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

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

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

Manual Revision 1.0b
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About this Manual

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

Please refer to the server specifications page on our Web site for updates on supported memory, processors and operating systems (http://www.supermicro.com).

This manual may be periodically updated without notice. Please check the Supermicro Web site for possible updates to the manual revision level.

Warnings

Special attention should be given to the following symbols used in this manual.

**Warning!** Indicates important information given to prevent equipment/property damage or personal injury.

**Warning!** Indicates high voltage may be encountered when performing a procedure.
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Chapter 1

Introduction

The Supermicro SuperServer 5028D-TN4T, based on the Intel Xeon processor D-1541 (8-Core) System-on-Chip, is well-suited for a network security appliance, a high performance NAS server, with a space-efficient, compact design. Applications include cloud and virtualization, corporate-WINS, DNS, and business critical applications.

1-1 Overview

The 5028D-TN4T is a compact, low-power server comprised of two main subsystems: the SC721TQ-250B mini-tower chassis and the X10SDV-TLN4F single processor motherboard. Refer to the Supermicro web site for operating systems that have been certified (www.supermicro.com).

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

- One SAS/SATA backplane (CSE-SAS-733TQ-O-P)
- Cooling: One 12-cm fan (FAN-0124L4)

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

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

For support, email support@supermicro.com.
1-2 Motherboard Features

The SuperServer 5028D-TN4T is built around the X10SDV-TLN4F, a single processor motherboard designed to provide maximum performance. Below are the main features. (see Figure 1-1 for a block diagram)

Processors
The motherboard supports a single Intel Xeon D SoC D-1541 eight Core 45W embedded processor. (SoC = System on a Chip)

Memory
The motherboard has four DDR4 DIMM slots that can support up to 128 GB of RDIMM or 64GB UDIMM memory. It supports 2133 MHz memory modules.

Serial ATA
The motherboard supports up to six SATA3 (6Gbps) hard drives or SSDs.

Input/Output Ports
The system features two GbE and two 10G Base-T LAN ports, a dedicated IPMI LAN port, two USB 3.0 ports (rear panel) and two 2x USB 2.0 ports (front panel), and a VGA port.
Figure 1-1. System Block Diagram

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

The SuperServer 5028D-TN4T is built on the SC721TQ-250B, a compact mini-tower chassis. It has a hinged front cover that hides the storage drives and control panel. The following is a general outline of the main features.

System Power
The system has a single 250W Flex ATX Multi-output AC-DC power supply (part number PWS-251-1H). It has Bronze level certification from 80 Plus.

Drives
The chassis supports up to four 3.5" hot-swap SAS/SATA drives and two 2.5" fixed internal drives. The internal drives are not hot-swappable. The four hot-swap drives are supported by a SATA/SAS backplane. It also supports one slim DVD drive.

PCI Slots
The chassis includes a slot for one low-profile PCI-E expansion card.

Control Panel
The control panel provides system monitoring and power control. LEDs indicate power on, network activity, hard disk drive activity and system overheat. The control panel also includes a main power button and a reset button.

Cooling System
The chassis has one 12-cm rear exhaust fan.
1-4 Contacting Supermicro

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Email: support@supermicro.com.tw
Website: www.supermicro.com.tw
2-1 Overview

The chassis includes a control panel on the front that includes power buttons and status monitoring lights.

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

The chassis includes two push-buttons that control power to the system.

**Power**

The main power switch applies or removes primary power from the power supply to the server but maintains standby power. To perform most maintenance tasks, unplug the system to remove all power.

**Reset**

The reset button is used to reboot the system.

2-3 Control Panel LEDs

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

**Power**

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

**HDD**

Indicates activity on the hard disk drive when flashing.
**NIC**

Indicates network activity when flashing.

---

**Information LED**

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

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

---

**Overheating**

There are several possible responses if the system overheats.

**Overheat Temperature Setting**

Some backplanes allow the overheat temperature to be set at 45, 50, or 55 degrees by changing a jumper setting. For more information, consult the backplane user manual on the Supermicro website.

**Responses**

1. Use the LEDs to determine the nature of the overheating condition.

2. Confirm that the chassis covers are installed properly.

3. Check the routing of the cables and make sure all fans are present and operating normally.

4. Verify that the heatsinks are installed properly.
Chapter 3

Standardized Warning Statements for AC Systems

About Standardized Warning Statements

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

Read this chapter in its entirety before installing or configuring components in the Supermicro chassis. Some warnings may not apply for your system.

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

Warning Definition

⚠️ Warning!

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

警告の定義

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

此警告符号代表危险。

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

此警告符号代表危险。

您正处于可能身体可能会受損傷的工作環境中。在您使用任何設備之前，請注意觸電的危險，並要熟悉預防事故發生的標準工作程序。請依照每一注意事項後的號碼找到相關的翻譯說明內容。
Warnung

WICHTIGE SICHERHEITSHINWEISE


BEWAHREN SIE DIESE HINWEISE GUT AUF.

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

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

GUARDE ESTAS INSTRUCCIONES.

IMPORTANTES INFORMATIONS DE SÉCURITÉ

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

CONSERVEZ CES INFORMATIONS.
Chapter 3: Warning Statements for AC Systems

Warning Statements for AC Systems

안전을 위한 주의사항

경고!

이 경고 기호는 위험이 있음을 알려 줍니다. 작업자의 신체에 부상을 야기 할 수 있는 상태에 있게 됩니다. 모든 장비에 대한 작업을 수행하기 전에 전기회로와 관련된 위험요소들을 확인하시고 사전에 사고를 방지할 수 있도록 표준 작업절차를 준수해 주시기 바랍니다.

해당 번역문을 찾기 위해 각 경고의 마지막 부분에 제공된 경고문 번호를 참조하십시오.

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

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

BEWAAR DEZE INSTRUCTIES
Installation Instructions

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

Warning
Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.

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

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

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

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

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

Warning
Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.
Warning!

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

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

警告
在你打开机箱并安装或移除内部器件前，必须将系统完全断电，并移除电源线。

警告
在您打开机壳安装或移除内部元件前，必须将系统完全断电，并移除电源线。

Warnung
Das System muss von allen Quellen der Energie und vom Netzanschlusskabel getrennt sein, das von den Spg.Versorgungsteilmodulen entfernt wird, bevor es auf den Chassisinnenraum zurückgreift, um Systemsbestandteile anzubringen oder zu entfernen.
¡Advertencia!
El sistema debe ser disconnected de todas las fuentes de energía y del cable eléctrico quitado de los módulos de fuente de alimentación antes de tener acceso el interior del chasis para instalar o para quitar componentes de sistema.

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

אזהרה
י어야 לה巴基 את המערבה מכל מקרור הזחמשל ויס להסר את כבל הזחמשל ממספק
לפני גישה לאלק המתחילים של המארז لمدة לזהרו התקנה או הסרה רכיבים.

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

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

Warning!

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

警告
只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

警告
只有经过受训且具资格人员才可安装、更换與維修此設備。

Warnung

Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden.

¡Advertencia!

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

Attention

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

אזהרה!

لازم שהציוד או לתת שירות עבור הציוד. אי להתקין, להחליף או להפעיל את הציוד אלא באמצעות ניסיון גורם מיומן.

경고!

훈련을 받고 공인된 기술자만이 이 장비의 설치, 교체 또는 서비스를 수행할 수 있습니다.
Waarschuwing
Deze apparatuur mag alleen worden geïnstalleerd, vervangen of hersteld door geschoold en gekwalificeerd personeel.

**Restricted Area**

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

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

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

警告
此装置仅限安装於進出管制區域，進出管制區域係指僅能以特殊工具、鎖頭及鑰匙或其他安全方式才能進入的區域。

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

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

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

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

電池の取り扱い

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

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

警告
電池更換不當會有爆炸危險。請使用製造商建議之相同或功能相當的電池更換原有電池。請按照製造商的說明指示處理廢棄舊電池。
Chapter 3: Warning Statements for AC Systems

Warnung

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

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

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

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

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

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

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

警告
此装置连接的电源可能不只一个，必须切断所有电源才能停止对装置的供电。

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

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

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

أم كييم يور مسفك أكوه
اؤوه! لياهوده يش يور مهبيور أهور شل مسق. يش لاهيرو آه كله مهبيور لمانه لاهوكن آه هتيروه.
Chapter 3: Warning Statements for AC Systems

**Backplane Voltage (if applicable to your system)**

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

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

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

Warning!

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

地方および国の電気規格に準拠
機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告
設備安装必须符合本地与本国电气法规。

Warning

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!

La instalacion del equipo debe cumplir con las normas de electricidad locales y nacionales.
Chapter 3: Warning Statements for AC Systems

Product Disposal

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

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

警告
本产品的废弃处理应根据所有国家的法律和规章进行。

Warning
Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.
¡Advertencia!
Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

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

Hot Swap Fan Warning (if applicable to your system)

Warning!
The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

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.

¡Advertencia!
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Waarschuwing
De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.
Warnung


¡Advertencia!

Los ventiladores podran dar vuelta cuando usted quite ell montaje del ventilador del chasis. Mandtenga los dedos, los destornilladores y todos los objetos lejos de las aberturas del ventilador

Attention

Il est possible que les ventilateurs soient toujours en rotation lorsque vous retirerez le bloc ventilateur du châssis. Prenez garde à ce que doigts, tournevis et autres objets soient éloignés du logement du bloc ventilateur.

¡Aẓāḥra!

כRestController את הלק הメリור מחמולה, י หาก הメリור עדיר נזר. יש להתרחק מהמרווח את האצבעות וכלי עבודה אחרים מהפתחים-et מחמולה.

Waarschuwing

Het is mogelijk dat de ventilator nog draait tijdens het verwijderen van het ventilatorsamenstel uit het chassis. Houd uw vingers, schroevendraaiers en eventuele andere voorwerpen uit de buurt van de openingen in de ventilatorbehuizing.
Power Cable and AC Adapter

Warning!

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

電源コードとACアダプター

製品を設置する場合、提供または指定された接続ケーブル、電源コードとACアダプターを使用下さい。他のケーブルやアダプタを使用すると故障や火災の原因になることがあります。電気用品安全法は、ULまたはCSA認定のケーブル(UL/CSEマークがコードに表記)をSupermicroが指定する製品以外に使用することを禁止しています。

警告

安装此产品时，请使用本身提供的或指定的连接线, 电源线和电源适配器. 使用其它线材或适配器可能会引起故障或火灾。除了Supermicro所指定的产品, 电气用品和材料安全法律规定禁止使用未经UL或CSA认证的线材。(线材上会显示UL/CSA符号)。

警告

安装此产品时，請使用本身提供的或指定的連接線, 電源線和電源適配器. 使用其它線材或適配器可能會引起故障或火災。除了Supermicro所指定的產品，電氣用品和材料安全法律規定禁止使用未經UL或CSA認證的線材。(線材上會顯示UL/CSA符號)。

Warnung


¡Advertencia!

Al instalar el producto, utilice los cables de conexión previstos o designados, los cables y adaptadores de CA. La utilización de otros cables y adaptadores podría ocasionar un mal funcionamiento o un incendio. Aparatos Eléctricos y la Ley de Seguridad del Material prohíbe el uso de UL o CSA cables certificados que tienen UL o CSA se muestra en el código de otros dispositivos eléctricos que los productos designados por Supermicro solamente.
Attention

Lors de l'installation du produit, utilisez les bables de connection fournis ou désigné. L'utilisation d'autres cables et adaptateurs peut provoquer un dysfonctionnement ou un incendie. Appareils électroménagers et de loi sur la sécurité Matériel interdit l'utilisation de UL ou CSA câbles certifiés qui ont UL ou CSA indiqué sur le code pour tous les autres appareils électriques que les produits désignés par Supermicro seulement.

**AC شملي**

אזהרה!

כאשר מתקינים את המוצר, יש ל отношении שבלים, ספקים ותחומים AC אשר נועדו וסופקו לשימוש ברך. שימור כבל חשמל או מתאם חשמלי לשימוש ברך של תקלה או קוצר חשמלי. על פיתור שמידות בﻘשבית השמאלית והימנית, קיים איור ל_LICENSE. לא תוקף לחשמלי מוכרים בשאר Heater UL/CSA (כשרא מפריע_UTILIZATION) שאור שבל (UL/CSA)

בעונ תורק ה الجمه風險 استخدام קבלים התווכי, הקבלת הקתובנית ומחלות התביר הדורגל, התייה intox או חיריך. הם מתאימים לא колק סופרמיקרו או בא UL/CSA.

경고!

제품을 설치할 때에는 제공되거나 지정된 연결케이블과 전원케이블, AC어댑터를 사용해야 합니다. 그 밖의 다른 케이블들이나 어댑터들은 고장 또는 화재의 원인이 될 수 있습니다. 전기용품안전법 (Electrical Appliance and Material Safety Law) 은 슈퍼마이크로에서 지정한 제품들 외에는 그 밖의 다른 전기 장치들을 위한 UL또는 CSA에서 인증한 케이블(전선 위에 UL/CSA가 표시)들의 사용을 금지합니다.

**Waarschuwning**

Bij het installeren van het product, gebruik de meegeleverde of aangewezen kabels, stroomkabels en adapters. Het gebruik van andere kabels en adapters kan leiden tot een storing of een brand. Elektrisch apparaat en veiligheidsinformatiebladen wet verbiedt het gebruik van UL of CSA gecertificeerde kabels die UL of CSA die op de code voor andere elektrische apparaten dan de producten die door Supermicro alleen.
Chapter 4

Advanced Motherboard Setup

This chapter covers the steps required to connect the data and power cables and install add-on cards. All motherboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference.

Note: For this server, the CPU heatsink are preinstalled on the motherboard, and not replacable by the user.

4-1 Handling the Motherboard

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

Precautions

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

Unpacking

The motherboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.
4-2 Connecting Cables

Once the motherboard is installed, the cables must be connected. These include the data (ribbon) cables for the peripherals and control panel and the power cables. See section 4-5 for connectors.

Connecting Data Cables

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

- SATA drive data cables (I-SATA1-6)
- Control Panel cable (JF1)

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

Connecting Power Cables

The motherboard has three power supply connectors, JPW1, PJ1, and J6.

Connecting the Control Panel

The JF1 connector contains header pins for the front control panel. All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis.
4-3 I/O Ports

Figure 4-1. Rear I/O Ports

<table>
<thead>
<tr>
<th>Back Panel I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. IPMI LAN</td>
</tr>
<tr>
<td>B. USB 3.0 Port 1</td>
</tr>
<tr>
<td>C. USB 3.0 Port 0</td>
</tr>
<tr>
<td>D. LAN Port 2, 1GbE</td>
</tr>
<tr>
<td>E. LAN Port 1, 1GbE</td>
</tr>
<tr>
<td>F. LAN Port 4, 10Gb Base T</td>
</tr>
<tr>
<td>G. LAN Port 3, 10Gb Base T</td>
</tr>
<tr>
<td>H. VGA Port</td>
</tr>
</tbody>
</table>
4-4 Memory Support

The X10SDV-TLN4F motherboard supports up to 128GB of DDR4 ECC RDIMM or 64GB of DDR4 ECC/Non-ECC UDIMM with speeds up to 2133MHz in four memory slots. Populating these DIMM slots with memory modules of the same type and same size will result in interleaved memory, which improves memory performance.

Check the Supermicro website for recommended memory modules.

---

**CAUTION**

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

---

Memory Population Guidelines

Follow the table below when populating the memory DIMMs.

<table>
<thead>
<tr>
<th>Recommended Population (Balanced)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIMMA1 Slot</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>4GB</td>
</tr>
<tr>
<td>4GB</td>
</tr>
<tr>
<td>8GB</td>
</tr>
<tr>
<td>8GB</td>
</tr>
<tr>
<td>16GB</td>
</tr>
</tbody>
</table>

---

**Figure 4-2. Memory Slot Labels**
**Memory Installation Guidelines**

When installing memory modules, the DIMM slots should be populated in the following order: DIMMA1, DIMMB1, then DIMMA2, DIMMB2.

- Always use DDR4 DIMM modules of the same size, type and speed. Mixing memory modules of different types and speeds is not allowed.
- The motherboard will support one DIMM module installed. However, for best memory performance, install DIMM modules in pairs.

**Installing DIMM Memory Modules**

1. Align the key on the bottom of the DIMM module against the key on the memory slot. Take note of the notches on the side of the DIMM module, and of the locking clips on the socket to avoid causing damage.

2. Install the DIMM module straight down into the socket until it is securely seated in the socket. The side clips will automatically lock the module into place.

**4-5 Expansion Cards**

The system supports one low profile PCI Express 3.0 expansion card in a x16 slot. It also offers an M.2 PCI-E x4 slot, M Key for 2242/2280 SSD. See Chapter 5 for installation instructions.
Notes:

1. "■" indicates the location of "Pin 1". Jumpers not indicated are for testing only.

2. When LED3 (Onboard Power LED Indicator) is on, system power is on. Unplug the power cable before installing or removing any components.

3. The X10SDV-TLN4F motherboard supports Turbo Boost Technology, offering turbo-boost capabilities to maximize system performance for server platforms.
# X10SDV-TLN4F Motherboard Quick Reference

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT1</td>
<td>Onboard Battery</td>
</tr>
<tr>
<td>COM1</td>
<td>COM1 Header</td>
</tr>
<tr>
<td>FAN1 ~ FAN4</td>
<td>CPU/System Cooling Fans (FAN4 is on PCB 2.00 only)</td>
</tr>
<tr>
<td>IPMI LAN</td>
<td>Dedicated IPMI LAN Port</td>
</tr>
<tr>
<td>I-SATA0 ~ I-SATA5</td>
<td>Intel Serial ATA Ports (I-SATA0 supports SuperDOM)</td>
</tr>
<tr>
<td>I-SGPIO1, I-SGPIO2</td>
<td>Serial Link General Purpose I/O Headers</td>
</tr>
<tr>
<td>JGPIO1</td>
<td>General Purpose I/O Expander Header</td>
</tr>
<tr>
<td>J6</td>
<td>4-pin Power Connector for HDD use (To provide power from the motherboard to onboard HDD devices.)</td>
</tr>
<tr>
<td>J21</td>
<td>M.2 Slot (Shared with I-SATA0 when a SATA device is installed in M.2)</td>
</tr>
<tr>
<td>JD1</td>
<td>Speaker (Pins 1-3: Power LED, Pins 4-7: Speaker)</td>
</tr>
<tr>
<td>JF1</td>
<td>Front Panel Control Header</td>
</tr>
<tr>
<td>JIPMB1</td>
<td>4-pin External SMbus I2C Header (for an IPMI Card)</td>
</tr>
<tr>
<td>JL1</td>
<td>Chassis Intrusion Header</td>
</tr>
<tr>
<td>JNVI2C1</td>
<td>NVMe I2C Header</td>
</tr>
<tr>
<td>JOH1</td>
<td>Overheat LED Header</td>
</tr>
<tr>
<td>JPCI2C1</td>
<td>Power Supply SMbus I2C Header (On PCB 2.00 only)</td>
</tr>
<tr>
<td>JPW1</td>
<td>24-pin ATX Main Power Connector</td>
</tr>
<tr>
<td>JSD1</td>
<td>SATA DOM (Device_On_Module) Power Connector</td>
</tr>
<tr>
<td>JSMB1</td>
<td>SMBus Header</td>
</tr>
<tr>
<td>JSTBY1</td>
<td>Standby Power Header</td>
</tr>
<tr>
<td>JTPM1</td>
<td>Trusted Platform Module (TPM)/Port 80 Connector</td>
</tr>
<tr>
<td>JUIDB1</td>
<td>Unit Identifier (UID) Button</td>
</tr>
<tr>
<td>LAN1~LAN2</td>
<td>Gigabit Ethernet (RJ45) Ports</td>
</tr>
<tr>
<td>LAN3~LAN4</td>
<td>10G Ethernet (RJ45) Ports</td>
</tr>
<tr>
<td>PJ1</td>
<td>4-pin 12V DC Power Connector (To provide alternative power for special enclosure when the 24-pin ATX power is not in use.)</td>
</tr>
<tr>
<td>SLOT7</td>
<td>PCI-E 3.0 x16 Slot</td>
</tr>
<tr>
<td>SRW1, SRW2</td>
<td>M.2 Holding Screws</td>
</tr>
<tr>
<td>USB 0/1</td>
<td>Back panel USB 3.0 Ports</td>
</tr>
<tr>
<td>USB 2/3, USB 4/5</td>
<td>Front Access USB 2.0 Ports</td>
</tr>
<tr>
<td>VGA</td>
<td>Back panel VGA Port</td>
</tr>
</tbody>
</table>
### Jumper Description

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Description</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>JBR1</td>
<td>BIOS Recovery</td>
<td>Pins 1-2 (Normal)</td>
</tr>
<tr>
<td>JBT1</td>
<td>CMOS Clear</td>
<td>Open: Normal, Short: Clear CMOS</td>
</tr>
<tr>
<td>JIFC1/JIFC2</td>
<td>SMB to PCI-Exp. Slots</td>
<td>Pins 2-3 (Disabled)</td>
</tr>
<tr>
<td>JPG1</td>
<td>VGA Enable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JPL1</td>
<td>LAN1/LAN2 Enable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JPME1</td>
<td>ME Recovery</td>
<td>Pins 1-2 (Normal)</td>
</tr>
<tr>
<td>JPME2</td>
<td>Manufacturing Mode</td>
<td>Pins 1-2 (Normal)</td>
</tr>
<tr>
<td>JPTG1</td>
<td>10Gb Ethernet Enable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JPUSB1</td>
<td>USB Wakeup</td>
<td>Pins 1-2 (Enabled) (For USB0/1 Only)</td>
</tr>
<tr>
<td>JWD1</td>
<td>Watch Dog Enable</td>
<td>Pins 1-2 (Reset)</td>
</tr>
</tbody>
</table>

### LED Indicators

<table>
<thead>
<tr>
<th>LED</th>
<th>Description</th>
<th>Color/State</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEDM1</td>
<td>BMC Heartbeat LED</td>
<td>Green: Blinking</td>
<td>BMC: Normal</td>
</tr>
<tr>
<td>LED3</td>
<td>Power LED</td>
<td>Green: On</td>
<td>System Power On</td>
</tr>
<tr>
<td>LED7</td>
<td>UID Switch LED</td>
<td>Blue: On</td>
<td>Unit Identified</td>
</tr>
<tr>
<td>LED8</td>
<td>Overheat/PWR Fail/Fan Fail LED</td>
<td>Red: Solid on/ Blinking</td>
<td>Solid On: Overheat, Blinking: PWR Fail or Fan Fail</td>
</tr>
</tbody>
</table>
Chapter 4: Advanced Motherboard Setup

4-7 Connector Definitions

Power Connectors

The 24-pin ATX power connector header (JPW1) provides power to the motherboard. PJ1 is the 12V DC power connector that provides alternative power for a special enclosure when the 24-pin ATX power is not in use. The 4-pin power connector J6 provides power to onboard HDD devices.

### ATX Power 24-pin Connector Pin Definitions (JPW1)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>+3.3V</td>
<td>1</td>
<td>+3.3V</td>
</tr>
<tr>
<td>14</td>
<td>NC</td>
<td>2</td>
<td>+3.3V</td>
</tr>
<tr>
<td>15</td>
<td>COM</td>
<td>3</td>
<td>COM</td>
</tr>
<tr>
<td>16</td>
<td>PS_ON</td>
<td>4</td>
<td>+5V</td>
</tr>
<tr>
<td>17</td>
<td>COM</td>
<td>5</td>
<td>COM</td>
</tr>
<tr>
<td>18</td>
<td>COM</td>
<td>6</td>
<td>+5V</td>
</tr>
<tr>
<td>19</td>
<td>COM</td>
<td>7</td>
<td>COM</td>
</tr>
<tr>
<td>20</td>
<td>NC</td>
<td>8</td>
<td>PWR_OK</td>
</tr>
<tr>
<td>21</td>
<td>+5V</td>
<td>9</td>
<td>5VSB</td>
</tr>
<tr>
<td>22</td>
<td>+5V</td>
<td>10</td>
<td>+12V</td>
</tr>
<tr>
<td>23</td>
<td>+5V</td>
<td>11</td>
<td>+12V</td>
</tr>
<tr>
<td>24</td>
<td>COM</td>
<td>12</td>
<td>+3.3V</td>
</tr>
</tbody>
</table>

### 12V DC Power Pin Definitions (PJ1)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>GND</td>
</tr>
<tr>
<td>3-4</td>
<td>12V</td>
</tr>
</tbody>
</table>

### 4-Pin HDD Power Pin Definitions (J6)

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12V</td>
</tr>
<tr>
<td>2-3</td>
<td>GND</td>
</tr>
<tr>
<td>4</td>
<td>5V</td>
</tr>
</tbody>
</table>
Control Panel Connectors

Figure 4-4. Control Panel Header Pins

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS--see Chapter 7). To turn off the power in the suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Signal</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Reset Button

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

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Reset</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
</tbody>
</table>
Chapter 4: Advanced Motherboard Setup

**Overheat (OH)/Fan Fail/PWR Fail/UID LED (Front Panel)**

Connect an LED cable to pins 7 and 8 of Front Control Panel to use the Overheat/Fan Fail/Power Fail and UID LED connections. These functions are described in Chapter 3; more UID description in Section 4-10.

<table>
<thead>
<tr>
<th>OH/Fan Fail/ PWR Fail/Blue_UID LED Pin Definitions (JF1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
</tbody>
</table>

**NIC1/NIC2 (LAN1/LAN2)**

The NIC (Network Interface Controller) LED connection for LAN ports 1 and 2 are located on pins 11 and 12 and pins 9 and 10 of JF1, respectively. Attach NIC LED cables to the NIC1 and NIC2 LED indicators to display network activity. Refer to the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>LAN1/LAN2 LED Pin Definitions (JF1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>9/11</td>
</tr>
<tr>
<td>10/12</td>
</tr>
</tbody>
</table>

**HDD LED**

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

<table>
<thead>
<tr>
<th>HDD LED Pin Definitions (JF1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HDD LED Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>Blinking</td>
</tr>
</tbody>
</table>

**Power LED**

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

<table>
<thead>
<tr>
<th>Power LED Pin Definitions (JF1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>16</td>
</tr>
</tbody>
</table>
Other Connectors

Universal Serial Bus (USB)
Two Universal Serial Bus 3.0 ports (USB0/1) are located on the I/O rear panel. Two USB 2.0 headers (USB2/3, 4/5) can provide front panel access.

Ethernet Ports
Two Gigabit Ethernet ports (LAN1, LAN2), two 10G Base T Ethernet ports (LAN3, LAN4), and an IPMI LAN port are located on the rear I/O panel to provide network connections.

VGA
A VGA port is located on the I/O rear panel.

Serial Port
A COM 1 header is located near DIMM slot A1.

Unit Identifier Switch
A Unit Identifier (UID) Switch and two LED indicators are located on the motherboard. The UID Switch is located next to the VGA port on the rear I/O panel. The rear UID LED (LED7) is located next to the UID Switch. The front panel UID LED is located at Pin 7 of JF1.

The UID Indicators assist in locating the system in a rack of many. When you press the UID switch, both rear UID LED and front panel UID LED Indicators turn on. Press the UID switch again to turn off both LED Indicators.

Note: UID can also be triggered using IPMI. More information on IPMI is available in the IPMI User's Guide the Supermicro website.
Fan Headers

There are four fan 4-pin headers. Pins 1-3 are backward compatible with the traditional 3-pin fans, but you can use 4-pin fans to take advantage of the fan speed control using Pulse Width Modulation through the BMC. This allows the fan speeds to be automatically adjusted based on the motherboard temperature. Refer to the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground (Black)</td>
</tr>
<tr>
<td>2</td>
<td>+12V (Red)</td>
</tr>
<tr>
<td>3</td>
<td>Tachometer</td>
</tr>
<tr>
<td>4</td>
<td>PWM_Control</td>
</tr>
</tbody>
</table>

Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard (not supported in this server).

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intrusion Input</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
</tbody>
</table>

System Management Bus Header

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

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

DOM PWR Connector (JSD1)

The Disk-On-Module (DOM) power connector, located at JSD1, provides 5V power to a solid-state DOM storage device connected to one of the SATA ports. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5V</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Ground</td>
</tr>
</tbody>
</table>
TPM Header/Port 80 Header

The JTPM1 header is used to connect a Trusted Platform Module (TPM)/Port 80. TPM is a security device that supports encryption and authentication in hard drives. It enables the motherboard to deny access if the TPM associated with the hard drive is not installed in the system. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LCLK</td>
<td>2</td>
<td>GND</td>
</tr>
<tr>
<td>3</td>
<td>LFRAME#</td>
<td>4</td>
<td>No Pin</td>
</tr>
<tr>
<td>5</td>
<td>LRESET#</td>
<td>6</td>
<td>+5V (X)</td>
</tr>
<tr>
<td>7</td>
<td>LAD3</td>
<td>8</td>
<td>LAD2</td>
</tr>
<tr>
<td>9</td>
<td>+3.3V</td>
<td>10</td>
<td>LAD1</td>
</tr>
<tr>
<td>11</td>
<td>LAD0</td>
<td>12</td>
<td>GND</td>
</tr>
<tr>
<td>13</td>
<td>NC</td>
<td>14</td>
<td>NC</td>
</tr>
<tr>
<td>15</td>
<td>+3V_DUAL</td>
<td>16</td>
<td>SERIRQ</td>
</tr>
<tr>
<td>17</td>
<td>GND</td>
<td>18</td>
<td>GND</td>
</tr>
<tr>
<td>19</td>
<td>3.3V</td>
<td>20</td>
<td>NC</td>
</tr>
</tbody>
</table>

Overheat/Fan Fail LED

The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating. Refer to the table on right for pin definitions.

<table>
<thead>
<tr>
<th>Pin Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pins 1-3</td>
<td>Power LED</td>
</tr>
<tr>
<td>Pins 4-7</td>
<td>Speaker</td>
</tr>
</tbody>
</table>

Speaker (JD1)

On the JD1 header, pins 4-7 are used for internal speaker. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V Standby</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>No connection</td>
</tr>
</tbody>
</table>
I-SGPIO1/I-SGPIO2

Two Serial Link General Purpose Input/Output (SGPIO) headers are used to communicate with the enclosure management chip in the system. See the table on the right for pin definitions. Refer to the board layout below for the locations of the headers.

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

GPIO Header (JGPIO1)

The JGPIO1 header is located near the SATA connectors on the motherboard. The JGPIO header is a general-purpose I/O expander on a pin header via the SMBus. See the table on the right for pin definitions. Refer to the board layout below for the locations of the headers.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P3V3</td>
<td>2</td>
<td>GND</td>
</tr>
<tr>
<td>3</td>
<td>GP0</td>
<td>4</td>
<td>GP1</td>
</tr>
<tr>
<td>5</td>
<td>GP2</td>
<td>6</td>
<td>GP3</td>
</tr>
<tr>
<td>7</td>
<td>GP5</td>
<td>8</td>
<td>GP5</td>
</tr>
<tr>
<td>9</td>
<td>GP6</td>
<td>10</td>
<td>GP7</td>
</tr>
</tbody>
</table>

System Management Bus Header

A PCH System Management Bus header for additional slave devices or sensors is located at JSMB1. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Data</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Clock</td>
</tr>
</tbody>
</table>

NVMe I2C Header

Connector JNVI2C is a management header for the Supermicro AOC NVMe PCI-E peripheral cards. Connect it with the I2C cable.

Power SMBus (I²C) Connector

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

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clock</td>
</tr>
<tr>
<td>2</td>
<td>Data</td>
</tr>
<tr>
<td>3</td>
<td>Power Fail</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>+3.3V</td>
</tr>
</tbody>
</table>
4-8 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 a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.

<table>
<thead>
<tr>
<th>Connector</th>
<th>Pins</th>
<th>Jumper Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 2 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CMOS Clear

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

To clear CMOS,

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

2. Remove the onboard CMOS battery.

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

4. Remove the screwdriver (or shorting device).

5. Replace the battery and reconnect the power cord(s).

Note: Do not use the PW_ON connector to clear CMOS.
**VGA Enable/Disable**

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

<table>
<thead>
<tr>
<th>VGA Enable/Disable Jumper Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
</tr>
<tr>
<td>Pins 1-2</td>
</tr>
<tr>
<td>Pins 2-3</td>
</tr>
</tbody>
</table>

**PCI Slot SMB Enable (I2C1/I2C2)**

Use Jumpers I2C1/I2C2 to enable PCI SMB (System Management Bus) support to improve system management for the onboard PCI-E slot. See the table on the right for jumper settings.

<table>
<thead>
<tr>
<th>PCI Slot SMB Enable Jumper Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
</tr>
<tr>
<td>Pins 1-2</td>
</tr>
<tr>
<td>Pins 2-3</td>
</tr>
</tbody>
</table>

**Watch Dog Timer Enable**

Watch Dog (JWD1) is a system monitor that can be used to enter LAN bypass default settings, reset the system or enter NMI when the Timer expires. 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. Open all pins to enter LAN pair default mode only. See the table on the right for jumper settings. Watch Dog may be enabled in the BIOS Setup. The default timer is around 5 minutes.

<table>
<thead>
<tr>
<th>Watch Dog Jumper Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
</tr>
<tr>
<td>Pins 1-2</td>
</tr>
<tr>
<td>Pins 2-3</td>
</tr>
<tr>
<td>Open</td>
</tr>
</tbody>
</table>

**LAN Ports Enable/Disable**

Jumper JPL1 enables or disables Ethernet LAN ports on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

<table>
<thead>
<tr>
<th>GbE LAN Enable Jumper Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
</tr>
<tr>
<td>Pins 1-2</td>
</tr>
<tr>
<td>Pins 2-3</td>
</tr>
</tbody>
</table>
Management Engine (ME) Recovery

Use JPME1 to select ME Firmware Recovery mode, which will limit resource allocation for essential system operation only in order to maintain normal power operation and management. In the single operation mode, online upgrade will be available via Recovery mode. See the table on the right for jumper settings.

ME Manufacturing Mode

Close JPME2 to bypass SPI flash security and force the system to use the Manufacturing Mode, which will allow the user to flash the system firmware from a host server to modify system settings. See the table on the right for jumper settings.

BIOS Recovery

Close pins 2 and 3 of jumper JBR1 for BIOS recovery. The default setting is on pins 1 and 2 for normal operation. See the table on the right for jumper settings.

10Gb Ethernet Enable/Disable

JPTG1 is used to enable or disable 10Gb support (LAN3 ~ LAN4). See the table on the right for jumper settings.
Gigabit LAN Ports Enable/Disable

JPL1 is used to enable or disable the Gigabit Ethernet ports (LAN1~LAN2). See the table on the right for jumper settings.

USB Wake-Up

Use the JPUSB1 jumper to enable the function of "System Waking-Up via USB devices" for USB0/1. This jumper allows you to "wake-up" the system by pressing a key on the USB keyboard or by clicking the USB mouse of your system. The JPUSB1 jumper is used together with the USB Wake-Up function in the BIOS. Enable both the jumper and the BIOS setting to enable this function. See the table on the right for jumper settings and connections.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Enabled (Default)</td>
</tr>
<tr>
<td>2-3</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pins 1-2</td>
<td>Enabled (Default)</td>
</tr>
<tr>
<td>Pins 2-3</td>
<td>Disabled</td>
</tr>
</tbody>
</table>
4-9 Onboard Indicators

LAN LEDs
Each LAN port has two LEDs. The Activity LED indicates connection and activity. The Link LED may be green, amber or off to indicate the speed of the connection. See the tables on the right for more information.

<table>
<thead>
<tr>
<th>Link Speed LED</th>
<th>Color</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No Connection or 10 Mbps</td>
<td></td>
</tr>
<tr>
<td>Amber</td>
<td>1 Gbps</td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>100 Mbps</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity LED</th>
<th>Color</th>
<th>Status</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No Connections</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td>Flashing</td>
<td>Active</td>
<td></td>
</tr>
</tbody>
</table>

BMC Heartbeat LED
A BMC Heartbeat LED is located at LEDM1. See the table on the right for more information.

<table>
<thead>
<tr>
<th>BMC Heartbeat LED Status</th>
<th>Color/State</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green: Blinking</td>
<td>BMC: Normal</td>
<td></td>
</tr>
</tbody>
</table>

Onboard Power LED
An Onboard Power LED is located at LED3 on the motherboard. When this LED is on, the system is on. See the table on the right for more information.

<table>
<thead>
<tr>
<th>Onboard PWR LED Indicator LED Settings</th>
<th>LED Color</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>System Off (PWR cable not connected)</td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>System On</td>
<td></td>
</tr>
</tbody>
</table>

Overheat/PWR Fail/Fan Fail LED
An onboard Overheat/PWR Fail/ Fan Fail LED is located at LED8. See the table on the right for more information.

<table>
<thead>
<tr>
<th>Overheat/PWR Fail/Fan Fail LED Settings</th>
<th>Color/State</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid</td>
<td>Overheat</td>
<td></td>
</tr>
<tr>
<td>Blinking</td>
<td>PWR Fail or Fan Fail</td>
<td></td>
</tr>
</tbody>
</table>
Unit Identification LED

Unit identifier (UID) LEDs help identify the server in a rack. A rear UID LED indicator (LED7) is located next to the UID switch on the I/O rear panel. The front control panel UID LED is connected to pin 7 of JF1. It is combined with the Overheat/PWR Fail/Fan Fail LED.

The UID function can be activated by the UID switch on the I/O rear panel or through IPMI. When activated, both front and rear LEDs are lighted blue. For the front LED, the red Overheat/PWR Fail/Fan Fail warnings take precedence over the blue UID by default.

Press the UID switch again to turn off both.

4-10 SATA Ports

SATA Ports (I-SATA0 ~ I-SATA5)

There are six SATA 3.0 ports on the motherboard. These ports provide serial-link signal connections, which are faster than the connections of Parallel ATA. I-SATA0 also supports SuperDOM, Supermicro proprietary SATA DOM with built-in power connection on pin 8.

M.2 Socket

M.2 is formerly known as Next Generation Form Factor (NGFF). The connector is designed for internal mounting devices. The motherboard deploys an M key dedicated for SSD devices with the ultimate performance capability in a PCI Express 3.0 x4 interface for native PCIe SSD support. The M.2 is mux with I-SATA0 port for legacy SATA SSD devices.
4-11 Installing Software

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

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

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

After creating a CD/DVD with the ISO files, insert the disk into the CD/DVD drive on your system and the display shown in Figure 4-5 should appear.

![Figure 4-5. Driver/Tool Installation Display Screen](image)

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. After installing each item, you must reboot the system before moving on to the next item on the list. The bottom icon with a CD on it allows you to view the entire contents.
SuperDoctor® 5

The Supermicro SuperDoctor® 5 is a hardware and operating system services 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, FTP, and SMTP services to optimize the efficiency of your operation.

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

![Image of SuperDoctor 5 Interface Display Screen (Health Information)]
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.

4-12 Serverboard Battery

Caution: There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites. This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032). Dispose of used batteries according to the manufacturer’s instructions.

Figure 4-8. Installing the Onboard Battery

Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.
Chapter 5

Advanced Chassis Setup and Maintenance

This chapter covers the steps required to install components and perform maintenance on the chassis. The only tool required is a Phillips screwdriver.

Review the warnings and precautions listed in the manual before setting up or servicing this chassis. These include information in Chapter 3 and the warnings and precautions listed in the setup instructions.

Figure 5-1. SC721 Chassis
5-1 Removing Power from the System

Before performing most setup or maintenance tasks, use the following procedure to ensure that power has been removed from the system.

1. Use the operating system to power down the system, following the on-screen prompts.

2. After the system has completely shut-down, carefully grasp the head of the power cord and gently pull it out of the back of the power supply.

3. Disconnect the cord from the power strip or wall outlet.

5-2 Hardware Security

The chassis features multiple locking devices to help deter hardware theft and protect user data. While no lock is infallible, it is recommended that users keep their systems locked when not in use.

Front Bezel Lock

The locking front bezel protects against unauthorized removal of the hard drives. The key to locks or unlocks the bezel. Always remove the key from the lock and store the key in a secure place.

Figure 5-2. Front Bezel Lock
Rear Chassis Hasp
Unauthorized entry through the rear of the chassis may be discouraged by placing a lock on the rear of the chassis. The chassis is equipped with a rear chassis hasp that can accommodate a variety of commonly available locks (not included).

Figure 5-3. Rear Bezel Lock

Kensington Cable Slot (K-Slot)
The chassis features a Kensington cable slot or K-slot. This slot accepts a standard Kensington cable locking device (not included). Attach the loop end of the cable to a secure object, then insert the device into the K-slot as illustrated below.

Figure 5-4. Inserting a Kensington Cable Device (Not Included)
5-3 Removing the Chassis Cover

Figure 5-5. Removing the Chassis Cover

Removing the Chassis Side Cover

1. Power down the system and unplug the power cord from the power supply as described in Section 5-1.

2. On the right side rear of the chassis, lift up on the release lever.

3. Slide the cover toward the rear of the chassis then lift off.

Caution: Except for short periods of time, do not operate the server without the cover in place. The chassis cover helps facilitate proper airflow and prevent overheating.
5-4 Removing and Installing Drives

Front Mounted Hot-Swap Drives

Figure 5-6. Removing the Hard Drive Carrier from the Drive Cage

The chassis supports four 3.5" hot-swappable hard drives in hard drive carriers. These hard drives can be removed from the chassis without powering down the system.

Removing 3.5" Hot-Swap Hard Drives

1. Unlock the front bezel and swing it open.

2. Press the release tab on the hard drive carrier, this will extend the hard drive carrier handle.

3. Use the hard drive carrier handle to pull the hard drive out of the chassis.
Installing a Hard Drive into the Hard Drive Carrier

1. Remove the six screws which secure the dummy drive into the hard drive carrier.
2. Remove the dummy drive from the hard drive carrier.
3. Install a new hard drive into the hard drive carrier with the printed circuit board side facing down so that the mounting holes in the drive align with those in the carrier.
4. Secure the hard drive by tightening all six screws.

Figure 5-7. Installing a Hard Drive into Hard Drive Carrier
Installing 3.5" Hot-Swap Hard Drives

1. Insert the new hard drive into the hard drive carrier.

2. Insert the hard drive carrier into the drive bay, using the drive carrier handle to push it to the back of the hard drive cage.

3. Close the handle until the drive carrier clicks into the locked position.

4. Close and lock the front bezel.

Figure 5-8. Installing the Hard Drive Carrier into the Hard Drive Cage
## Installing the Internal Fixed Hard Drives

The chassis supports two internal 2.5" SATA fixed hard drives, one top mounted drive and one side mounted drive.

![Diagram of hard drive installation](image)

### Figure 5-9. Installing the Top Mounted Fixed Hard Drive

#### Installing the Top Mounted Fixed Hard Drive

1. Power down the system as described in Section 5-1 and remove the chassis cover.

2. Place the 2.5" hard drive into the hard drive bracket and secure the hard drive to the bracket with the four screws provided.

3. Place the hard drive and bracket into the top mounting position of the chassis as illustrated above and secure it to the chassis with two screws.

4. Replace the chassis cover, plug the power cord into the rear of the power supply and power up the system.
Chapter 5   Advanced Chassis Setup and Maintenance

Installing the Side Mounted Fixed Hard Drive

1. Power down the system as described in Section 5-1 and remove the chassis cover.

2. Place the 2.5" hard drive into the hard drive bracket and secure the hard drive to the bracket with the four screws provided.

3. Place the hard drive and bracket into the side mounting position of the chassis by inserting the pin on the bracket into the mounting hole on the chassis as illustrated above.

4. Replace the chassis cover, plug the power cord into the rear of the power supply and power up the system.
5-5 Installing the DVD Drive

The chassis supports one DVD drive. It can be installed only if the top mounted fixed HDD is not used. It requires a mounting bracket rail, pn MCP-220-81502-0N.

1. Power down the system as described in Section 5-1 and remove the chassis cover.

2. Unlock the front bezel and swing it open.

3. Remove the bracket for the top mounted fixed hard drive, by removing the two screws.

4. Remove the two screws securing the EMI grid to the front of the chassis.

5. Remove the EMI grid from inside the chassis, just behind the chassis front. If you will later remove the DVD drive, save the EMI grid.

6. Remove the plastic DVD bay cover from the chassis front by carefully breaking it out.
7. Install the bracket rail (part number MCP-220-81502-0N) onto the left hand side of the DVD drive, using the two screws provided.

8. Slide the DVD drive into the chassis until it snaps into place.

9. Some DVD drives allow you to secure the drive with two screws.

10. Connect the SATA cable and the power cable to the DVD drive.

11. Close the front bezel, replace the chassis cover and power up the system.
5-6 Installing Expansion Cards

The SC721 chassis includes one PCI slot for a low profile expansion card. It is installed by removing the chassis tray that holds the motherboard and rear I/O shield.

![Removing the Rear Tray from the Chassis](image)

**Figure 5-14. Removing the Rear Tray from the Chassis**

*Installing the Expansion Card*

1. Power down the system as described in Section 5-1 and remove the chassis cover.

2. Remove the three screws securing the rear tray to the rear of the chassis and set them aside for later use.

3. Pull the rear tray out from the chassis.
4. Remove the screw securing the PCI slot cover over the PCI slot in the rear of the tray and set it aside for later use.

5. Slide the PCI slot cover up and out of the PCI slot.

6. Insert the card into its slot on the motherboard while aligning its bracket into the slot on the chassis drawer.

7. Secure the bracket of the expansion card with the screw previously set aside.

8. Slide the rear tray into the chassis and secure it with the screws.

9. Replace the chassis cover and power up the system.
5-7 Installing the Rear Exhaust Fan

The chassis includes a 12 cm rear exhaust fan that provides cooling. The chassis also features a set of mounting holes which will support a standard 9 cm exhaust fan (fan not included).

Figure 5-16. Installing the Exhaust Fan

Installing the Exhaust Fan

1. Power down the system as described in Section 5-1 and remove the chassis cover.

2. Place the fan on top of the fan grill, aligning the mounting holes of the fan grill with the mounting holes of the system fan.

3. Secure the fan to the chassis with four screws.

4. Connect the fan cable to the motherboard.

5. Replace the chassis cover, plug the power cord into the rear of the power supply and power up the system.
5-8 **Replacing the Power Supply**

The chassis includes a fixed power supply. If it is necessary to replace the power supply, follow the instructions below.

*Changing the Power Supply*

1. Power down the system as described in Section 5-1 and remove the chassis cover.

2. Remove power cables from the motherboard, hard drives, and backplane.

3. Remove the screws securing the power supply to the chassis, which are located on the rear of the chassis. Set these screws aside for later use.

4. Remove the power supply from the the chassis.

5. Replace the failed power supply with an identical model power supply.

6. Secure the new power supply using the screws previously set aside.

7. Reattach the power cables to the motherboard, hard drives, and backplane.

8. Replace the chassis cover, plug the power cord into the rear of the power supply and power up the system.
5-9 Replacing the Backplane

The chassis includes a backplane, CSE-SAS-733TQ. In the unlikely event that it becomes necessary to replace the backplane, follow the instructions below. Information on backplane settings can be found on the Supermicro web site under Accessories > Storage Backplanes > SAS > CSE-SAS-733TQ.

Replacing the Backplane

1. Power down the system as described in Section 5-1 and remove the chassis cover.

2. Remove the screw securing the backplane mounting bracket to the chassis. Set the screw aside for later use.

3. Remove the backplane mounting bracket with the backplane from the chassis.

4. Remove the screws securing the backplane to the backplane mounting bracket and set these aside for later use.

5. Lift the backplane off of the backplane mounting bracket.

6. Place a new backplane into the backplane mounting bracket and secure it with the screws previously set aside.

7. Insert the backplane and backplane mounting bracket into the chassis and secure it with the screw previously set aside.

8. Replace the chassis cover, plug the power cord into the rear of the power supply and power up the system.

Figure 5-18. Replacing the Backplane and Mounting Bracket
Chapter 6

BIOS

6-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X10SDV-TLN4F motherboard. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Note: For instructions on BIOS recovery, please refer to the instruction guide posted at http://www.supermicro.com/support/manuals/.

Starting BIOS Setup Utility

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

Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often informational text will accompany it. (Note: the AMI BIOS has default informational text built in. Supermicro 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 the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

Note: Options printed in Bold are default settings.

How To Change the Configuration Data

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

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

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

6-2 Main Setup

When you first enter the AMI BIOS setup utility, you enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.
The following Main menu items are displayed:

**System Date/System Time**

Use this feature to change the system date and time. Highlight *System Date* or *System Time* using the arrow keys. Enter new values using the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format.

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

The following BIOS items are also displayed:

**Supermicro X10SDV-TLN4F**

**Version**

**Build Date**

**Memory Information**

**Total Memory**

This displays the total size of memory available in the system.
6-3 Advanced Setup Configurations

Use the arrow keys to select Boot Setup and press <Enter> to access the submenu items.

Caution: Take caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency, or an incorrect DRAM timing setting may make the system unstable. When this occurs, revert to the default to the manufacture default settings.

▶ Boot Feature

Quiet Boot

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

AddOn ROM Display Mode

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

Bootup NumLock State

Use this feature to set the Power-on state for the <Numlock> key. The options are Off and On.
Wait For 'F1' If Error

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

INT19 (Interrupt 19) Trap Response

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

Re-try Boot

If this item is enabled, the BIOS will automatically reboot the system from a specified boot device after its initial boot failure. 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 reset or generate NMI based on jumper settings when it is expired for more than 5 minutes. The options are Disabled and Enabled.

Power Button Function

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

Restore on AC Power Loss

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

The following CPU information will be displayed:

- Processor ID
- Processor Frequency
- Processor Max Ratio
- Processor Min Ratio
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache Ram
- CPU Version

Clock Spread Spectrum
If this feature is set to Enabled, the BIOS utility will monitor the level of Electromagnetic Interference caused by the components and will attempt to reduce the interference whenever needed. The options are Disabled and Enabled.

Hyper-Threading (ALL)
Select Enable to use Intel Hyper-Threading Technology to enhance CPU performance. The options are Disable and Enable.

Cores Enabled
Set a numeric value to enable the number of cores. (Please refer to Intel's website for more information.) Enter 0 to enable all cores.

Monitor/Mwait
Select Enabled to enable the Monitor/MWait instructions. The Monitor instruction monitors a region of memory for writes, and MWait instructions instruct the CPU to stop until the monitored region begins to write. The options are Disable and Enable.
Execute Disable Bit (Available if supported by the OS & the CPU)
Select Enabled to enable the Execute-Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is Enable. (Refer to the Intel® and Microsoft® websites for more information.)

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

Hardware Prefetcher (Available when supported by the CPU)
If set to Enabled, 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 Enable and Disable.

Adjacent Cache Prefetch (Available when supported by the CPU)
The CPU prefetches the cache line for 64 bytes if this feature is set to Disabled. The CPU prefetches both cache lines for 128 bytes as comprised if this feature is set to Enable.

DCU Streamer Prefetcher (Available when supported by the CPU)
Select Enabled to enable the DCU (Data Cache Unit) Streamer Prefetcher which will stream and prefetch data and send it to the Level 1 data cache to improve data processing and system performance. The options are Enable and Disable.

DCU IP Prefetcher (Available when supported by the CPU)
Select Enabled for DCU (Data Cache Unit) IP Prefetcher support, which will prefetch IP addresses to improve network connectivity and system performance. The options are Enable and Disable.

Direct Cache Access (DCA)
Select Enabled to use Intel's DCA (Direct Cache Access) Technology to improve data transfer efficiency. The options are Disable, Enable, and Auto.

Intel® Virtualization Technology (Available when supported by the CPU)
Select Enabled to support Intel® Virtualization Technology, which will allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are Enable and Disable.
Note: If a change is made to this setting, you will need to reboot the system for the change to take effect. Refer to Intel’s website for detailed information.

▶ Advanced Power Management Configuration

This section is used to configure the following CPU Power Management settings.

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.

If the above is set to Enable, CPU P State will display:

▶ CPU P State Control

P State Domain
This feature allows the user to indicate the P-State domain for each logical process in the system. All processes indicate the same domain in the same package. The options are ALL and ONE.

P-State Coordination
This feature allows the user 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.

Energy Efficient P-State
Select Enable to support power-saving mode for P-State. The options are Disable and Enable.

Boot Performance Mode
This feature allows the user to select the performance state that the BIOS will set before the operating system handoff. The options are Max Performance and Max Efficient.
Turbo Mode
Select Enable for processor cores to run faster than the frequency specified by the manufacturer. The options are Disable and Enable.

CPU HWPM State Control

Enable CPU HWPM
Select Enable for better CPU energy performance. The options are Disable, HWPM NATIVE MODE, and HWPM OOB MODE.

Enable CPU Autonomous Cstate
Use this feature to enable CPU Autonomous C State, which converts HALT instructions to Mwait. The options are Disable and Enable.

CPU C State Control

CPU C State
Use this feature to enable the enhanced C State of the CPU. The options are Disable and Enable.

Package C State Limit
This feature allows the user to set the limit on the C State package register. The options are C0/C1 State, C2 State, C6 (Non Retention) State, C6 (Rentention) state, and No Limit.

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

Enhanced Halt State (C1E)
Select Enabled to use Enhanced Halt-State technology, which will significantly reduce the CPU’s power consumption by reducing the CPU’s clock cycle and voltage during a Halt-state. The options are Disable and Enable.
CPU T State Control

ACPI (Advanced Configuration Power Interface) T-States

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

CPU Advanced PM Tuning

Energy Perf BIAS

Energy Performance Tuning

When enabled, this item selects whether the BIOS or Operating System can turn on the energy performance bias tuning. The options are Enable and Disable.

If the above is set to Disable, Energy Performance BIAS Setting will display:

Energy Performance BIAS Setting

This feature allows balancing Power Efficiency vs Performance. This will override whatever setting is in the Operating System. The options are Performance, Balanced Performance, Balanced Power, and Power.

Power/Performance Switch

This feature allows dynamic switching between Power and Performance power efficiency. The options are Enable and Disable.

Workload Configuration

This feature allows for optimization of workload. Balanced is recommended. The options are Balanced and I/O Sensitive.

Program PowerCTL_MSR

PKG C-state Lat. Neg.

Use this feature to indicate whether latency should be negotiated with PCH for packaging C-States. The options are Enable and Disable.
SAPM Control
This feature indicates whether the PCU should control the System Agent PM using its power-performance tuning algorithm. The options are Enable and Disable.

Energy Efficient Turbo
Use this feature to enable energy efficient turbo mode. The options are Enable and Disable.

► DRAM RAPL Configuration

Override BW_LIMIT_TF
Use this feature to set the value for the custom tuning of BW_LIMIT_TF. The default value is 1.

DRAM RAPL Extended Range
Use this feature to set the DRAM Running Average Power Limit (RAPL) Extended Range. The options are Disable and Enable.

► Chipset Configuration

Warning: Setting the wrong values in the following features may cause the system to malfunction.

► North Bridge

This feature allows the user to configure the following North Bridge settings.

► IIO 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.
IIO1 Configuration

M.2 PCI-E 3.0 X4
This item configures the link speed of the PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s) and Gen 3 (Generation 3) (8 GT/s).

SLOT 7 PCI-E 3.0 X16
This item configures the link speed of the PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s) and Gen 3 (Generation 3) (8 GT/s).

IOAT (Intel® IO Acceleration) Configuration

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

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

Intel® VT for Directed I/O (VT-d)

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

ACS Control
Use this feature to program Access Control Services (ACS) to the PCI-E Root Port Bridges. The options are Enable and Disable.

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

Enforce POR

Select Enable to enforce POR restrictions on DDR4 frequency and voltage programming. The options are Enabled and Disabled.

Memory Frequency

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

Data Scrambling

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

DRAM RAPL Baseline

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

Set Throttling Mode

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

A7 Mode

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

DIMM Information

This item displays the status of a DIMM module specified by the user.

- DIMMA1
- DIMMB1
- DIMMA2
- DIMMB2
Memory RAS (Reliability_Availability_Serviceability) Configuration

Use this submenu to configure the following Memory RAS settings.

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

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

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

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

South Bridge
The following South Bridge information will display:

- USB Configuration
- USB Module Version
- USB Devices

Legacy USB Support
This feature enables support for legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disable to have USB devices available only for EFI applications. The options are Enabled, Disabled and Auto.
XHCI Hand-Off

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

EHCI Hand-Off

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

Port 60/64 Emulation

This feature enables or disables I/O port 60h/64h emulation support. This should be enabled for complete USB keyboard legacy support for non-USB-aware Operating Systems. The options are Disabled and Enabled.

USB 3.0 Support

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

EHCI1

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

EHCI2

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

XHCI Pre-Boot Driver

Select Enabled to enable XHCI (Extensible Host Controller Interface) support on a pre-boot drive specified by the user. The options are Enabled and Disabled.

►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:

SATA Frozen

Use this item to enable the HDD Security Frozen Mode. The options are Enabled and Disabled.

SATA AHCI LPM

Use this feature to enable the Link Power Management for SATA AHCI. The options are Disabled and Enabled.

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 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 initialize the device. The options are Enabled and Disabled.

Port 0 ~ Port 5 SATA Device Type

Use this item to specify if the connected SATA device is 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:

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

Use this item to specify if the connected SATA device is a Solid State drive or a Hard Disk Drive. The options are Hard Disk Drive and Solid State Drive.

**Server ME (Management Engine) Configuration**

This feature displays the following system ME configuration settings.

- General ME Configuration
- Operational Firmware Version
- ME Firmware Type
- Recovery Firmware Version
- ME Firmware Features
- ME Firmware Status #1
- ME Firmware Status #2
  - Current State
  - Error Code

**PCle/PCI/PnP Configuration**

The following information will display:

- PCI Bus Driver Version
- PCI Devices Common Settings:

**PCI PERR/SERR Support**

Select Enabled to allow a PCI device to generate a PERR/SERR number for a PCI Bus Signal Error Event. The options are Enabled and Disabled.

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

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

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

Select Enabled for Single-Root IO Virtualization support. The options are Enabled and Disabled.
*Onboard 10GbE LAN SR-IOV not supported on D-1540/D-1520.

**Maximum Payload**

Use this feature to select the setting for the PCI Express maximum payload size. The options are Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

**Relaxed Ordering**

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

**Extended Tag**

Use this item to allow a device to use the 8-bit tag field as a requester. The options are Disabled and Enabled.

**ARI Forwarding**

When this feature is enabled, the Downstream Port disables its traditional device number to 0 when turning Type1 Configuration Request into a Type0 Configuration Request. The default value is Disabled.

**M.2 PCI-E 3.0 X4 OPROM**

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled, Legacy, and EFI.

**SLOT 7 PCI-E 3.0 X16 Bifurcation**

Use this feature to set the PCI-E slot to operate as a single x16 slot or to bifurcate into two x8 slots. A proper riser card must be used to take advantage of bifurcation. The options are x8x8 and x16.

**SLOT 7 PCI-E 3.0 X16 OPROM**

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled, Legacy, and EFI.

**Onboard LAN Option ROM Type**

Use this option to enable Option ROM support to boot the computer using a network device specified by the user. The options are Legacy and EFI.

**Onboard LAN1 Option ROM**

Use this option to select the type of device installed in LAN Port 1 used for system boot. The options are Disabled, PXE, and iSCSI.
Onboard LAN2 Option ROM
Use this option to select the type of device installed in LAN Port 2 used for system boot. The options are Disabled and PXE.

Onboard LAN3 Option ROM
Use this option to select the type of device installed in LAN Port 3 used for system boot. The options are Disabled and PXE.

Onboard LAN4 Option ROM
Use this option to select the type of device installed in LAN Port 4 used for system boot. The options are Disabled and PXE.

Onboard Video Option ROM
Use this item to select the Onboard Video Option ROM type. The options are Disabled, Legacy, and EFI.

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.

Network Stack
Use this feature to enable PXE (Preboot Execution Environment) or UEFI (Unified Extensible Firmware Interface) for network stack support. The options are Disabled and Enabled.

*If the item above set to Enabled, the four items below will appear:

IPv4 PXE Support
Use this feature to enable IPv4 PXE boot support. The options are Enabled and Disabled.

IPv6 PXE Support
Use this feature to enable IPv6 PXE boot support. The options are Enabled and Disabled.

PXE boot wait time
Use this option to specify the number of times media will be checked. Press "+" or "-" on your keyboard to change the value. The default setting is 0.

Media detect count
Use this option to specify the number of times media will be checked. Press "+" or "-" on your keyboard to change the value. The default setting is 1.
Super IO Configuration

Super IO Chip AST2400

Serial Port 1 Configuration
This submenu allows the user to configure settings of Serial Port 1.

Serial Port
Select Enabled to enable the selected onboard serial port. The options are Enabled and Disabled.

Device Settings
This item displays the status of a serial part specified by the user.

Change Port 1 Settings
This feature specifies the base I/O port address and the Interrupt Request address of a serial port specified by the user. Select Auto to allow the BIOS to automatically assign the base I/O and IRQ address. The options for Serial Port 1 are Auto, (IO=3F8h; IRQ=4), (IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12) and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12).

Serial Port Console Redirection

COM1 Console Redirection

Console Redirection
Select Enabled to enable console redirection support for a serial port specified by the user. The options are Enabled and Disabled.

COM1 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 op-
tions are 1 and 2.

Flow Control
Use this feature 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 re-
ceiving 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 ter-
minals. The options are Enabled and Disabled.

Recorder Mode
Select Enabled to capture the data displayed on a terminal and send it as text mes-
sages 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 the settings for Function Keys and KeyPad used for Putty, which is a terminal emulator designed for the Windows OS. The options are VT100, LINUX, XTERMR6, SC0, 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.

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

*If the item above set to Enabled, the following items will become available for user's configuration:

►SOL Console Redirection Settings
Use this feature to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

Terminal Type
Use this feature 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
Use this feature 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.

EMS (Emergency Management Services) Console Redirection

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

*If the item above set to Enabled, the following items will become available for user's configuration:

EMS 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.

Out-of-Band Mgmt Port

The feature selects a serial port in a client server to be used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are COM1 and SOL.

Terminal Type

Use this feature 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

Use this item 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.

Data Bits

Parity

Stop Bits

▶ACPI Settings

WHEA Support

This feature Enables the Windows Hardware Error Architecture (WHEA) support for the Windows 2008 (or a later version) operating system. The options are Enabled and Disabled.

High Precision Event Timer

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

PCI AER Support

Use this feature to enable the ACPI OS to manage PCI Advanced Error Reporting. The options are Enabled and Disabled.

▶Trusted Computing (Available when a TPM Device is Detected and TPM Jumper is Enabled)

Configuration

Security Device Support

Select Enable for the AMI BIOS to automatically download the drivers needed to provide Trusted Computing platform support for this machine to ensure date integrity and network security. The options are Disable and Enable.
TPM State

Select Enabled to use TPM (Trusted Platform Module) settings for system data security. The options are Disabled and Enabled.

**Note:** The system will reboot for the change on TPM State to take effect.

Pending Operation

Use this item to schedule a TPM-related operation to be performed by a security device for TPM support. The options are None, Enable Take Ownership, Disable Take Ownership, and TPM Clear.

**Note:** The computer will reboot to carry out a pending TPM operation and change TPM state for a TPM device.

Current Status Information

This feature indicates the status of the following TPM items:

- **TPM Enabled Status**
- **TPM Active Status**
- **TPM Owner Status**

Intel TXT (LT-SX) Configuration

TXT Support

Intel TXT (Trusted Execution Technology) helps protect against software-based attacks to ensure the security, confidentiality, and integrity of all data stored in the system. The options are Enabled and Disabled.
6-4 Event Logs

Use this feature to configure Event Log settings.

Change SMBIOS Event Log Settings

Enabling/Disabling Options

SMBIOS Event Log

Change this item to enable or disable all features of the SMBIOS Event Logging during system boot. The options are Enabled and Disabled.

Runtime Error Logging Support

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

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

Select Enable for the BIOS to correct a memory error if it is correctable. The options are Disable and Enable.

Memory Correctable Error Threshold

Use this item to enter the threshold value for correctable memory errors. The default setting is 10.
PCI-Ex (PCI-Express) Error Enable

Select Yes for the BIOS to correct errors occurred in the PCI-E slots. The options are Yes and No.

Erasing Settings

Erase Event Log

If No is selected, data stored in the event log will not be erased. Select Yes, Next Reset, data in the event log will be erased upon next system reboot. Select Yes, Every Reset, data in the event log will be erased upon every system reboot. The options are No, Yes, Next reset, and Yes, Every reset.

When Log is Full

Select Erase Immediately for all messages to be automatically erased from the event log when the event log memory is full. The options are Do Nothing and Erase Immediately.

SMBIOS Event Long Standard Settings

Log System Boot Event

This option toggles the System Boot Event logging to enabled or disabled. The options are Disabled and Enabled.

MECI

The Multiple Event Count Increment (MECI) counter counts the number of occurrences that a duplicate event must happen before the MECI counter is incremented. This is a numeric value. The default value is 1.

METW

The Multiple Event Time Window (METW) defines number of minutes must pass between duplicate log events before MECI is incremented. This is in minutes, from 0 to 99. The default value is 60.

Note: After making changes on a setting, be sure to reboot the system for the changes to take effect.

View SMBIOS Event Log

This section displays the contents of the SMBIOS Event Log.
6-5 IPMI

Use this feature to configure Intelligent Platform Management Interface (IPMI) settings.

BMC Firmware Revision
This item indicates the IPMI firmware revision used in your system.

IPMI Status (Baseboard Management Controller)
This item indicates the status of the IPMI firmware installed in your system.

▶ System Event Log

Enabling/Disabling Options

SEL Components
Select Enabled for all system event logging at bootup. The options are Enabled and Disabled.

Erasing Settings

Erase SEL
Select Yes, On next reset to erase all system event logs upon next system reboot. Select Yes, On every reset to erase all system event logs upon each system reboot.
Select No to keep all system event logs after each system reboot. The options are No, Yes, On next reset, and Yes, On every reset.

When SEL is Full
This feature allows the user to decide what the BIOS should do when the system event log is full. Select Erase Immediately to erase all events in the log when the system event log is full. The options are Do Nothing and Erase Immediately.

Note: After making changes on a setting, be sure to reboot the system for the changes to take effect.

▶ BMC Network Configuration

BMC Network Configuration

IPMI LAN Selection
This item displays the IPMI LAN setting. The default setting is Failover.

IPMI Network Link Status
This item displays the IPMI Network Link status. The default setting is Dedicated LAN.

Update IPMI LAN Configuration
Select Yes for the BIOS to implement all IP/MAC address changes at the next system boot. The options are No and Yes.

Configuration Address Source
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 and Static. The following items are assigned IP addresses automatically if DHCP is selected.

Current Configuration Address Source
This item displays the current configuration address for this computer.

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

Gateway IP Address
This item displays the Gateway IP address for this computer. This should be in decimal and in dotted quad form (i.e., 172.31.0.1).

IPMI Function Support
Use this feature to enable or disable IPMI support within the BIOS. The options are Enabled and Disabled. When Disabled, the motherboard powers on quickly by removing BIOS control for extended IPMI features. The Disable option is for applications that require faster power on time without using Supermicro Update Manager (SUM) or extended IPMI features. The BMC network configuration in the BIOS setup is also invalid when IPMI Function Support is disabled. General BMC function and motherboard health monitor such as temperature and fan control are still active even when this option is disabled.
6-6 Security Settings

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

Password Check

Select Setup for the system to check for a password at Setup. Select Always for the system to check for a password at bootup or upon entering the BIOS Setup utility. The options are Setup and Always.

Administrator Password

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

CSM Support

Select Enabled to support the EFI Compatibility Support Module (CSM), which provides compatibility support for traditional legacy BIOS for system boot. The options are Enabled and Disabled. The options are Enabled and Disabled.

Secure Boot Menu

This section displays the contents of the following secure boot features:

- System Mode
- Secure Boot
- Vendor Keys
Secure Boot
Use this item to enable secure boot. The options are Disabled and Enabled.

Secure Boot Mode
Use this item to select the secure boot mode. The options are Standard and Custom.

Key Management
This submenu allows the user to configure the following Key Management settings.

Factory Default Key Provision
Select Enabled to install the default Secure-Boot keys set by the manufacturer. The options are Disabled and Enabled.

Enroll All Factory Default Keys
Select Yes to install all default secure keys set by the manufacturer. The options are Yes and No.

Save All Secure Boot Variables
This feature allows the user to decide if all secure boot variables should be saved.

Platform Key (PK)
This feature allows the user to configure the settings of the platform keys.

Set New Key
Select Yes to load the new platform keys (PK) from the manufacturer's defaults. Select No to load the platform keys from a file. The options are Yes and No.

Key Exchange Key (KEK)

Set New Key
Select Yes to load the KEK from the manufacturer's defaults. Select No to load the KEK from a file. The options are Yes and No.

Append Key
Select Yes to add the KEK from the manufacturer's defaults list to the existing KEK. Select No to load the KEK from a file. The options are Yes and No.


▶ Authorized Signatures

Set New Key
Select Yes to load the database from the manufacturer’s defaults. Select No to load the DB from a file. The options are Yes and No.

Append Key
Select Yes to add the database from the manufacturer’s defaults to the existing DB. Select No to load the DB from a file. The options are Yes and No.

▶ Forbidden Signatures

Set New Key
Select Yes to load the DBX from the manufacturer’s defaults. Select No to load the DBX from a file. The options are Yes and No.

Append New Key
Select Yes to add the DBX from the manufacturer’s defaults to the existing DBX. Select No to load the DBX from a file. The options are Yes and No.

▶ Authorized TimeStamps

Set New Key
Select Yes to load the DBT from the manufacturer's defaults. Select No to load the DBT from a file. The options are Yes and No.

Append Key
Select Yes to add the DBT from the manufacturer's defaults list to the existing DBT. Select No to load the DBT from a file. The options are Yes and No.
6-7  Boot Settings

Use this feature to configure Boot Settings:

**Setup Prompt Timeout**

Use this item to indicate the length of time (the number of seconds) for the BIOS to wait before rebooting the system when the setup activation key is pressed. Enter the value of 65535 (0xFFFF) for the BIOS to wait indefinitely. The default setting is 1.

**Boot Mode Select**

Use this item to select the type of device that the system is going to boot from. The options are Legacy, UEFI, and Dual. The default setting is 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.

- Dual Boot Order #1
- Dual Boot Order #2
- Dual Boot Order #3
- Dual Boot Order #4
- Dual Boot Order #5
• Dual Boot Order #6
• Dual Boot Order #7
• Dual Boot Order #8
• Dual Boot Order #9
• Dual Boot Order #10
• Dual Boot Order #11
• Dual Boot Order #12
• Dual Boot Order #13
• Dual Boot Order #14
• Dual Boot Order #15

► Delete Boot Option
Use this feature to remove a pre-defined boot device from which the system will boot during startup.
The settings are [any pre-defined boot device].

► Network Drive BBS Priorities
This feature allows the user to specify which Network devices are boot devices.
• Legacy Boot Order #1

► UEFI Application Boot Priorities
This feature allows the user to specify which UEFI devices are boot devices.
• UEFI Boot Order #1
6-8  Save & Exit

Select the Exit tab from the BIOS setup utility screen to enter the Exit BIOS Setup screen.

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

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

Save Options

Save Changes
After completing the system configuration changes, select this option to save the changes you have made. This will not reset (reboot) the system.

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

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

Save As User Defaults

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

Restore User Defaults

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

System Specifications

Processors
One Intel Xeon D SoC D-1541 processor

BIOS
128 Mb AMI BIOS SPI EEPROM BIOS

Memory
Memory Capacity: 128GB DDR4 ECC RDIMM or 64GB DDR4 ECC/Non-ECC UDIMM with speeds of 1600MHz, 1800MHz up to 2133MHz in four slots
DIMM Sizes: 4GB, 8GB, 16GB and 32GB (32GB for RDIMM only, Dual Rank Data width x4)

SATA Controller
Six SATA3 (6Gbps) connectors

Drives
Supports up to four 3.5" hot-swap SAS/SATA drives using a backplane with SES2 and two 2.5" fixed internal drives
Also supports one slim DVD drive

Expansion Slots
One low profile PCI Express 3.0 x16 card

Motherboard
X10SDV-TLN4F (mini-ITX form factor)
Dimensions: 6.7"x6.7" (17cm x 17cm)
Chassis
SC721TQ-250B mini-tower
Dimensions: height 9.45" (240.03mm), width 8.27" (210.06mm), depth 11" (279.4mm)

System Cooling
One 12-cm fan

System Input Requirements
AC Input: 100-240 VAC, 50-60 Hz
Rated Input Current: 5 Amp

Power Supply
Part# PWS-251-1H, Flex ATX Multi-output, 80 Plus Bronze level
Rated Output Power: 250 W
Rated Output Voltages:
- +12V Max: 18 Amp; Min: 1 Amp @100V-240V
- -12V Max: 3 Amp; Min: 0 Amp
- +5V Max: 14 Amp; Min: 0.5 Amp
- +3.3V Max: 12 Amp Min: 0.3Amp
- 5VSB Max: 2.5 Amp Min: 0 Amp

Operating Environment
Operating Temperature: 5°C ~ 40°C (41°F ~ 104°F)
Non-Operating Temperature: -40°C ~ 60°C (-40°F ~ 140°F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-Operating Relative Humidity: 5% to 95% (non-condensing)

Regulatory Compliance
Electromagnetic Emissions: FCC Class B, EN 55022 Class B, EN 61000-3-2/-3-3, CISPR 22 Class B
Electromagnetic Immunity: EN 55024/CISPR 22, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)
Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)
California Best Management Practices Regulations for Perchlorate Materials:
This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”
(continued from front)

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