

X10DAi
X10DAC
X10DAX

USER'S MANUAL

Revision 1.2b

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Manual Revision 1.2b

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Preface

This manual is written for system integrators, PC technicians, IT professionals, and knowledgeable PC users. It provides information for the installation and use of the X10DAi/X10DAC/X10DAX motherboard.

About This Motherboard

The Super X10DAi/X10DAC/X10DAX motherboard supports dual Intel E5-2600v3/v4 Series Processors (Socket R3) that offer the new Intel Microarchitecture 22nm (E5-2600v3)/14nm (E5-2600v4) Process Technology, delivering the most-balanced solution of performance, power efficiency, and features, ideal for workstation platforms and graphics applications. With the PCH C612 built in, the X10DAi/DAC/DAX motherboard supports the Intel® Node Manager 3.0, Intel® Management Engine, and up to 2400 MHz DDR4 memory. This motherboard is optimized for workstation platforms used for graphics applications and engineering CAD drawings. Please refer to our website (http://www.supermicro.com) for CPU and memory support updates.

Manual Organization

Chapter 1 describes the features, specifications and performance of the motherboard. It also provides detailed information about the Intel C612 chipset.

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 BIOS, and provides detailed information on running the CMOS setup utility.

Appendix A provides BIOS error beep codes.

Appendix B lists software installation instructions**.**

Appendix C details UEFI BIOS recovery instructions.

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 avoid damaging the components or the motherboard,

Note: Additional important information provided for correct system setup.

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Chapter 1

Overview

1-1 Overview

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.

Please check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

The following items are included in the retail box:

- One (1) Supermicro Mainboard
- Six (6) Serial ATA cables (CBL-0044Lx6) (X10DAi/X10DAX Only)
- Two (2) Serial ATA cables (CBL-0044Lx2) (X10DAC Only)
- Two (2) SAS cable (CBL-SAST-0532x2) (X10DAC Only)
- One (1) I/O Shield (MCP-260-00045-1N)
- One (1) Quick Reference Guide (MNL-1563-QRG)

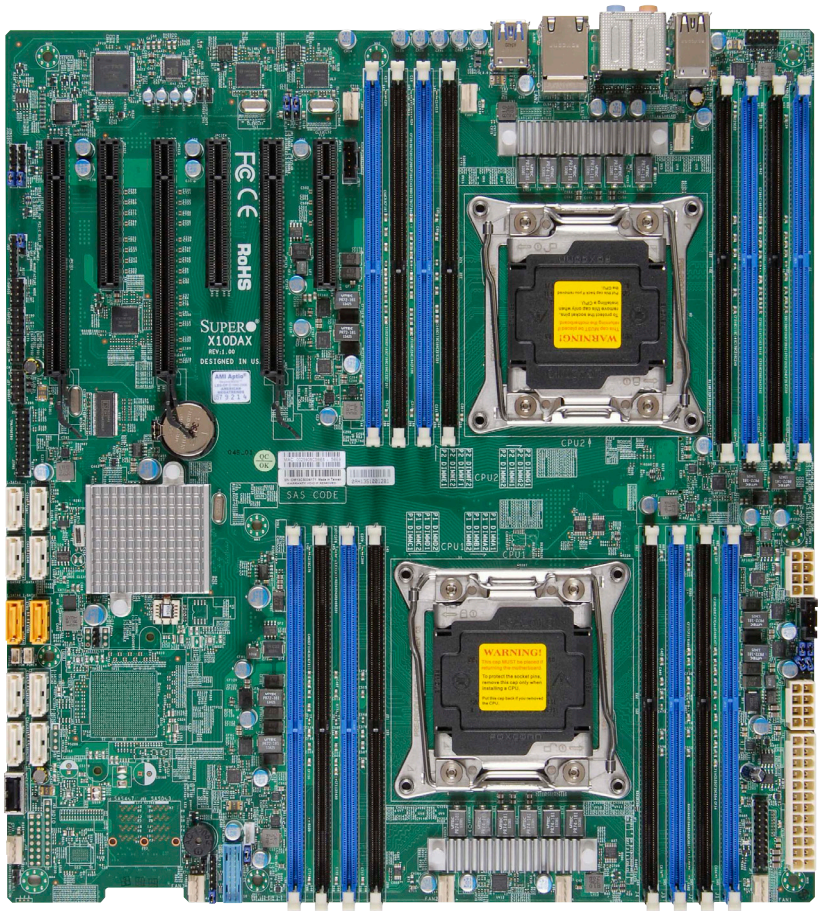


Note: For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your motherboard.

- Supermicro product manuals: http://www.supermicro.com/support/manuals/
- Product Drivers and utilities: http://www.supermicro.com/wftp
- Safety Information: http://www.supermicro.com/about/policies/safety_information.cfm.

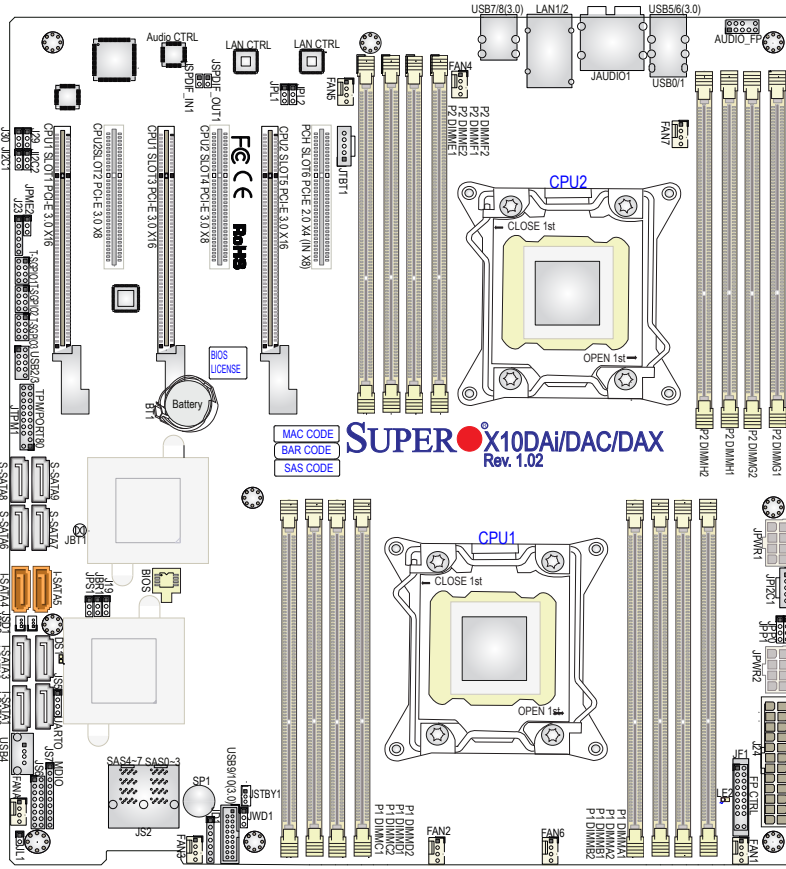
If you have any questions, please contact our support team at support@supermicro.com.

Motherboard Image



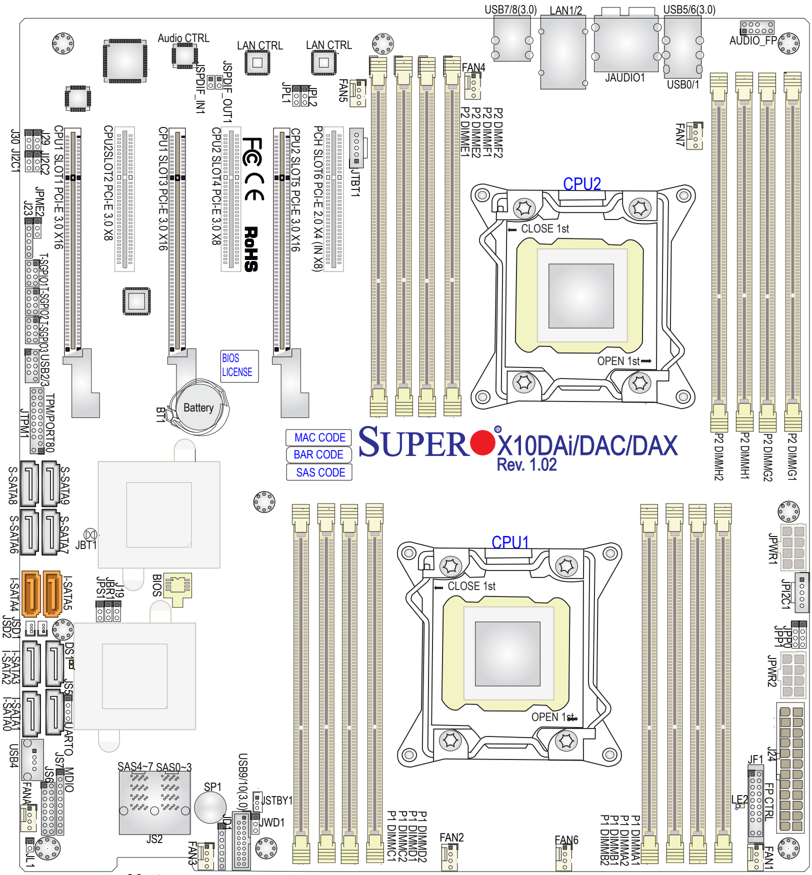
Note: All graphics shown in this manual were based upon the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in this manual.

Motherboard Layout



Note: For the latest CPU/Memory updates, please refer to our website at http://www.supermicro.com/products/motherboard/ for details.

X10DAi/X10DAC/X10DAX Quick Reference



Notes:

- See Chapter 2 for detailed information on jumpers, I/O ports and JF1 front panel connections.
- "∎" indicates the location of "Pin 1".
- Jumpers/LEDs not indicated are for internal testing only. Also, components that are not documented in this manual are reserved for internal use only.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid damaging the motherboard.

X10DAi/X10DAC/X10DAX Jumpers

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Chapter 2
JI^{2}C1/JI^{2}C2	SMBus to PCI-E Slots	Pins 2-3 (Normal)
JPL1	GLAN1 & GLAN2 Enable/Disable	Pins 1-2 (Enabled)
JPL2	GLAN2 Enable/Disable	Pins 1-2 (Enabled)
JPME2	ME (Manufacture) Mode Select	Pins 1-2 (Normal)
JPS1 (X10DAC Only)	SAS Enable	Pins 1-2 (Enabled)
JWD1	Watch Dog	Pins 1-2 (Reset)

X10DAi/X10DAC/X10DAX Connectors

Connectors	Description
Audio_FP (JA1)	Audio Connector for Front Access
JAudio1	7.1 HD (8-channel High-Definition) Audio Connector
BT1	Onboard CMOS Battery (See Chapter 3 for Used Battery Disposal)
CPU1 Slot1/Slot3	PCI-E 3.0 x16 Slots
CPU2 Slot5	PCI-E 3.0 x16 Slot (This slot is available when CPU2 is installed.)
CPU2 Slot2	PCI-E 3.0 x8 Slot (This slot is available when CPU2 is installed.)
CPU2 Slot4	PCI-E 3.0 x8 Slot (The slots are available when CPU2 is installed.)
PCH Slot6	PCI-E 2.0 x4 in x8 Slot (See the note below for Thunderbolt AOC support.)
FAN1-7, FANA	CPU/System Fan Headers
J24	ATX 24-Pin Power Connector
JD1	Speaker/Power LED Indicator
JF1	Front Panel Control Header
JL1	Chassis Intrusion
JPI^{2}C1	Power Supply SMBbus I^{2}C Header
JPWR1/JPWR2	12V 8-Pin Power Connectors
JSD1/JSD2	SATA DOM (Device_On_Module) Power Connection Header 1/Header 2
JSPDIF_In	SPDIF_(Sony/Philips Digital Interface)_In Header
JSPDIF_Out	SPDIF_(Sony/Philips Digital Interface)_Out Header
JTBT1	GPIO (General-Purpose I/O) header for Thunderbolt Add-on Card (See the note below for Thunderbolt AOC support.)
JTPM1	TPM (Trusted Platform Module)/Port 80 Header

Note: This motherboard supports the latest Thunderbolt technology. For proper Thunderbolt support, please install the Thunderbolt add-on card on PCH Slot6 and connect the GPIO cable from the Thunderbolt add-on card to the GPIO header (JTBT1) on the motherboard for TBT hot-plug support.

LAN1/LAN2	G-bit Ethernet Ports 1/2
(I-)SATA0-5	Serial_Link ATA Connections 0-5 supported by Intel PCH (I-SATA4/5 support Supermicro SuperDOMs [Devices-on-Module] with power pins built-in)
(S-)SATA6-9	Serial_Link ATA Connections 6-9 supported by Intel SCU
SAS 0-3, 4-7 (JS2) (X10DAC Only)	Serial_Link SCSI Connections 0-3, 4-7 supported by LSI SAS Controller
SP1	Onboard Buzzer (Internal Speaker)
STBY1	Standby Power Header
T-SGPIO 1/2/3	Serial-Link General_Purpose IO Headers 1/2/3 (T-SGPIO1: for I-SATA 0-3; T-SGPIO2: for I-SATA 4/5; T-SGPIO3: for S-SATA 6-9)
USB 5/6 (3.0)	Rear USB 3.0 Ports 5/6
USB 7/8 (3.0)	Rear USB 3.0 Ports 7/8
USB 9/10 (3.0)	Front-accessible USB 3.0 Connections 9/10
USB 0/1 (2.0)	Rear USB 2.0 Connections 0/1
USB 2/3 (2.0)	Front-accessible USB 2.0 Connections 2/3
USB 4 (2.0)	Type A USB 2.0 Connector USB 4

X10DAi/X10DAC/X10DAX LED Indicators

LED	Description	State	Status
DS2 (X10DAC Only)	SAS Heartbeat LED	Green: Blinking	SAS: Normal
LE2	Standby PWR LED	Green: On	SB Power On

Warning: To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin and two 8-pin power connectors. Be sure to connect these power supply connectors to the 24-pin power connector (J24) and two 8-pin power connectors (JPWR1, JPWR2) on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

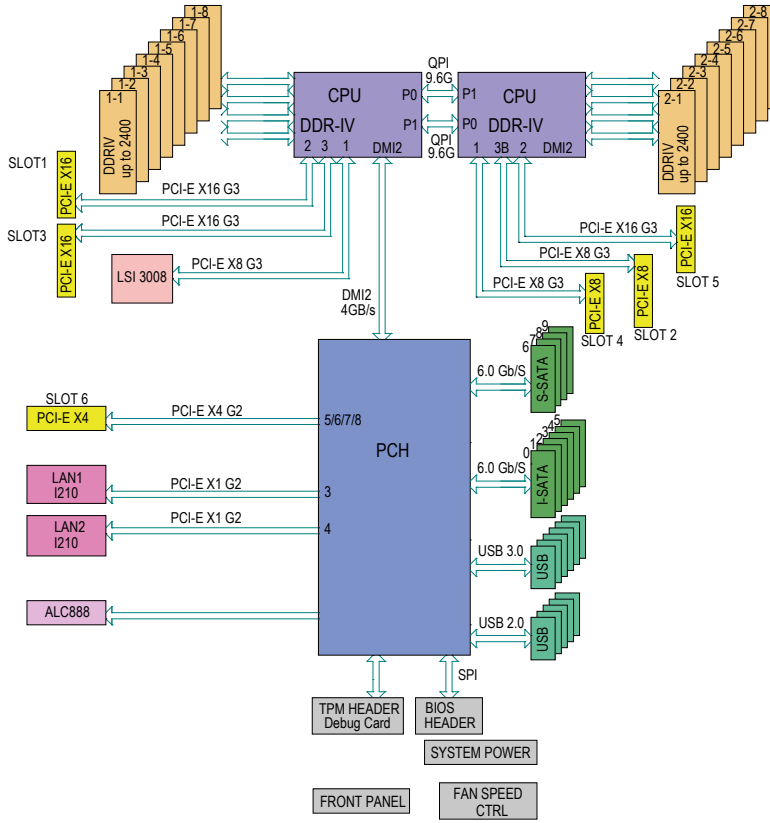
Motherboard Features

CPU	• Dual Intel® E5-2600v3/v4 Series Processors (Socket R3 LGA 2011); each processor supports two full-width Intel QuickPath Interconnect (QPI) links (with support of up to 9.6 GT/s per QPI link). **Note:** E5-2600v4 requires Revision 2.0 BIOS (or higher).	
Memory	• Integrated memory controller supports up to 2048 GB of Load Reduced (LRDIMM) or up to 512 GB of Registered (RDIMM) ECC DDR4 2400/2133/1866/1600 MHz memory modules in 16 DIMM slots. **Note 1:** Memory speed support is dependent on the CPUs installed on the motherboard. **Note 2:** For the latest memory updates, please refer to the Tested Memory List posted on our website (http://www.supermicro.com/products/motherboard).	
	• Virtualization: VT-x, VT-d, and VT-c	
Chipset	• Intel® C612 Chipset (PCH)	
Expansion Slots	• Three (3) PCI-Express 3.0 x16 slots (CPU1 Slot1/ CPU1 Slot3, CPU2 Slot5), • Two (2) PCI-E3.0 x8 slot (CPU2 Slot2, CPU2 Slot4), • One (1) PCI Express 2.0x4 in x8 slot (PCH Slot6) (See the note on Page 1-5.)	
Network	• Two (1) i210 Gigabit (100/1000 Mb/s) Ethernet Controllers for LAN 1/LAN 2 ports.	
	SATA/SAS Connections	
	• SATA Ports	Six (6) SATA 3.0 ports supported by Intel PCH (I-SATA 0-6) **Note**: I-SATA4/5 support Supermicro with power pins built-in) Four (4) SATA 3.0 ports supported by Intel SCU (S-SATA 6-9) **Note**: Please do not combine I-SATA0-5 with S-SATA 6-9 for RAID configuration

	• SAS Connections (X10DAC only)	Eight (8) SAS connections supported by LSI 3008 controller (SAS 0-3, SAS 4-7)
	• RAID	RAID 0, 1, 10 **Note**: I-SATA0-5 cannot be combined with S-SATA 6-9 for RAID configuration
Peripheral Devices	**USB Devices**	
	• Four (4) rear USB 3.0 ports (USB 3.0 ports 5/6, 7/8), • Two (2) rear USB 2.0 ports (USB 2.0 ports 0/1)	
	• Two (2) USB 3.0 connections for front access (USB 9/10) • Two (2) USB 2.0 connections for front access (USB 2/3) • One (1) Type A USB 2.0 header (USB 4)	
I/O Devices	**Audio**	
	• ALC 888 Audio controller • Rear 7.1 High-Definition Audio (JAudio1) • Audio header for front access (JA1) • SPDIF_In/SPDIF_Out (Sony_Philips Digital Interface)_In/Out headers	
Power Connectors	**System Power Connectors**	
	• One (1) 24-pin Main power (JPWR3) • Two (2) 8-pin CPU power connectors (JPWR1/2)	
Acceleration Plus (HW)	**Hardware Hyper-Speed (OverClocking)**	
	• Geforce SLI support (X10DAX only)	
BIOS	• 16MB AMI SPI BIOS® (Dual: X10DAX, One: X10DAi/X10DAC) • APM 1.2, DMI 2.3, PCI 2.3, ACPI 1.0/2.0/3.0, Plug & Play (PnP) and SMBIOS 2.3	

	Thunderbolt Technology Support
	• Intel Thunderbolt Technology supported **Note**: This motherboard supports the latest Thunderbolt technology. For proper Thunderbolt support, please install the Thunderbolt add-on card on PCH Slot6 and connect the GPIO cable from the Thunderbolt add-on card to the GPIO header (JTBT1) on the motherboard for Thunderbolt hot-plug support.
Power Config.	• ACPI/ACPM Power Management • Main switch override mechanism • Keyboard Wake-up from Soft-Off USB • Power-on mode for AC power recovery
System-Health Monitoring	**CPU Monitoring**
	• Onboard voltage monitors for +1.05V, 1.5V, +3.3V, 3.3VSB, +5V, +5V Standby, +12V, chipset, memory, CPU1/2 vcores, and battery voltages. • CPU/System overheat LED and control • CPU Thermal Trip support • Thermal Monitor 2 (TM2) support
	Fan Control
	• Low noise fan speed control
	LED Indicators
	• System/CPU Overheat LED • Suspend-state LED
System Management	**System Management**
	• PECI (Platform Environment Configuration Interface) 2.0 support
	• System resource alert via SuperDoctor® 5
	• Thermal Monitor 2 (TM2) support
	• Chassis Intrusion Header and Detection
	• SuperDoctor® 5, Watch Dog, NMI
Dimensions	• 12.00" (L) x 13.00" (W) (304.80 mm x 330.20 mm)

Note: Both CPUs need to be installed for full access to the PCI-E slots, DIMM slots, and onboard controllers. Refer to the block diagram on page 1-11 to determine which slots or devices may be affected.



System Block Diagram

Note 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.

Note 2: This block diagram is intended for your reference only.

Note 3: Both CPUs need to be installed for full access to the PCI-E slots, DIMM slots, and onboard controllers. Refer to the block diagram above to determine which slots or devices may be affected.

Note 4: Please do not combine I-SATA0-5 with S-SATA 6-9 for RAID configuration

1-2 Processor and Chipset Overview

Built upon the functionality and the capability of the Intel E5-2600v3/v4 Series Processors (Socket R3 LGA 2011) and the C612 chipset, the X10DAi/DAC/DAX motherboard provides the performance and feature sets required for dual_processor-based workstation platforms.

With support of Intel QuickPath interconnect (QPI) Technology, the X10DAi/DAC/DAX offers point-to-point serial interconnect interface with a transfer speed of up to 9.6 GT/s, providing superb system performance.

The C612 chipset provides extensive IO support, including the following features:

- DDR4 288-pin memory support
- Support for MCTP protocol and ME
- GSX capable of GPIO expansion
- Improved I/O capabilities to high-storage-capacity configurations
- SPI Enhancements
- Intel® Node Manager 3.0

Notes:

1. E5-2600v4 requires Revision 2.0 BIOS (or higher).

2. Node Manager 3.0 support is dependent on the power supply used in the system.

1-3 Special Features

Recovery from AC Power Loss

The Basic I/O System (BIOS) provides a setting that determines how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must press the power switch to turn it back on), or for it to automatically return to the power-on state. See the Advanced BIOS Setup section for this setting. The default setting is **Last State**.

1-4 System Health Monitoring

This motherboard has an onboard Hardware Monitor Controller that supports system health monitoring, and it will scan the following onboard voltages continuously: 1.05V, 1.2V, 1.5V, +3.3V, 3.3VSB, +5V, +5V Standby, +12V, chipset, memory, and battery voltages. Once a voltage becomes unstable, a warning is given, or an error message is sent to the screen. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware Control

The onboard Hardware Monitor Controller can check the RPM status of a cooling fan.

Environmental Temperature Control

The Hardware Monitor Controller monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal fan control to prevent the CPU from overheating. The onboard chassis thermal circuitry can monitor the overall system temperature and alert the user when the chassis temperature is too high.

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

System Resource Alert

This feature is available when used with SuperDoctor® 5. SuperDoctor 5 is used to notify the user of certain system events. For example, you can configure SuperDoctor 5 to provide you with warnings when the system/CPU temperatures, CPU voltages and fan speeds go beyond a predefined range.

1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripheral devices such as network cards, hard disk drives and printers.

In addition to enabling operating_system-directed power management, ACPI also provides a generic system event mechanism for Plug and Play, and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures, while providing a processor architecture-independent implementation that is compatible with Windows 8/R2 and Windows 2012/R2 Operating Systems.

1-6 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.

The X10DAi/DAC/DAX motherboard accommodates 24-pin ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. In addition, two 8-pin power connections are also required to ensure adequate power supply to the system. Your power supply must also supply 1.5A for the Ethernet ports.

Warning: To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin and two 8-pin power connectors. Be sure to connect these power supply connectors to the 24-pin (J24) and two 8-pin power connectors (JPWR1, JPWR2) on the motherboard. Failure to do so will void the manufacturer warranty on your power supply and motherboard.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant. (For more information, please refer to the website at http://www.ssiforum.org/). Additionally, 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.

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 in the Supermicro chassis.

Battery Handling



Warning!

There is a 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

池更 不当会有爆炸危 。 只使用同类 池或制造商推荐的功能相当的 池更原有 池。 按制造商的 明处理 旧 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 استبدال البطارية بطريقة غير صحيحة فعليك
استبدال البطارية
فقط بنفس النوع أو ما يعادلها كما أوصت به الشركة المصنعة
تخلص من البطاريات المستعملة وفقا لتعليمات الشركة 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 品的 弃处理 根据所有国家的法律和 章 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.

סילוק המוצר

אזהרה !

סילוק סופי של מוצר זה חייב להיות בהתאם להנחיות וחוקי המדינה.

عند التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين واللوائح الوطنية

경고!

이 제품은 해당 국가의 관련 법규 및 규정에 따라 폐기되어야 합니다.

Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

2-2 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To avoid damaging 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

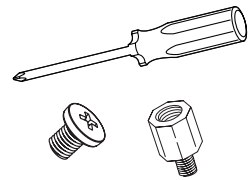
The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure that the person handling it is static protected.

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.

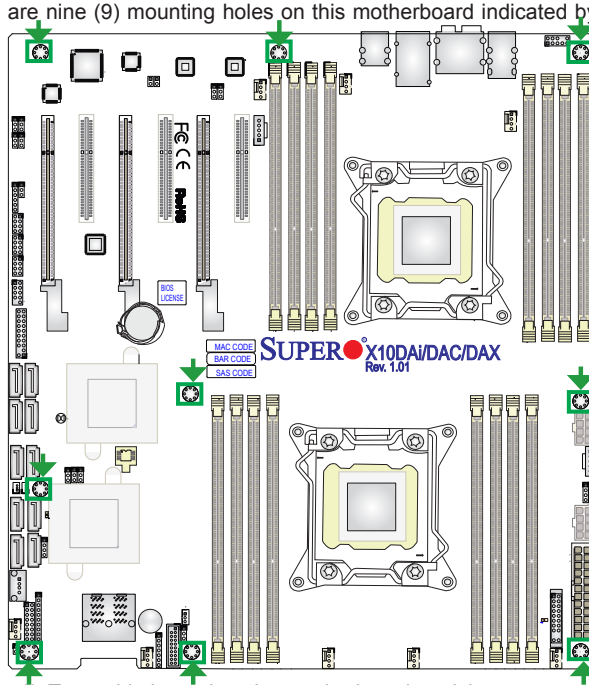
Tools Needed

- Phillips Screwdriver
- Pan head screws (9 pieces)
- Standoffs (9 pieces, if needed)



Location of Mounting Holes

There are nine (9) mounting holes on this motherboard indicated by the arrows.

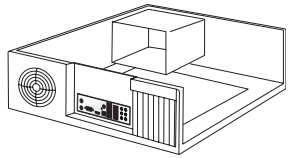


Warning: 1) To avoid damaging the motherboard and its components, please do not use a force greater than 8 lb/inch on each mounting screw during motherboard installation. 2) Some components are very close to the mounting holes. Please take precautionary measures to prevent damage to these components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

Installing the Motherboard

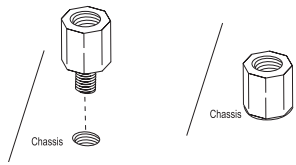
Note: Always connect the power cord last, and always remove it before adding, removing or changing any hardware components.

1. Install the I/O shield into the chassis.



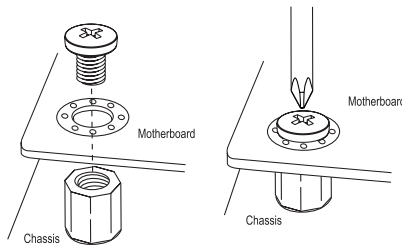
2. Locate the mounting holes on the motherboard.

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 motherboard 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 components might look different from those shown in this manual.

2-4 Processor and Heatsink Installation

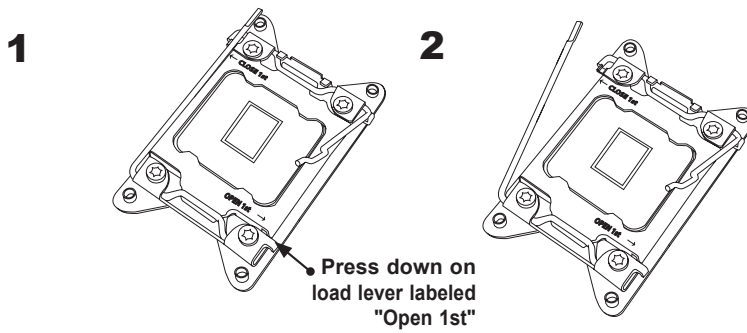
Warning: When handling the processor package, avoid placing direct pressure on the label area. Also, improper CPU installation or socket/pin misalignment can cause serious damage to the CPU or the motherboard that will require RMA repairs. Be sure to read and follow all instructions thoroughly before installing your CPU and heatsink.

Notes:

- Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.
- Make sure to install the system board into the chassis before you install the CPU heatsink.
- When receiving a server board 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.

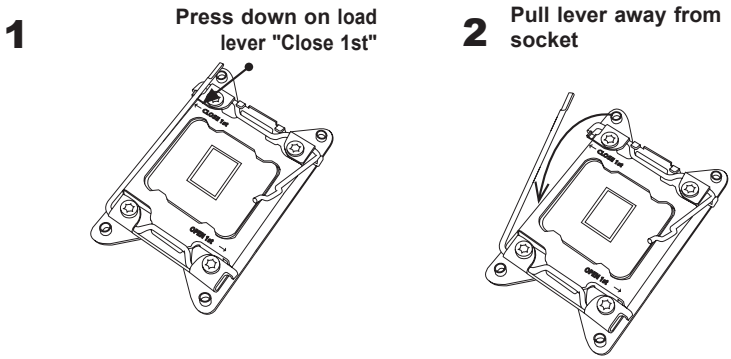
Installing the LGA2011 Processor

1. There are two load levers on the LGA2011 socket. To open the socket cover, first press and release the load lever labeled "Open 1st."

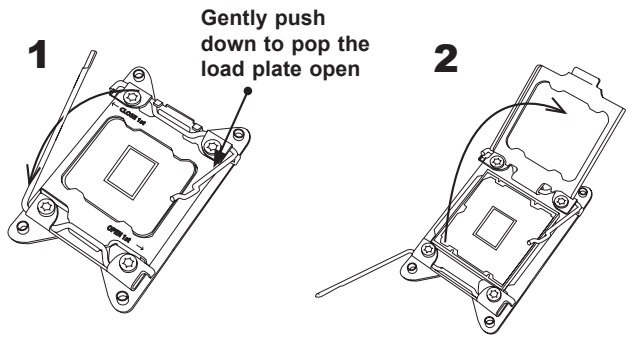


Note: All graphics, drawings, and pictures shown in this manual are for illustration only. The components that came with your machine may or may not look exactly the same as those shown in this manual.

2. Press the second load lever labeled "Close 1st" to release the load plate that covers the CPU socket from its locking position.

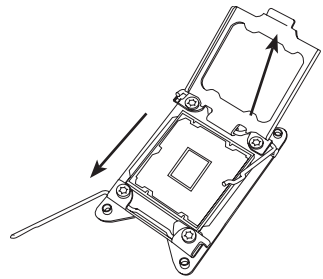


3. With the lever labeled "Close 1st" fully retracted, gently push down on the lever labeled "Open 1st" to open the load plate. Lift the load plate to open it completely.

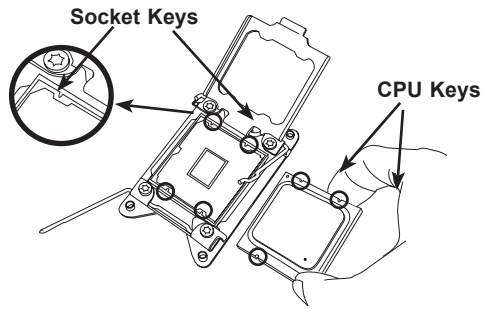


Note: All graphics, drawings and pictures shown in this manual are for illustration only. The components that came with your machine may or may not look exactly the same as those shown in this manual.

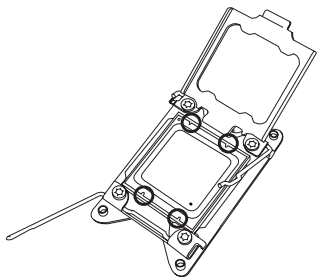
4. Use your thumb and index finger to loosen the lever and open the load plate.



5. Using your thumb and index finger, hold the CPU by its edges. Align the CPU keys, which are semicircle notches, against the socket keys.



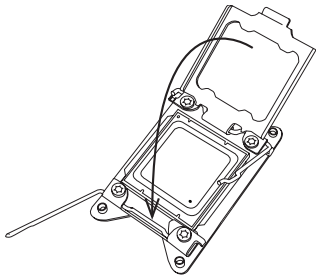
6. Once they are aligned, carefully lower the CPU straight down into the socket. Do not drop the CPU on the socket or move the CPU horizontally or vertically. Do not rub the CPU against the surface or against any of the socket pins to avoid damaging the CPU or the socket.



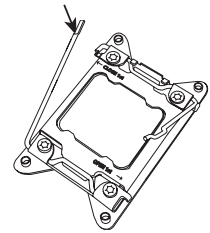
Warning: You can only install the CPU inside the socket in one direction. Make sure that it is properly inserted into the CPU socket before closing the load plate. If it doesn't close properly, do not force it as this may damage your CPU. Instead, open the load plate again to make sure that the CPU is aligned properly.

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

1 **Gently close the load plate**

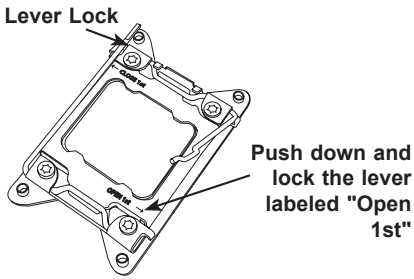


2 **Push down and lock the lever labeled "Close 1st"**

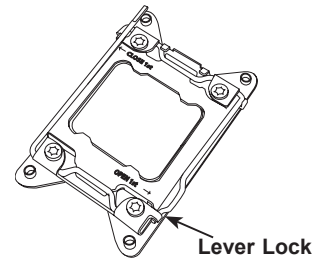


8. Close the load plate with the CPU inside the socket. Lock the lever labeled "Close 1st" first, then lock the lever labeled "Open 1st" second. Using your thumb, gently push the load levers down to the lever locks.

3



4



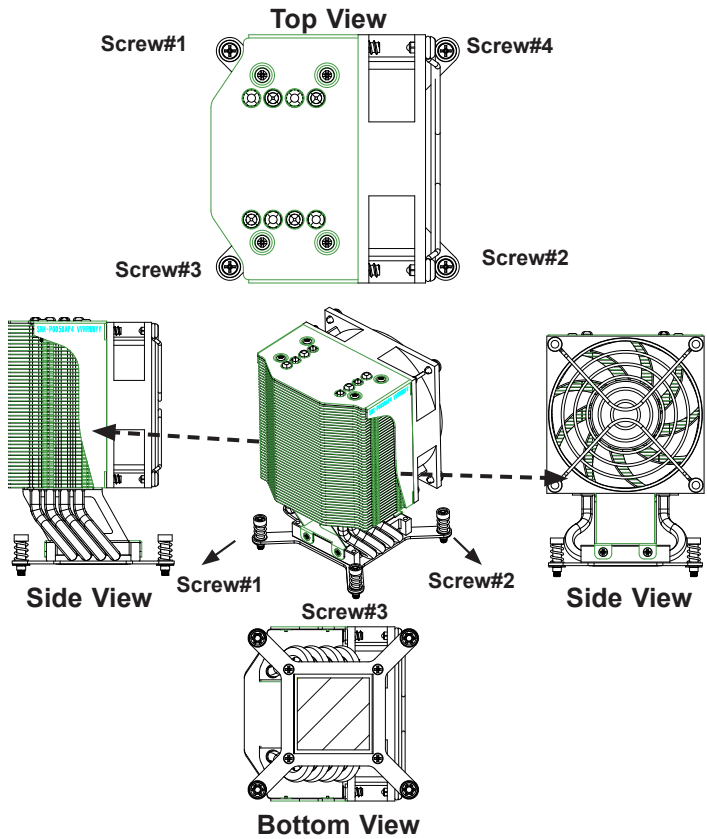
Installing a CPU Heatsink

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

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

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

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



Notes: 1. For optimized airflow, please follow your chassis airflow direction to install the correct CPU heatsink direction. 2. Graphics shown in this manual are for reference only. They may or may not look the same as the components installed in your system.

Removing the Heatsink

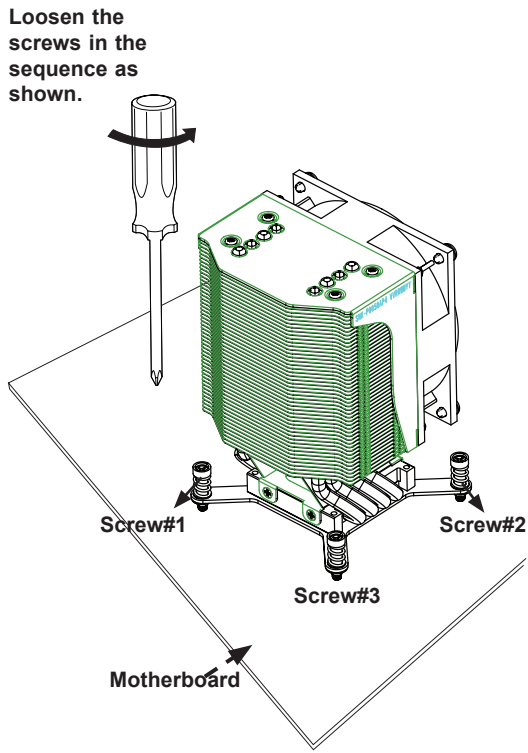
Warning: We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions below to uninstall the heatsink to prevent damage done to the CPU or the CPU socket.

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

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

3. Once the CPU is loosened, remove the heatsink from the CPU socket.

4. Remove the used thermal grease and clean the surface of the CPU and the heatsink, Reapply the proper amount of thermal grease on the surface before reinstalling the CPU and the heatsink.



2-5 Installing and Removing the Memory Modules

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

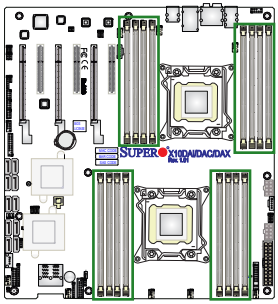
CAUTION

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

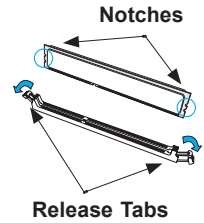
Installing & Removing DIMMs

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 the same speed.)

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







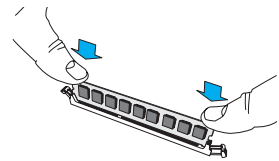
3. Align the key of the DIMM module with the receptive point on the memory slot.

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 notches straight down into the memory slot at the same time.



Removing Memory Modules

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

Memory Support for the X10DAi/DAC/DAX Motherboard

This motherboard supports up to 2048 GB of Load Reduced (LRDIMM) or up to 512 GB of Registered (RDIMM) ECC DDR4 2400/2133/1866/1600 MHz memory modules in 16 DIMM slots.

Note1: Memory speed support is pending on the CPUs installed on the motherboard.

Note2: For the latest memory updates, please refer to the Tested Memory List posted on our website (http://www.supermicro.com/products/motherboard).

Processor & Memory Module Population Configuration

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

Processors and their Corresponding Memory Modules								
CPU#	Corresponding DIMM Modules							
CPU 1	P1-DIMMA1	P1-DIMMB1	P1-DIMMC1	P1-DIMMD1	P1-DIMMA2	P1-DIMMB2	P1-DIMMC2	P1-DIMMD2
CPU2	P2-DIMME1	P2-DIMMF1	P2-DIMMG1	P2-DIMMH1	P2-DIMME2	P2-DIMM F2	P2-DIMMG2	P2-DIMMH2

Populating RDIMM/LRDIMM DDR4 Memory Modules for the E5-2600v3-based Motherboard

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)		
				1 Slot Per Channel	2 Slots Per Channel	
				1DPC	1DPC	2DPC
		4Gb	8Gb	1.2V	1.2V	1.2V
RDIMM	SRx4	8GB	16GB	2133	2133	1866
RDIMM	SRx8	4GB	8GB	2133	2133	1866
RDIMM	DRx8	8GB	16GB	2133	2133	1866
RDIMM	DRx4	16GB	32GB	2133	2133	1866
LRDIMM	QRx4	32GB	64GB	2133	2133	2133
LRDIMM 3DS†	8Rx4	64GB	128GB	2133	2133	2133

Populating RDIMM/LRDIMM DDR4 Memory Modules for the E5-2600v4-based Motherboard

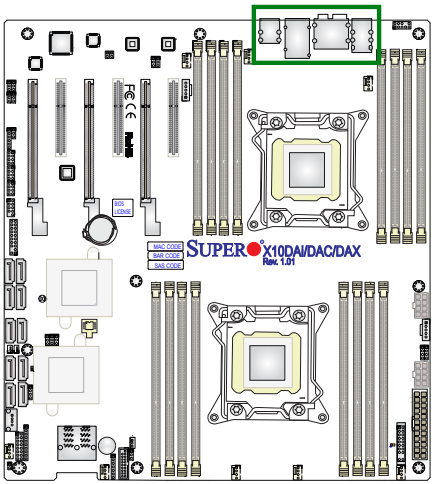
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)		
				1 Slot Per Channel	2 Slots Per Channel	
				1DPC	1DPC	2DPC
		4Gb	8Gb	1.2V	1.2V	1.2V
RDIMM	SRx4	8GB	16GB	2400	2400	2133
RDIMM	SRx8	4GB	8GB	2400	2400	2133
RDIMM	DRx8	8GB	16GB	2400	2400	2133
RDIMM	DRx4	16GB	32GB	2400	2400	2133
LRDIMM	QRx4	32GB	64GB	2400	2400	2400
LRDIMM 3DS	8Rx4	64GB	128GB	2400	2400	2400

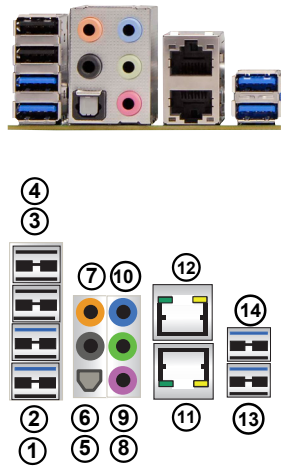
Note: Be sure to use memory modules of the same type, same speed, same frequency on the same motherboard. Mixing of memory modules of different types and speeds is not allowed.

2-6 Control Panel Connectors and I/O Ports

The I/O ports are color coded in conformance with the industry standards. See the picture below for the colors and locations of the various I/O ports.

Back Panel Connectors and I/O Ports





Back Panel I/O Port Locations and Definitions

1. Rear USB 3.0 Port 5
2. Rear USB 3.0 Port 6
3. Rear USB 2.0 Port 0
4. Rear USB 2.0 Port 1
5. SPDIF_Out
6. Surround_Out
7. CEN/LFE_Out
8. Mic_In
9. Line-Out
10. Line_In
11. Gigabit LAN 1
12. Gigabit LAN 2
13. Rear USB 3.0 Port 7
14. Rear USB 3.0 Port 8

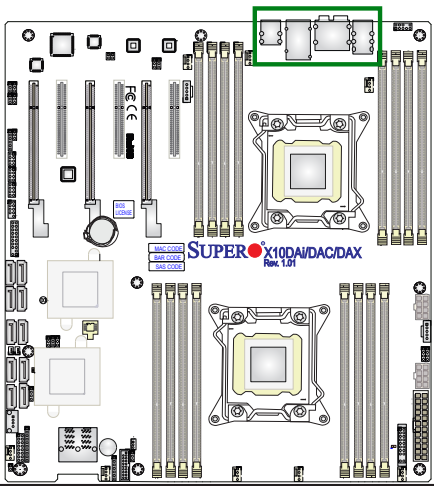
Ethernet Ports

Two Gigabit Ethernet ports (LAN1/2) are located on the I/O back panel on the motherboard All these ports accept RJ45 type cables. (**Note:** Please refer to the LED Indicator Section for LAN LED information.)

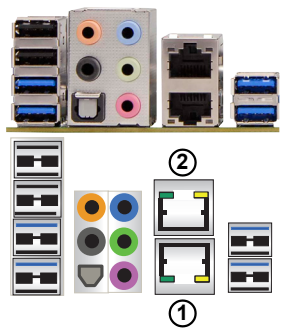
LAN Ports Pin Definition

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

(NC: No Connection)



1. LAN1
2. LAN2



Universal Serial Bus (USB)

Six Universal Serial Bus (USB) ports are located on the I/O back panel. Rear USB ports 5/6 and USB 7/8 support 3.0 connections, while USB ports 0/1 support 2.0 connections. Two USB headers provide four USB connections (USB 2/3, 9/10) for front access. USB ports 2/3 support USB 2.0, and USB ports 9/10 support USB 3.0 connections. In addition, a Type A USB header (USB 4) also provides USB 2.0 connection. USB Cables are not included. See the tables below for pin definitions.

Rear USB (2.0) 0/1 Pin Definitions

Pin#	Definition	Pin#	Definition
1	+5V	5	+5V
2	USB_PN1	6	USB_PN0
3	USB_PP1	7	USB_PP0
4	Ground	8	Ground

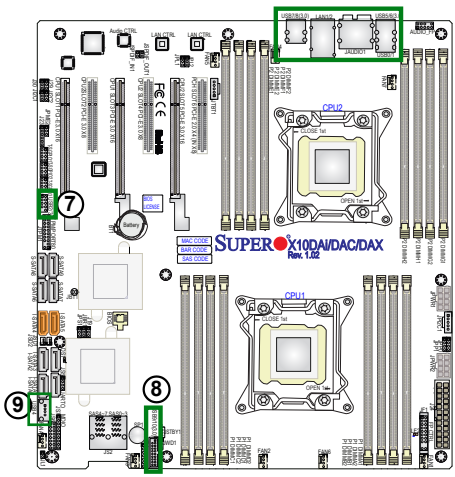
Front Panel USB (2.0) 2/3, 4, Pin Definitions

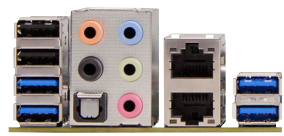
USB 2/4 Pin #	Definition	USB 3 Pin #	Definition
1	+5V	2	+5V
3	USB_PN2	4	USB_PN3
5	USB_PP2	6	USB_PP3
7	Ground	8	Ground
9	Key	10	Ground

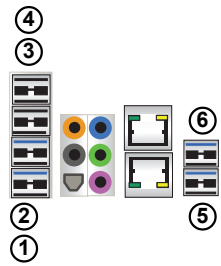
Rear USB (3.0) 5/6, 7/8, Front Panel USB (3.0) 9/10 Pin Definitions

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

1. Rear USB Port5 (3.0)
2. Rear USB Port6 (3.0)
3. Rear USB Por0 (2.0)
4. Rear USB Port1 (2.0)
5. Rear USB Port7 (3.0)
6. Rear USB Port8 (3.0)
7. Front USB Port 2/3 (USB 2.0)
8. Front USB Port 9/10 (USB 3.0)
9. Type A USB 4 (USB 2.0)



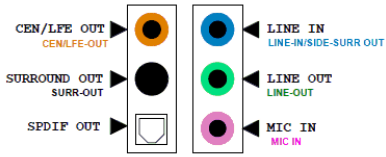




7.1 HD (High-Definition) Audio

This motherboard features a 7.1 Channel High-Definition Audio (HDA) codec that provides 8 DAC channels. The HD audio supports multiple-streaming 7.1 sound playback through the frontpanel stereo output via the subwoofer speakers. Download the appropriate software from our website to enable this function.

7.1 HD Audio	
Conn#	Signal
1	SPDIF_Out
2	Surround_Out
3	CEN/LFE_Out
4	Mic_In
5	Line_Out
6	Line_In



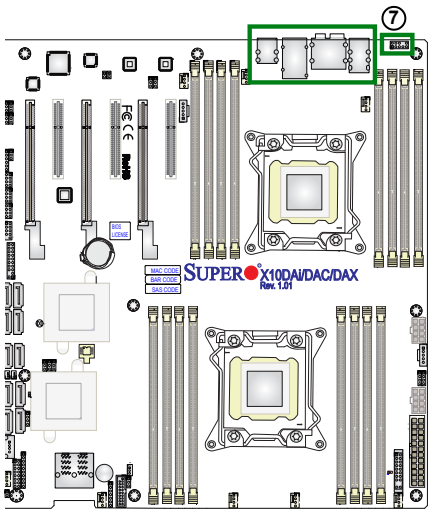
HD Audio

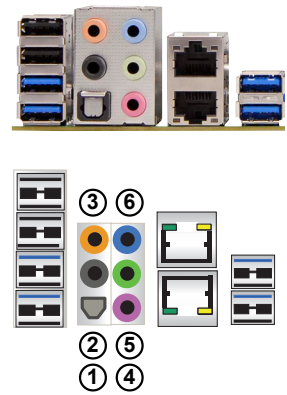
10-Pin Audio Pin Definitions	
Pin#	Signal
1	Microphone_Left
2	Audio_Ground
3	Microphone_Right
4	Audio_Detect
5	Line_2_Right
6	Ground
7	Jack_Detect
8	Key
9	Line_2_Left
10	Ground

Front Accessible Audio Header

A 10-pin audio header (AUDIO_FP), located next to USB ports 0-4, allows you to use the onboard sound for audio playback. Connect an audio cable to the audio header to use this feature. See the tables above for pin definitions for onboard audio headers.

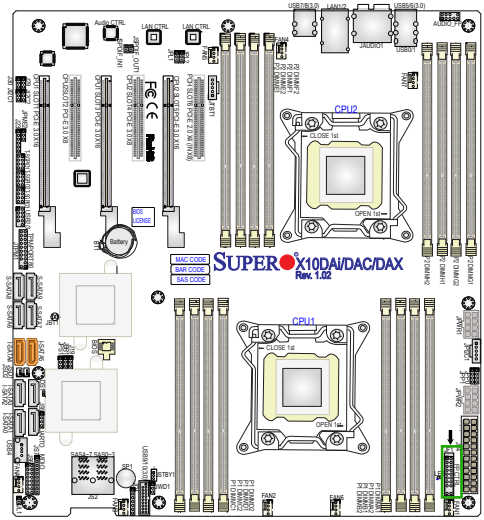
1.SPDIF_Out
2. Surround_Out
3. CEN/LFE_Out
4. Mic_In
5. Line-Out
6. Line_In
7. Audio Header



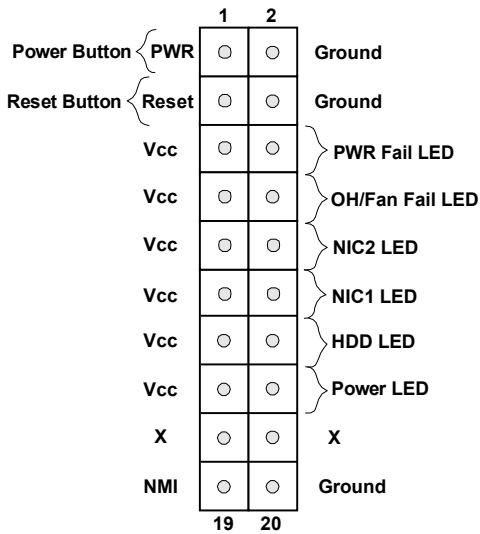


Front Control Panel

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.



JF1 Header Pins



Front Control Panel Pin Definitions

NMI Button

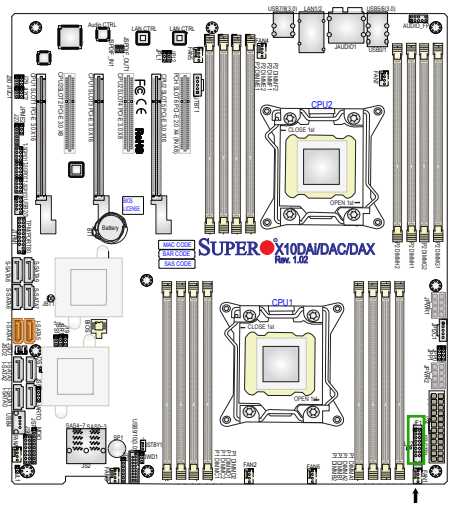
The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

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

Power LED

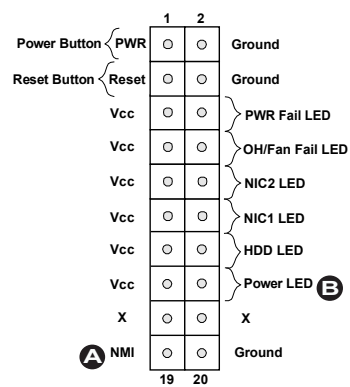
The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

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



A. NMI

B. PWR LED



HDD LED

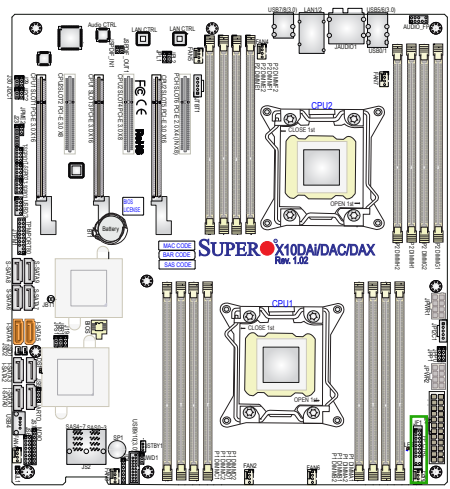
The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable here to indicate HDD activity. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	3.3V Standby
14	HD Active

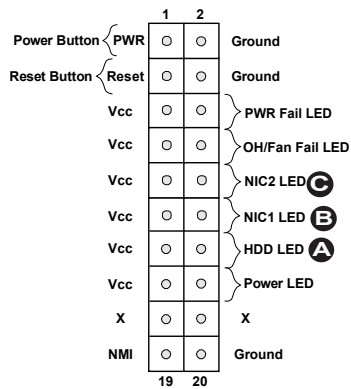
NIC1/NIC2 LED Indicators

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



Overheat (OH)/Fan Fail LED

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

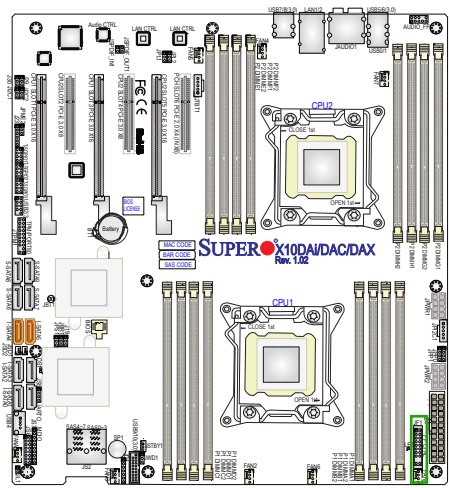
OH/Fan Fail/PWR Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	OH/Fan Fail LED)

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flash-ing	Fan Fail

Power Fail LED

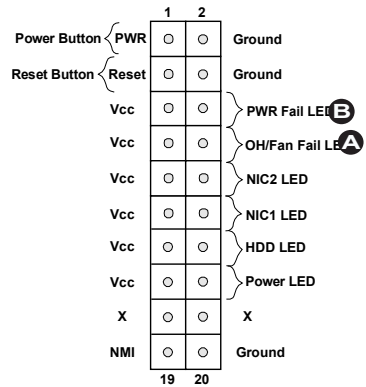
The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

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



A. OH/Fail Fail LED

B. PWR Supply Fail



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. Refer to the table on the right for pin definitions.

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

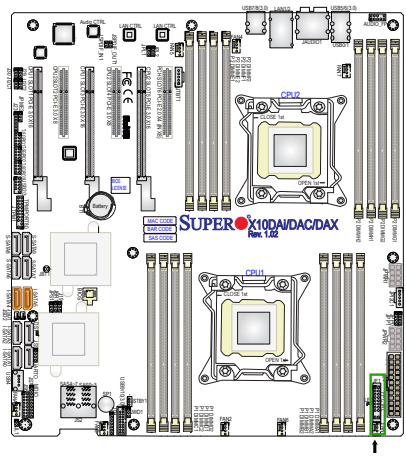
Power Button

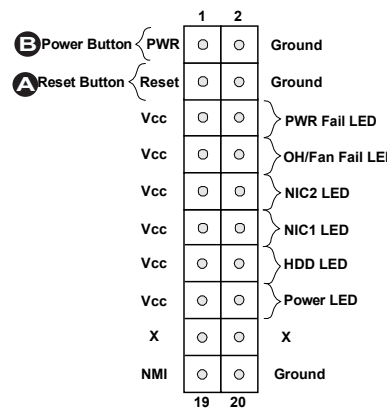
The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. Refer to the table on the right for pin definitions.

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

A. Reset Button

B. PWR Button





2-7 Connecting Cables

Power Connectors

A 24-pin main power supply connector(J24) and two 8-pin CPU PWR connectors (JPWR1, JPWR2) are located on the motherboard. These power connectors meet the SSI EPS 12V specification. These power connectors must also be connected to your power supply. See the table on the right for pin definitions.

Warning: To provide adequate power supply to the motherboard, be sure to connect the 24-pin ATX PWR (J24) and two 8-pin PWR connectors (JPWR1, JPWR2) to the power supply. Failure to do so will void the manufacturer warranty on your power supply and motherboard.

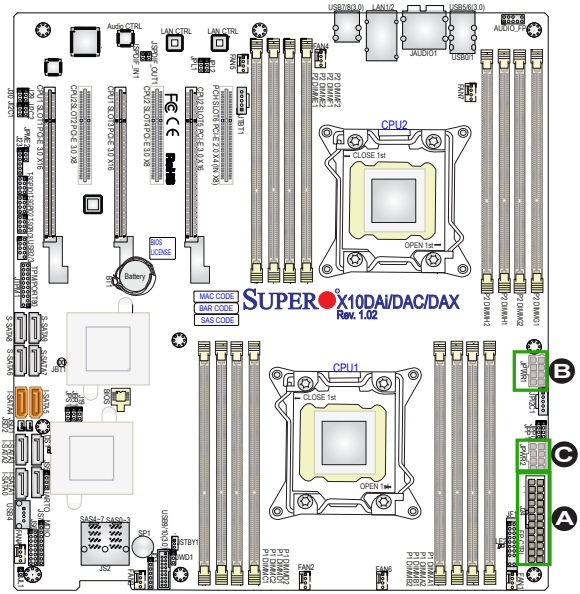
ATX Power 24-pin Connector Pin Definitions

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

12V 8-pin PWR Connector Pin Definitions

Pins	Definition
1 through 4	Ground
5 through 8	+12V

(Required)



A. J24: 24-pin ATX PWR (Req'd)
B. JPWR1: 8-pin Processor PWR (Req'd)
C. JPWR2: 8-pin Processor PWR (Req'd)

Fan Headers

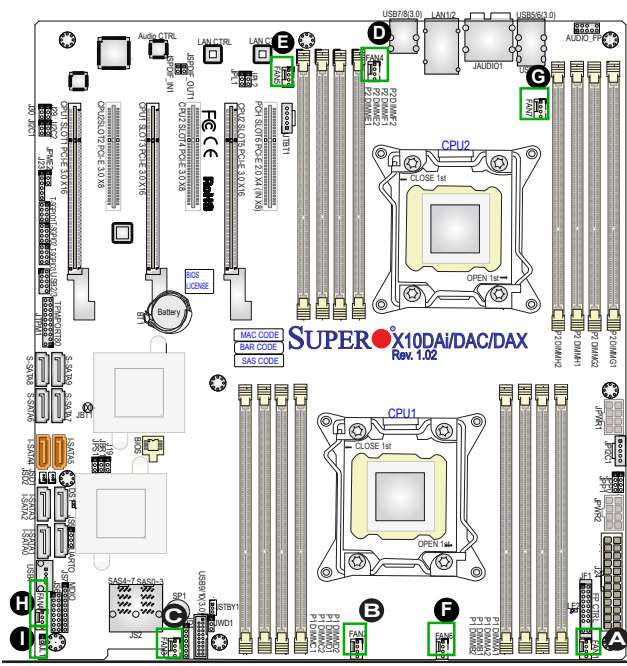
This motherboard has eight system/CPU fan headers (Fan 1~Fan 7, and Fan A) on the motherboard. All these 4-pin fans headers are backward compatible with the traditional 3-pin fans. See the table on the right for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	Pulse Width Modulation

Chassis Intrusion

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

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



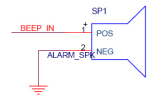
A. Fan 1
B. Fan 2
C. Fan 3
D. Fan 4
E. Fan 5
F. Fan 6
G. Fan7
H. Fan A
I. Chassis Intrusion

Internal Speaker

The internal speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions. Refer to the layout below for the locations of the internal buzzer (SP1).

Internal Buzzer (SP1) Pin Definition

Pin#		Definitions
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker



Power LED/Speaker

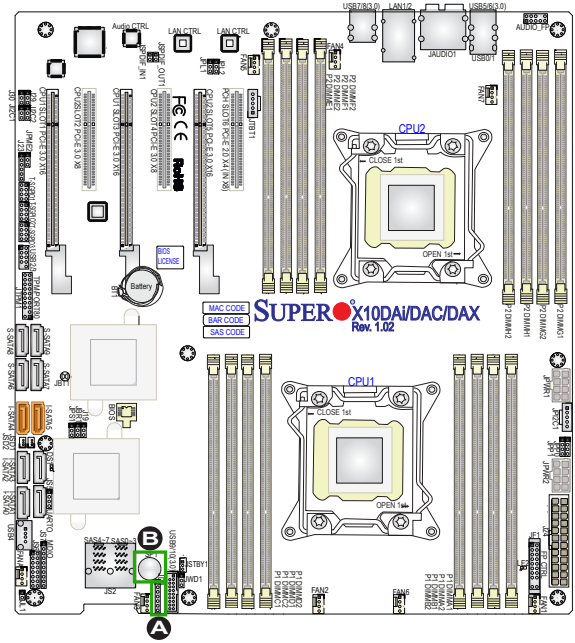
On JD1 header, pins 1-3 are used for power LED indication, and pins 4-7 are for the speaker. See the tables on the right for pin definitions. Please note that the speaker connector pins (4-7) are used with an external speaker. If you wish to use the onboard (internal) buzzer, please close pins 6-7 with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

PWR LED Pin Definitions

Pin#	Definition
Pin 1	Anode (+)
Pin2	Cathode (-)
Pin3	NA

Speaker Connector Pin Settings

Pin#	Definition
Pins 4-7	External Speaker
Pins 6-7	Internal Speaker



A. Internal Speaker (Buzzer)

B. PWR LED/Speaker

TPM Header/Port 80 Header

A Trusted Platform Module/Port 80 header is located at JTPM1 to provide TPM support and Port 80 connection. Use this header to enhance system performance and data security. See the table on the right for pin definitions.

TPM/Port 80 Header Pin Definitions

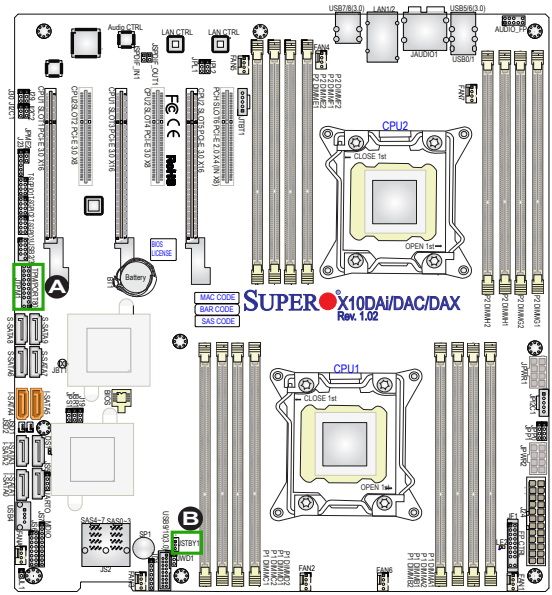
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	+5V (X)
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK4	14	SMB_DAT4
15	+3V_DUAL	16	SERIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#	20	LDRQ# (X)

Standby Power Header

The Standby Power header is located at STBY1 on the motherboard. See the table on the right for pin definitions.

Standby Power Pin Definitions

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



A. TPM/Port 80 Header

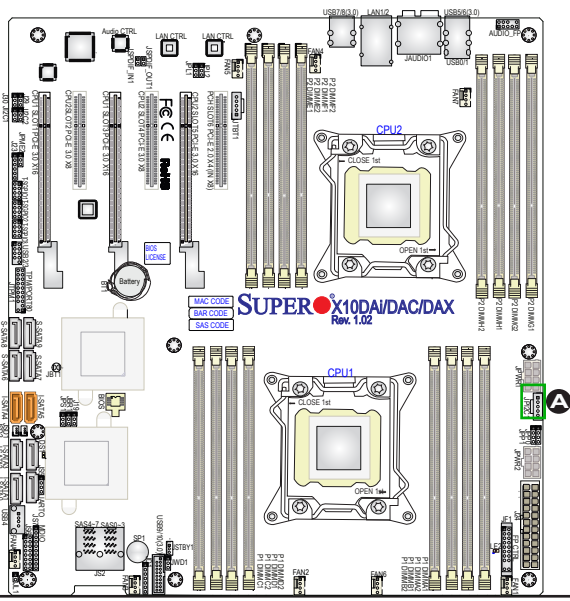
B. Standby PWR

Power SMB (I²C) Connector

Power System Management Bus (I²C) Connector (JPI²C1) monitors power supply, fan and system temperatures. See the table on the right for pin definitions.

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

A. JPI²C1



T-SGPIO 1/2/3 Headers

Three SGPIO (Serial-Link General Purpose Input/Output) headers are located on the motherboard. These headers support Serial_Link interface for onboard SATA connections when available. I-SATA 0-3, 4/5, and 6-9 are controlled by T-SGPIO 1, 2, and 3 respectively. See the tables on the right for more information.

T-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

T-SGPIO Assignments

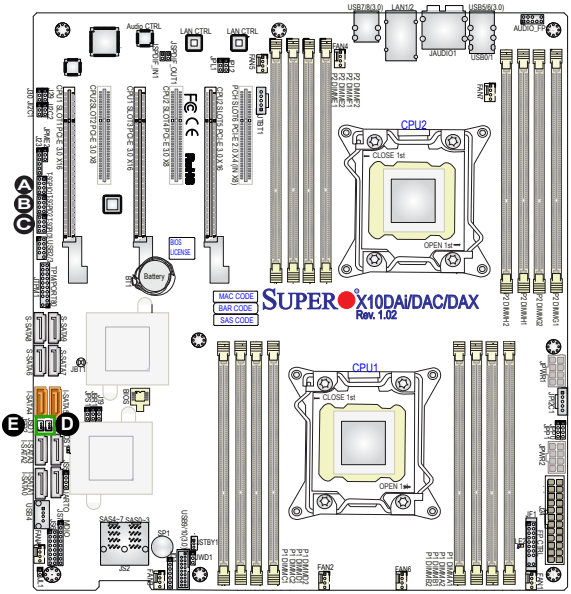
Header#	I-SATA Port#
T-SGPIO1	0-3
T-SGPIO2	4/5
T-SGPIO3	6-9

SATA_DOM Power Connectors

Two 3-pin power connectors (JSD1/ JSD2) are used to provide power to onboard SATA DOM (Disk_On_Module) devices. Connect appropriate cables here to provide power for your SATA DOM devices. See the layout below for the locations of the power connectors.

SATA DOM/Connectors Pin Definitions

Pin#	Definition
1	+5V
2	Ground
3	Ground



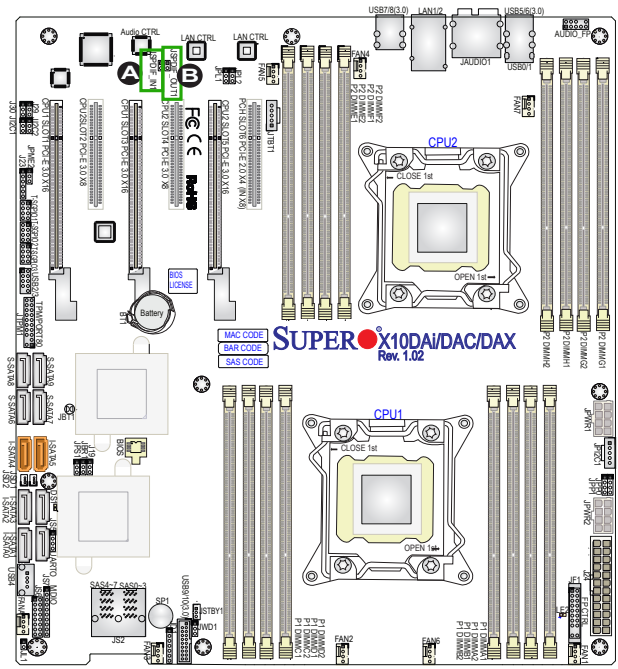
A. T-SGPIO1
B. T-SGPIO2
C. T-SGPIO3
D. JSD1
E. JSD2

SPDIF_In/SPDIF_Out Headers

The SPDIF_In (JSPDIF_In) and SPDIF_Out (JSPDIF_Out) headers are located next to the GLAN Controller on the motherboard. Place a cap on each header for audio support. You will also need to have a cable to use each connection.

SPDIF_In Pin Definitions	
Pin#	Definition
1	S/PDIF_In
2	Ground

SPDIF_Out Pin Definitions	
Pin#	Definition
1	S/PDIF_Out
2	Ground



A. SPDIF_In

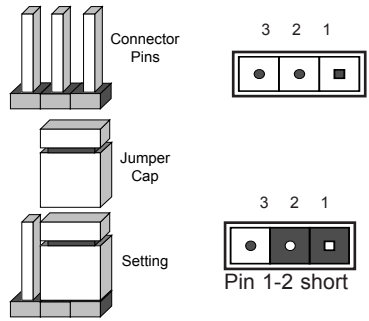
B. SPDIF_Out

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.

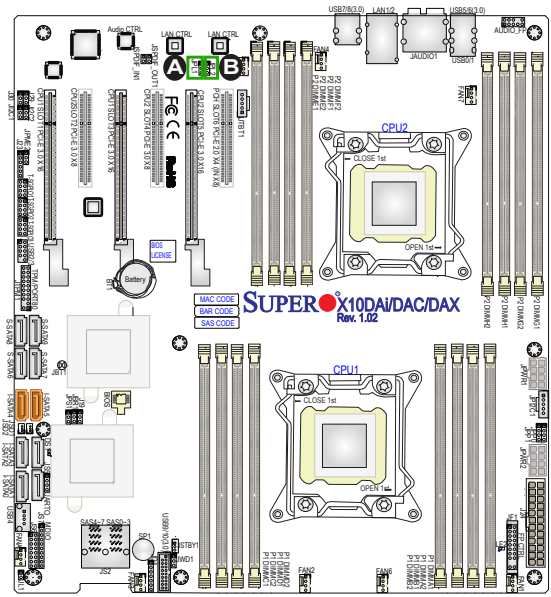


GLAN Enable/Disable

JPL1 enables or disables the GLAN ports 1 & 2; while JPL2 enables/ disables GLAN2. See the tables on the right for jumper settings.

LAN Enable/Disable Jumpers	
Jumpers	LAN Ports Supported
JPL1	Enable/Disable LAN1 & LAN 2
JPL2	Enable/Disable LAN 2

LAN Enable Jumper Settings	
Jumper Setting	Definition
1-2	Enabled (default)
2-3	Disabled



A. GLAN1 Enable

B. GLAN2 Enable

CMOS Clear

JBT1 is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS.

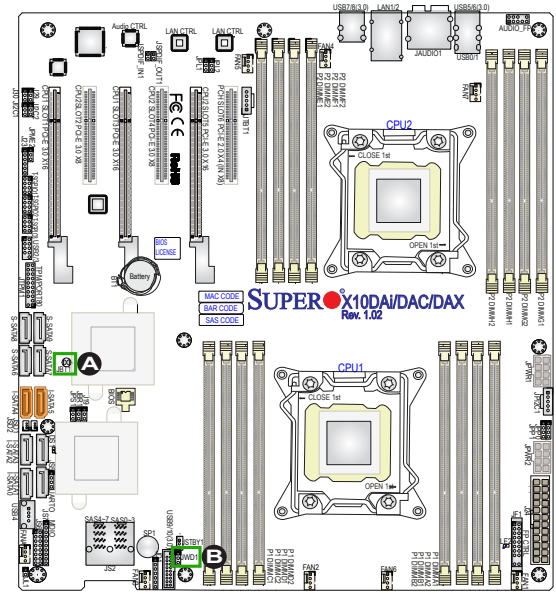
Note 1: Please completely shut down the system, remove the AC power cord, and then short JBT1 to clear CMOS.

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

Watch Dog Enable/Disable

Watch Dog (JWD1) is a system monitor that can reboot the system when a software application hangs. Close pins 1-2 to reset the system if an application hangs. Close pins 2-3 to generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

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



A. Clear CMOS

B. Watch Dog Enable

Manufacturer Mode Select

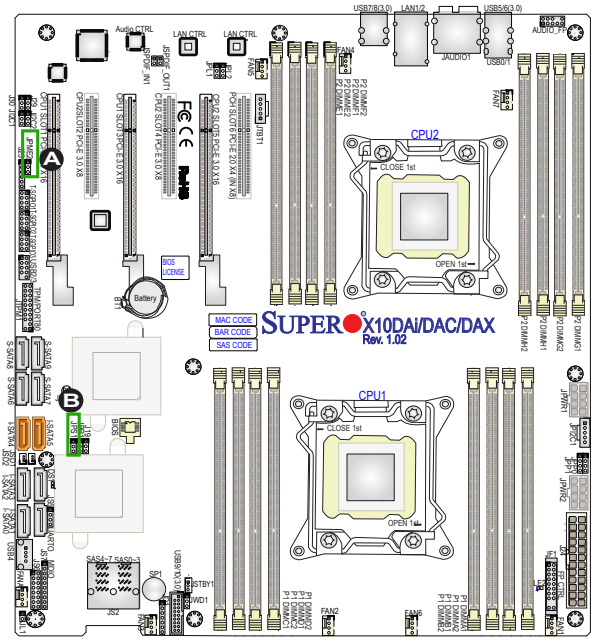
Close pins 2 & 3 of this jumper (JPME2) to bypass SPI flash security, and force the system to use the manufacture (ME) mode to flash the system firmware from a host server to modify system settings. The default setting for this jumper is to close pins 1 &2 for normal operation. See the table on the right for jumper settings.

ME Mode Select Jumper Settings	
Jumper Setting	Definition
1-2	Normal (Default)
2-3	Manufacture Mode

SAS Enable (X10DAC Only)

Jumper JPS1 allows the user to enable the onboard SAS connectors (SAS ports 0-3, 4-7). The default setting is 1-2 to enable the connection. See the table on the right for jumper settings.

SAS Enable Jumper Settings	
Jumper Setting	Definition
1-2	Enabled (Default)
2-3	Disabled



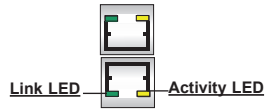
A. ME Select

B. SAS Enable

2-9 Onboard LED Indicators

GLAN LEDs

Two LAN ports (LAN 1/LAN 2) are located on the IO Backplane of the motherboard. Each Ethernet LAN port has two LEDs. The yellow LED indicates activity, while the other Link LED may be green, amber or off to indicate the speed of the connections. See the tables on the right for more information.



Rear View (when facing the rear side of the chassis)

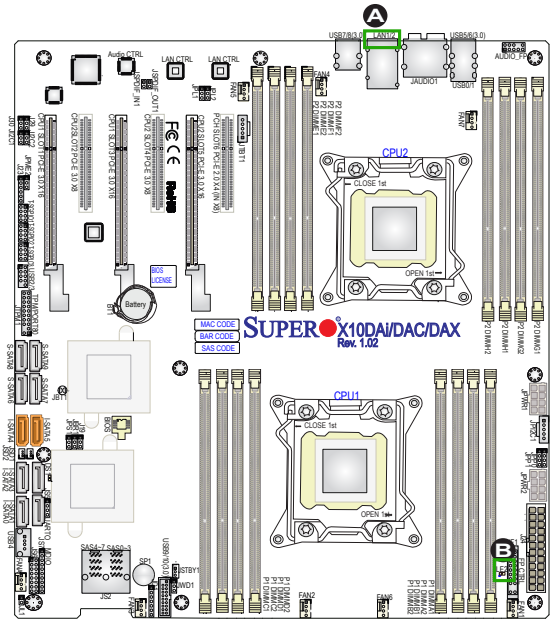
GLAN 1/2 Activity Indicator LED Settings		
Color	Status	Definition
Yellow	Flashing	Active

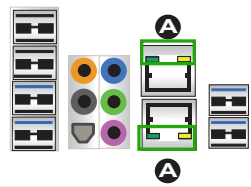
GLAN Ports 1/2 Link Indicator LED Settings	
LED Color	Definition
Off	No Connection/10 Mbps
Amber	1 Gbps
Green	100 Mbps

Onboard Power LED

An Onboard Power LED is located at LE2 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 on the right for more information.

Onboard PWR LED Indicator (LE1) LED Settings	
LED Color	Status
Off	System Off (PWR cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State





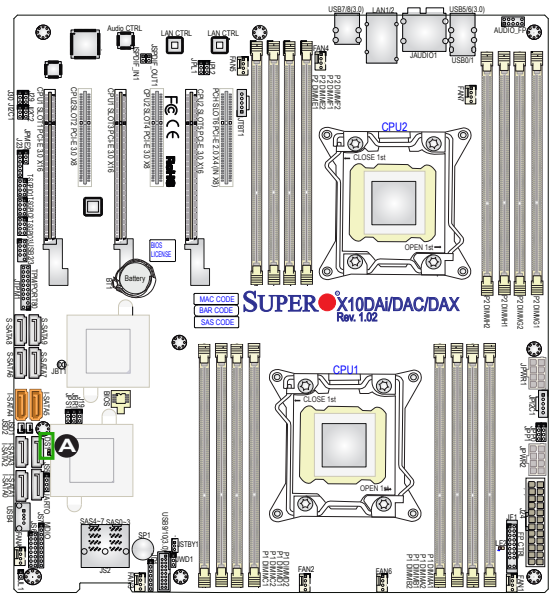
A. LAN1/2 LEDs

B. Onboard PWR LED

SAS Heartbeat LED (X10DAC Only)

A SAS Heartbeat LED is Located at DS1 on the motherboard. See the table on the right for more information.

SAS Heartbeat LED Status (DS1)	
Color/State	Definition
Green: Blinking	SAS Active
Red: Solid On	SAS Error



A. SAS LED (X10DAC Only)

2-10 SATA/SAS Connections

SATA/SAS Connections

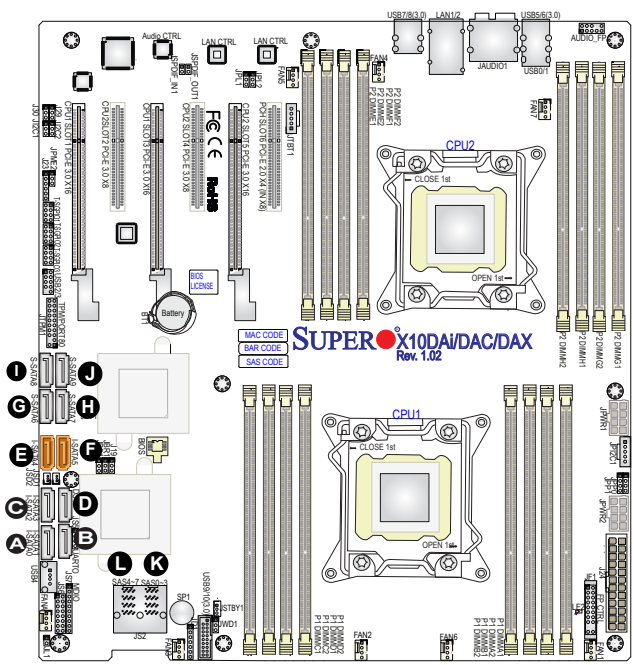
Six SATA 3 ports (I-SATA0-5) and four S-SATA 3 ports (S-SATA6-9) are located on the motherboard. Please note that I-SATA4/5 are used with Supermicro SuperDOMs which are yellow SATA DOM connectors with power pins built in, and no external cables are required. Supermicro SuperDOMs are backward-compatible with regular SATA HDDs or SATA DOMs that require external power cables. In addition, eight SAS ports (SAS 0-3/SAS 4-7), supported by the LSI 3008 SAS controller, are also located on the X10DAC. All these SATA/SAS ports provide serial-link signal connections, which are faster than the connections of Parallel ATA. See the table on the right for pin definitions.

SATA/SAS Pin Definitions

Pin#	Definition
1	Ground
2	TX_P
3	TX_N
4	Ground
5	RX_N
6	RX_P
7	Ground

Notes: For more information on SATA HostRAID configuration, please refer to the Intel SATA HostRAID User's Guide posted on our website @ http://www.supermicro.com.

Note: Please do not combine I-SATA0-5 with S-SATA 6-9 for RAID configuration



A. I-SATA0
B. I-SATA1
C. I-SATA2
D. I-SATA3
E. I-SATA4
F. I-SATA5
G. S-SATA6
H. S-SATA7
I. S-SATA8
J. S-SATA9
K. SAS 0-3 (X10DAC Only)
L. SAS 4-7 (X10DAC Only)

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 CPU 1 first (making sure it is fully seated) and connect the front panel connectors to the motherboard.

No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.
2. Make sure that all power connectors are properly connected.
3. Check that the 115V/230V switch on the power supply is properly set, if available.
4. Turn the power switch on and off to test the system, if applicable.
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 have no video, remove all the add-on cards and cables.

2. Use the speaker to determine if any beep codes exist. Refer to Appendix A for details on beep codes.

System Boot Failure

If the system does not display POST or does not respond after the power is turned on, check the following:

1. Check for any error beep from the motherboard speaker.

- If there is no error beep, try to turn on the system without DIMM modules installed. If there is still no error beep, try to turn on the system again with only one processor installed in CPU Socket#1. If there is still no error beep, replace the motherboard.

- If there are error beeps, clear the CMOS settings by unplugging the power cord and contracting both pads on the CMOS Clear Jumper (JBT1). (Refer to Section 2-8 in Chapter 2.)

2. Remove all components from the motherboard, especially the DIMM modules. Make sure that the system's power is on, and memory error beeps are activated.

3. Turn on the system with only one DIMM module installed. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure in this Chapter.

Losing the System's Setup Configuration

1. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 2-7 for details on recommended power supplies.

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

Memory Errors

When a No-Memory Beep Code is issued by the system, check the following:

1. Make sure that the memory modules are compatible with the system and that the DIMM modules are properly and fully installed. (For memory compatibility, refer to the Memory Compatibility Chart posted on our Website @ http://www.supermicro.com.)

2. Check if different speeds of DIMMs have been installed. It is strongly recommended that you use the same RAM speed for all DIMMs in the system.

3. Make sure that you are using the correct type of Registered (RDIMM)/Load Reduced (LRDIMM) ECC DDR4 2400/2133/1866/1600 MHz modules recommended by the manufacturer.

4. Check for bad DIMM modules or slots by swapping a single module among all memory slots and check the results.

5. Make sure that all memory modules are fully seated in their slots. Follow the instructions given in Section 2-4 in Chapter 2.

6. Please follow the instructions given in the DIMM Population Tables listed in Section 2-4 to install your memory modules.

When the System Becomes Unstable

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

1. CPU/BIOS support: Make sure that your CPU is supported, and you have the latest BIOS 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 CPU 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 heatsink fans, and CPU/system fans, etc., work properly. Check Hardware Monitoring settings in the BIOS to make sure that the CPU 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 drivers are used.

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

1. Source of installation: Make sure that the devices used for installation are working properly, including boot devices such as CD/DVD disc, CD/DVD-ROM.

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 CPU and a memory module 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.

3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, please note that as a motherboard manufacturer, Supermicro also sells motherboards through its channels, so 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. BIOS 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

- BIOS release date/version (This can be seen on the initial 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).

- 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 as shown below.
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.

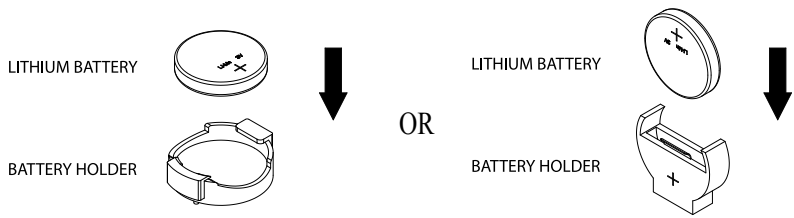
Proper Battery Disposal

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 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.

Battery Installation

1. To install an onboard battery, follow the steps 1 & 2 above 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.



3-4 Frequently Asked Questions

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

Answer: The motherboard supports Registered (RDIMM)/Load Reduced (LRDIMM) ECC DDR4 2400/2133/1866/1600 MHz DIMM modules. To enhance memory performance, do not mix memory modules of different speeds and sizes. Please follow all memory installation instructions given on Section 2-4 in Chapter 2.

Question: How do I update my BIOS?

It is recommended that you **do not** upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our website at http://www.supermicro.com. Please check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. You can choose from the zip file and the .exe file. If you choose the zip BIOS file, please unzip the BIOS file onto a bootable USB device. Run the batch file using the format AMI.bat filename.rom from your bootable USB device to flash the BIOS. Then, your system will automatically reboot.

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

Note: The SPI BIOS chip used on this motherboard cannot be removed. Send your motherboard back to our RMA Department at Supermicro for repair. For BIOS Recovery instructions, please refer to the AMI BIOS 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.

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

BIOS

4-1 Introduction

This chapter describes the AMI BIOS setup utility for the X10DAi/X10DAC/X10DAX. The ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS setup utility screens.

Note: For AMI BIOS recovery, please refer to the UEFI BIOS Recovery Instructions in Appendix C.

Starting BIOS Setup Utility

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

Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen.

Each main BIOS menu option is described in this manual. The AMI BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

Note: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.

The AMI BIOS setup utility uses a key-based navigation system called "hot keys." Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F4>, <Enter>, <Esc>, arrow keys, etc.

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

How To Change the Configuration Data

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

How to Start the Setup Utility

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

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

4-2 Main Setup

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



The following Main menu items will be displayed:

System Date/System Time

Use this option to change the system date and time. Highlight *System Date* or *System Time* using the arrow keys. Enter new values using 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.

Note: The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.

Supermicro X10DAX

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

Build Date: This item displays the date when the version of the BIOS ROM used in the system was built.

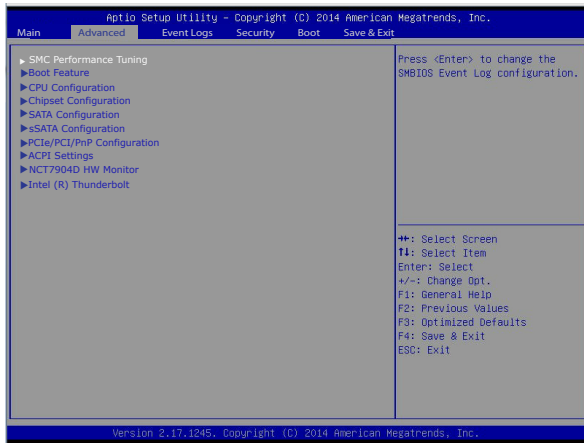
Memory Information

Total Memory: This item displays the total size of memory available in the system.

Memory Speed: This item displays the default speed of the memory modules installed in the system.

4-3 Advanced Setup Configurations

Use the arrow keys to select Advanced setup and press <Enter> to access the submenu items:



Warning: Take Caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency or an incorrect BIOS timing setting may cause the system to malfunction. When this occurs, please clear CMOS, restore the setting to the manufacture default setting, and reboot your system. (Please refer to the Jumper section in Chapter 2 for the instructions on how to clear CMOS.)

▶SMC Performance Tuning (Available on the X10DAX Only)

CPU Vcore Voltage

This item allows the user to enter a new CPU Vcore voltage value to override the CPU Vcore value that was previously set. The options are **VID+Offset 0m volts**, VID+Offset 50m volts, VID+Offset 100m volts, VID+Offset 150m volts, and VID+Offset 200m volts.

Supermicro Hyper-Speed

Use this item to select the hardware acceleration level of the machine. CPU, Memory, PCIe, and related-components will be accelerated in lockstep. Please note that an improper hyper-speed setting may impede the stability of your machine. The options are **Disabled**, Level 1, Level 2, Level 3, and Level 4 (not recommended).

Supermicro Hyper-Turbo

Select Enabled to maximize the performance of the Turbo-Mode feature built-in the CPU. Please note that an improper hyper-turbo setting may impede the stability of your machine. The options are **Disabled** and Enabled.

▶Memory Timing Tuning

The following memory timing-tuning settings will display:

Memory Timing

- CAS Latency
  - Current tCAS
- tRCD
  - Current tRCD
- tRP
  - Current tRP
- tRAS
  - Current tRAS

▶Boot Feature

Quiet Boot

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

AddOn ROM Display Mode

Use this item to set the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM display setting. Select Force BIOS to use the Option ROM display mode set by the system BIOS. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock State

Use this feature to set the Power-on state for the Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

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

INT19 (Interrupt 19) Trap Response

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

Re-try Boot

When EFI Boot is selected, the system BIOS will automatically reboot the system from an EFI boot device after its initial boot failure. Select Legacy Boot to allow the BIOS to automatically reboot the system from a Legacy boot device after its initial boot failure. The options are **Disabled**, Legacy Boot, and EFI Boot.

Power Configuration

EuP

Select Enabled for EuP (Energy using Product) support to conserve energy use and enhance power performance. The options are Enabled and **Disabled.**

Watch Dog Function

Select Enabled to allow the Watch Dog timer to reboot the system when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

Power Button Function

This feature controls how the system shuts down when the power button is pressed. Select 4 Seconds Override for the user to power off the system after pressing and holding the power button for 4 seconds or longer. Select Instant Off to instantly power off the system as soon as the user presses the power button. The options are 4 Seconds Override and **Instant Off.**

Restore on AC Power Loss

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

▶CPU Configuration

This submenu displays the following CPU information as detected by the BIOS. It also allows the user to configure CPU settings.

- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ratio
- Processor Min Ratio
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- Processor 0 Version
- Processor 1 Version

Clock Spread Spectrum

Select Enabled to allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

Hyper-Threading (All)

Select Enable to support Intel's Hyper-threading Technology to enhance CPU performance. The options are **Enable** and Disable.

Cores Enabled

This feature allows the user to set the number of CPU cores to enable. Enter "0" to enable all cores. The default setting is **0**.

Execute-Disable Bit (Available if supported by the OS & the CPU)

Select Enable for Execute Disable Bit Technology support, which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal

codes to overwhelm the processor to damage the system during an attack. This feature is used in conjunction with the items: "Clear MCA," "VMX," "Enable SMX," and "Lock Chipset" for Virtualization media support. The options are **Enable** and Disable. (Refer to Intel and Microsoft websites for more information.)

PPIN Control

Select Unlock/Enable to use the Protected-Processor Inventory Number (PPIN) in the system. The options are **Unlock/Enable** and Unlock/Disable.

Hardware Prefetcher (Available when supported by the CPU)

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

Adjacent Cache Prefetch (Available when supported by the CPU)

Select Enable for the CPU to prefetch both cache lines for 128 bytes as comprised. Select Disable for the CPU to prefetch both cache lines for 64 bytes. The options are Disable and **Enable**.

Note: Please reboot the system for changes on this setting to take effect. Please refer to Intel's website for detailed information.

DCU (Data Cache Unit) Streamer Prefetcher (Available when supported by the CPU)

If set to Enable, the DCU Streamer Prefetcher will prefetch data streams from the cache memory to the DCU (Data Cache Unit) to speed up data accessing and processing to enhance CPU performance. The options are Disable and **Enable**.

DCU IP Prefetcher

If set to Enable, the IP prefetcher in the DCU (Data Cache Unit) will prefetch IP addresses to improve network connectivity and system performance. The options are **Enable** and Disable.

Direct Cache Access (DCA)

Select Enable to use Intel DCA (Direct Cache Access) Technology to improve the efficiency of data transferring and accessing. The options are **Auto**, Enable, and Disable.

X2APIC (Advanced Programmable Interrupt Controller)

Based on Intel's Hyper-Threading architecture, each logical processor (thread) is assigned 256 APIC IDs (APIDs) in 8-bit bandwidth. When this feature is set to Enable, the APIC ID will be expanded from 8 bits (X2) to 16 bits to provide 512 APIDs to each thread to enhance CPU performance. The options are **Disable** and Enable.

AES-NI

Select Enable to use the Intel Advanced Encryption Standard (AES) New Instructions (NI) to ensure data security. The options are Enable and **Disable**.

Intel Virtualization Technology

Select Enable to use Intel Virtualization Technology support for Direct I/O VT-d support by reporting the I/O device assignments to the VMM (Virtual Machine Monitor) through the DMAR ACPI tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data-sharing. The options are **Enable** and Disable.

▶ Advanced Power Management Configuration

Advanced Power Management Configuration

Power Technology

Select Energy Efficient to support power-saving mode. Select Custom to customize system power settings. Select Max Performance to optimize system performance. Select Disabled to disable power-saving settings. The options are Disable, **Energy Efficient**, and Custom.

If the option is set to Custom, the following items will display:

▶ CPU P State Control (Available when Power Technology is set to Custom)

EIST (P-states)

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are Disable and **Enable**.

Turbo Mode

Select Enabled to use the Turbo Mode to boost system performance. The options are **Enable** and Disable.

P-state Coordination

This feature is used to change the P-state (Power-Performance State) coordination type. P-state is also known as "SpeedStep" for Intel processors. Select HW_ALL to change the P-state coordination type for hardware components only. Select SW_ALL to change the P-state coordination type for all software installed in the system. Select SW_ANY to change the P-state coordination type for a software program in the system. The options are **HW_All,** SW_ALL, and SW_ANY.

▶ CPU C State Control (Available when Power Technology is set to Custom)

Package C State limit

Use this item to set the limit on the C-State package register. The options are C0/1 state, C2 state, C6 (non-Retention) state, **C6 (Retention) state**, and No Limit.

CPU C3 Report

Select Enable to allow the BIOS to report the CPU C3 State (ACPI C2) to the operating system. During the CPU C3 State, the CPU clock generator is turned off. The options are Enable and **Disable.**

CPU C6 Report (Available when Power Technology is set to Custom)

Select Enable to allow the BIOS to report the CPU C6 state (ACPI C3) to the operating system. During the CPU C6 state, power to all cache is turned off. The options are **Enable** and Disable.

Enhanced Halt State (C1E)

Select Enabled to use Enhanced Halt-State technology, which will significantly reduce the CPU's power consumption by reducing the CPU's clock cycle and voltage during a Halt-state. You will need to reboot the system for the change of this setting to take effect. The options are Disable and **Enable**.

▶ CPU T State Control (Available when Power Technology is set to Custom)

ACPI (Advanced Configuration Power Interface) T-States

Select Enable to support CPU throttling by the operating system to reduce power consumption. The options are **Enable** and Disable.

▶Chipset Configuration

Warning! Please set the correct settings for the items below. A wrong configuration setting may cause the system to malfunction.

▶North Bridge

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

▶IIO Configuration

EV DFX (Device Function On-Hide) Feature

When this feature is set to Enable, the EV_DFX Lock Bits that are located on a processor will always remain clear during electric tuning. The options are **Disable** and Enable.

▶IIO0 Configuration

IIO1 Port 1A Link Speed

Use this item to configure the link speed of a PCI-E device installed on the PCI-E slot specified by the user. The options are Gen1 (2.5 GT/s), Gen2 (5 GT/s), Gen3 (8 GT/s), and **Auto**.

IIO1 Port 2A Link Speed

Use this item to configure the link speed of a PCI-E device installed on the PCI-E slot specified by the user. The options are Gen1 (2.5 GT/s), Gen2 (5 GT/s), Gen3 (8 GT/s), and **Auto**.

IIO1 Port 3A Link Speed

Use this item to configure the link speed of a PCI-E device installed on the PCI-E slot specified by the user. The options are Gen1 (2.5 GT/s), Gen2 (5 GT/s), Gen3 (8 GT/s), and **Auto**.

▶IIO1 Configuration

IIO2 Port 1A Link Speed

Use this item to configure the link speed of a PCI-E device installed on the PCI-E slot specified by the user. The options are Gen1 (2.5 GT/s), Gen2 (5 GT/s), Gen3 (8 GT/s), and **Auto**.

IIO2 Port 2A Link Speed

Use this item to configure the link speed of a PCI-E device installed on the PCI-E slot specified by the user. The options are Gen1 (2.5 GT/s), Gen2 (5 GT/s), Gen3 (8 GT/s), and **Auto**.

IIO2 Port 3C Link Speed

Use this item to configure the link speed of a PCI-E device installed on the PCI-E slot specified by the user. The options are Gen1 (2.5 GT/s), Gen2 (5 GT/s), Gen3 (8 GT/s), and **Auto**.

▶IOAT (Intel® IO Acceleration) Configuration

Enable IOAT

Select Enable to enable Intel I/OAT (I/O Acceleration Technology) support, which will significantly reduce CPU overhead by leveraging CPU architectural improvements and freeing the system resource for other tasks. The options are **Enable** and Disable.

No Snoop

Select Enable to support no-snoop mode for each CB device. The options are **Disable** and Enable.

Relaxed Ordering

Select Enable to enable Relaxed Ordering support which will allow certain transactions to violate the strict-ordering rules of PCI bus for a transaction to be completed prior to other transactions that have already been enqueued earlier. The options are **Disable** and Enable.

▶ Intel VT for Directed I/O (VT-d)

VTd Azalea VCp Optimization (Available on the X10DAX only)

Select Enable to optimize Azalea VCp performance for system overclocking, which might impede the stability of your machine. The options are **Disable** and Enable.

Intel VT for Directed I/O (VT-d)

Select Enable to use Intel Virtualization Technology support for Direct I/O VT-d support by reporting the I/O device assignments to the VMM (Virtual Machine Monitor) through the DMAR ACPI Tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data-sharing. The options are **Enable** and Disable.

Interrupt Remapping

Select Enable for Interrupt Remapping support to enhance system performance. The options are **Enable** and Disable.

Coherency Support (Non-Isoch)

Select Enable for the Non-Iscoh VT-d engine to pass through DMA (Direct Memory Access) to enhance system performance. The options are **Enable** and Disable.

Coherency Support (Isoch)

Select Enable for the Iscoh VT-d engine to pass through ATS to enhance system performance. The options are Enable and **Disable**.

▶QPI (Quick Path Interconnect) Configuration

▶QPI General Configuration

QPI Status

The following information will display:

- Number of CPU
- Number of IIO
- Current QPI Link Speed
- Current QPI Link Frequency
- QPI Global MMIO Low Base/Limit
- QPI Global MMIO High Base/Limit
- QPI PCIe Configuration Base/Size

Link Frequency Select

Use this item to select the desired frequency for QPI Link connections. The options are 6.4GB/s, 8.0GB/s, 9.6GB/s, **Auto,** and Auto Limited.

Link L0p Enable

Select Enable for Link L0p support. The options are **Enable** and Disable.

Link L1 Enable

Select Enable for Link L1 support. The options are **Enable** and Disable.

Early Snoop (Available when the OS and the CPU support this feature)

Select Enable for Early Snoop support to enhance system performance. The options are Enable, Disable, and **Auto**.

Isoc Mode

Select Enable for Isochronous support to meet QoS (Quality of Service) requirements. This feature is especially important for Virtualization Technology. The options are Enable and **Disable**.

▶Memory Configuration

Enforce POR

Select Enabled to enforce POR restrictions on memory frequency and voltage programming. The options are **Enabled** and Disabled.

Memory Frequency

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**,1333, 1400, 1600, 1800, 1867, 2000, 2133, 2200, 2400, 2600, 2667, 2800, 2993, 3000, 3200, and Reserved (Do not select Reserved).

Data Scrambling

Select Enabled to enable data scrambling to enhance system performance and data integrity. The options are **Auto**, Disabled, and Enabled.

DRAM RAPL (Running Average Power Limit) Baseline

Use this feature to set the run-time power-limit baseline for the DRAM modules. The options are Disable, DRAM RAPL Mode 0, and **DRAM RAPL Mode 1**.

Set Throttling Mode

Throttling improves reliability and reduces power consumption in processors via automatic voltage control during processor idle states. The options are Disabled and **CLTT** (Closed Loop Thermal Throttling).

A7 Mode

Select Enabled to support the A7 (Addressing) mode to improve memory performance. The options are **Enable** and Disable.

▶DIMM Information

This item displays the status of a DIMM module as detected by the BIOS.

P1-DIMMA1/A2, P1-DIMMB1/B2, P1-DIMMC1/C2, P1-DIMMD1/D2, P2-DIMME1/E2, P2-DIMMF1/F2, P2-DIMMG1/G2, and P2-DIMMH1/H2

▶Memory RAS (Reliability_Availability_Serviceability) Configuration

Use this submenu to configure the following Memory RAS settings.

RAS Mode

When Disable is selected, RAS is not supported. When Mirror is selected, the motherboard maintains two identical copies of all data in memory for data backup. When Lockstep is selected, the motherboard uses two areas of memory to run the same set of operations in parallel to boost performance. The options are **Disable**, Mirror, and Lockstep Mode.

Memory Rank Sparing

Select Enable to enable memory-sparing support for memory ranks to improve memory performance. The options are **Disabled** and Enabled.

Patrol Scrub

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected on a memory module and send the correction to the requestor (the original source). When this item is set to Enable, the PCH (Platform Control Hub) will read and write-back one cache line every 16K cycles if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the PCH will be scrubbed every day. The options are **Enable** and Disable.

Patrol Scrub Interval

This feature allows you to decide how many hours the system should wait before the next complete patrol scrub is performed. Use the keyboard to enter a value from 0-24. The Default setting is **24**.

Demand Scrub

Demand Scrubbing is a process that allows the CPU to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error, the error is corrected and sent to the requestor (the original source). Memory is updated as well. Select Enable to use Demand Scrubbing for ECC memory correction. The options are **Enable** and Disable.

Device Tagging

Select Enable to support device tagging. The options are **Disable** and Enable.

▶South Bridge Configuration

The following South Bridge information will display:

▶USB Configuration

- USB Module Version
- USB Devices

Legacy USB Support

Select Enabled to support onboard legacy USB devices. Select Auto to disable legacy support if there are no legacy USB devices present. Select Disable to have all USB devices available for EFI applications only. The options are **Enabled,** Disabled, and Auto.

XHCI (Extensible Host Controller Interface) Hand-Off

This is a work-around solution for operating systems that do not support XHCI (Extensible Host Controller Interface) hand-off. The XHCI ownership change should be claimed by the XHCI driver. The settings are **Enabled** and Disabled.

EHCI (Enhanced Host Controller Interface) Hand-Off

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

Port 60/64 Emulation

Select Enabled for I/O port 60h/64h emulation support, which in turn, will provide complete legacy USB keyboard support for the operating systems that do not support legacy USB devices. The options are Disabled and **Enabled**.

USB 3.0 Support

Select Enabled for USB 3.0 support. The options are Smart Auto, Auto, **Enabled**, Disabled, and Manual.

EHCI1

Select Enabled to enable EHCI (Enhanced Host Controller Interface) support on USB 2.0 connector #1 (-at least one USB 2.0 connector should be enabled for EHCI support). The options are Disabled and **Enabled**.

EHCI2

Select Enabled to enable EHCI (Enhanced Host Controller Interface) support on USB 2.0 connector #2 (-at least one USB 2.0 connector should be enabled for EHCI support). The options are Disabled and **Enabled**.

Azalia

Select Enabled to enable onboard Azalia audio devices. Select Auto for the BIOS to automatically enable Azalia support when an onboard Azalia device is detected. The settings are **Auto**, Enabled, and Disabled.

Azalia PME Enable

Select Enabled to enable PME (Power Management Event) support for Azalia. The settings are Enabled and **Disabled**.

▶SATA Configuration

When this submenu is selected, AMI BIOS automatically detects the presence of the SATA devices that are supported by the Intel PCH chip and displays the following items:

SATA Controller

This item enables or disables the onboard SATA controller supported by the Intel PCH chip. The options are **Enabled** and Disabled.

Configure SATA as

Select IDE to configure a SATA drive specified by the user as an IDE drive. Select AHCI to configure a SATA drive specified by the user as an AHCI drive. Select RAID to configure a SATA drive specified by the user as a RAID drive. The options are IDE, **AHCI**, and RAID.

**If the item above "Configure SATA as" is set to AHCI, the following items will display:*

Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are **Enabled** and Disabled.

SATA Port 0~ Port 5

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

- Model number of drive and capacity
- Software Preserve Support

SATA Port 0~ Port 5

Select Enabled to enable a SATA port specified by the user. The options are Disabled and Enabled.

Port 0 ~ Port 5 Spin Up Device

On an edge detect from 0 to 1, set this item to allow the PCH to initialize the device. The options are Enabled and **Disabled**.

Port 0 ~ Port 5 SATA Device Type

Use this item to specify if the SATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

**If the item above "Configure SATA as" is set to IDE, the following items will display:*

Serial ATA Port 0~ Port 5

This item indicates that a SATA port specified by the user is installed (present) or not.

SATA Port 0 ~ Port 5 SATA Device Type (Available when a SATA port is detected)

Use this item to specify if the SATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

**If the item above "Configure SATA as" is set to RAID, the following items will display:*

Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are **Enabled** and Disabled.

SATA RAID Option ROM/UEFI Driver

Select EFI to load the EFI driver for system boot. Select Legacy to load a legacy driver for system boot. The options are Disabled, EFI, and **Legacy**.

SATA/sSATA RAID Boot Select

Select SATA Controller to boot the system from a SATA RAID device. Select sSATA Controller to boot the system from a S-SATA RAID device. Select Both to boot the system either from a SATA RAID device or from an sSATA RAID device. Please note that the option-Both is not supported by the Windows Server 2012/R2 OS. The options are None, Both, SATA Controller, and **sSATA Controller**.

Serial ATA Port 0~ Port 5

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

- Model number of drive and capacity
- Software Preserve Support

Port 0~ Port 5

Select Enabled to enable a SATA port specified by the user. The options are Disabled and **Enabled**.

Port 0 ~ Port 5 Spin Up Device

On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRESET initialization to the device. The options are Enabled and **Disabled**.

Port 0 ~ Port 5 SATA Device Type

Use this item to specify if the SATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

▶sSATA Configuration

When this submenu is selected, AMI BIOS automatically detects the presence of the SATA devices that are supported by the PCH-sSATA controller and displays the following items:

sSATA Controller

This item enables or disables the onboard SATA controller supported by the Intel PCH-sSATA controller. The options are **Enabled** and Disabled.

Configure sSATA as

Select IDE to configure an sSATA drive specified by the user as an IDE drive. Select AHCI to configure an sSATA drive specified by the user as an AHCI drive. Select RAID to configure an sSATA drive specified by the user as a RAID drive. The options are IDE, **AHCI**, and RAID.

**If the item above "Configure sSATA as" is set to AHCI, the following items will display:*

Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are **Enabled** and Disabled.

sSATA Port 6~ Port 9

This item displays the information detected on the installed on the sSATA port specified by the user.

- Model number of drive and capacity
- Software Preserve Support

sSATA Port 6 ~ Port 9 Spin Up Device

On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRESET initialization to the device. The options are Enabled and **Disabled**.

Port 6 ~ Port 9 sSATA Device Type

Use this item to specify if the sSATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

**If the item above "Configure sSATA as" is set to IDE, the following items will display:*

sSATA Port 6~ Port 9

This item indicates that an sSATA port specified by the user is installed (present) or not.

Port 6 ~ Port 9 sSATA Device Type (Available when a SATA port is detected)

Use this item to specify if the sSATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

**If the item above "Configure sSATA as" is set to RAID, the following items will display:*

Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are **Enabled** and Disabled.

sSATA RAID Option ROM/UEFI Driver

Select EFI to load the EFI driver for system boot. Select Legacy to load a legacy driver for system boot. The options are Disabled, EFI, and **Legacy**.

SATA/sSATA RAID Boot Select

Select SATA Controller to use a device supported by the SATA connector for system boot. Select sSATA Controller to use a device supported by the sSATA connector for system boot. The options are None, SATA Controller, **sSATA Controller**, and Both.

sSATA Port 0~ Port 3

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

- Model number of drive and capacity
- Software Preserve Support

sSATA Port 6~ Port 9

Select Enabled to enable an sSATA port specified by the user. The options are Disabled and Enabled.

sSATA Port 6 ~ Port 9 Spin Up Device

On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRESET initialization to the device. The options are Enabled and **Disabled**.

Port 6 ~ Port 9 sSATA Device Type

Use this item to specify if the sSATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

▶PCIe/PCI/PnP Configuration

PCI Devices Common Settings

PCI Latency Timer

Use this item to configure the PCI latency timer for a device installed on a PCI bus. Select 32 to set the PCI latency timer to 32 PCI clock cycles. The options are **32**, 64, 96, 128, 160, 192, 224, and 248 (PCI Bus Clocks).

VGA Palette Snoop

Select Enabled to support VGA palette register snooping which will allow the PCI cards that do not contain their own VGA color palette to examine the video cards palette and mimic it for proper color display. The options are **Disabled** and Enabled.

PCI PERR# Generation

Select Enabled for the BIOS to generate a PERR number when a runtime PERR (PCI/PCI-E Parity Error) event occurs on a PCI/PCI-E slot for PERR reporting. The options are Enabled and **Disabled**.

PCI SERR# Support

Select Enabled for the BIOS to generate a SERR number when a runtime SERR (System Error) event occurs on a PCI/PCI-E slot for SERR reporting. The options are Enabled and **Disabled**.

PCI PERR/SERR Support

Select Enabled to support PERR (PCI/PCI-E Parity Error)/SERR (System Error) runtime error reporting for a PCI/PCI-E slot. The options are Enabled and **Disabled**.

Above 4G Decoding (Available if the system supports 64-bit PCI decoding)

Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are Enabled and **Disabled**.

SR-IOV (Available if the system supports Single-Root Virtualization)

Select Enabled for Single-Root IO Virtualization support. The options are Enabled and **Disabled.**

Maximum Payload

Select Auto for the system BIOS to automatically set the maximum payload value for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

Maximum Read Request

Select Auto for the system BIOS to automatically set the maximum size for a read request for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

ASPM Support

Use this item to set the Active State Power Management (ASPM) level for a PCI-E device. Select Auto for the system BIOS to automatically set the ASPM level based on the system configuration. Select Disabled to disable ASPM support. The options are **Disabled** and Auto.

Warning: Enabling ASPM support may cause some PCI-E devices to fail!

MMIOHBase

Use this item to select the base memory size according to memory-address mapping for the PCH. The base memory size must be between 4032G to 4078G. The options are **56T**, 48T, 24T, 2T, 512G, and 256G.

MMIO High Size

Use this item to select the high memory size according to memory-address mapping for the PCH. The options are **256G**, 128G, 512G, and 1024G.

PCI Devices Option ROM Setting

CPU1 Slot 1 PCI-E x16 OPROM (Option ROM)/CPU2 Slot 2 PCI-E x8 OPROM (Option ROM)/CPU1 Slot 3 PCI-E x16 OPROM (Option ROM)/CPU2 Slot 4 PCI-E x8 OPROM (Option ROM)/CPU2 Slot 5 PCI-E x16 OPROM (Option ROM)/PCH Slot 6 PCI-E x4 OPROM (Option ROM)/Onboard LSI 3008 OPROM (Option ROM)

Select Enabled to enable Option ROM support to boot the computer using a device installed on the slot specified by the user. The options are Disabled, **Legacy**, and EFI.

Onboard LAN Option ROM Type

Select Legacy to boot the computer using a Legacy device installed on the motherboard. The options are **Legacy** and EFI.

Onboard LAN1 Option ROM/Onboard LAN2 Option ROM

Use this option to select the type of device installed in LAN Port1, LAN Port2 or the onboard video device used for system boot. The default setting for LAN1 Option ROM is **PXE**, for LAN2 Option ROM is **Disabled**.

Network Stack

Select Enabled to enable PXE (Preboot Execution Environment) or UEFI (Unified Extensible Firmware Interface) for network stack support. The options are Enabled and **Disabled**.

▶Trusted Computing (Available when a TPM device is installed and detected by the BIOS)

Configuration

Security Device Support

If this feature and the TPM jumper on the motherboard are both set to Enabled, onboard security devices will be enabled for TPM (Trusted Platform Module) support to enhance data integrity and network security. Please reboot the system for a change on this setting to take effect. The options are Enabled and **Disabled**.

TPM State

Select Enabled to use TPM (Trusted Platform Module) settings to enhance system data security. Please reboot your system for any change on the TPM state to take effect. The options are Disabled and **Enabled**.

Pending Operation

Use this item to schedule a TPM-related operation to be performed by a security device for system data integrity. Your system will reboot to carry out a pending TPM operation. The options are **0**, Enable Take Ownership, Disable Take Ownership, and TPM Clear.

Note: Your system will reboot to carry out a pending TPM operation.

Current Status Information

This item displays the status of the TPM support on this motherboard.

Note: For more information on TPM, please refer to the TPM manual at http://www.supermicro.com/manuals/other/TPM.pdf.

▶ACPI Settings

WHEA Support

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

High Precision Timer

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

NUMA (Available when the OS supports this feature)

Select Enabled to enable Non-Uniform Memory Access support to enhance system performance. The options are **Enabled** and Disabled.

ACPI Sleep State

This feature selects the ACPI Sleep State that the system will enter into when the suspend button is activated. The options are Suspend Disabled, and **S3 only (Suspend to RAM)**.

PCI AER (Advanced Error-RepoArting) Support

Select Enabled to support Advanced Error-Reporting for onboard PCI devices. The options are **Disabled** and Enabled.

▶NCT7904D HW Monitor

This submenu displays system health monitoring information on the following items as detected by the BIOS:

- CPU1 Temperature
- CPU2 Temperature
- PCH Temperature
- System Temperature
- Fan1 Speed - Fan7 Speed & FanA Speed
- 1.05V
- 1.5V
- 5VSB
- 5V
- 12V
- CPU1 VCore/CPU2 VCore
- VDIMM AB/VDIMM CD/VDIMM EF/VDIMM GH
- 3.3V
- 3.3VSB
- VBAT

▶Intel® Thunderbolt

This feature is used to enable hot-plug support in the BIOS setup.

The following items will be displayed:

- Thunderbolt Specification
- Intel Sample Code Version
- Thunderbolt Host Chip

BIOS Hot-Plug Support

Select Enabled to enable BIOS hot-plug support which will allow the user to replace a component or disk drive without shutting down the system. Select Disabled when an add-on card other than a TBT (Thunderbolt Technology) AIC device is installed on PCI-E Slot 6. The options are **Enabled** and Disabled.

Intel Thunderbolt Technology (Available when the optional Supermicro Thunderbolt Add-on card is installed)

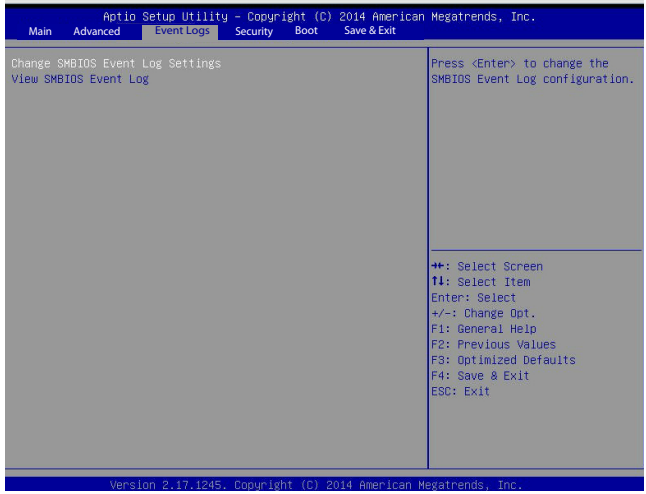
Select Enabled to support Intel Thunderbolt Technology to enhance system performance if the optional Supermicro Thunderbolt Add-on card is installed in your system. Please refer to the product website for compatible Thunderbolt Add-on cards. The options are **Enabled** and Disabled.

Security Level

This item allows the user to set the security level for a new TBT (Thunderbolt) device attached to your system. If Legacy Mode is selected, no security clearance is required, and the device can be used immediately. When Unique ID is selected, a pop-up window will appear asking you whether a particular device is allowed to be connected. If it is allowed, a unique ID will be assigned to be used to identify this device. When One Time Saved Key is selected, a one-time ID key will be assigned to the device. When DP++ Only is selected, only DP-compatible devices will be allowed to be connected to your system. The options are Legacy Mode, **Unique ID**, One Time Saved Key, and DP++ Only.

4-4 Event Logs

Use this feature to configure Event Log settings.



▶Change SMBIOS Event Log Settings

This feature allows the user to configure SMBIOS Event settings.

Enabling/Disabling Options

SMBIOS Event Log

Select Enabled to enable SMBIOS (System Management BIOS) Event Logging during system boot. The options are **Enabled** and Disabled.

Runtime Error Logging Support

Select Enabled to support Runtime Error Logging. The options are **Enabled** and Disabled. If this item is set to Enabled, the following item will be available for configuration:

Memory Corrected Error Enabling (Available when the item above-Runtime Error Logging Support is set to Enable)

Select Enabled for the BIOS to correct a memory error if it is correctable. The options are **Enabled** and Disabled.

PCI-Ex (PCI-Express) Error Enable

Select Yes for the BIOS to correct errors occurred in the PCI-E slots. The options are Enabled and **Disabled**.

Memory Correctable Error Threshold

Use this item to enter the threshold value for correctable memory errors. The default setting is **10**.

Erasing Settings

Erase Event Log

Select Enabled to erase all error events in the SMBIOS (System Management BIOS) log before an event logging is initialized at bootup. The options are **No**, Yes, Next reset, and Yes, Every reset.

When Log is Full

Select Erase Immediately to immediately erase all errors in the SMBIOS event log when the event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings

Log System Boot Event

Select Enabled to log system boot events. The options are **Disabled** and Enabled.

MECI (Multiple Event Count Increment)

Enter the increment value for the multiple event counter. Enter a number between 1 to 255. The default setting is **1**.

METW (Multiple Event Count Time Window)

This item is used to determine how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number between 0 to 99. The default setting is **60**.

Note: Please reboot the system for the changes to take effect.

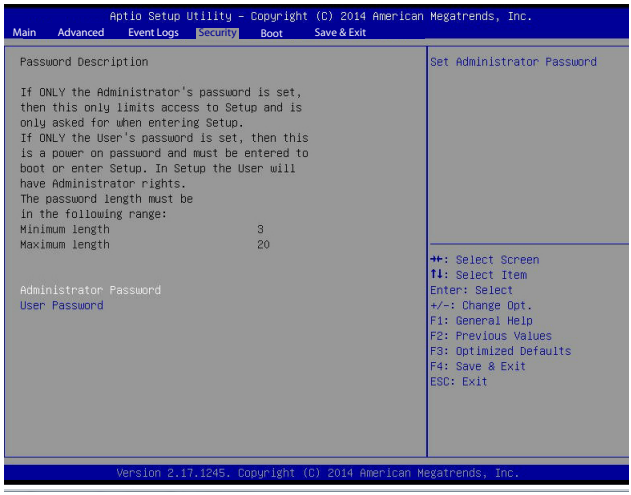
▶View SMBIOS Event Log

This item allows the user to view the event in the SMBIOS event log. Select this item and press <Enter> to view the status of an event in the log. The following categories are displayed:

Date/Time/Error Code/Severity

4-5 Security Settings

This menu allows the user to configure the following security settings for the system.



Administrator Password

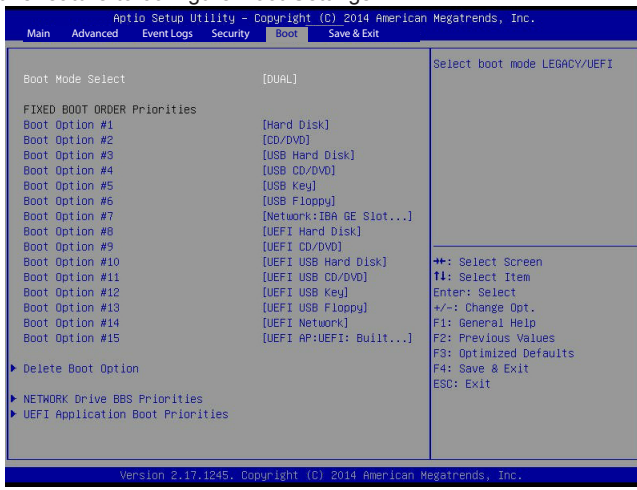
Use this feature to set the administrator password which is required before the user entering the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

User Password

Use this feature to set the user password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

4-6 Boot Settings

Use this feature to configure Boot Settings:



Boot Configuration

Boot Mode Select

Use this item to select the type of device to be used for system boot. The options are Legacy, UEFI, and **Dual.**

Fixed Boot Order Priorities

This option prioritizes the order of bootable devices from which the system will boot. Press <Enter> on each entry from top to bottom to select devices.

- Boot Option #1
- Boot Option #2
- Boot Option #3
- Boot Option #4
- Boot Option #5
- Boot Option #6
- Boot Option #7
- Boot Option #8

- Boot Option #9
- Boot Option #10
- Boot Option #11
- Boot Option #12
- Boot Option #13
- Boot Option #14
- Boot Option #15

▶Hard Disk Drive BBS Priorities

- Boot Option #1
- Boot Option #2

▶Network Drive BBS Priorities

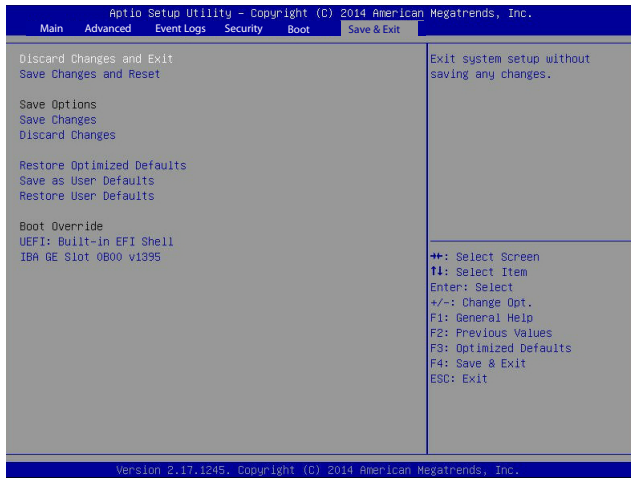
- Boot Option #1

▶UEFI Application Boot Priorities

- UEFI Boot Option #1

4-7 Save & Exit

Select the Save & Exit tab from the BIOS setup screen to configure the settings below.



Discard Changes and Exit

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

Save Changes and Reset

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

Save Options

Save Changes

When you have completed the system configuration changes, select this option to save all changes made. This will not reset (reboot) the system.

Discard Changes

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

Restore Optimized Defaults

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

Save as User Defaults

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

Restore User Defaults

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

Boot Override

This feature allows the user to override the Boot priorities sequence in the Boot menu, and immediately boot the system with another device specified by the user. This is a one-time override.

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed at each system boot, errors may occur.

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

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

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

A-1 BIOS Error Beep Codes

BIOS Error Beep Codes

Beep Code/LED	Error Message	Description
1 beep	Refresh	Ready to boot
5 short beeps + 1 long beep	Memory error	No memory detected in the system
5 beeps	No Con-In or no Con-Out devices	Con-In includes USB or PS/2 keyboard, PCI or Serial Console Redirection. Con-Out includes Video Controller, PCI or Serial Console Redirection.

Appendix B

Software Installation Instructions

B-1 Installing Software Programs

The Supermicro website that contains drivers and utilities for your system is located at http://www.supermicro.com/wftp. Some of these must be installed, such as the chipset driver.

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

After creating a DVD with the ISO files, insert the disk into the DVD drive on your system and the display shown in Figure B-1 should appear.

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 to your hard drive or a USB flash drive and install from there.

Note: Please refer to the documents posted on our website at http://www.supermicro.com/support/manuals/ for additional instructions that may be applicable to your system.

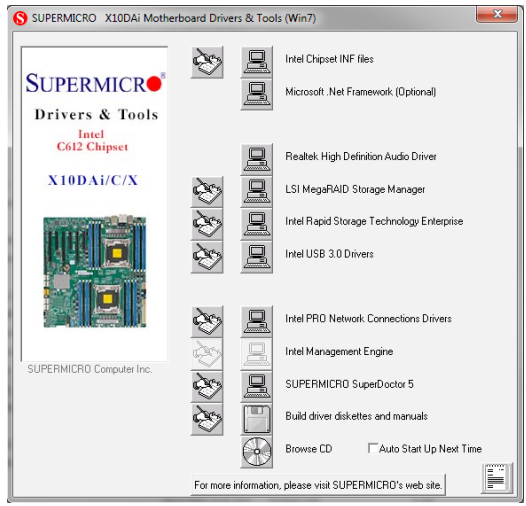


Figure B-1. Driver/Tool Installation Display Screen

Click the icons showing a hand writing on the paper to view the readme files for each item. Click a computer icon to the right of an item to install an item (from top to the bottom) one at a time. After installing each item, you must reboot the system before proceeding with the next item on the list. The bottom icon with a CD on it allows you to view the entire contents of the CD.

When making a storage driver diskette by booting into a Driver CD, please set the SATA Configuration to "Compatible Mode" and configure SATA as IDE in the BIOS Setup. After making the driver diskette, be sure to change the SATA settings back to your original settings.

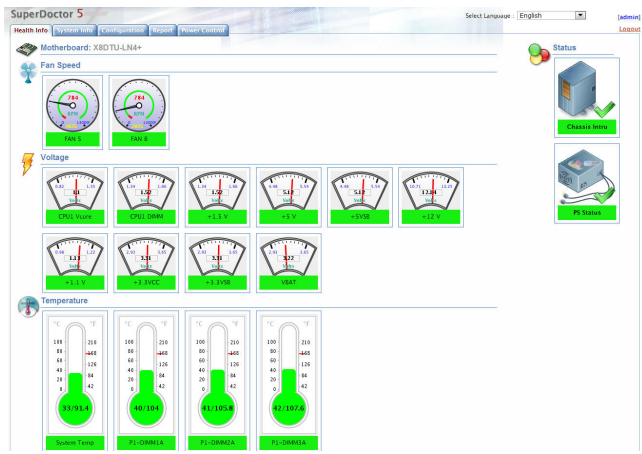
B-2 Configuring SuperDoctor® 5

The Supermicro SuperDoctor 5 is a hardware monitoring program that functions in a command-line or web-based interface in Windows and Linux operating systems. The program monitors system health information such as CPU temperature, system voltages, system power consumption, fan speed, and provides alerts via email or Simple Network Management Protocol (SNMP).

SuperDoctor 5 comes in local and remote management versions and can be used with Nagios to maximize your system monitoring needs. With SuperDoctor 5 Management Server (SSM Server), you can remotely control power on/off and reset chassis intrusion for multiple systems with SuperDoctor 5 or IPMI. SD5 Management Server monitors HTTP and SMTP services to optimize the efficiency of your operation.

Note: The default User Name and Password for SuperDoctor 5 is admin/admin.

Figure B-2. SuperDoctor 5 Interface Display Screen (Health Information)



Appendix C

UEFI BIOS Recovery Instructions

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

C-1 An Overview to the UEFI BIOS

The Unified Extensible Firmware Interface (UEFI) specification provides a software-based interface between the operating system and the platform firmware in the pre-boot environment. The UEFI specification supports an architecture-independent mechanism for add-on card initialization to allow the UEFI OS loader, which is stored in the add-on card, to boot up the system. UEFI offers a clean, hands-off control to a computer system at bootup.

C-2 How to Recover the UEFI BIOS Image

A UEF BIOS flash chip consists of a recovery BIOS block, comprised of a main BIOS block (a main BIOS image). The boot block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a new BIOS image if the original main BIOS image is corrupted. When the system power is on, the boot block codes execute first. Once that is completed, the main BIOS code will continue with system initialization and bootup.



Note: Follow the BIOS Recovery instructions below for BIOS recovery when the main BIOS boot crashes.

C-3 To Recover the Main BIOS Block Using a USB-Attached Device

This feature allows the user to recover a BIOS image using a USB-attached device without additional utilities used. A USB flash device such as a USB Flash Drive, or a USB CD/DVD ROM/RW device can be used for this purpose. However, a USB Hard Disk drive cannot be used for BIOS recovery at this time.

The file system supported by UEFI is FAT (including FAT12, FAT16, and FAT32) installed on a bootable or non-bootable USB-attached device. However, the BIOS

might need several minutes to locate the SUPER.ROM file if the media size becomes too large because it contains too many folders and files.

To perform UEFI BIOS recovery using a USB-attached device, follow the instructions below.

1. Using a different machine, copy the "Super.ROM" binary image file into the disc Root "\" Directory of a USB device or a writeable CD/DVD.

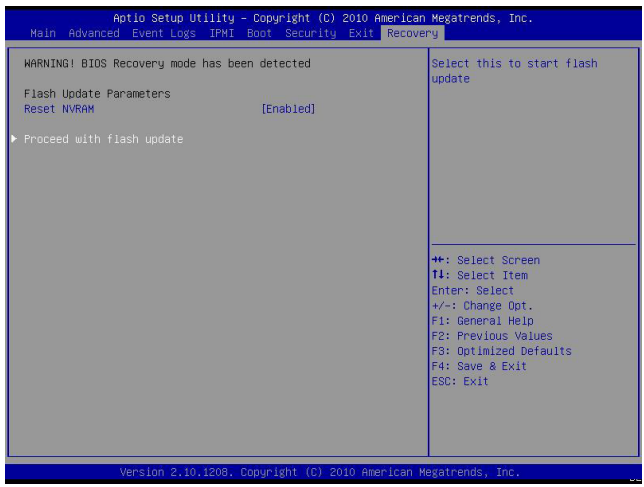
   Note: If you cannot locate the "Super.ROM" file in your driver disk, visit our website at www.supermicro.com to download the BIOS image into a USB flash device and rename it "Super ROM" for BIOS recovery use.

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB drive and power on the system

3. While powering on the system, keep pressing <Ctrl> and <Home> simultaneously on your keyboard until your hear two short beeps. This may take from a few seconds to one minute.

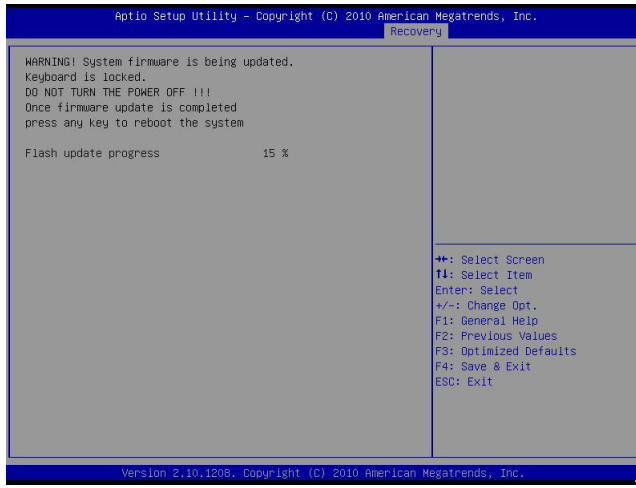
4. After locating the new BIOS binary image, the system will enter the BIOS Recovery menu as shown below.

   Note: At this point, you may decide if you want to start with BIOS Recovery. If you decide to proceed with BIOS Recovery, follow the procedures below.

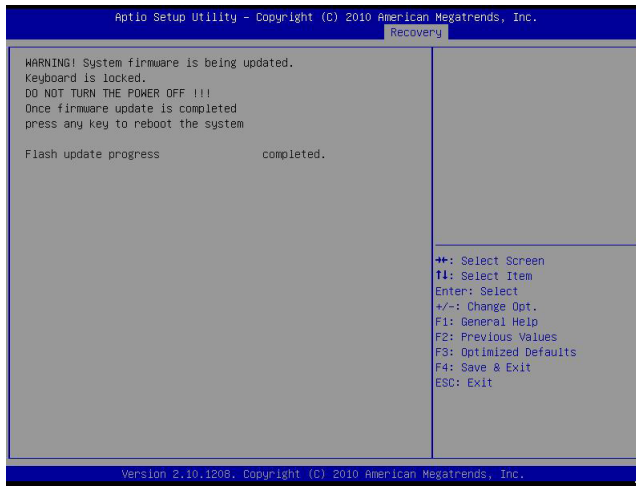


5. When the screen as shown above displays, using the arrow key, select the item- "Proceed with flash update" and press the <Enter> key. You will see the progress of BIOS Recovery as shown in the screen below.

Note: *Do not interrupt* the process of BIOS flashing until it is completed.



6. After the process of BIOS Recovery is complete, press any key to reboot the system.



7. Using a different system, extract the BIOS package into a bootable USB flash drive.

8. When a DOS prompt appears, enter AMI.BAT BIOSname.### at the prompt.

Note: *Do not interrupt this process* until BIOS flashing is completed.

9. After seeing the message that BIOS update is completed, unplug the AC power cable from the power supply to clear CMOS, and then plug the AC power cable in the power supply again to power on the system.

10. Press <Del> continuously to enter the BIOS Setup utility.

11. Press <F3> to load default settings.

12. After loading default settings, press <F4> to save the settings and exit the BIOS Setup utility.