



X10DBT X10DBT-T

USER'S MANUAL

Revision 1.0a

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Preface

This manual is written for system integrators, IT professionals, and knowledgeable end-users. It provides information for the installation and use of the X10DBT/X10DBT-T motherboard.

About This Motherboard

The Super X10DBT(-T) motherboard supports dual Intel E7-2800v2/E7-4800*/E7-8800* series processors that offer new Intel Microarchitecture 22nm Process Technology, delivering the best balanced solution of performance, power efficiency, and features to address the diverse needs of next-generation data centers. With the PCH C602 built in, the X10DBT(-T) motherboard supports Integrated Clocking, Advanced Management Bus Infrastructure, MCTP Protocol, and Intel® Node Manager 3.0. This motherboard is optimized for high-performance cloud-computing platforms. Please refer to our website (<http://www.supermicro.com>) for CPU and memory support updates.

*(*E7-4800/E7-8800 CPU support is verified on some SKUs only. For CPU support updates, please refer to our website.)*

Manual Organization

Chapter 1 describes the features, specifications, and performance of the motherboard. It also provides detailed information about the Intel PCH C602 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 contains UEFI BIOS Recovery instructions.

Conventions Used in the Manual

Pay special attention to the following symbols for proper system installation:

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



Note: Additional information given to differentiate between models or instructions provided for proper 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.

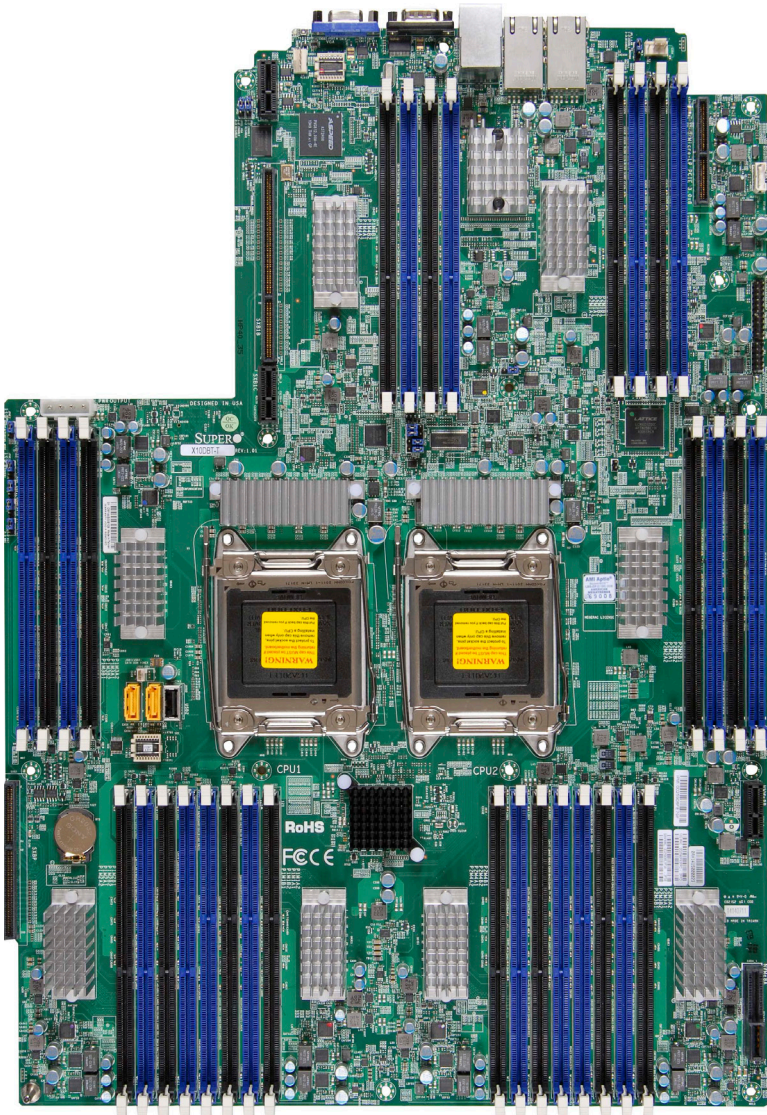
-  **Note 1:** The X10DBT(-T) motherboard was designed to be used with a Supermicro-proprietary chassis as an integrated server platform. It is not to be used as a stand-alone product and will not be shipped independently in a retail box. No motherboard shipping package will be provided in your shipment.

-  **Note 2:** For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your system.
 - Supermicro product manuals: <http://www.supermicro.com/support/manuals/>
 - Product Drivers and utilities: <http://www.supermicro.com/wftp>

-  **Note 3:** For safety considerations, please refer to the complete list of safety warnings posted on the Supermicro website at http://www.supermicro.com/about/policies/safety_information.cfm

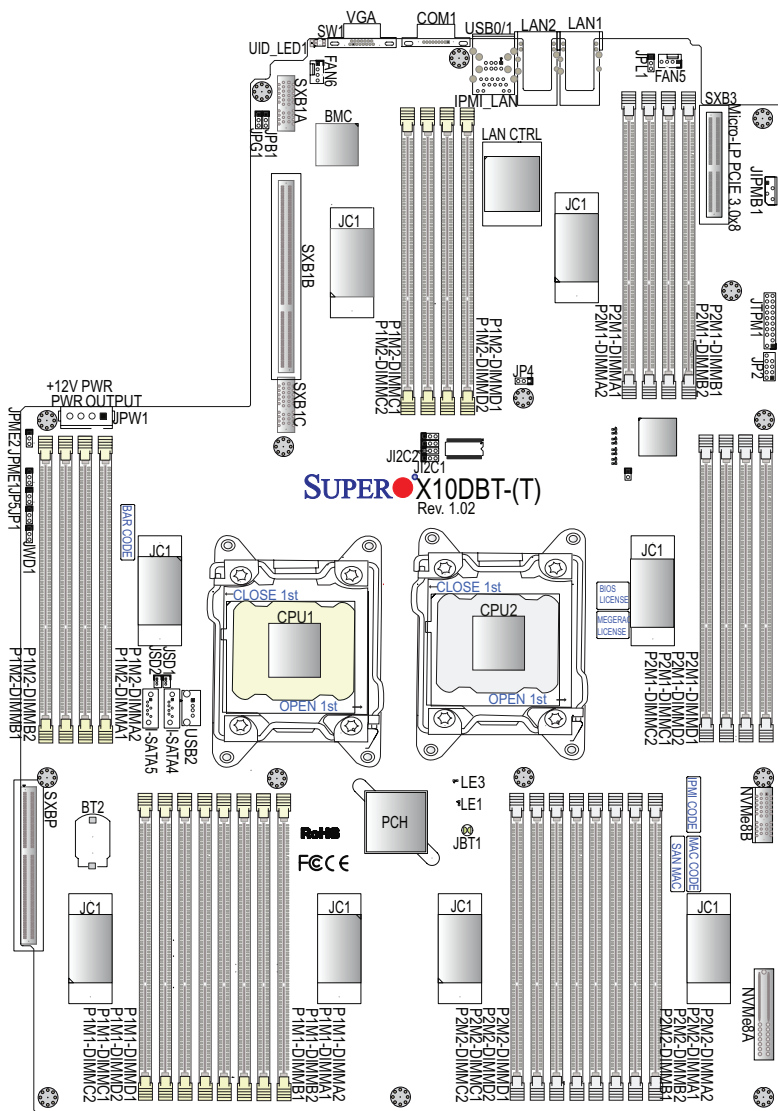
If you have any questions, please contact our support team at support@supermicro.com.


SUPER X10DBT(-T) Motherboard Image



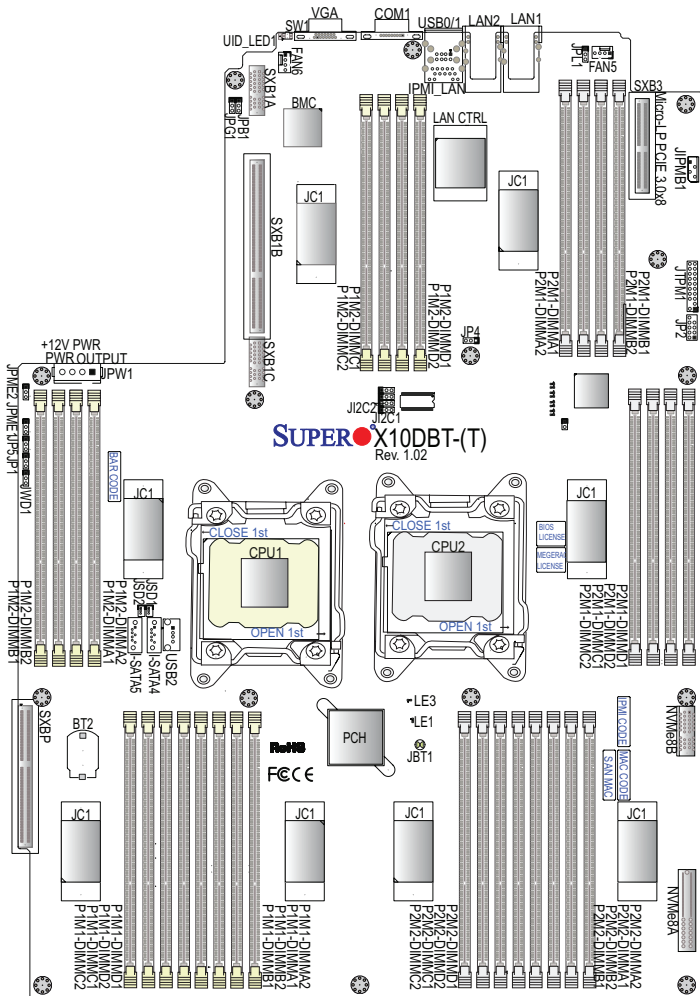
Note: All graphics shown in this manual were based upon the latest PCB revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in this manual.


X10DBT(-T) Motherboard Layout



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

X10DBT(-T) 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/LED Indicators not indicated are for internal testing 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 possible explosion.

X10DBT(-T) Jumpers

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Chapter 3
J1 ² C1/J1 ² C2	SMB to PCI-E slots	Pins 2-3 (Disabled)
JPB1	BMC Enable	Pins 1-2 (Enabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1	GLAN1/GLAN2 Enable (X10DBT) 10_GLAN1/10G_LAN2 Enable (X10DBT-T)	Pins 1-2 (Enabled)
JPME1	Manufacture Mode (ME) Recovery	Pins 1-2 (Normal)
JPME2	Manufacture Mode (ME) Select	Pins 1-2 (Normal)
JWD1	Watch-Dog Timer Enable	Pins 1-2 (Reset)

X10DBT(-T) Connectors




Connectors	Description
Battery (BT2)	Onboard Battery (See Chpt. 3 for used battery disposal)
COM1	Backplane COM port
FAN5, FAN6	CPU/System fan headers
I-SATA4/5	Intel SATA 3.0 connectors (4/5) from Intel PCH
JIPMB1	4-pin external BMC I ² C header (for IPMI-card support)
JPW1	+12V Power Output connector header
JSD1/JSD2	SATA DOM (Device-On-Module) power connectors 1/2
JTPM1	TPM (Trusted Platform Module)/Port 80 header
LAN1/LAN2	G-bit Ethernet (GLAN) ports 1/2 (for X10DBT) 10 G-bit Ethernet (GLAN) ports 1/2 (for X10DBT-T)
(IPMI)_LAN	IPMI_Dedicated LAN support by the BMC
NVMe8A/NVMe8B	Solid-State Drive (SSD) slots for SMCI-proprietary Non-Volatile Memory Express (NVMe) devices with Windows 8 support (Note: The part number for the add-on card to be used with NVMe8A or NVMe8B is BPN-ADP-8PCIE3-1UBR.)
SXB1A/1B/1C	SMC-proprietary PCI-E 3.0 x16+x16 slot for riser card support (Left)
SXBP	SMC-proprietary PCI-E 3.0x8 slot for storage add-on cards with two SATA 3.0 and six SATA 2.0 connections supported (Right) (Note: The part number for the add-on card to be used for SXBP is BPN-ADP-8SATA3-1UBL-O-P or BPN-ADP-SAS3-227HD-N2.)
SXB3	Micro-LP (Low-Profile) PCI-E 3.0 x8 slot
SXB4_2	Solid-State Drive (SSD) Slot B for Non-Volatile Memory Express (NVMe) drive with Windows 8 support
SW1	UID Switch

(BP) USB 0/1 (2.0)	Backpanel USB 2.0 Port 0/ Port 1
(FP) USB 2 (2.0)	Front-accessible Type A USB 2.0 connection header
VGA	Backpanel VGA port

X10DBT(-T) LED Indicators


LED	Description	State	Status
LE1	Standby Power LED	On	Power On
LE3	BMC Heartbeat LED	Green: Blinking	BMC Normal
UID_LED1	Rear UID LED	Blue: On	Unit Identified

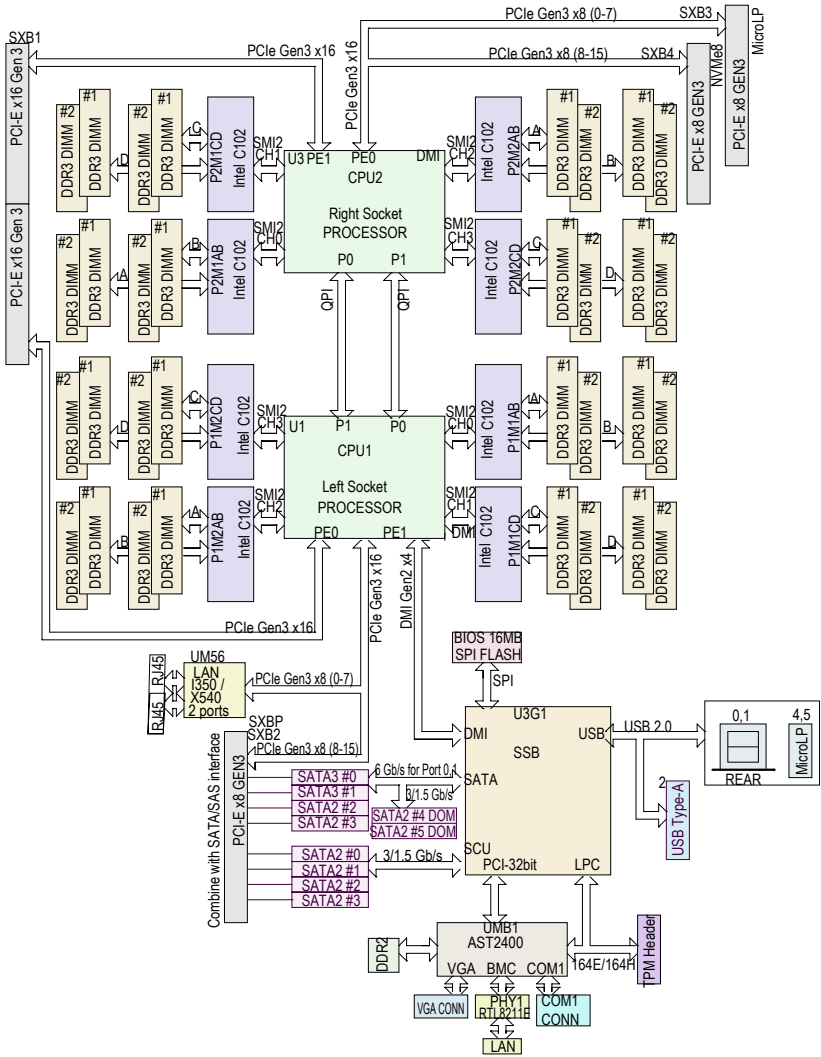
Motherboard Features

CPU	<ul style="list-style-type: none"> Dual Intel® E7-2800/E7-4800*/E7-8800*) series processors (Socket R1-LGA 2011); each processor supports dual full-width Intel QuickPath Interconnect (QPI) links (of up to 8.0 GT/s one direction per QPI) (<i>*E7-4800/E7-8800 CPU support is verified on some SKUs only. For the latest CPU support updates, please refer to our website at http://www.supermicro.com/products/motherboard.</i>)
Memory	<ul style="list-style-type: none"> Integrated memory controller supports: Up to 1 TB of Registered (RDIMM) or up to 2 TB of Load Reduced (LRDIMM) DDR3 ECC 800/1066/1333/1600 MHz 240-pin memory modules in 32 slots (2 DIMMs per channel). <p> Note: For the latest memory updates, please refer to our website at http://www.supermicro.com/products/motherboard.</p>
	DIMM sizes
	<ul style="list-style-type: none"> DIMM Up to 32GB (RDIMM @ 1.25V, 1.5V, LRDIMM @ 1.35V, 1.5V)
Chipset	<ul style="list-style-type: none"> Intel® PCH C602
Expansion Slots	<ul style="list-style-type: none"> One (1) SMC-proprietary PCI-E 3.0 x16+x16 slot for riser card support (Left) (SXB1A/1B/1C) One (1) PCI-E 3.0x8 slot to be used with an SMC-proprietary storage add-on card with support of two SATA 3.0 and six SATA 2.0 connections (Right) (SXBP).  Note: The part number for the add-on card to be used for SXBP is BPN-ADP-8SATA3-1UBL-O-P or BPN-ADP-SAS3-227HD-N2. Micro-LP (Low-Profile) PCI-E 3.0 x8 slot (SXB3) Two (2) Solid-State Drive (SSD) slots for Non-Volatile Memory Express (NVMe) drives w/Windows 8 support (NVMe8A/NVMe8B)  Note: The part number for the add-on card to be used with NVMe8A or NVMe8B is BPN-ADP-8PCIE3-1UBR.
Graphics	<ul style="list-style-type: none"> Graphics controller via the Aspeed AST2400 BMC

Network	<ul style="list-style-type: none"> Intel i350 Gigabit (10/100/1000 Mb/s) Ethernet controller for LAN 1/LAN 2 ports (X10DBT only), Intel X540 10_Gigabit Ethernet controller for LAN 1/ LAN 2 ports (X10DBT-T only) 	
	<ul style="list-style-type: none"> Aspeed 2400 Baseboard Controller (BMC) supports IPMI_LAN 2.0 	
I/O Devices	SATA Connections	
	<ul style="list-style-type: none"> SATA Ports 	<ul style="list-style-type: none"> Two (2) SATA 3.0 port headers (I-SATA 4/5) Two (2) SATA 3.0 and six (6) SATA 2.0 connections supported by SMC-proprietary PCI-E 3.0x8 slot for storage add-on cards (SXBPF)
	<ul style="list-style-type: none"> RAID 	RAID 0, 1, 5, 10
	IPMI 2.0	
	<ul style="list-style-type: none"> IPMI 2.0 supported by Aspeed AST 2400 	
	Serial (COM) Port	
	<ul style="list-style-type: none"> One (1) Fast UART 16550 port 	
Peripheral Devices	USB Devices	
	<ul style="list-style-type: none"> Two (2) USB 2.0 ports on the rear I/O panel (USB 0/1) One (1) USB 2.0 Type A for front access support (USB 2) 	
BIOS	<ul style="list-style-type: none"> 128Mb SPI AMI BIOS® SM Flash UEFI BIOS 	
	<ul style="list-style-type: none"> APM 1.2, ACPI 3.0/4.0, USB keyboard, Plug & Play (PnP), BIOS rescue hotkey, riser card auto-detection, RTC (Real-Time Clock) wake-up, Dual-Boot Block, and SMBIOS 2.7 & later 	
Power Management	<ul style="list-style-type: none"> ACPI/ACPM power management 	
	<ul style="list-style-type: none"> S1, S4, S5 support 	
	<ul style="list-style-type: none"> Main switch override mechanism 	
	<ul style="list-style-type: none"> Power-on mode for AC power recovery 	
	<ul style="list-style-type: none"> Intel® Intelligent Power Node Manager 3.0 (Available when the "Supermicro Power Manager (SPM)" is installed and special power supply is used.) 	
	<ul style="list-style-type: none"> Management Engine (ME) 	

System health Monitoring	System health/CPU Monitoring
	<ul style="list-style-type: none"> Onboard voltage monitoring for +3.3V, 3.3V standby, +5V, +5V standby, +/-12V, CPU core, memory, chip-set, HT, and battery voltages
	<ul style="list-style-type: none"> CPU/System overheat LED and control
	<ul style="list-style-type: none"> 6 switch-phase voltage regulator
	<ul style="list-style-type: none"> CPU Thermal Trip support
	<ul style="list-style-type: none"> Status Monitor for speed control
	<ul style="list-style-type: none"> Status Monitor for On/Off control
	Fan Control
	<ul style="list-style-type: none"> Fan status monitoring via IPMI connections
	<ul style="list-style-type: none"> Dual Cooling Zone
	<ul style="list-style-type: none"> Multi-speed fan control via onboard BMC
	<ul style="list-style-type: none"> Pulse Width Modulation (PWM) fan control
System Management	<ul style="list-style-type: none"> PECI (Platform Environment Configuration Interface) 2.0/TSI support
	<ul style="list-style-type: none"> UID (Unit Identification)/Remote UID
	<ul style="list-style-type: none"> System resource alert via SuperDoctor 5
	<ul style="list-style-type: none"> SuperDoctor® 5, Watch Dog, NMI
	<ul style="list-style-type: none"> Chassis Intrusion header and detection
Dimensions	<ul style="list-style-type: none"> 19.33" (L) x 13.68" (W) (490.98 mm x 347.47 mm)

 **Note:** For IPMI Configuration instructions, please refer to the Embedded IPMI Configuration User's Guide available @ <http://www.supermicro.com/support/manuals/>.



System Block Diagram



Note: This is a general block diagram and may not represent the features on your motherboard. See the "Motherboard Features" pages for the actual specifications of each motherboard.

1-2 Processor and Chipset Overview

Built upon the functionality and capability of the Intel E7-2800 v2 processors (Socket R1) and the Intel C602 PCH, the X10DBT(-T) motherboard provides the best solution for High-Performance Computing (HPC) and Cloud-computing server platforms.

With support of new Intel Microarchitecture 22nm Processing Technology and Intel® Silicon View Technology, the X10DBT(-T) dramatically increases performance for a multitude of server applications.

The PCH C602 chip provides Enterprise SMBus and MCTP support with the following features included:

- DDR3 240-pin memory support on Socket R1
- Integrated Clocking capable of extending to most 2S platforms
- Support for MCTP protocol and ME
- Support of SMBus speeds of up to 1 MHz for BMC connectivity
- GSX capable of GPIO expansion
- Improved I/O capabilities to high-storage-capacity configurations
- Flexible Management Infrastructure focused on Run-Time with support for MCTP Protocol/End Points, and Management traffic over DMI
- SPI Enhancements
- Intel® Node Manager 3.0 for advanced power monitoring, capping and management for BMC enhancement
- BMC supports remote management, virtualization, and the security package for enterprise platforms

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 section describes the features of system health monitoring of the motherboard. This motherboard has an onboard BaseBoard Management Controller (BMC) chip that monitors system health. An onboard voltage monitor will scan the following onboard voltages continuously: +3.3V, 3.3V standby, +5V, +5V standby, +/-12V, CPU core, memory, chipset, HT, 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 system health monitoring support provided by the BMC controller can check the RPM status of a cooling fan. The onboard CPU and chassis fan speeds are controlled by IPMI Thermal Management.

Environmental Temperature Control

A thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. 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 in the Windows OS environment or in Linux. SuperDoctor is used to notify the user of certain system

events. For example, you can configure SuperDoctor to provide you with warnings when the system temperature, CPU temperatures, 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 peripherals such as CD-ROMs, network cards, hard disk drives and printers.

In addition to 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 the latest Windows Operating Systems.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will "wake up" and the LED will automatically stop blinking and remain on.

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 X10DBT(-T) motherboard accommodates Supermicro-proprietary power supply. For adequate cooling, be sure to use the power supply recommended for this motherboard by Supermicro.

It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

1-7 Advanced Power Management

The following new advanced power management features are supported by this motherboard:

Intel[®] Intelligent Power Node Manager (NM) (Available when the "Supermicro Power Manager (SPM)" is Installed)

The Intel[®] Intelligent Power Node Manager 3.0 (IPNM) provides your system with real-time thermal control and power management for maximum energy efficiency. Although IPNM Specification Version 1.5/2.0 is supported by the BMC (Baseboard Management Controller), your system must also have IPNM-compatible Management Engine (ME) firmware installed to use this feature.



Note: Support for IPNM Specification Version 1.5 or Vision 2.0 depends on the power supply used in the system.

Management Engine (ME)

Management Engine, an ARC controller embedded in the PCH, provides Server Platform Services (SPS) support to your system. The services provided by SPS are different from those provided by the ME on client platforms.

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

電池更不会有爆炸危险。只使用同类电池或制造商推荐的功能相的电池更原有电池。按制造商的明处理电池。

警告

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

Warnung

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

Attention

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

¡Advertencia!

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

אזהרה!

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

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من التيار الكهربائي أو الطاقة الموجودة على اللوحة عندما يكون النظام يعمل كن حذرا عند خدمة هذا الجهاز

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

本製品の処理根据所有国家的法律和章程行。

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 motherboard 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 motherboard, make sure that the person handling it is static protected.

2-3 Processor and Heatsink Installation

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

 **Notes:**

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

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

Make sure to install the motherboard into the chassis before you install the CPU heatsink.

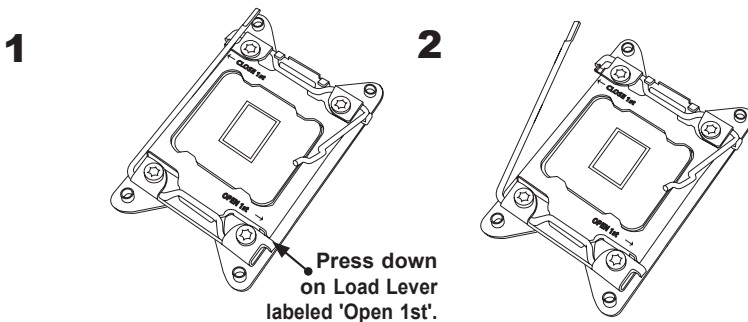
When receiving a motherboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.


Refer to the Supermicro website for updates on CPU support.

Installing the E7-2800/E7-4800*/E7-8800* Series Processor

(*E7-4800/E7-8800 CPU support is verified on some SKUs only. Please refer to our website for the latest CPU support updates.)

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

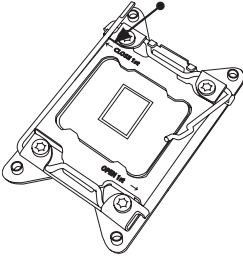


 **Note:** All graphics, drawings and pictures shown in this manual are for illustration only. The components that came with your machine may or may not look exactly the same as those shown in this manual.

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

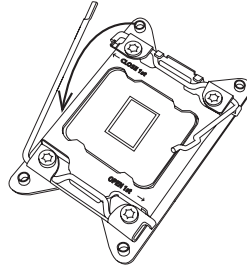
1

Press down on Load Lever 'Close 1st'



2

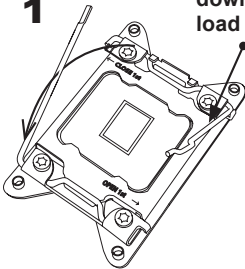
Pull lever away from the socket



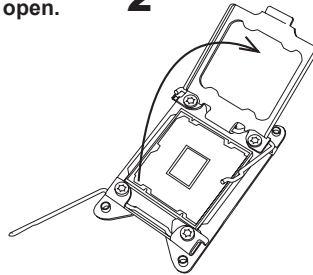
3. With the lever labelled 'Close 1st' fully retracted, gently push down on the lever labelled 'Open 1st' to open the load plate. Lift the load plate to open it completely.


1

Gently push down to pop the load plate open.

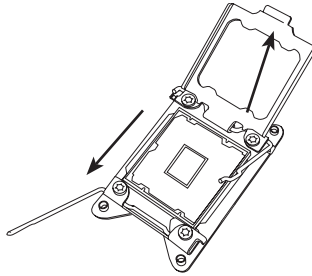


2

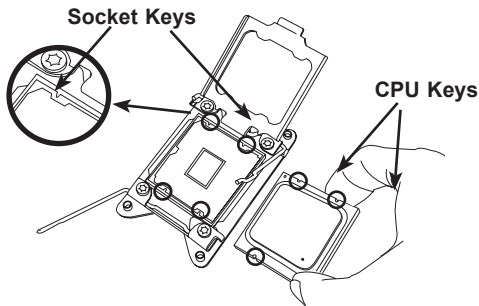


 **Note:** All graphics, drawings and pictures shown in this manual are for illustration only. The components that came with your machine may or may not look exactly the same as those shown in this manual.

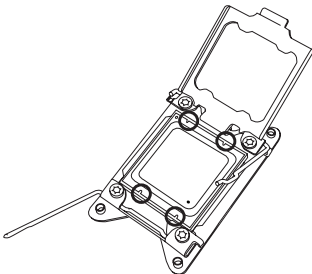
1. Use your thumb and the index finger to loosen the lever and open the load plate.



2. Using your thumb and index finger, hold the CPU on its edges. Align the CPU keys, which are semi-circle cutouts, against the socket keys.



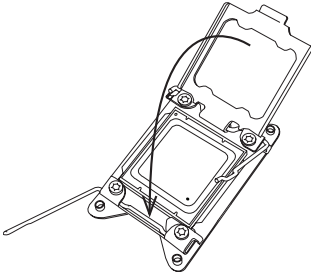
3. Once they are aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface or against any pins of the socket to avoid damaging the CPU or the socket.)



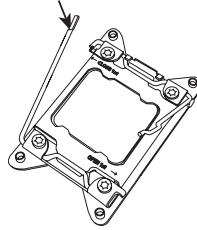
Warning: You can only install the CPU inside the socket in one direction. Make sure that it is properly inserted into the CPU socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again to make sure that the CPU is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

4. 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.



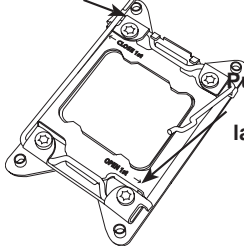
2 Push down and lock the lever labelled 'Close 1st'.



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

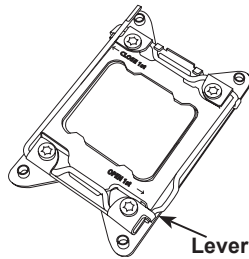
3

Lever Lock



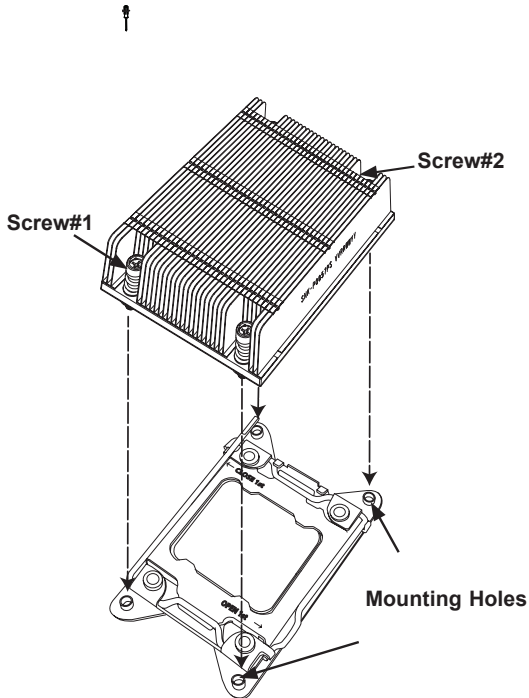
Push down and lock the lever labelled 'Open 1st'.

4



Installing a Passive CPU Heatsink

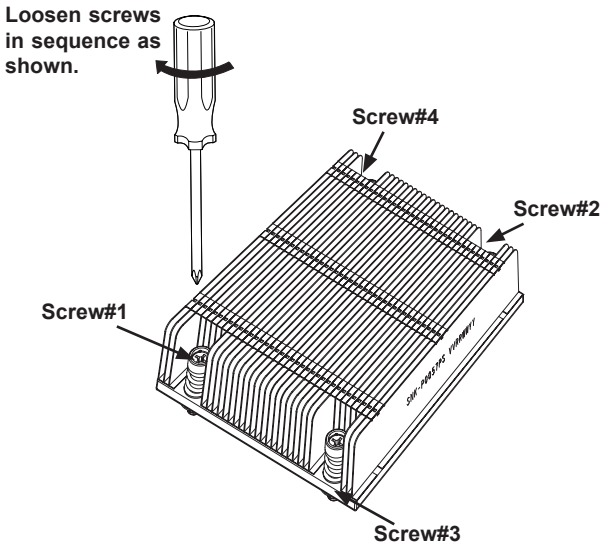
1. Do not apply any thermal grease to the heatsink or the CPU die -- the required amount has already been applied.
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the Motherboard and the Heatsink Bracket underneath.
3. Screw in two diagonal screws (i.e., the #1 and the #2 screws) until just snug (-do not over-tighten the screws to avoid possible damage to the CPU.)
4. Finish the installation by fully tightening all four screws.




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 from the socket, remove the CPU 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.



 **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.

2-4 Installing and Removing the Memory Modules

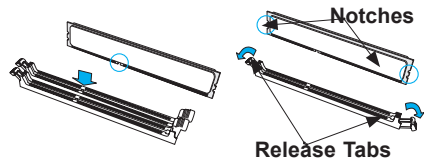
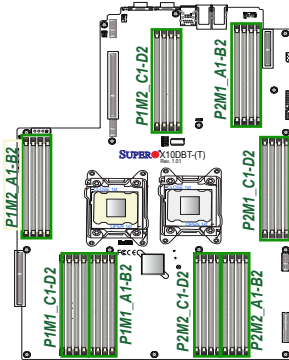
Note: Check Supermicro's website for recommended memory modules.

CAUTION

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

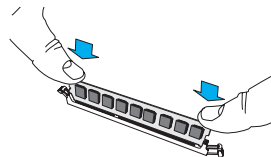
Installing & Removing DIMMs

1. Insert the desired number of DIMMs into the memory slots, starting with P1M1-DIMMA1. (For best performance, please use the memory modules of the same type and speed in the same bank.)
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.



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 X10DBT(-T) Motherboard

The X10DBT(-T) Motherboard supports Up to 1 TB of Registered (RDIMM) or up to 2 TB of Load Reduced (LRDIMM) DDR3 ECC 800/1066/1333/1600 MHz 240-pin memory modules in 32 slots (2 DIMMs per channel). For the latest memory updates, please refer to our website at <http://www.supermicro.com/products/motherboard>.

Processor & Memory Module Population Configuration

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

Fully-Populated Configuration

Please follow the instructions below to populate all DIMM slots:

Processors and their Corresponding Memory Modules								
CPU#	Corresponding DIMM Modules for Full-Populated Configuration							
CPU 1	P1M1-DIMM A1/B1	P1M1-DIMM C1/D1	P1M1-DIMM A2/B2	P1M1-DIMM C2/D2	P1M2-DIMM A1/B1	P1M2-DIMM C1/D1	P1M2-DIMM A2/B2	P1M2-DIMM C2/D2
CPU2	P2M1-DIMM A1/B1	P2M1-DIMM C1/D1	P2M1-DIMM A2/B2	P2M1-DIMM C2/D2	P2M2-DIMM A1/B1	P2M2-DIMM C1/D1	P2M2-DIMM A2/B2	P2M2-DIMM C2/D2

Half-Populated Configuration

Please follow the instructions below to populate half of the DIMM slots:

Processors and their Corresponding Memory Modules				
CPU#	Corresponding DIMM Modules for Half-Populated Configuration			
CPU 1	P1M1-DIMM A1/B1	P1M1-DIMM C1/D1	P1M2-DIMM A1/B1	P1M2-DIMM C1/D1
CPU2	P2M1-DIMM A1/B1	P2M1-DIMM C1/D1	P2M2-DIMM A1/B1	P2M2-DIMM C1/D1

An Important Note:

- For the memory modules to work properly, please install DIMM modules of the same type, same speed and same operating frequency in the motherboard. Mixing of DIMMs of different types or different speeds is not allowed.

RDIMM/LRDIMM DDR3 ECC in Performance Mode (2:1)

Type	Ranks Per DIMM and Data Width (x8 is supported for RDIMMs but not listed) SR Single Rank DR Dual Rank QR Quad Rank	Max DIMM Capacity (GB)		Max Speed (GHz) ; Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)										
				2 SPC				3 SPC						
				1DPC		2DPC		1DPC		2DPC		3DPC		
		2Gb	4Gb	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	N/A
RDIMM	SRx4	4GB	8GB	1333	1333	1333	1333	1333	1333	1333	1066	1066	N/A	
RDIMM	DRx4	8GB	16GB	1333	1333	1333	1333	1333	1333	1333	1066	1066	N/A	
RDIMM	QRx4	16GB	32GB	1066	1066	1066	1066	1066	N/A	N/A	N/A	N/A	N/A	
LRDIMM	QRx4	16GB	32GB	1333	1333	1333	1333	1333	1333	1333	1333	1333	N/A	
LRDIMM (RM)	8Rx4	32GB	64GB	1066	N/A	1066	N/A	1066	N/A	1066	N/A	1066	N/A	

RDIMM/LRDIMM DDR3 ECC in Lockstep Mode (1:1)

Type	Ranks Per DIMM and Data Width (x8 is supported for RDIMMs but not listed)	Max DIMM Capacity (GB)		Max Speed (MT/s) ; Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)										
				2 SPC				3 SPC						
				1DPC		2DPC		1DPC		2DPC		3DPC		
		2Gb	4Gb	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	N/A
RDIMM	SRx4	4GB	8GB	1600	1333	1600	1333	1333	1333	1333	1066	1066	N/A	
RDIMM	DRx4	8GB	16GB	1600	1333	1600	1333	1333	1333	1333	1066	1066	N/A	
RDIMM	QRx4	16GB	32GB	1066	1066	1066	1066	1066	N/A	N/A	N/A	N/A	N/A	
LRDIMM	QRx4	16GB	32GB	1600	1333	1600	1333	1600	1333	1600	1333	1333	N/A	
LRDIMM (RM)	8Rx4	32GB	64GB	1066	N/A	1066	N/A	1066	N/A	1066	N/A	1066	N/A	

2-5 Motherboard Installation

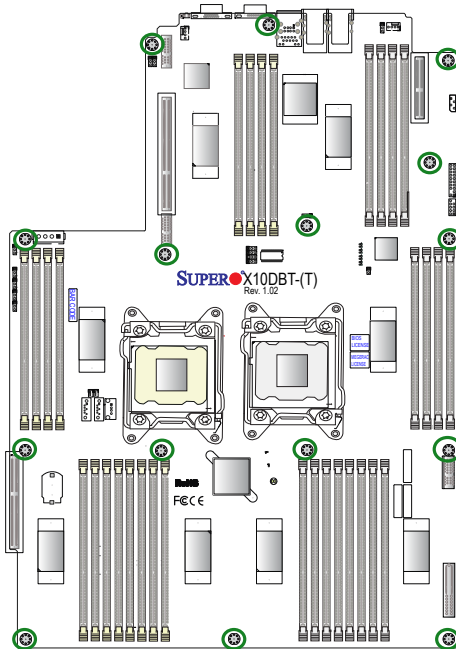
All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both motherboard and chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground 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 (15 pieces)
- Standoffs (15 pieces, if needed)

Location of Mounting Holes

There are fifteen (15) mounting holes on this motherboard indicated by the arrows.



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

Installing the Motherboard

1. 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.

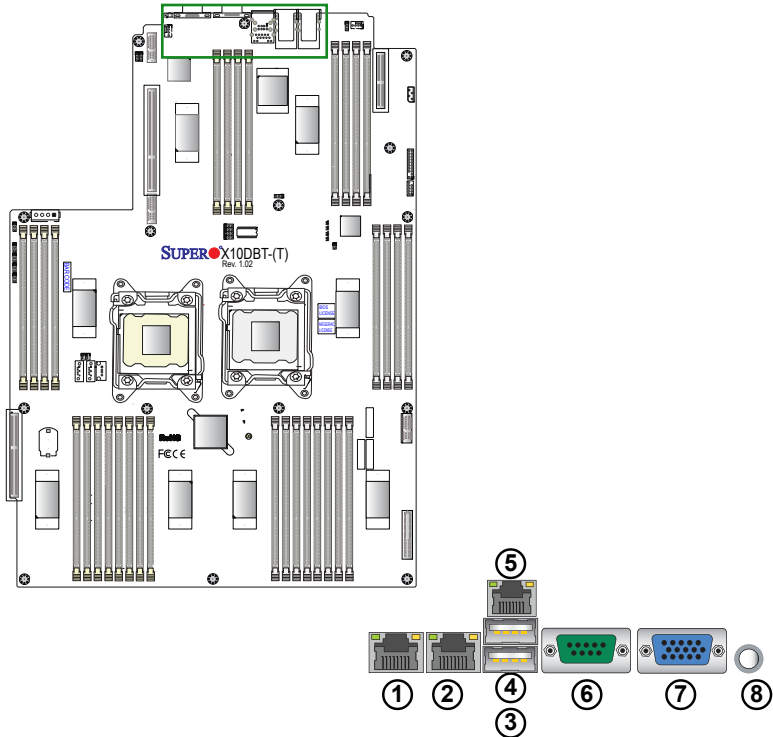


Note: Images displayed are is for illustration only. Your chassis or components might look different from those shown in this manual.

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. Gigabit_LAN 1 (X10DBT), 10G_LAN 1 (X10DBT-T)
2. Gigabit_LAN 2 (X10DBT), 10G_LAN 2 (X10DBT-T)
3. Back Panel USB 2.0 Port 0
4. Back Panel USB 2.0 Port 1
5. IPMI_Dedicated LAN
6. COM1
7. VGA (Blue)
8. UID Switch/UID LED (LED1)

Video Connection

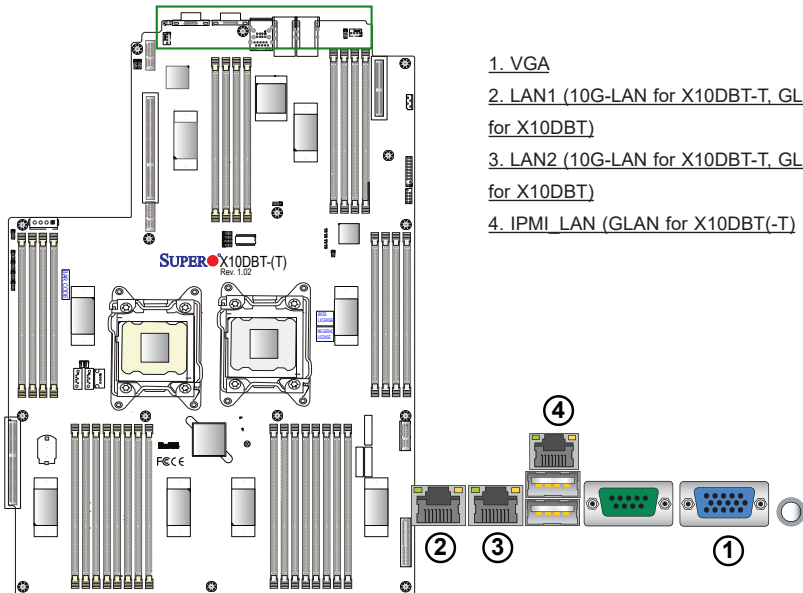
A Video (VGA) port is located next to COM1 on the I/O backplane. Refer to the motherboard layout below for the location.

Ethernet Ports

Two Ethernet ports (LAN1, LAN2) are located on the I/O backplane. These Ethernet ports support 10G LAN connections on the X10DBT-T, and Gigabit LAN connections on the X10DBT. In addition, an IPMI_Dedicated LAN that supports Gigabit LAN is located above USB 0/1 ports on the backplane. All Ethernet ports accept RJ45 type cables. Please refer to the LED Indicator Section for LAN LED information.

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

(NC: No Connection)



1. VGA

2. LAN1 (10G-LAN for X10DBT-T, GLAN for X10DBT)

3. LAN2 (10G-LAN for X10DBT-T, GLAN for X10DBT)

4. IPMI LAN (GLAN for X10DBT(-T))

Universal Serial Bus (USB)

Two USB2.0 ports (USB 0/1) are located on the I/O backpanel. In addition, a Type A USB header, located next to CPU Socket 1, also provides USB 2.0 connection (USB 2) for front panel support. (Cables are not included). See the tables on the right and below for pin definitions.

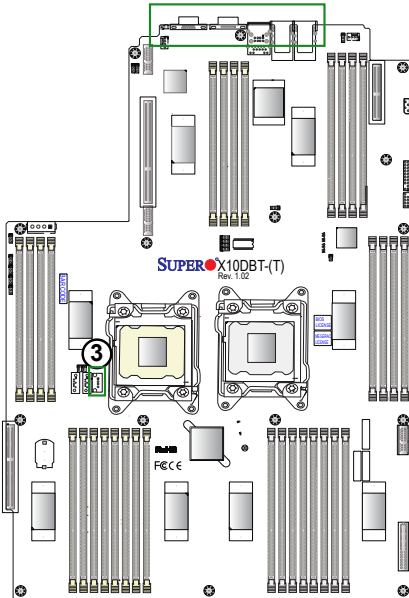
Back Panel USB 0/1 (2.0) Pin Definitions			
Pin#	Definition	Pin#	Definition
1	+5V	5	+5V
2	USB_PN1	6	USB_PN0
3	USB_PP1	7	USB_PP0
4	Ground	8	Ground

Backplane USB 2 (2.0) Pin Definitions	
Pin#	Definition
1	+5V
2	PO-
3	PO+
4	Ground
5	NA

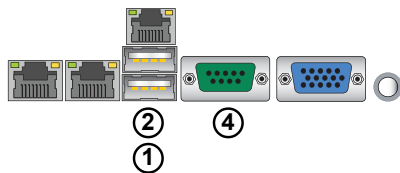
Serial Port

A COM connection (COM1) is located next to USB 0/1 on the I/O back panel. This port provides serial port support. See the table on the right for pin definitions.

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



1. Backpanel USB0 (USB2.0)
2. Backpanel USB1 (USB2.0)
3. Type A USB2 (USB 2.0)
4. COM1



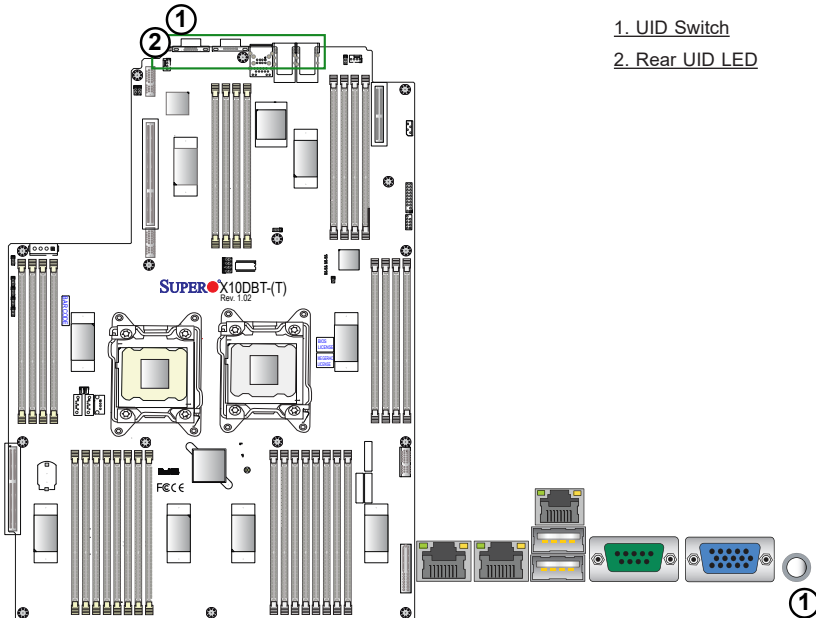
Unit Identifier Switch/UID LED Indicator

A Unit Identifier (UID) switch (SW1) is located on the I/O backplane, and a UID LED indicator (UID_LED1) is located next to the UID switch on the motherboard. When you press the UID switch, the UID LED indicators will be turned on. Press the UID switch again to turn off the LED indicator. The UID Indicator provide easy identification of a system unit that may be in need of service.

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

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

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



1. UID Switch

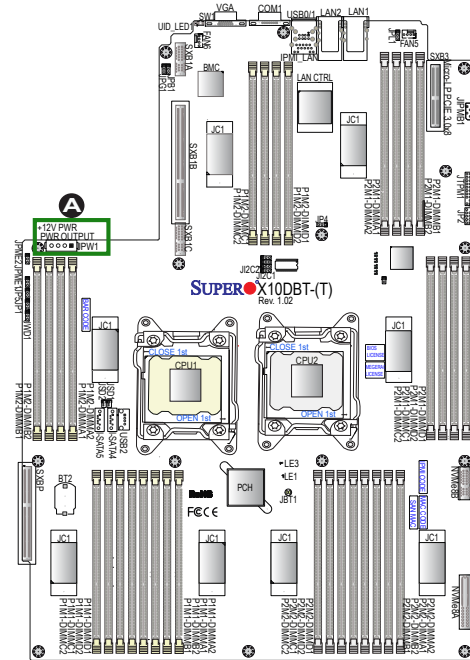
2. Rear UID LED

2-7 Connecting Cables

Power Output Connector

This motherboard supports SMCI- \proprietary power supply. A 4-pin +12V power output connector located at JPW1 on the motherboard. Be sure to use the power supply recommended for this motherboard for adequate power supply to your system. See the layout below for the power output connector location.

A. Power Output (JPW1)



Fan Headers

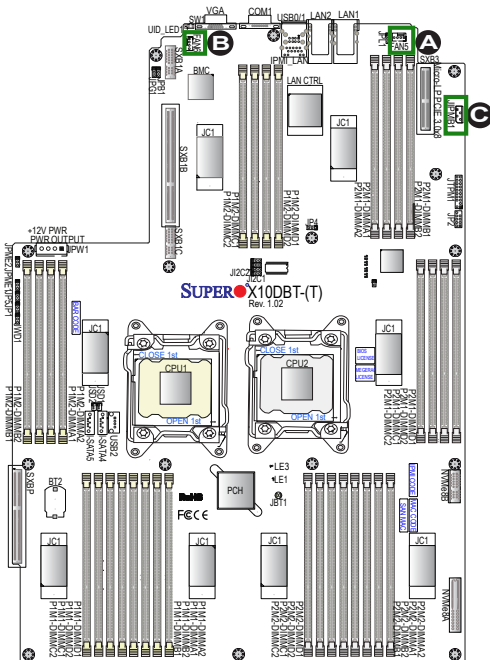
This motherboard has two system/CPU fan headers (Fan 5/Fan 6) on the motherboard. These 4-pin fan headers are backward compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only. The fan speeds are controlled by Thermal Management via IPMI 2.0 interface. See the table on the right for pin definitions.

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

IPMB

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

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



A. Fan 5

B. Fan 6

C. IPMB

TPM/Port 80 Header

A Trusted Platform Module/Port 80 header, located at JTPM1, provides 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.

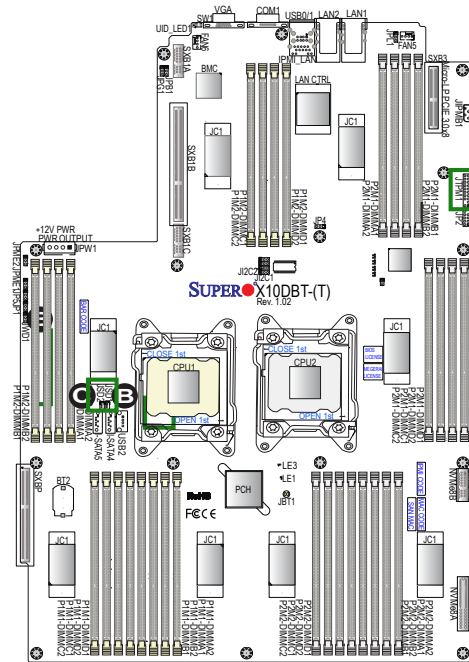
TPM/Port 80 Header Pin Definitions			
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	+5V (X)
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK4	14	SMB_DAT4
15	+3V_DUAL	16	SERIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#	20	LDRQ# (X)

SATA DOM Power Connectors

Two power connectors for SATA DOM (Disk_On_Module) devices are located at JSD1/JSD2. Connect appropriate cables here to provide power support for your Serial Link DOM devices.

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


- A. TPM/80 Port
- B. JSD1
- C. JSD2

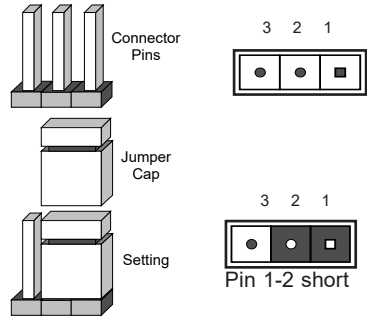


2-8 Jumper Settings

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.

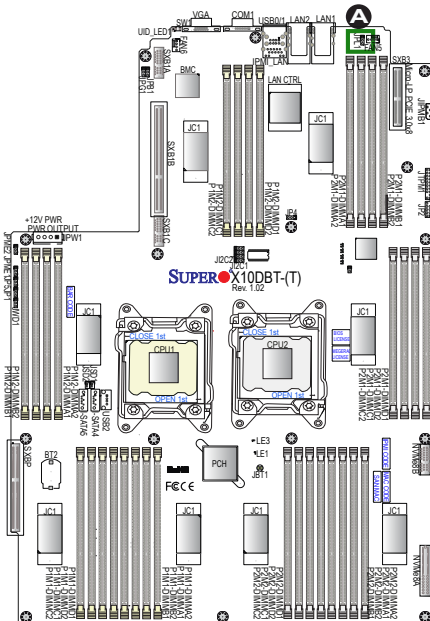
 **Note:** On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.



LAN Enable/Disable

JPL1 enables or disables Gigabit_LAN ports 1/2 on the X10DBT, and 10G_LAN ports 1/2 on the X10DBT-T. See the table on the right for jumper settings. The default setting is Enabled.

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



A. GLAN1/2_Enable (X10DBT)

A. 10G_LAN1/2_Enable (X10DBT-T)

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.



Note 1. For an ATX power supply, you must completely shut down the system, and then short JBT1 to clear CMOS.



Note 2. Clearing CMOS will also clear all passwords.

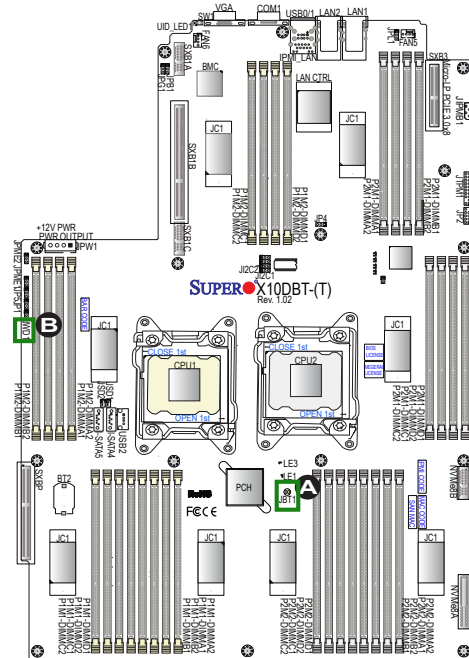
Watch Dog Enable/Disable

Watch Dog (JWD1) is a system monitor that will 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



VGA Enable

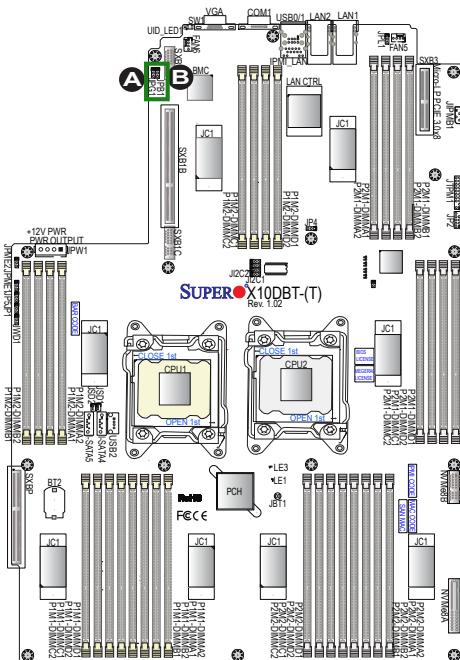
Jumper JPG1 allows the user to enable the onboard VGA connector. The default setting is on pins 1-2 to enable the connection. See the table on the right for jumper settings.

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

BMC Enable

Jumper JPB1 is used to enable or disable the embedded AST2400 BMC (Baseboard Management Controller) that provides IPMI 2.0/KVM support on the motherboard. See the table on the right for jumper settings.

BMC Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	BMC Enable (Default)
Pins 2-3	Disabled



[A. VGA Enabled](#)

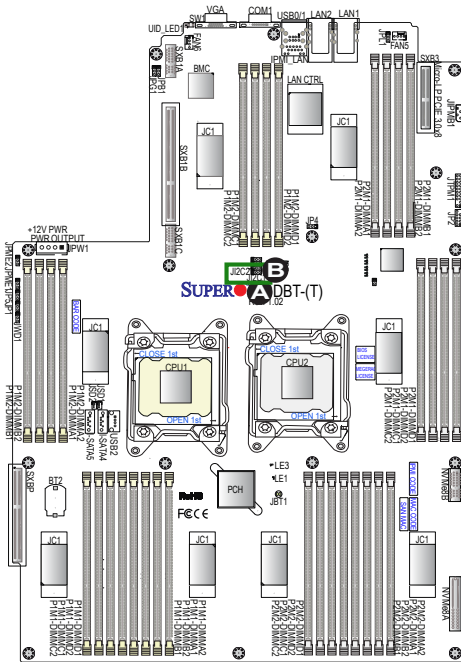
[B. BMC Enabled](#)

I²C Bus to PCI-Exp. Slots

Use Jumpers JI²C1 and JI²C2 to connect the System Management Bus (I²C) to PCI-Express slots to improve PCI performance. These two jumpers are to be set at the same time. The default setting is on pins 1-2 to disable the connection for normal operations. See the table on the right for jumper settings.

I ² C for PCI-E slots Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	Enabled

- A. JI²C1
- B. JI²C2



Manufacturer Mode Select

Close pin 2 and pin 3 of Jumper JPME2 to bypass SPI flash security and force the system to operate in the Manufacturer mode, which will allow the user to flash the system firmware from a host server for system setting modifications. 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

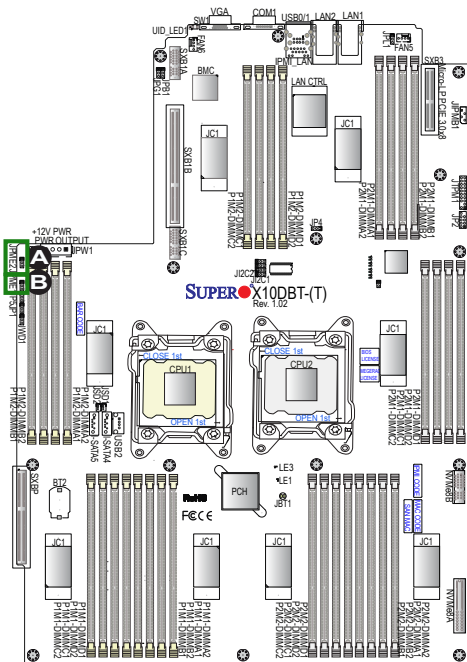
ME Recovery

JPME1 is used for ME Firmware Recovery mode, which will limit system resource for essential function use only without putting restrictions on power use. In the single operation mode, online upgrade will be available via Recovery mode. See the table on the right for pin definitions.

ME Recovery Jumper Settings	
Jumper Setting	Definition
Open	Normal (Default)
Closed	ME Recovery

A. JPME1

B. JPME2



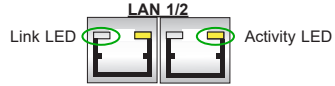
2-9 Onboard LED Indicators

LAN LEDs

The LAN ports are located on the IO Backplane on the motherboard. Each Ethernet LAN port has two LEDs. The yellow LED indicates activity. Link LED, located on the left side of the LAN port, may be green, amber or off indicating the speed of the connection. See the tables at right for more information.

IPMI Dedicated LAN LEDs

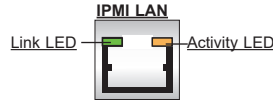
In addition to LAN 1/LAN 2, an IPMI-dedicated LAN is located on the I/O Backplane of the motherboard. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the tables at right for more information.



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

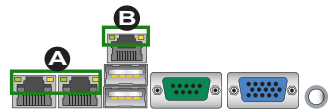
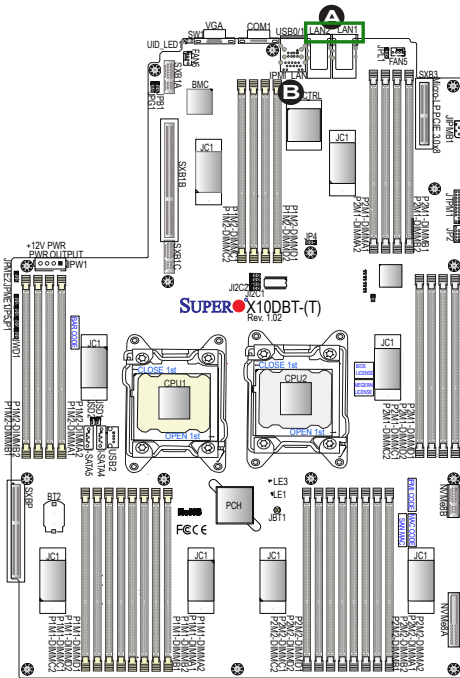
GLAN Activity Indicator (Left) LED Settings		
Color	Status	Definition
Yellow	Flashing	Active

LAN Link Indicator LED Settings	
LED Color	Definition
Off	No Connection, 10 or 100 Mbps
Green	10 Gbps (X10DBT-T Only)
Amber	1 Gbps



IPMI LAN Link LED (Left) & Activity LED (Right)		
	Color/State	Definition
Link (Left)	Green: Solid	100 Mbps
Activity (Right)	Amber: Blinking	Active

- A. LAN1/2 LEDs
- B. IPMI LAN LEDs



Onboard Power LED

An Onboard Power LED is located at LE1 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 tables at right for more information.

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

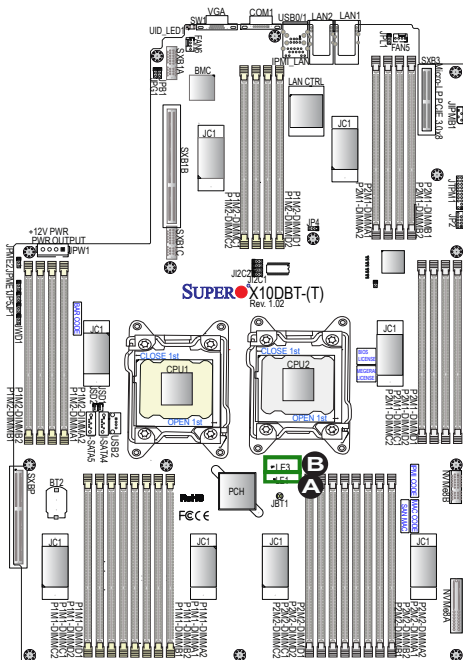
BMC Heartbeat LED

A BMC Heartbeat LED is located at LE3 on the motherboard. When LE3 is blinking, BMC functions normally. See the table at right for more information.

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



Note: Refer to Page 2-19 for information on the UID LED (UID_LED1).



A. PWR LED

B. BMC LED

2-10 SATA Connections

SATA 2.0/3.0 Ports

Ten SATA 2.0/3.0 connections supported by Intel PCH 602 are located on the motherboard. Two SATA 3.0 ports are located at I-SATA 4/5. Two SATA 3.0 connections and six SATA 2.0 connections are supported by SXB2 (SXBP), which is an SMC-proprietary PCI-E 3.0x8 slot for a storage add-on card with SATA support (Right). These SATA 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 3.0 (I-SATA 4/5) Pin Definitions	
Pin#	Signal
1	Ground
2	SATA_TXP
3	SATA_TXN
4	Ground
5	SATA_RXN
6	SATA_RXP
7	Ground

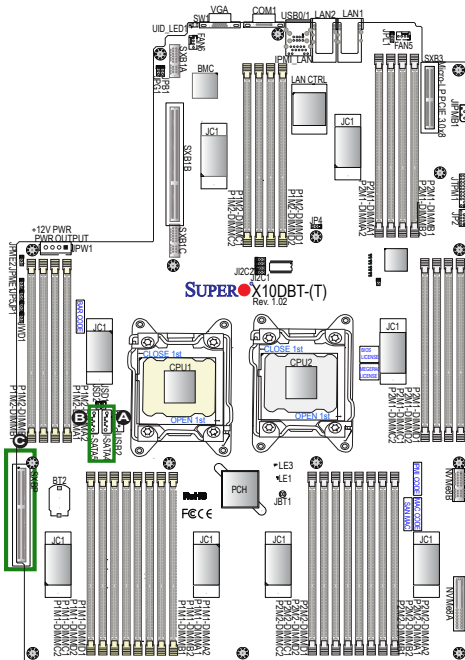


Note: For more information on SATA HostRAID configuration, please refer to the Intel SATA HostRAID User's Guide posted on our website @ <http://www.supermicro.com>.

A. I-SATA4

A. I-SATA5

C. SXB2 (SXBP) Slot (for storage add-on card with support of two SATA 3.0 & six SATA 2.0 connections)




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 no short circuits between the motherboard and the chassis.
2. Make sure that the ATX 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 (JB1). (Refer to Section 2-8 in Chapter 2.)
2. Remove all components from the motherboard, especially the DIMM modules. Make sure that system 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 1-7 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 type and speed for all DIMMs in the system.
3. Make sure that you are using the correct type of Registered (RDIMM)/Load Reduced (LRDIMM) DDR3 ECC 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

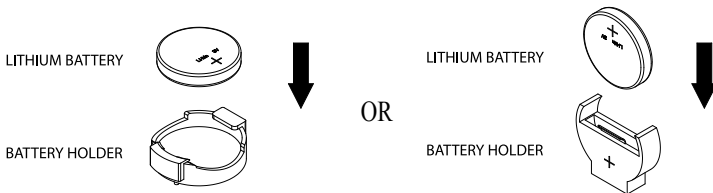
Battery Removal

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.



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 DDR3 of up to 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>).

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 X10DBT/X10DBT-T. It also provides the instructions on how to navigate the AMI BIOS setup utility screens. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated.

Starting BIOS Setup Utility


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

 **Note:** In most cases, the key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F3>, <F4>, etc.

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

 **Note:** The AMI BIOS has default informational messages built in. The manufacturer retains the option to include, omit, or change any of these informational 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 setup navigation. These keys include <F3>, <F4>, <Enter>, <ESC>, arrow keys, etc.

 **Note 1:** Options printed in **Bold** are default settings.

Note 2: <F3> is used to load optimal default settings. <F4> is used to save the settings and exit the setup utility.

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 <Delete> at the appropriate time during system boot.



Note: For AMI UEFI BIOS Recovery, please refer to the UEFI BIOS Recovery User Guide posted @ <http://www.supermicro.com/support/manuals/>.

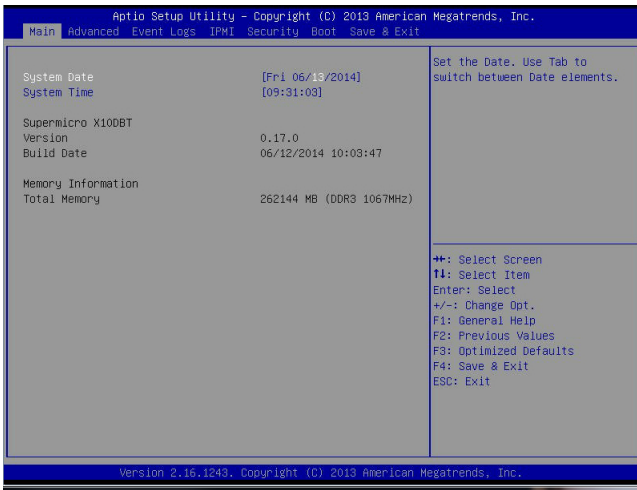
Starting the Setup Utility

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 the manufacturer be liable for direct, indirect, special, incidental, or consequential damage arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is being updated 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 AMI BIOS Main menu displays the following information:

System Date/System Time

Use this option to change the system date and time using the arrow keys. Enter new values through the keyboard and press <Enter>. Press the <Tab> key 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 X10DBT**Version**

This item displays the SMC version of the BIOS ROM used in this system.

Build Date

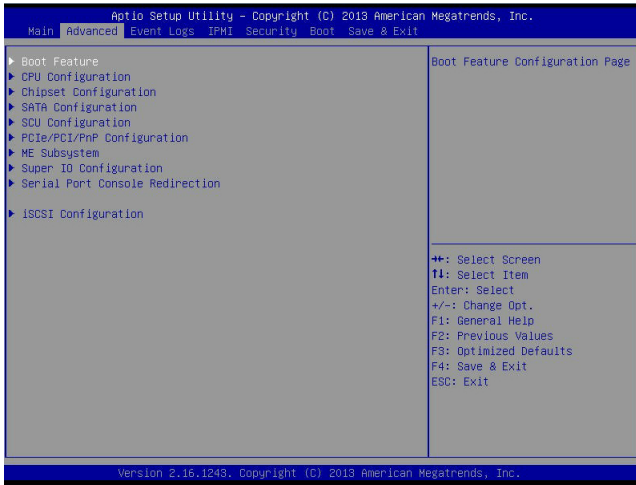
This item displays the date that the BIOS setup utility was built.

Memory Information**Total Memory**

This item displays the amount of memory that is available in the system.

4-3 Advanced Setup Configurations

Select the Advanced tab to access the following submenu items.



► Boot Features

Boot Configuration

Quiet Boot

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

CSM (Compatibility Support Module) Support

Select Enabled to enable CSM booting support to boot an UEFI-compatible device from a legacy BIOS-based system. 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 set by the system BIOS. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

Use this item 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 when an error occurs. The options are Disabled and **Enabled**.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Immediate, the BIOS ROM of the host adaptors will immediately capture Interrupt 19 at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Postponed, the BIOS ROM of the host adaptors will only capture Interrupt 19 during bootup from a legacy device. The options are **Immediate** and Postponed.

Re-try Boot

Select Legacy Boot for the BIOS to continuously attempt to boot from the legacy boot drive. Select EFI Boot for the BIOS to continuously attempt to boot from the EFI boot drive. The options are **Disabled**, Legacy Boot, and EFI Boot.

Power Configuration

Watch Dog Function

If enabled, the Watch Dog timer will allow the system to automatically reboot when a non-recoverable error that lasts for more than five minutes occurs. The options are Enabled and **Disabled**.

Power Button Function

If this feature is set to Instant Off, the system will power off immediately as soon as the user presses the power button. If this feature is set to 4 Seconds Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant Off** and 4 Seconds Override.

Restore on AC Power Loss

Use this item to set the power state after a power outage. Select Stay Off for the system power to remain off after a power outage. Select Power On to turn on the system power after a power outage. Select Last State to allow the system to resume its last power state before a power outage. 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 0/Processor 1

This submenu displays the following information of the CPU installed a CPU socket detected by the BIOS.

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

Clock Spread Spectrum

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

Hyper-Threading [All]

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

Performance/Watt

Select Power Optimized to enable Intel® Turbo Boost Technology support when the Power Performance State-P0 has lasted more than two seconds. The options are **Traditional** and Power Optimized.

Clear MCA (Available if supported by the OS & the CPU)

Select Yes to enable Machine-Check Architecture (MCA) support for CPU error logging. This feature is used in conjunction with the items below: "Execute Disable Bit," "VMS," "Enable SMX," and "Lock Chipset" for Virtualization media support. The default setting is **No**.

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

Select Enable to support Intel® Execute Disable Bit Technology, which will allow the processor to designate areas in the system memory where an application code can be executed and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. This feature is used in conjunction with the items: "Clear MCA," "VMX," "Enable SMX," and "Lock Chipset" for Virtualization media support. The default setting is **Enable**. (Refer to Intel and Microsoft websites for more information.)

Intel TXT (Trusted Execution Technology) Support

Select Enable to support Intel Trusted Execution Technology to verify the authenticity of a platform and its operating system (OS). This feature is used in conjunction with the items below: "Clear MCA," "Enable SMX," and "Lock Chipset" for Virtualization media support. The options are **Enable** and Disable.

VMX

Select Enable to support CPU-related Virtualization. This feature is used in conjunction with the items: "Clear MCA," "Enable SMX," and "Lock Chipset" for Virtualization media support. The options are **Enable** and Disable.

Enable SMX

Select Enable to support Safer Mode Extensions (SMX) which will enhance data security in the processor. This feature is used in conjunction with the items: "Clear MCA," "VMX," and "Lock Chipset" for Virtualization media support. The options are Enable and **Disable**.

Lock Chipset

Select Enable to lock chipset register tables and set the register tables to "read-only" to prevent new data being written into the processor to ensure system security. This feature is used in conjunction with the items: "Clear MCA," "VMX," and "Enable SMX" for Virtualization media support. The options are **Enable** and Disable.

BIST Selection

Select Enable to configure Built-In_Self_Test (BIST) settings, which will allow the system to perform BIST testing on the processors at bootup. The options are Enable and **Disable**.

Hardware Prefetcher (Available when supported by the CPU)

If this item is 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 web site for detailed information.

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

If this item is 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 for CPU performance enhancement. The options are Disable and **Enable**.

DCU IP Prefetcher

If this feature is 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.

DCU Mode

Use this feature to set the data-prefetching mode for the DCU (Data Cache Unit). The options are **32KB 8Way Without ECC** and 16KB 4Way With ECC.

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 **Enable** and Disable.

DCA Prefetch Delay

A DCA Prefetcher is used with a TOE (TCP/IP Offload Engine) adapter to prefetch data in order to shorten execution cycles and maximize data processing efficiency. Prefetching data too frequently can saturate the cache directory and delay necessary cache access. This feature reduces or increases the frequency the system prefetches data. The options are [8], [16], **[32]**, [40], [48], [56], [64], [72], [80], [88], [96], [104], [112], [120].

Extended APIC (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 to 16 bits to provide 512 APIDs to each thread to enhance CPU performance. The options are **Disable** and Enable.

AES-NI (New Encryption Standard-New Instructions)

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

Down Stream PECI (Platform Environment Control Interface)

Select Enable to allow the client server to interact with the host server directly to achieve better host-client communication in the PECI platform, which will result in power saving and energy use efficiency. The options are **Disable** and Enable.

SMM Save State (System Management Mode)

Select Enable for SMM (System Management Mode) Save state support which is used for advanced power management and other operating-system-independent functions. The options are Enable and **Disable**.

Cbox Pipe Serial Mode

Cbox is the caching agent that works as the external cache and system interface unit within the Intel 7500 (or newer) series processors. Select Pipe Serial Mode Enable to connect various serial ports used by different host/client virtual machines together (pipe) for processor-interconnect and system-interface communications. The options are **Pipe Serial Mode Enable** and Pipe Serial Mode Disable.

► Advanced Power Management Configuration**Advanced Power Management Configuration****Power Technology**

Select Energy Efficient to support power-saving mode, which might have an impact on system performance. Select Custom to customize system power settings. Select Max Performance to optimize system performance, which might increase power consumption. Select Disabled to disable power-saving settings. The options are Disabled, **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)

C2C3TT (C2-to-C3 Transaction Timer)

This feature sets the transaction timer from C2 to C3. Enter 0 for Auto, which will allow the BIOS to configure the transaction timer automatically. The Default setting is **0 (Auto)**.

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, and **C6 (Retention) state**.

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 the "Enhanced Halt State" feature, which will significantly reduce CPU power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disable and **Enable**.

► CPU T State Control

ACPI (Advanced Configuration Power Interface) T-States

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

► CPU Advanced PM (Power Management) Tuning

► Energy Perf (Performance) BIAS

Energy Performance Tuning

Select OS for the operating system to manage the settings of energy-performance tuning. Select BIOS for the BIOS to manage the settings of energy-performance tuning. The options are **OS** and BIOS.

Energy Performance Bias Setting

Use this feature to select an appropriate fan setting to achieve maximum system performance (with maximum cooling) or maximum energy efficiency with maximum power saving). The fan speeds are controlled by the firmware management via IPMI 2.0. The options are Performance, **Balanced Performance**, Balanced Power, and Power.

Workload Configuration

Use this feature to set the power management setting optimized for regular workload condition. The options are **Balanced** and I/O sensitive.

► Socket RAPL (Running Average Power Limit) Configuration

Turbo Pwr (Power) Limit Lock

Select Enable to set the power use limit for the machine when it is running in the turbo mode. The options are Enable and **Disable**.

Long Pwr (Power) Limit Ovr (Override)

Select Enable to support long-term power limit override. If this feature is set to Disabled, BIOS will set the default value. The options are Enable and **Disable**.

Short Pwr (Power) Limit En (Enable)

Select Enable to support Short Duration Power Limit (Power Limit 2). The options are Enable and **Disable**.

► Chipset Configuration

► North Bridge


This feature is used to configure Intel North Bridge settings.

► Integrated IO Configuration

EV DFX (Device Function On-Hide) Features

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**.

IIO Configuration

 **Note:** For /IIO1 Configuration/IIO2 Configuration/ IIO3 Configuration, please refer to Page 4-16.

IIO0 Configuration


PCI-E Completion Timeout

Select Enable for PCI-E Completion Timeout support for electric tuning. The options are **Enable** and **Disable**.

PCI-E Completion Timeout Value

Use this item to set the PCI-E Completion Time-out value for electric tuning. Enter a value between 260ms to 900ms.

► PCI Express Port 0 (DMI)

 **Note:** For PCI Express Port 1A/Port 1B/Port 2A/Port 2B/Port 2C/Port 2D/Port 3A/Port 3B/Port 3C/Port 3D, see the next section.

Use the items below to configure the PCI-E settings for a PCI-E port specified by the user.

The following items will display:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

Link Speed

Use this item to select the PCI-E link speed for the PCI-E port specified by the user. The options are GEN1 (2.5 GT/s), GEN2 (5 GT/s), and **Auto**.

Override Max Link Width

Use this feature to set the link speed for a selected PCI-E port to override the maximum link-width which was previously set by PCI-Bifurcation. The options are **Auto**, x1, x2, x4, x8, and x16.

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and **-3.5 dB**.

PCI-E ASPM Support

Select Enable to support the Active State Power Management (ASPM) level for a PCI-E port specified by the user. Select Disabled to disable ASPM support. The options are **Disable** and **L1 Only**.

Fatal Err (Error) Over

Select Enable to force the fatal error propagation to the IIO core-error-logic for the port specified by the user. The options are **Disable** and **Enable**.

Non-Fatal Err (Error) Over

Select Enable to force non-fatal error propagation to the IIO core-error-logic for the port specified by the user. The options are **Disable** and **Enable**.

Corr (Correctable) Err (Error) Over

Select Enable to force correctable error propagation to the IIO core-error-logic for the port specified by the user. The options are **Disable** and **Enable**.

L0s Support

When this item is set to Disable, IIO will never put its transmitter in the L0s state. The options are **Disable** and **Enable**.

► PCI Express Port 1A/Port 1B/Port 2A/Port 2B/Port 2C/ Port 2D/Port 3A/Port 3B/Port 3C/Port 3D

Use the items below to configure the PCI-E settings for a PCI-E port specified by the user.

The following items will display:

- PCI-E Port Link Status

- PCI-E Port Link Max
- PCI-E Port Link Speed

PCI-E Port

Select Enable to enable the PCI-E port specified by the user. The options are **Auto**, Enable, and Disable.

PCI-E Port Link

Select Disable to disable the link that is not involved in PCI training, but its CFG space is still active. The options are **Enable** and Disable.

Link Speed

Use this item to select the PCI-E link speed for the PCI-E port specified by the user. The options are GEN1 (2.5 GT/s), GEN2 (5 GT/s), and **Auto**.

Override Max Link Width

This item allows the user to set the link speed for a selected PCI-E port to override the maximum link-width which was previously set by PCI-Bifurcation. The options are **Auto**, x1, x2, x4, x8, and x16.

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and -3.5 dB.

PCI-E ASPM Support

Select Enable to support the Active State Power Management (ASPM) level for a PCI-E port specified by the user. Select Disabled to disable ASPM support. The options are **Disable** and L1 Only.

Fatal Err (Error) Over

Select Enable to force the fatal error propagation to the IIO core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Non-Fatal Err (Error) Over

Select Enable to force the non-fatal error propagation to the IIO core error logic for the port specified by the user. The options are **Disable** and Enable.

Corr (Correctable) Err (Error) Over

Select Enable to force the correctable error propagation to the IIO core-error-logic for the port specified by the user. The options are **Disable** and Enable.

L0s Support

When this item is set to Disable, IIO will never put its transmitter in the L0s state. The options are **Disable** and Enable.

PM ACPI Support

Select Enable to generate an _HPGPE message on a PM ACPI event. Select Disable to generate an MSI message. The options are **Disable** and Enable.

Gen3 (Generation 3) Eq (Equalization) Mode

Use this item to set PCI-E Gen3 Adaptive Equalization mode. The options are **Auto**, Enable Phase 0, 1, 2, 3; Disable Phase 0, 1, 2, 3; Enable Phase 1 Only, Enable Phase 0, 1 Only, and Advanced.

Gen3 (Generation 3) Spec (Specifics) Mode

Use this item to set the Specifics mode for PCI-E Gen3 device. The options are **Auto**, 0.70 July, 0.70 Sept and 071 Sept.

Gen3 (Generation 3) Phase2 Mode

Use this item to configure the Loop-count setting for PCI-E Gen3 Phase 2. The options are **Hardware Adaptive** and Manual.

Gen3 (Generation 3) DN TX Preset

Use this item to set the Preset mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0 /3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Gen3 (Generation 3) DN RX Preset Hint

Use this item to set the Preset Hint mode for PCI-E Gen3 downstream Resets (from the master device to a slave device). The options are **Auto**, P0 (-6.0 dB), P1 (-7.0 dB), P2 (-8.0 dB), P3 (-9.0 dB), P4 (-10.0 dB) P5 (-11.0 dB), and P6 (-12.0 dB).

Gen3 (Generation 3) Up TX Preset

Use this item to set the Preset mode for PCI-E Gen3 upstream transactions (from a slave device to the master device).The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0/3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Hide Port?

Select Yes to hide a selected PCI-E port from the OS. The options are **No** and Yes.

IIO1 Configuration/IIO2 Configuration/IIO3 Configuration

IOU0 (IIO PCIE Port 2)

This item configures the PCI-E port Bifurcation settings for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU1 (IIO PCIE Port 3)

This item configures the PCI-E port Bifurcation settings for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

PCI-E Completion Timeout

Select Enable to issue a "time-out" command when PCI-E electric tuning is completed. The options are **Enable** and Disable.

PCI-E Completion Timeout Value

Use this item to set the PCI-E Completion Time-out value. Enter a value between 260ms to 900ms.

No PCI-E Port Active EC0

This is a workaround setting when there is no active PCI-E port detected. The options are **PCU Squelch exit ignore option**, and Reset the SQ FLOP by CSR optio.

►PCI Express Port 0/Port 1A/Port 1B/Port 2A/Port 2B/Port 2C/Port 2D/Port 3A/Port 3B/Port 3C/Port 3D

Use the items below to configure the PCI-E settings for a PCI-E port specified by the user.

The following items will display:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

PCI-E Port

Select Enable to enable the PCI-E port specified by the user. The options are **Auto**, Enable, and Disable.

PCI-E Port Link

Select Disable to disable the link that is not involved in training activities, but its CFG is still active. The options are **Enable** and Disable.

Link Speed

Use this item to select the link speed for the PCI-E port specified by the user. The options are GEN1 (2.5 GT/s), GEN2 (5 GT/s), and **Auto**.

Override Max Link Width

Use this item to set the link speed for a selected PCI-E port to override the maximum link width that was set by PCI-bifurcation. The options are **Auto**, x1, x2, x4, x8, and x16.

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and **-3.5 dB**.

PCI-E ASPM Support

Select Enable to support the Active State Power Management (ASPM) level for a PCI-E port specified by the user. Select Disabled to disable ASPM support. The options are **Disable** and L1 Only.

Fatal Err (Error) Over

Select Enable to force the fatal error propagation to the IIO core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Non-Fatal Err (Error) Over

Select Enable to force the non-fatal error propagation to the IIO core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Corr (Correctable) Err (Error) Over

Select Enable to force the correctable error propagation to the IIO core-error-logic for the port specified by the user. The options are **Disable** and Enable.

L0s Support

When this item is set to Disable, IIO will never put its transmitter in the L0s state. The options are **Disable** and Enable.

PM ACPI Support

Select Enable to generate an _HPGPE message on a PM ACPI event. Select Disable to generate an MSI message. The options are **Disable** and Enable.

Gen3 (Generation 3) Eq (Equalization) Mode

Use this item to set the "Adaptive Equalization" mode for PCI-E Generation 3 devices. The options are **Auto**, Enable Phase 0, 1, 2, 3; Disable Phase 0, 1, 2, 3; Enable Phase 1 Only, Enable Phase 0, 1 Only, and Advanced.

Gen3 (Generation 3) Spec (Specifics) Mode

Use this item to set the Specifics mode for PCI-E Generation 3 devices. The options are **Auto**, 0.70 July, 0.70 Sept and 071 Sept.

Gen3 (Generation 3) Phase2 Mode

Use this item to set the PCI-E Generation 3 Phase 2 mode. The options are **Hardware Adaptive** and **Manual**.

Gen3 (Generation 3) DN TX Preset

Use this item to set the Preset mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0 /3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Gen3 (Generation 3) DN TX Preset Hint

Use this item to set the Preset Hint mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0 dB), P1 (-7.0 dB), P2 (-8.0 dB), P3 (-9.0 dB), P4 (-10.0 dB) P5 (-11.0 dB), and P6 (-12.0 dB).

Gen3 (Generation 3) Up TX Preset

Use this item to set the Preset mode for PCI-E Gen3 upstream transactions (from a slave device to the master device).The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0/3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Hide Port?

Select Yes to hide the PCI-E port specified from the OS. The options are **No** and **Yes**.

►Integrated IO Configuration

Enable I/OAT

Select Enable to enable Intel I/OAT (I/O Acceleration Technology), which significantly reduces 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**.

Disable TPH

Select Enable to de-activate TLP Processing Hint support. The options are **Disable** and Enable.

► IIO Generation Configuration

The following information will display:

TXT DPR memory setting

Use this item to set TXT DPR settings. The options are 1M DPR, **3M DPR**, 64M DPR, 128M DPR, and 255M DPR.

Unhide QPI PMU Counter

Select Enable to use the PCI-Express counters. Select Disable to hide the PCI-Express counters. The options are **Disable** and 255M Enable.

IIO0/IIO1/IIO2/IIO3**IIO IOAPCI**

Select Enable to support IIO IOAPIC (I/O Advanced Power Interface Configuration). The options are **Enable** and Disable.

► Intel VT for Directed I/O (VT-d)**Intel VT for Direct I/O (VT-d)****Isoc**

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

Intel® VT for Directed I/O (VT-d)

Select Enable to enable Intel Virtualization Technology support for Direct I/O VT-d 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.

VTD (VT-d) BARLock Enable

Select Enable to enable Bar-lock support for the devices used in Intel Virtualization Technology. The options are **Enable** and Disable.

Interrupt Remapping

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

Pass Through DMA

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.

ATS

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

Super Pages

Select Enable for VT-d Super-Pages support to improve system performance. The options are **Enable** and Disable.

Coherence Support

Select Enable for Non-IscoH VT-d Engine Coherence support to improve system performance. The options are **Disable** and Enable.

PCI Express Global Options

Gen3 (Generation 3) Phase3 Loop Count

Use this feature to set the Loop-Count value for PCI-E Gen3 Phase3 operations. The options are 1, 4, **16**, and 256.

Skip Halt On DMI Degradation

Select Enable to avoid the system being put on hold during DMI width/link degradation. The options are **Disable** and Enable.

Power Down Unused Ports

Select Enable to disable the PCI-E ports that are not active. The options are **Disable**, Enable, HSX Disable

► QPI (Quick Path Interconnect) Configuration

QPI Status

The following information will display:

- Number of CPU
- Number of IIO

- Link Speed
- Current QPI Link Frequency
- QPI Global MMIO Low Base/Limit
- QPI Global MMIO High Base/Limit
- QPI PCI-E Configuration Base/Siz (Size)

Link Speed Mode

Use this feature to select the data transfer speed for QPI Link connections. The options are **Fast** and Slow.

Link Frequency Select

Use this feature to select the desired frequency for QPI Link connections. The options are 6.4GB/s, 7.2GB/s, 8.0GB/s, **Auto**, and Use Per Link Setting.

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.

Legacy VGA Socket

Enter the VGA socket number (from 0-7) that will be used to support legacy VGA. The default setting is **0**.

MMIO P2P Disable

Select No to prevent MMIO (Memory-Mapped I/O) P2P (PCI-E device to PCI-E device) signals from crossing the CPU socket. The options are **No** and Yes.

PPIN Opt-in

Select Yes to use the Protected-Processor Inventory Number (PPIN) in the system. The options are **No** and Yes.

QPI Debut Print Level

Use this item to select the QPI Debug level that will be displayed in the monitor. The options are Fatal, Warning, Summary, Detail, and **All**.

Resource Auto Adjust

Select Enable for the PCI resource-requests for each CPU socket to be automatically adjusted on the need-base when the PCI resource allocator fails. The options are **Enable** and Disable.

► QPI Per Socket Configuration

► CPU 0/CPU 1

Bus Resource Allocation Ratio

Use this feature to set the bus resource-allocation ratio (from 0-8). The default setting is 1.

IO Resource Allocation Ratio

Use this feature to set the IO resource-allocation ratio (from 0-8). The default setting is 1.

MMIOL Resource Allocation Ratio

Use this feature to set the Memory-Mapped IO resource-allocation ratio (from 0-8). The default setting is 1.

IIO UniPhy Disable

Select Yes to hide the entire UNIFY in L2 cache. The options are **No**, Yes, and Yes w/Memory Hot Add.

► Memory Configuration

This section displays the following Integrated Memory Controller (IMC) information.

Promote Warnings

Select Enable to treat memory warnings as memory errors or memory faults for system-level debugging. The options are **Enable** and Disable.

DDR Speed

Use this feature to force a DDR3 memory module to run at a frequency other than what is specified in the specification. The options are **Auto**, 1067, 1333, 1600, 1867, and 2133.

DDR Voltage Level

Select Auto for the BIOS to set the voltage settings for all DDR3 memory modules. Select Force to 1.50V to force all DDR3 memory modules to operate at 1.50V. The options are **Auto** and Force to 1.50V.

Advanced Clk (Clock) Training

Select Enable to support Advanced Clock Training, which will allow the memory command line to be synchronized with the clock line to enhance memory performance. The options are Enable and **Disable**.

Perbit (Per-bit) Deskew Training

Select Enable to support Perbit Deskew Training, which will allow the memory controller to include various adjustable delay circuits in both Read and Write paths on a per-bit base for effective memory interface to maximize memory performance. The options are **Disable** and Enable.

ODT (On-Die Termination) Timing Mode

Use this feature to configure the timing mode setting for the ODT (On-Die Termination) where the termination resistor for impedance matching in transmission lines is located inside a chip instead of on a printed circuit board. The options are **Aggressive Timing** and Conservative Timing.

MxB Rank Sharing Mapping

Use this feature to select the address-mapping setting for memory-rank sharing to enhance extended multimedia platform performance. The options are **Maximum Performance** and Maximum Margin.

DIMM Vref. (Voltage Reference) Circuit

This feature allows the user to decide how to configure the voltage reference point (gate) for a DDR3 memory module. The options are Internal and **External**.

BIOS VMSE Reset

If this feature is set to Enable, BIOS settings pertaining to the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller will be reset to improve system performance. The options are Disable and **Enable**.

Save JCK Error Longs

Select Enable to save the JCK Error log at each system reset caused by system firmware. The options are Enable and **Disable**.

Phase Shedding

Select Enabled to enable Static Phase-Shedding support for DDR3 memory voltage regulators to improve memory performance. The options are **Auto**, Disabled and Enabled.

Multi-Threaded MRC (Memory Reference Code)

Select Enabled for the system to execute multi-threaded memory codes to improve memory performance. The options are **Auto**, Disabled and Enabled.

Rank Multiplication

Select Enabled to force the LRDIMM (Load-Reduced DIMM) memory modules to operate at the Rank-Multiplication mode for memory performance enhancement. The options are **Auto** and Enabled.

LRDIMM (Load-Reduction DIMM) Module Delay

When this item is set to Disabled, the MRC (Memory Regulator Controller) will not use SPD bytes 90-95 for module delay on LRDIMM memory. The options are **Disabled** and Auto.

Memory Type

Use this feature to select the memory type to be used in this system. The options are RDIMMs only, UDIMMs only, and **UDIMMs and RDIMMs**.

Skip MemTest (Memory Test) on Fast Boot

Select Enable to skip memory routine testing at bootup if this machine is set to Fast-boot mode. The options are Disable and **Enable**.

BDAT

Select Enabled for BDAT (Binary Data Advanced Technology) support to increase system performance. The options are **Disabled** and Enabled.

Data Scrambling

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

Scrambling Speed Low

Use this feature to set the data scrambling speed to low-32 bits. Enter a value between 0 and 32. The default setting is **0**.

Scrambling Speed High

Use this feature to set the data scrambling speed to high-32 bits. Enter a value between 0 and 32. The default setting is **0**.

Enable ADR

Select Enabled for ADR (Automatic Diagnostic Repository) support to enhance memory performance. The options are Enabled and **Disabled**.

VMSE Lockstep Mode

Select Enabled to support the VMSE Lockstep mode, which will support Lock step mode for the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller. The options are **2:1 Mode**.

NB Persistent Error

Select Enable to allow the system to properly handle the persistent errors occurred in the North Bridge. The options are Enable and **Disable**.

SB Persistent Error

Select Enable to allow the system to properly handle the persistent errors occurred in the South Bridge. The options are is **Enable** and Disable.

SB Error Threshold

Use this feature to set the threshold for South Bridge errors. When the number of South Bridge errors reaches beyond the threshold, the system will automatically take corrective actions. The default setting is **10**.

Link Failure Threshold

Use this feature to set the link failure threshold. When the number reaches beyond the threshold, the system will automatically take corrective actions. The default setting is **7**.

Refresh Options

Use this feature to set self-refresh mode The options are **Acc Self Refresh** and 2x Refresh.

HA (Hash Mode) Early Write Post Mode

Select Enable to support memory hash-method-comparison mode when the system is running at the early stage of POST (Power-On-Self-Test). The options are is **Enable** and Disable.

MC Channel Hash Mode

Select Enabled to support the hash-method-comparison mode for the memory controller to improve memory performance. The options are Enabled and **Disabled**.

Unused Memory Channel Input

Select Enabled to allow input from unused memory channels. The options are **Enabled** and Disabled.

Command 2 Data Tuning

Select Enabled to fine-tune electrical command paths from the host system to the memory-extension buffer (MXB). The options are **Enabled** and Disabled.

JordonCreek Power Management

Select Enabled to activate power management features embedded in the Jordon Creek chip for the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller. The options are **Enabled** and Disabled.

MRC Debug Level

Use this feature to set the debugging level for memory reference codes, which are used for memory multiple threads initialization. The options are **L0**, L1 and L2.

Halt on Memory Fatal Error

Select Enabled to put the system on hold when a memory fatal error occurs. The options are **Enabled** and Disabled.

Promote MEM (Memory) Train Err (Error)

Select Enabled to promote warnings when a memory training-error occurs. The options are Enabled and **Disabled**.

Promote MEM (Memory) RAS Warnings

Select Enabled to promote warnings pertaining to RAS (Reliability, Availability, Serviceability) issues. The options are Enabled and **Disabled**.

Memory Test

When this feature is set to Enabled, memory tests will be performed in the system. The options are Enabled and **Disabled**.

JCK (Jordon Creek) per DIMM Parity Error Enable

Select Enabled for the system to monitor and keep track of DIMM parity errors occurred on each DIMM module. The options are Enabled and **Disabled**.

DRAM RAPL (Running Average Power Limit) Mode

Use this feature to set the run-time power-limit mode for DRAM modules. The options are Disabled, **VR Measured** and Estimated.

Closed Loop Thermal Throttling

Select Enabled to support Closed-Loop Thermal Throttling which will improve reliability and reduces CPU power consumption via automatic voltage control while the CPU are in idle states. The options are Disabled and **Enabled**.

Memory Hot Sense Thermal Throttling

Select Enabled to activate thermal-throttling when the hot-sensor reaches the predefined threshold via automatic voltage control when the CPU is in idle states. The options are **Enabled** and Disabled.

Memory Hot Output Thermal Throttling

Select Enabled to provide thermal-throttling warnings when the hot-sensor reaches the predefine threshold via automatic voltage control when the CPU is in idle states. The options are **Enabled** and Disabled.

MC ODT Mode

This feature sets the ODT (On-Die Termination) mode for the memory controller. The options are **Auto**, 100 Ohms, and 50 Ohms.

MRC (Memory Reference Code) Promote Warnings

Select Enabled for the system to provide MRC warnings to improve memory performance. The options are **Enabled** and Disabled.

Num (Number) of Sparing Transac (Transaction)

Use this feature to set the number of memory sparing transactions that will allow data to be written from a failing component to another component to ensure data security. The options are **4**.

PSMI Support

Select Enabled for Power Supply Management Interface (PSMI) support. The options are Enabled and **Disabled**.

VMSE Clock Stop

Select Enabled to de-activate the clock driver for the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller. The options are **Enabled** and Disabled.

Safe MC (Micro Code) BGF (Buffer Generation First-in-First-Out) PSV

Select Enabled to use the Micro-Code Safe mode to allow the onboard power control mechanism to supply power to the memory buffer on the on-demand basis in an effort to save power consumption. The options are Enabled and **Disabled**.

►Memory Topology

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

- Node
- Channel
- DIMM Frequency

►Memory Thermal

Memory Power Savings Mode

Use this item to configure chipset-related memory power-saving features. The options are Auto, **Slow**, Fast, Disabled, and User Defined.

►Memory Power Savings Advanced Options

IBT (Intel Burn Test) Off

Select Enabled to turn off Intel Burn-in memory tests. The options are Disabled, **Auto**, and Enabled.

CK in SR

This feature is used to configure PCH behaviors while in self-refreshing cycles. The options are Auto, **Driven**, Tri-State, Pulled Low, and Pulled High.

MDLL Off

Select Enable to shut down MDLL (Multiple Delay-Locked Loop) operations while system memory is synchronizing resources for power-saving. The options are **Auto**, Disabled, and Enabled.

►Extreme Memory Profile

XMP Profile Support

Select Enabled for Extreme Memory support. The options are **Disabled**, Profile 1, and Profile 2.

XMP Profile

Use this item to select which type of Extreme Profile to use. The options are **Disabled** and Manual.

Memory Frequency

Use this item to set the frequency of system memory. The options are **Auto**, 1067 (MHz), 1333 (MHz), 1600 (MHz), 1867 (MHz), 2133 (MHz), and 2400 (MHz).

► Memory RAS (Reliability_Availability_Serviceability) Configuration

Use this submenu to configure the following Memory RAS settings.

Memory RAS Configuration Setup

Socket 0 Branch 0/Socket 0 Branch1/Socket 1 Branch 0/Socket 1 Branch1

Select Enable to enable the memory module installed on the socket specified by the user. The default setting is **Enable** and Disable.

Migration Spare

Use this feature to set the bit-mask of the riser card that is designated as a spare riser. The default setting is **0**.

Current Memory Speed

This item displays the current memory speed.

Mirroring

This item indicates if memory mirroring is supported by the motherboard. Memory mirroring creates a duplicate copy of the data stored in the memory to enhance data security.

Sparing

This item indicates if memory sparing is supported by the motherboard. Memory sparing enhances system performance.

Memory Rank Sparing

This item indicates if memory rank sparing is supported by the motherboard. Memory rank sparing enhances system performance.

Spare Error/Memory Correctable Thr (Threshold)

Use this feature to set the correctable error threshold for spare memory modules. The default setting is **10**.

Leaky Bucket Low Bit

Use this feature to set the Low Bit value for the Leaky Bucket algorithm which is used to check the data transmissions between CPU sockets and the memory controller. The default setting is **40**.

Leaky Bucket High Bit

Use this feature to set the High Bit value for the Leaky Bucket algorithm which is used to check the data transmissions between CPU sockets and the memory controller. The default setting is **41**.

Publish SRAT (Static Resource Affinity Table)

Select Enable for the BIOS to report the ACPI SRAT table to the OS in order to enhance CPU and memory performance when the NUMA (Non-Uniformed Memory Access) is optimized. The options are **Enable** and **Disable**.

Memory Interleaving

Use this feature to set the DIMM memory interleaving mood. The options are NUMA (1-way) Node Interleave, 2-way Node Interleave, 4-way Interleave, 8 Way Interleaving, Inter-socket, and **Auto**.

Socket Interleave Below 4GB

Select Enabled for the memory above the 4G Address space to be split between two sockets. The options are **Enable** and **Disable**.

Channel Interleaving

Use this feature to set the DIMM channel interleaving mood. The options are **Auto**, 1-Way Interleave, 2-Way Interleave, 3-Way Interleave, and 4-Way Interleave.

Rank Interleaving

Use this feature to select a rank memory interleaving method. The options are **Auto**, 1-Way, 2-Way, 4-Way, and 8-Way.

DRAM Maintenance

Select Auto for the BIOS to automatically configure DRAM Refreshing and Patrol settings. The options are **Manual** and **Auto**.

pTRR (Pseudo Target Row Refresh) Support

Select Enabled for Pseudo TRR support which will allow the BIOS to assign an invalid address to a questionable memory module to prevent this memory module from being accessed by other components. The options are **Enabled** and **Disabled**.

Injection Probability

AMEI (Asynchronous MCA Error Injection) (AMEI) is a error-handling mechanism that allows the BIOS to report the MCA errors to the CPU core or the CPU before resuming normal operations. This item is used to set the threshold of the AMEI events beyond which the BIOS will report the error events before resuming operations. The options are 512, 1024, 1365, 1638, 1820, 1928, 2048, 2731, 3277, 3641, **4096**, 5461, 6554, 8192, 10923, 16384, 32768.

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.

Memory Power Management

Select Enabled for memory power management support. The options are **Disabled** and Enabled.

Memory Rank Mask

Select Enabled to support memory rank in the memory controller. The options are **Disabled** and Enabled.

A7 Mode

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

DDDC Support

Select Enabled to enable Double-Device Data Correction (DDDC) support for the error-correction codes to correct memory errors caused by two failed DRAM devices. The options are **Disable** and Enable.

DDDC Wirekill (Wire-Kill)

Select Enabled for Double-Device Data Correction (DDDC) Wire-kill support which will disable the wire connection between two DRAM devices when they fail. The options are **Disable** and Enable.

DDDC Wirekill (Wire-Kill) Threshold

Use this feature to set the DDDC Wirekill threshold. When the memory errors reach the threshold, wire-connections between the failed DRAM modules will be disconnected. The default setting is **2**.

Apply Memory RAS (Reliability-Availability-Serviceability Policy Globally

When this item is set to Enabled, the configuration settings for memory sparing, Mirroring, DDDC, Device-Tagging will be applied to all nodes in the system. The options are **Disable** and Enable.

Apply Memory RAS Policy Globally

Select Enable to apply Memory RAS policy to all related components and systems. The options are **Disable** and Enable.

Memory Mirroring

Select Enable to enable memory-mirroring support which will create a duplicate copy of the data stored in the memory to enhance data security. The options are **Disable** and Enable.

► South Bridge

This feature is used to configure Intel South Bridge settings.

► USB Configuration

The following USB items will display.

- USB Module Version
- USB Devices

Legacy USB Support (Available when USB Functions is not Disabled)

Select Enabled to support legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disabled to have USB devices available for EFI (Extensive Firmware Interface) applications only. The settings are Disabled, **Enabled** and Auto.

USB 3.0 Support

Select Enabled for USB 3.0 support. The options are Disabled and **Enabled**.

XHCI Hand-Off

This feature 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 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**.

USB Mass Storage Driver Support

Select Enabled to use USB mass storage devices. The options are Disabled and **Enabled**.

Port 60/64 Emulation

Select Enabled for I/O port 60h/64h emulation support which will provide complete USB keyboard legacy support for the operating system that does not support Legacy USB devices. The options are Disabled and **Enabled**.

USB Hardware Delays and Time-outs**USB Transfer Time-out**

Use this feature sets the USB Transfer Time-out values for control, bulk, and interrupt transfers. The default setting is **20 sec (seconds)**.

Device Reset Time-out

Select Auto for the BIOS to automatically configure the delay maximum time setting before a USB device properly reports itself to the system. The options are **Auto** and Manual.

Device Power-up Delay

Use this feature sets the maximum time-out value for initialization of USB mass storage devices. The options are **Auto** and Manual.

Mass Storage Devices:**Aten Virtual CDROM YS0J**

Use this feature select the emulation type for the mass storage device. The options are **Auto**, Floppy, Forced FDD, Hard Disk, and CD-ROM.

►SATA Configuration

When this submenu is selected, the 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 in a low power mode during extended periods of I/O inactivity, and will return the link to an active state when I/O activity resumes. 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

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 Hot Plug

This feature designates the port specified for hot plugging. Set this item to Enabled for hot-plugging support, which will allow the user to replace a SATA disk drive without shutting down the system. The options are **Enabled** and Disabled.

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 not installed or not present.

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 in a low power mode during extended periods of I/O inactivity, and will return the link to an active state when I/O activity resumes. 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.

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 Hot Plug

This feature designates this port for hot plugging. Set this item to Enabled for hot-plugging support, which will allow the user to replace a SATA drive without shutting down the system. The options are Enabled and **Disabled**.

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.

► SCU (Storage Control Unit) Configuration

Storage Controller Unit

Select Enabled to enable PCH SCU storage devices. The options are Disable and **Enable**.

Onchip SCU Option ROM

Select Disabled to boot the system from a SAS device. Select EFI to boot the system from an EFI device. Select Legacy to boot the system from a Legacy SCU device. The options are Disable, EFI, and **Legacy**.

Boot from SCU or SATA RAID

Use this feature to select device from which the system will boot. The options are Boot from SCU, **Boot from SATA RAID**, Do not boot from SATA or SCU drives, and No Legacy RAM Space Restrictions.

The AMI BIOS will display the status of an SCU port as detected:

- SCU Port 0
- SCU Port 1
- SCU Port 2
- SCU Port 3

► PCIe/PCI/PnP Configuration

PCI Latency Timer

Use this feature to set the latency timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are **32**, 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.

PERR# Generation

Select Enabled to allow a PCI/PCI-E device to generate a PCI/PCI-E Parity-Error (PERR) number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

SERR# Generation

Select Enabled to allow a PCI/PCI-E device to generate a System-Error (SERR) number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

PCI AER (Advanced Error-Reporting) Support

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

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**.

42-bit Address AOC

Select Enabled to enable 42-bit Address Add-On card for Nvidia Tesla support. The options are Enabled and **Disabled**.

SR-IOV Support (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 to allow 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.

PCI AER (Advanced Error-Reporting) Support

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

Maximum Read Request

Select Auto to allow the system BIOS to automatically set the maximum Read Request size 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

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Force L0s to force all PCI-E links to operate at L0s state. Select Auto to allow the system BIOS to automatically set the ASPM level for the system. Select Disabled to disable ASPM support. The options are **Disabled**, Force L0s, and Auto.

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

PCI Devices Option ROM Setting

Slot1 x16 thru (through) SXB1 OPROM/Slot2 x16 thru (through) SXB1 OPROM/Slot SXB2 x8 thru (through) BPN-ADP-8SATA3-1 OPROM/Slot SXB3 x8 OPROM

Use this feature to select the type of device installed on a slot specified by the user for the system to boot from. The options are EFI, **Legacy** and Disabled.

NVME thru (through) BPN-ADP-8SATA3-1 OPROM

Use this feature to select the type of NVME (Non-Volatile Memory Express) device installed on the slot specified above for the system to boot from. The options are **EFI**, Legacy and Disabled.

Onboard Video OPROM

This feature controls how the system executes UEFI (Unified Extensible Firmware Interface), and legacy Option ROM. Select Legacy Only to boot the system using a legacy video device. The options are Do not launch, UEFI Only and **Legacy Only**.

VGA Priority

This feature allows the user to select the graphics adapter to be used as the primary boot device. The options are **Onboard** and Offboard.

Onboard LAN Option ROM Type

Use this item to select the device type for onboard LAN Option ROM for system boot. The options are EFI and **Legacy**.

Onboard LAN 1 OpROM/Onboard LAN 2 OpROM

Select iSCSI to use the iSCSI Option ROM to boot the computer using a iSCSI network device. Select PXE (Preboot Execution Environment) to use an PXE Option ROM to boot the computer using a PXE network device. The default option for Onboard LAN 1 is **PXE and for Onboard LAN 2 is Disabled**.

►ME (Management Engine) Subsystem

This feature displays the following ME Subsystem Configuration settings.

General ME Configuration

- Operational Firmware Version
- Recovery Firmware Version
- ME Firmware Features

- ME Firmware Status #1
- ME Firmware Status #2
- Current State
- Error Code

► Super IO Configuration

Super IO Chip: This item displays the Super IO chip used in the motherboard.

► Serial Port 1 Configuration

Serial Port

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

Device Settings

This item displays the settings of Serial Port 1 (COM).

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 (COM). Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, IO=3F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2E8h; IRQ=IRQ=3, 4, 5, 6, 7, 10, 11, 12.

Device Mode

Use this feature to select the desired mode for a serial port specified. The options are **24MHz/13** and 24MHz.

► Serial Port 2 Configuration

Serial Port

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

Device Settings

This item displays the settings of Serial Port 2.

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 2 (SOL). Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, O=2F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2E8h; IRQ=IRQ=3, 4, 5, 6, 7, 10, 11, 12.

Device Mode

Use this feature to select the desired mode for a serial port specified. The options are **24MHz/13** and 24MHz.

Serial Port 2 Attribute

Use this feature to select the attribute for this serial port. The options are **SOL** (Serial Over LAN), and COM.

► Serial Port Console Redirection

COM 1 Console Redirection

This submenu allows the user to configure the following Console Redirection settings for this port.

Console Redirection

Select Enabled for Console Redirection support. The options are Enabled and **Disabled**.

COM2/SOL Console Redirection

This submenu allows the user to configure the following Console Redirection settings for the SOL Port specified by the user.

Console Redirection

Select Enabled to use the SOL Port for Console Redirection. The options are **Enabled** and Disabled.

► Console Redirection Settings

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

Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to

add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are **ANSI**, VT100, VT100+, and VT-UTF8.

Bits Per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

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

Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

Redirection After BIOS Post

Use this feature to enable or disable legacy console redirection after BIOS POST. When set to Bootloader, legacy console redirection is disabled before booting the OS. When set to Always Enable, legacy console redirection remains enabled when booting the OS. The options are **Always Enable** and Bootloader.

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

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

Console Redirection (for EMS)

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

► Console Redirection Settings (for EMS)

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

Out-of-Band Management Port

The feature selects a serial port used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote server. The options are **COM1 Console Redirection** and COM2/SOL Console Redirection.

Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII

character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, VT100+, and **VT-UTF8**.

Bits Per Second

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

Flow Control

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

The setting for each these features is displayed:

Data Bits, Parity, Stop Bits

► Trusted Computing (Available when a TPM device is detected by the BIOS)

Configuration

Security Device Support

Select Enabled on this item and enable the TPM jumper on the motherboard to enable onboard security devices to improve data integrity and network security. The options are **Enabled** and Disabled.

TPM (Trusted-Platform Module) State

Select Enabled to enable TPM security settings to improve data integrity and network security. The options are Disabled and **Enabled**.

Pending Operation

Use this item to schedule an operation for the security device. The options are **None**, Enable Take Ownership, Disable Take Ownership, and TPM Clear.



Note: The computer will reboot in order to execute the pending commands and change the state of the security device.

Current Status Information: This item displays the information regarding the current TPM status.

TPM Enable Status

This item displays the status of TPM Support to indicate if TPM is currently enabled or disabled.

TPM Active Status

This item displays the status of TPM Support to indicate if TPM is currently active or deactivated.

TPM Owner Status

This item displays the status of TPM Ownership.

► iSCSI Configuration

This item displays iSCSI configuration information:

iSCSI Initiator Name

This item displays the name of the iSCSI Initiator, which is a unique name used in the world. The name must use IQN format. The following actions can also be performed:

► Add an Attempt

► Delete Attempts

► Change Attempt Order

4-4 Event Logs

Select the Event Logs tab to access the following submenu items.



► Change SMBIOS Event Log Settings

This feature allows the user to configure SMBIOS Event settings.

Runtime Error Logging Support

Select Enabled to enable runtime error logging upon system boot. The options are **Auto**, Enabled, and Disabled.

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.

Erasing Settings

Erase Event Log

Select Enabled to erase the SMBIOS (System Management BIOS) event log, which is completed before a event logging is initialized upon system reboot. The options are **No**, Yes, Next reset, and Yes, Every reset.

When Log is Full

Select Erase Immediately to immediately erase SMBIOS error event logs that exceed the limit when the SMBIOS 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 from 1 to 255. The default setting is 1.

METW (Multiple Event Count Time Window)

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

Custom Options

Log OEM Codes

Select Enabled to log the OEM's EFI Status codes that is not in Legacy format. The options are **Enabled** and Disabled.

Convert OEM Codes

Select Enabled to convert the OEM's EFI Status codes to standard SMBIOS-compatible codes. The options are **Enabled** and Disabled.



Note: Please reboot your system for your 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 IPMI

Select the IPMI (Intelligent Platform Management Interface) tab to access the following submenu items.



These items indicate your system IPMI firmware revision number and status.

- IPMI Firmware Revision
- IPMI Status

► BMC Network Configuration

Update IPMI LAN Configuration

Select Yes for the AMI BIOS to configure the following IPMI LAN settings. The options are **No** and Yes. If the option is set to Yes, the following items will be available for the user to configure IPMI network settings:

Configuration Address Source (Available when the item above is set to Yes)

This feature allows the user to select the source of the IP address for this computer. If Static is selected, you will need to know the IP address of this computer and enter it to the system manually in the field. If DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that is attached to and request the next available IP address for this computer. The options are **DHCP**, Unspecified, and Static.

The following items are assigned IP addresses automatically if DHCP is selected, or can be configured manually if Static is selected.

Station IP Address (Available when the item above is set to Yes)

This item displays the Station IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

Subnet Mask (Available when the item above is set to Yes)

This item displays the sub-network that this computer belongs to. The value of each three-digit number separated by dots should not exceed 255.

Station MAC Address (Available when the item above is set to Yes)

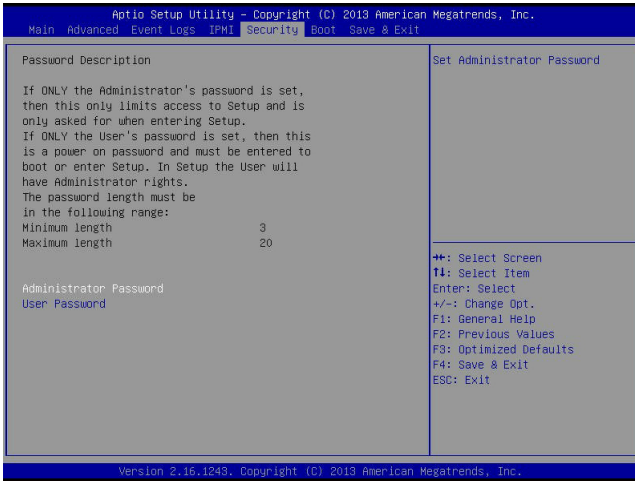
This item displays the Station MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

Router IP Address (Available when the item above is set to Yes)

This item displays the Router IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

4-6 Security

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



Administrator Password

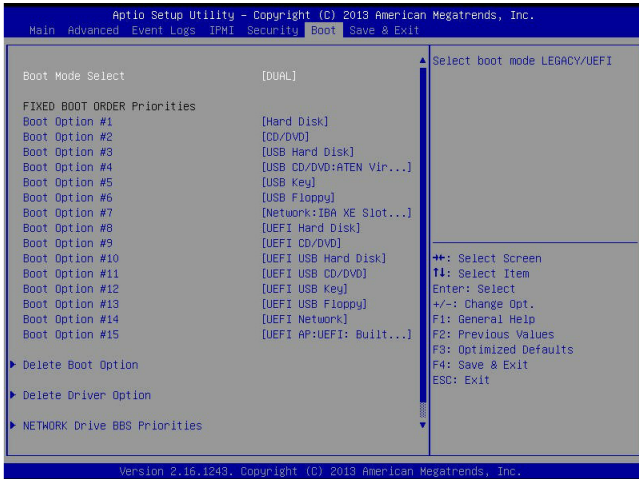
Use this item to set the administrator password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

User Password

Use this item to set a user password which is required to log into the system and to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

4-7 Boot

This submenu allows the user to configure the following boot settings for the system.



Boot Mood Select

Use this item to configure boot mood select settings for the machine. The options are Legacy, UEFI, and **Dual**.

Fixed Boot Order Priorities

This option prioritizes the order of bootable devices that the system to boot from. Press [ENTER] on each entry from top to bottom to select devices.

- Boot Order #1 through #15

▶Delete Boot Option

Use this item to select a boot device to delete from the boot priority list.

Delete Boot Option

Select the target boot device to delete.

▶Delete Driver Option

Use this item to select a driver to delete from the boot priority list.

Delete Driver Option

Select the target driver to delete.

▶ Hard Disk Drive BBS Priorities (Available when a device is installed in this drive)

This item sets the boot sequence of available hard disk drives.

- Boot Order #1

▶ CD/DVD ROM Drive BBS Priorities (Available when a device is installed in this drive)

- Boot Order #1

▶ USB Hard Disk Drive BBS Priorities (Available when a device is installed in this drive)

- Boot Order #1

▶ Network Drive BBS Priorities (Available when a device is installed in this drive)

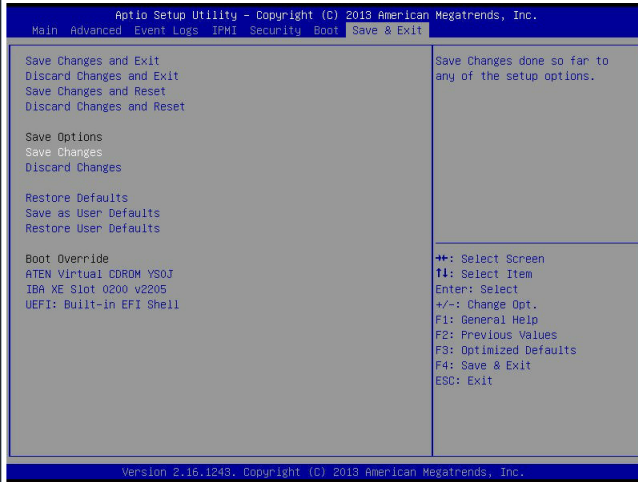
- Boot Order #1

▶ UEFI Application Boot Priorities (Available when a device is installed in this drive)

- Boot Order #1

4-8 Save & Exit

This submenu allows the user to configure the Save and Exit settings for the system.



Save Changes and Exit

When completing the system configuration changes, select this option to save the changes and exit from the BIOS setup utility. When a dialog box appears, asking you if you want to save configuration and exit, select **Yes** to save the changes and exit from the BIOS setup utility.

Discard Changes and Exit

Select this option to quit the BIOS setup without making any changes to the system configuration. Select Discard Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select **Yes** to quit BIOS without saving the changes.

Save Changes and Reset

When completing the system configuration changes, select this option to save the changes and reboot the computer so that the new system configuration settings can take effect.

Discard Changes and Reset

When completing the system configuration changes, select this option to discard the changes made the user and reboot the computer so that the new system configuration settings can take effect.

Save Options

Save Changes

Select this option and press <Enter> to save all changes you've made so far and return to the AMI BIOS utility. When the dialog box appears, asking you if you want to save configuration, select **Yes** to save the changes, or select No to return to the BIOS without making changes.

Discard Changes

Select this feature and press <Enter> to discard all the changes and return to the BIOS setup. When the dialog box appears, asking you if you want to load previous values, select **Yes** to load the values previous saved, or select No to keep the changes you've made so far.

Restore Defaults

Select this feature and press <Enter> to load the optimized default settings that help optimize system performance. When the dialog box appears, asking you if you want to load the factory defaults, select **Yes** to load the optimized default settings, or select No to abandon optimized defaults.

Save as User Defaults

Select this feature and press <Enter> to save the current settings as the user's defaults. When the dialog box appears, asking you if you want to save values as user's defaults, select **Yes** to save the current values as user's default settings, or select No to keep the defaults previously saved as the user's defaults.

Restore User Defaults

Select this feature and press <Enter> to load the user's defaults previously saved in the system. When the dialog box appears, asking you if you want to restore user's defaults, select **Yes** to restore the user's defaults previously saved in the system, or select No to abandon the user's defaults that were previously saved.

Boot Override

This feature allows the user to override the Boot Option Priority sequence set in the Boot menu, and boot the system with one of the listed devices instead. This is a one-time override.

Notes

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

X9 Motherboard 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, IPMI KVM or SOL. Con-Out includes Video Controller, PCI or Serial Console Redirection, IPMI SOL.
1 beep per device	Refresh	1 beep or each USB device detected
X9 IPMI Error Codes		
1 Continuous Beep	System OH	System Overheat

Notes

Appendix B

Software Installation Instructions

B-1 Installing Software Programs

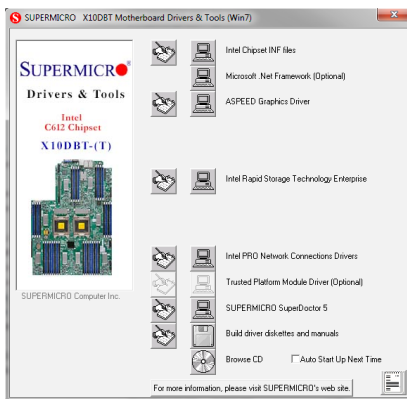
The Supermicro website that contains drivers and utilities for your system is located at <http://www.supermicro.com/wftp>. Some of these must be installed, such as the chipset driver.

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



Driver/Tool Installation Display Screen

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

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.



Note: The SuperDoctor 5 program and User's Manual can be downloaded from the Supermicro web site at http://www.supermicro.com/products/info/sms_sd5.cfm. For Linux, we recommend that you use the SuperDoctor II application instead.

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 (-the Main BIOS Block)

A UEFI BIOS flash chip consists of a recovery BIOS block, comprised of two boot blocks and 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. However, when the BIOS boot block crashes, you will need to follow the procedures in Appendix D.

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.

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.

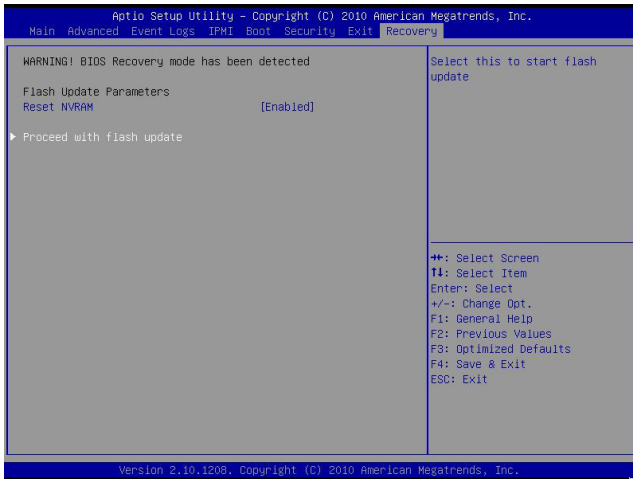


Note: If you cannot locate the "Super.ROM" file in your driver disk, visit our website at www.supermicro.com to download the BIOS image into a USB flash device and rename it "Super ROM" for BIOS recovery use.

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 you 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.



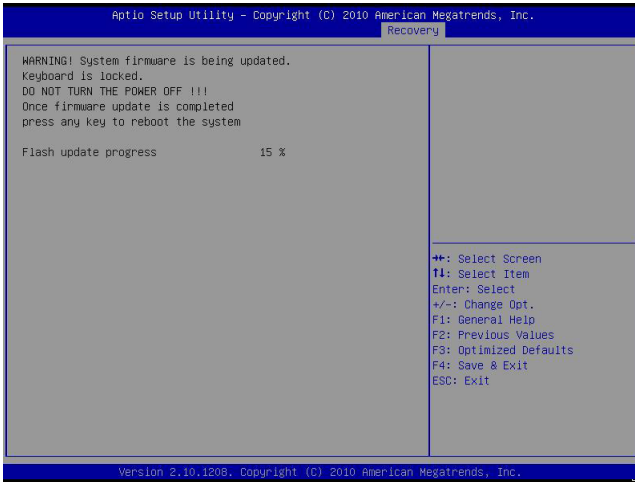
Note: At this point, you may decide if you want to start with BIOS Recovery. If you decide to proceed with BIOS Recovery, follow the procedures below.



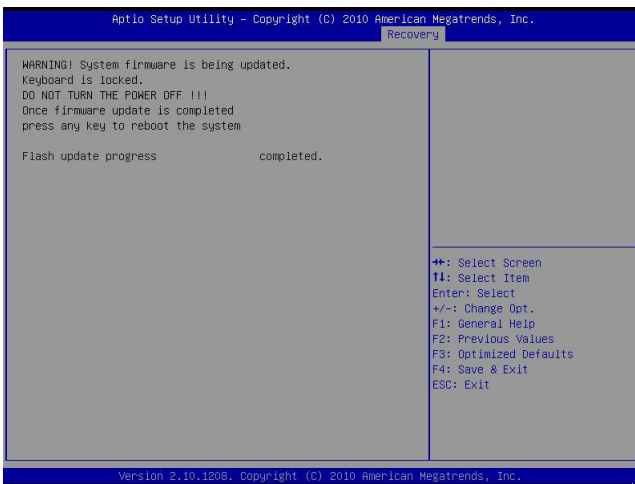
5. When the screen as shown above displays, using the arrow key, select the item- "Proceed with flash update" and press the <Enter> key. You will see the progress of BIOS Recovery as shown in the screen below.




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



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



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