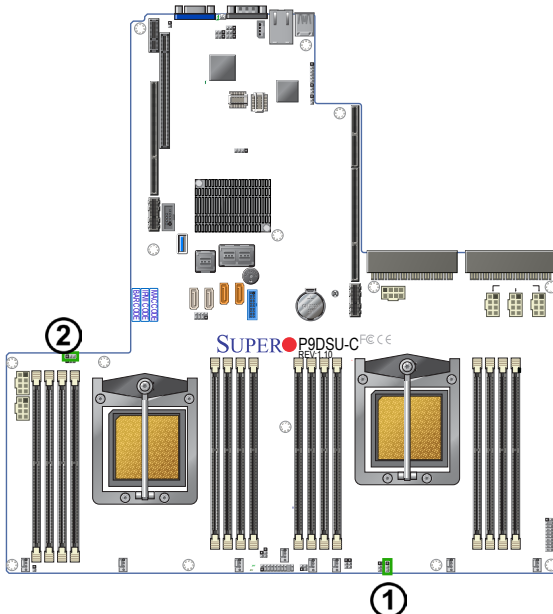
1. J1_FSI_CP0
2. J1_FSI_CP1

2-9   Onboard LED Indicators

Dedicated IPMI LAN LEDs

A Dedicated IPMI LAN is also located on the back panel. The amber LED below indicates activity, while the link LED on the left indicates the speed of the connection. See the table below for more information.
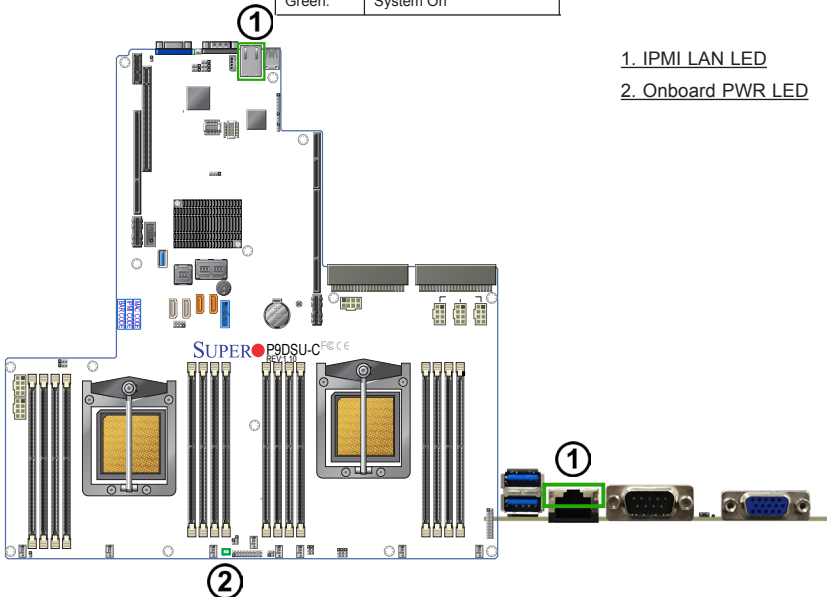
IPMI LAN

Link LED ——— ⬜ 🟨 ——— Activity LED
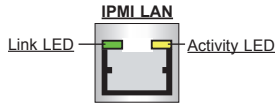
IPMI LAN Link LED (Left) & Activity LED (Right)		
	Color/State	Definition
Link (Left)	Green	100 Mbps
	Amber	1 Gbps
Activity (Right)	Amber: Blinking	Active

Onboard Power LED

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

Onboard PWR LED Indicator LED States	
LED Color	Definition
Off	System Off (PWR cable not connected)
Green:	System On

1. IPMI LAN LED
2. Onboard PWR LED
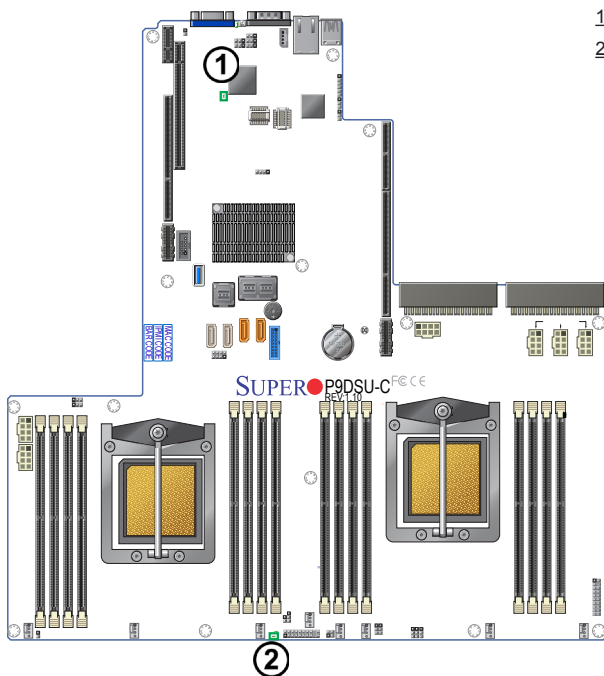
BMC Heartbeat LED

A BMC Heartbeat LED is located at LEDBMC on the motherboard. When this LED is blinking, BMC functions normally. See the table below for more information.

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

Hard Disk Activity LED

The Hard Disk Activity LED located HDD_LED1 on the motherboard functions as an indicator of the hard disk drive activity. This LED will flash indicating that the hard drive is being used and functioning normally. See the table below for more information.

| HDD LED States	
Status	Definition
On	Activity
Off	No activity

1. BMC Heartbeat LED
2. Hard Disk Activity LED

2-10 SAS/SATA Connections

SAS/SATA 3.0 Connections

P9DSU-C can support up to sixteen SAS/SATA 3.0 ports via MicroSemi PM8069 controller. This can be done by utilizing SAS0-3, SAS4-7 and SAS8-11 connectors, each of which can support up to four SAS3.0 or USB3.0 ports. There are also SAS12 and SAS14 ports which can support SAS devices or can be used as unpowered SATA ports. The SAS13 and SAS15 ports can be used as SAS ports as well as Supermicro SuperDOM SATA ports.

1. SAS 0-3
2. SAS 4-7
3. SAS 8-11
4. SAS 12
5. SAS 13
6. SAS 14
7. SAS 15
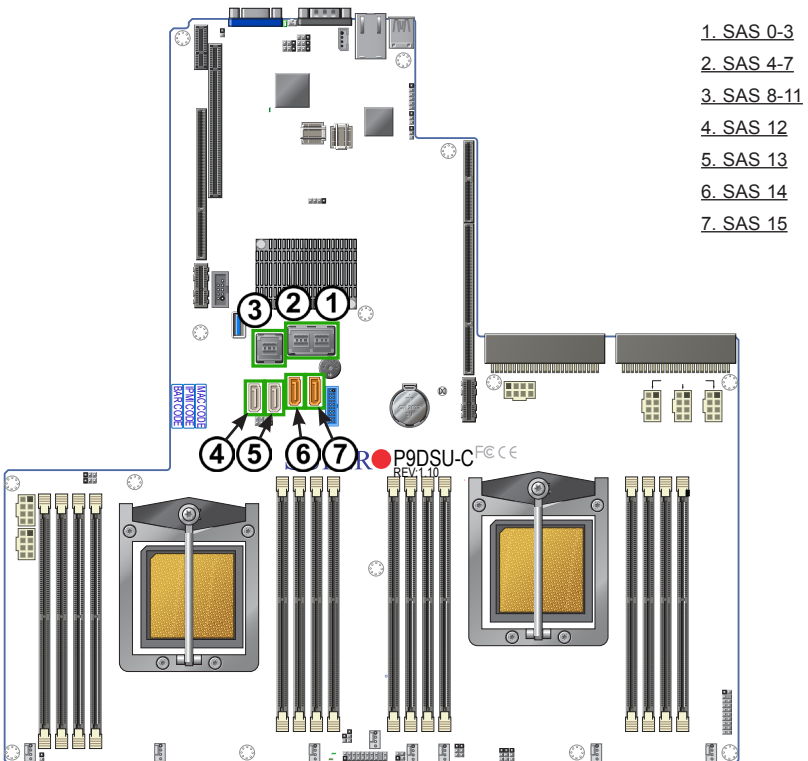
Chapter 3

Troubleshooting

3-1   Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter. Note: Always disconnect the power cord before adding, changing or installing any hardware components.

Before Power On

1. Make sure that there are no short circuits between the motherboard and chassis.

2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.

3. Remove all add-on cards.

4. Install Processor 1 first (making sure that it is fully seated) and connect the front panel connectors to the motherboard.

No Power

1. Make sure that no short circuits between the motherboard and the chassis.

2. Make sure that the power connectors are properly connected.

3. Make sure that the AC power cord connection are properly connected.

4. If BMC (Baseboard Management Controller) heartbeat is not detected, please check the power supply and make sure that it is properly connected.

5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on, but you do not have video, remove all the add-on cards and cables.

2. If BMC (Baseboard Management Controller) heartbeat is not detected, please check the power supply and make sure that it is properly connected.

Difficulty in Booting Up the System

If you experience difficulty in system boot, please refer to IBM's boot_flow document posted on Github's website at https://github.com/open-power/docs/blob/master/hostboot/P8_IPL_Flow_OpenPower.pdf. Please also refer to Appendix A for more information.

Losing the System's Setup Configuration

1. Make sure that system date and time is restored to 1996/01/01 00:00:01.

2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

3. If the steps indicated above do not fix the Setup Configuration problem, contact your vendor for repairs.

When the System Becomes Unstable

A. When the system becomes unstable during or after OS installation, check the following:

1. Processor PNOR support: Make sure that your processor is supported, and you have the latest PNOR installed in your system.

2. Memory support: Make sure that the memory modules are supported by testing the modules using memtest86 or a similar utility.

   🖉 **Note**: Refer to the product page on our website http:\\www.supermicro.com for memory and processor support and updates.

3. HDD support: Make sure that all hard disk drives (HDDs) work properly. Replace the bad HDDs with good ones.

4. System cooling: Check system cooling to make sure that all system fans work properly. Check Hardware Monitoring settings in BMC to make sure that the SCM and system temperatures are within the normal range. Also check the front panel Overheat LED, and make sure that the Overheat LED is not on.

5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Please refer to our website for more information on minimum power requirement.

6. Proper software support: Make sure that the correct software and firmware are used.

B. When the system becomes unstable before or during OS installation, check the following:

1. Installation Devices: Make sure that the devices used for installation are working properly, including boot devices such as CD/DVD.

2. Cable connection: Check to make sure that all cables are connected and working properly.

3. Using minimum configuration for troubleshooting: Remove all unnecessary components (starting with add-on cards first) and use minimum configuration (with a processor and two memory modules installed) to identify the trouble areas. Refer to the steps listed in Section A above for proper troubleshooting procedures.

4. Identifying bad components by isolating them: If necessary, remove a component in question from the chassis, and test it in isolation to make sure that it works properly. Replace a bad component with a good one.

5. Check and change one component at a time instead of changing several items at the same time. This will help isolate and identify the problem.

6. To find out if a component is good, swap this component with a new one to see if the system will work properly. If so, then the old component is bad. You can also install the component in question in another system. If the new system works, the component is good and the old system has problems.

C. When the system becomes unstable or you cannot boot to the OS

Please refer to Section B-2 in Appendix B for troubleshooting in an event when your system becomes unstable or you cannot boot to the OS.

3-2   Technical Support Procedures

<u>Before contacting Technical Support, please take the following steps.</u> Also, please note that as a motherboard manufacturer, Supermicro, also sells motherboards through its distributors. It is best to first check with your distributor or reseller for troubleshooting services - they should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our website (http://www.supermicro.com/) before contacting Technical Support.

2. The PNOR utility upgrades can be downloaded from our website (http://www. supermicro.com).

3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:

* Motherboard model and PCB revision number

* PNOR firmware release date/version (This can be seen on the PNOR setup utility display when your system first boots up.)

* System configuration

4.   An example of a Technical Support form is on our website at (http://www. supermicro.com/RmaForm/).

* Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com.

3-3   Battery Removal and Installation

Battery Removal

To remove the onboard battery, follow the steps below:

1. Power off your system and unplug your power cable.

2. Locate the onboard battery.

3. Using a tool such as a pen or a small screwdriver, push the battery lock outwards to unlock it. Once unlocked, the battery will pop out from the holder.

4. Remove the battery.

Proper Battery Disposal

- **Warning:** 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 into the garbage or on a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Battery Installation

1. To install an onboard battery, follow the steps 1 & 2 in the *Battery Removal* section (previous page) and continue below:

2. Identify the battery's polarity. The positive (+) side should be facing up.

3. Insert the battery into the battery holder and push it down until you hear a click to ensure that the battery is securely locked.

Warning: When replacing a battery, be sure to only replace it with the same type.

LITHIUM BATTERY

BATTERY HOLDER
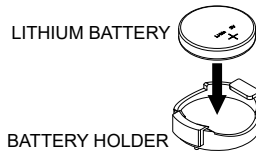
3-4   Frequently Asked Questions

Question: What are the various types of memory that my motherboard can support?

Answer: The motherboard supports ECC DDR4 RDIMM modules. To enhance memory performance, do not mix memory modules of different speeds and sizes. Please follow all memory installation instructions given on Section 2-5 in Chapter 2.

Question: How do I update my PNOR (firmware)?

It is recommended that you **do not** upgrade your PNOR firmware if you are not experiencing any problems with your system. Updated PNOR files are located on our website at http://www.supermicro.com. Please check our PNOR warning message and the information on how to update your PNOR on our website. Select your motherboard model and download the firmware file to your computer. Also, check the current PNOR revision to make sure that it is newer than what is installed before downloading. You can upload the PNOR firmware through the BMC web UI. After the firmware is uploaded, following the instruction to click the update button. Then, your system will automatically reboot after update complete.

Warning: Do not shut down or reset the system while updating the firmware to prevent possible system boot failure!

> **Note**: The PNOR chip used on this motherboard cannot be removed. Send your motherboard back to our RMA Department at Supermicro for repair. For recovery instructions, please refer to the recovery Instructions posted at http://www.supermicro.com.

Question: How do I handle the used battery?

Answer: 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. Refer to Section 3-3 in this chapter.

Question: Why are my sensor readings different from the readings of other machines?

Answer: The BMC (Baseboard Management Controller) installed on your motherboard monitors your system continuously and will display the status and the readings on the screen. Because operation conditions change constantly, sensor readings will differ as well. Please refer to Appendix C for more information on senor reading variations.

3-5 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning the motherboard to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and the shipping package is mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete. For faster service, you can also request a RMA authorization online (http://www.supermicro.com/RmaForm/).

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Chapter 4

PNOR

4-1   Introduction

This chapter describes the PNOR setup utility for the P9DSU-C. It also provides the instructions on how to navigate the PNOR setup utility screens. The PNOR is stored in a Flash EEPROM and can be easily updated.

Starting the PNOR Setup Utility

When the system is turned on and finishes the Power-On Self-Test (POST, it will automatically enter the PNOR utility. The PNOR setup screen will appear as shown below:

Note: For the purposes of this manual, the text portions of the screen will be zoomed in on the succeeding pages to better illustrate the functions of the PNOR.

4-2   Main Setup

When you first enter the PNOR setup, you will enter the Main setup screen. You can always return to the Main setup screen by pressing the Escape [ESC] key on your keyboard.

```
Petitboot (dev.20160920)


*System information
 System configuration
 Language
 Rescan devices
 Retrieve config from URL
 Exit to shell
```

System Information


```
Petitboot System Information

System type: 0000000000000000
System id:   0000000000000000

Primary platform versions:
        open-power-SUPERMICRO-P8DTU-V1.10.SP1-20160920
        op-build-9d82f91
        hostboot-70eb852-62a9b73
        occ-1093bf9
        skiboot-5.1.15-c04d9cc
        linux-4.4.6-openpower1-2d0b49b
        petitboot-c005b17-dabcf07
        p8dtu-xml-179cd87

BMC current side:
        Device ID: 0x20
        Device Rev: 0x1
        Firmware version: 1.14.0
        IPMI version: 2

Management (BMC) interface
 MAC:  0c:c4:7a:68:2d:d5

Network interfaces
enP2p1s0f0:
 MAC:  0c:c4:7a:b7:f9:a8
 link: up

enP2p1s0f1:
 MAC:  0c:c4:7a:b7:f9:a9
 link: down

enP2p1s0f2:
 MAC:  0c:c4:7a:b7:f9:aa
 link: up

enP2p1s0f3:
 MAC:  0c:c4:7a:b7:f9:ab
 link: up

tun10:
 MAC:  00:00:00:00:08:00
 link: up
```

This submenu displays the following information about the system:

System Type

System ID

Primary Platform Versions

BMC Current Side

Management (BMC) Interface (MAC Address)

Network Interfaces (Detected)

▶System Configuration

Add Device


```
Select a boot device to add

(*) net:  enP2p1s0f0 [mac: 0c:c4:7a:b7:f9:a8]
( ) net:  enP2p1s0f1 [mac: 0c:c4:7a:b7:f9:a9]
( ) net:  enP2p1s0f2 [mac: 0c:c4:7a:b7:f9:aa]
( ) net:  enP2p1s0f3 [mac: 0c:c4:7a:b7:f9:ab]
( ) net:  tun10 [mac: 00:00:00:00:08:00]
( ) Any Disk device
( ) Any USB device
( ) Any CD/DVD device

[   OK   ] [ Cancel ]
```
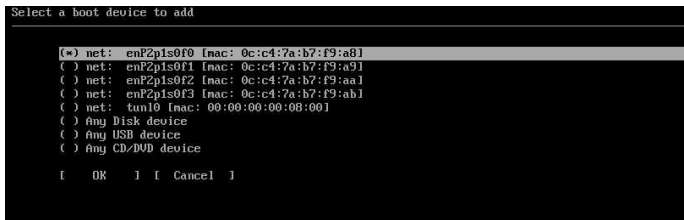
This option allows for the addition of a boot device. Scroll down to your selection and press <Enter> or select OK to select. Press <Cancel> to cancel and return to the previous screen.

Clear & Boot Any

Use this option to clear a previously selected boot device and boot from any available boot device. Press <Enter> or select. Press <Cancel> to cancel and return to the previous screen.

Clear

This option will clear a previously selected boot device. Press <Enter> or select. Press <Cancel> to cancel and return to the previous screen.

Timeout

This option is informational and displays the boot timeout in seconds.

Network

This section will configure the manner in which the system obtains an IP address to connect to the network.

DHCP on all active interfaces

Select this option to allow the system to obtain a dynamic IP address from a DHCP server (Dynamic Host and Configuration Protocol) within the network. Scroll to this selection, then press <Enter> or select. Press <Cancel> to cancel and return to the previous screen.

DHCP on a specific interface

Select this option to allow the system to obtain a dynamic IP address from a DHCP server (Dynamic Host and Configuration Protocol) within the network for a particular network interface. Scroll to this selection, then press <Enter> or select, then select the interface that will be used. Press <Cancel> to cancel and return to the previous screen.

Static IP Configuration

Select this option to manually enter the IP Address (Static IP), Gateway Address, DNS Servers, and other configuration settings. Press <Enter> or select, then enter the information on the fields provided. Press <Cancel> to cancel and return to the previous screen.

Disk R/W

This option controls whether booloader scripts will be allowed Read/Write access to the system disk. The options are "Prevent All Writes To Disk" and **"Allow Boot-loader To Modify Disks"** (Default).

Default TTY

This option selects the default communication port to connect to the system remotely. The options are dependent on the detected devices. Press <Enter> or select, Press <Cancel> to cancel and return to the previous screen.

►Language

```
Petitboot Language Selection

Language      (*) English

              [   OK   ] [ Cancel ]
```

When other options are available, this feature will change the default language of this interface for **English** (Default). Press <Enter> or select, then enter the information on the fields provided. Press <Cancel> to cancel and return to the previous screen.

►Rescan Devices

This option forces the PNOR to rescan the system to detect any new devices.

```
Petitboot Config Retrieval

Configuration URL:

              [   OK   ] [  Help  ] [ Cancel ]
```

►Retrieve Config from URL

This feature may be used when a configuration file is available from a URL. Enter a valid URL, select OK to accept. Press <Cancel> to cancel and return to the previous screen.

```
Exiting petitboot. Type 'exit' to return.
/ # _
```

►Exit to Shell

Select this option to exit to the Linux shell. Type 'Exit' from the shell to return.

Appendix A

Software Installation Instructions

A-1　Installing Software Programs

After you've installed the operating system, you are ready to install software programs that have not yet been installed.

Note 1: To properly install the supported OS, please refer to the instructions posted on our website at http://www.supermicro.com/support/manuals/.

Note 2: Your system supports Linux, and all drivers needed for your system have been integrated in the Linux kernel. There will be no Driver CD provided for your system.

Note 3: To configure onboard Marvell RAID settings, please download the mvcli-Marvell RAID utility and RAID Configuration documentation from our website at http://www.supermicro.com/support/.

A-2   When Your System Becomes Unstable or You Cannot Boot to the OS

When your system becomes unstable or you cannot boot to the OS, please follow the instructions below for troubleshooting.

- Check the following settings to make sure that these settings are set to Factory Default settings.
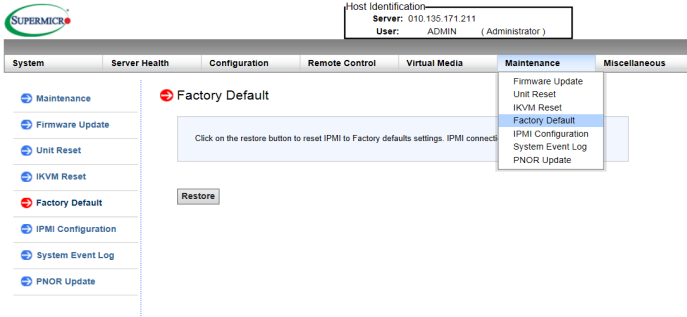
- To load the Factory Defaults, please follow the steps below:

1. Log into the BMC WebUI page.

2. Click on the "Maintenance" tab. From the drop-down menu, select "Factory Default" as shown in the screen shot above.

3. Restore your computer to the Factory Default settings.

4. After the Factory Default setting are loaded, reboot the system.

Appendix B

Sensor Reading Variations

B-1   Sensor Reading Variations

This motherboard has an onboard Baseboard Management Controller (BMC) chip that performs system health monitoring continuously. When the BMC detects the settings of a components in the system, it will display the status and the readings of this component. For instance, the Power9 Sforza processor can support up to 24 cores. However, not all 24 cores are enabled at the same time nor are all 24 cores programmed to function in the same way at all time, so the BMC readings for these cores will differ, depending on the factors such as operation conditions, processor production lots, and the manufacture settings etc. Sensor reading variations will occur depending on the internal state of a component, and the operating environment of this component at the time of BMC health monitoring. Please do not be overly concerned when sensor readings show variations as displayed in the screen below.