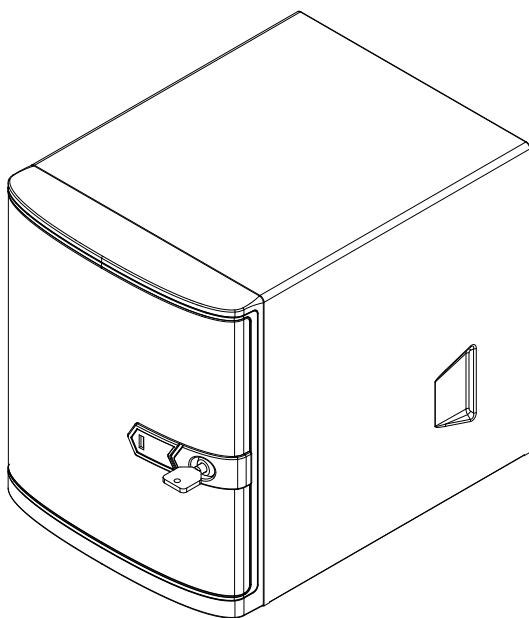




SUPERSERVER®

5028D-TN4T



USER'S MANUAL

Revision 1.0b

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

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**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

Release Date: February 22, 2016

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## Preface

### 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 maintenance 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.

# Contents

**Chapter 1 Introduction..... 1-1**

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

1-2 Motherboard Features..... 1-2

    Processors ..... 1-2

    Memory ..... 1-2

    Serial ATA..... 1-2

    Input/Output Ports ..... 1-2

1-3 Server Chassis Features ..... 1-4

    System Power ..... 1-4

    Drives ..... 1-4

    PCI Slots ..... 1-4

    Control Panel ..... 1-4

    Cooling System ..... 1-4

1-4 Contacting Supermicro..... 1-5

**Chapter 2 System Interface**

2-1 Overview ..... 2-1

2-2 Control Panel Buttons ..... 2-2

2-3 Control Panel LEDs ..... 2-2

    Overheating..... 2-3

        Overheat Temperature Setting ..... 2-3

        Responses..... 2-3

**Chapter 3 Standardized Warning Statements for AC Systems**

    About Standardized Warning Statements ..... 3-1

    Warning Definition ..... 3-1

    Installation Instructions..... 3-4

    Circuit Breaker ..... 3-5

    Power Disconnection Warning ..... 3-6

    Equipment Installation..... 3-8

    Restricted Area..... 3-9

    Battery Handling..... 3-10

    Redundant Power Supplies (if applicable to your system)..... 3-12

    Backplane Voltage (if applicable to your system)..... 3-13

    Comply with Local and National Electrical Codes ..... 3-14

    Product Disposal ..... 3-15

    Hot Swap Fan Warning (if applicable to your system) ..... 3-16

    Power Cable and AC Adapter ..... 3-18



## **Chapter 4 Advanced Motherboard Setup**

4-1	Handling the Motherboard .....	4-1
	Precautions .....	4-1
	Unpacking .....	4-1
4-2	Connecting Cables .....	4-2
	Connecting Data Cables .....	4-2
	Connecting Power Cables .....	4-2
	Connecting the Control Panel .....	4-2
4-3	I/O Ports .....	4-3
4-4	Memory Support .....	4-4
	Memory Population Guidelines .....	4-4
	Memory Installation Guidelines .....	4-5
	Installing DIMM Memory Modules .....	4-5
4-5	Expansion Cards .....	4-5
4-6	Motherboard Details .....	4-6
	X10SDV-TLN4F Motherboard Quick Reference .....	4-7
4-7	Connector Definitions .....	4-9
	Power Connectors .....	4-9
4-8	Jumper Settings .....	4-16
4-9	Onboard Indicators .....	4-20
4-10	SATA Ports .....	4-21
4-11	Installing Software .....	4-22
	SuperDoctor® 5 .....	4-23
4-12	Serverboard Battery .....	4-24

## **Chapter 5 Advanced Chassis Setup and Maintenance ..... 5-1**

5-1	Removing Power from the System .....	5-2
5-2	Hardware Security .....	5-2
	Front Bezel Lock .....	5-2
	Rear Chassis Hasp .....	5-3
	Kensington Cable Slot (K-Slot) .....	5-3
5-3	Removing the Chassis Cover .....	5-4
5-4	Removing and Installing Drives .....	5-5
	Front Mounted Hot-Swap Drives .....	5-5
	Installing the Internal Fixed Hard Drives .....	5-8
	Installing the Side Mounted Fixed Hard Drive .....	5-9
5-5	Installing the DVD Drive .....	5-10
5-6	Installing Expansion Cards .....	5-12
5-7	Installing the Rear Exhaust Fan .....	5-14

5-8 Replacing the Power Supply ..... 5-15

5-9 Replacing the Backplane ..... 5-16

**Chapter 6 BIOS**

6-1 Introduction..... 7-1

    Starting BIOS Setup Utility..... 7-1

    How To Change the Configuration Data..... 7-1

    How to Start the Setup Utility ..... 7-2

6-2 Main Setup..... 7-2

6-3 Advanced Setup Configurations..... 7-4

6-4 Event Logs ..... 7-27

6-5 IPMI..... 7-29

6-6 Security Settings ..... 7-32

6-7 Boot Settings..... 7-35

6-8 Save & Exit ..... 7-37

**Appendix A System Specifications ..... A-1**

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Web Site: [www.supermicro.com.tw](http://www.supermicro.com.tw)

**Notes**

# 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](http://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 drivers and utilities: <ftp://ftp.supermicro.com>
- Product safety information:  
[http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm)

For support, email [support@supermicro.com](mailto: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.

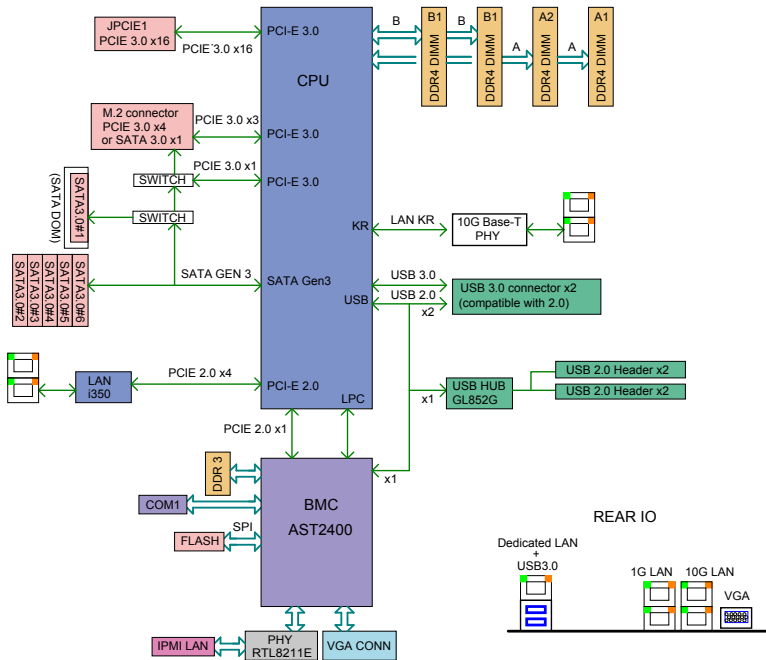


Figure 1-1. System Block Diagram

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](mailto:support@supermicro.com.tw)

Website: [www.supermicro.com.tw](http://www.supermicro.com.tw)

**Notes**

## Chapter 2

### System Interface

#### 2-1 Overview

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

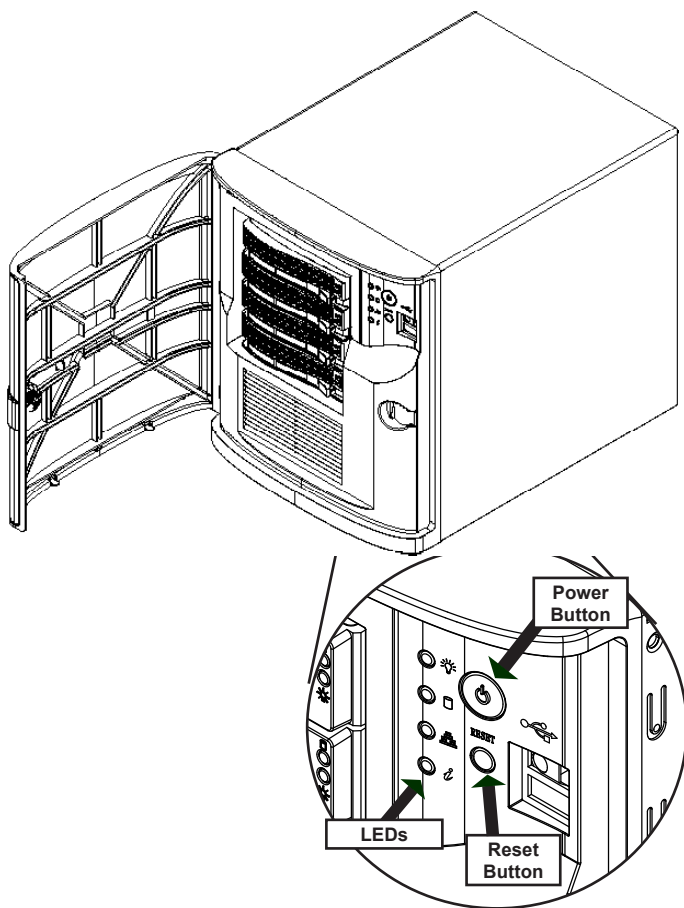


Figure 2-1. Control Panel

## 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



### **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.

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

## 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.

## Notes

## 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](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。

此警告符号代表危險。

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。

此警告符號代表危險。

您正處於可能身體可能會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，並且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

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

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.

## תקנון הצהרות אזהרה

הצהרות הבאות הן אזהרות על פי תקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בבעיה כלשהי, יש ליצור קשר עם מחלקת תמיכה טכנית של סופרמיקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים.

יש לקרוא את הנספח במלוואו לפני התקנת או הגדרת הרכיבים במארוזי סופרמיקרו.



تحذير! هذا الرمز يعني خطر انك في حالة يمكن أن تتسبب في اصابة جسدية .  
 قبل أن تعمل على أي معدات، كن على علم بالمخاطر الناجمة عن الدوائر  
 الكهربائية  
 وكن على دراية بالممارسات الوقائية لمنع وقوع أي حوادث  
 استخدم رقم البيان المنصوص في نهاية كل تحذير للعثور ترجمتها

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.

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告

将此系统连接电源前，请先阅读安装说明。

警告

將系統與電源連接前，請先閱讀安裝說明。

Warnung

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.

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقرأ إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

Waarschuwing

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

## Circuit Breaker



### Warning!

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

サーキット・ブレーカー

この製品は、短絡(過電流)保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

### 警告

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

### 警告

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

### Warnung

Dieses Produkt ist darauf angewiesen, dass im Gebäude ein Kurzschluss- bzw. Überstromschutz installiert ist. Stellen Sie sicher, dass der Nennwert der Schutzvorrichtung nicht mehr als: 250 V, 20 A beträgt.

### ¡Advertencia!

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

### Attention

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

מוצר זה מסתמך על הגנה המותקנת במבנים למניעת קצר חשמלי. יש לוודא כי המכשיר המגן מפני הקצר החשמלי הוא לא יותר מ-250 V, 20 A

هذا المنتج يعتمد على معدات الحماية من الدوائر القصيرة التي تم تثبيتها في المبنى

تأكد من أن تقييم الجهاز الوقائي ليس أكثر من: 250V, 20A

경고!

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

Waarschuwing

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

## Power Disconnection Warning



### Warning!

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

### 電源切斷の警告

システムコンポーネントの取り付けまたは取り外しのために、シャーシ内部にアクセスするには、

システムの電源はすべてのソースから切斷され、電源コードは電源モジュールから取り外す必要があります。

### 警告

在你打开机箱并安装或移除内部器件前，必须将系统完全断电，并移除电源线。

### 警告

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

### 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 châssis pour installer ou enlever des composants de système.

**אזהרה !**

יש לנתק את המערכת מכל מקורות החשמל ויש להסיר את כבל החשמלי מהספק לפני גישה לחלק הפנימי של המארז לצורך התקנת או הסרת רכיבים.

يجب فصل النظام من جميع مصادر الطاقة وإزالة سلك الكهرباء من وحدة امداد الطاقة قبل الوصول إلى المناطق الداخلية للهيكल لتثبيت أو إزالة مكونات الجهاز

경고!

시스템에 부품들을 장착하거나 제거하기 위해서는 새시 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.

### 機器の設置

トレーニングを受け認定された人だけがこの装置の設置、交換、またはサービスを許可されています。

### 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

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

### 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!

צוות מוסמך בלבד רשאי להתקין, להחליף את הציוד או לתת שירות עבור הציוד.

يجب أن يسمح فقط للموظفين المؤهلين والمدربين لتكوين واستبدال أو خدمة هذا الجهاز

### 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、アクセス制限区域に設置されることを想定しています。

アクセス制限区域は、特別なツール、鍵と錠前、その他のセキュリティの手段を用いてのみ出入りが可能です。

### 警告

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

### 警告

此裝置僅限安裝於進出管制區域，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.

## אזור עם גישה מוגבלת

### אזהרה!

יש להתקין את היחידה באזורים שיש בהם הגבלת גישה. הגישה ניתנת בעזרת כלי אבטחה בלבד (מפתח, מנעול וכד').

تم تخصيص هذه الوحدة لتركيبها في مناطق محظورة .  
يمكن الوصول إلى منطقة محظورة فقط من خلال استخدام أداة خاصة،  
قفل ومفتاح أو أي وسيلة أخرى للأمان

경고!

이 장치는 접근이 제한된 구역에 설치하도록 되어있습니다. 특수도구, 잠금 장치 및 키, 또는 기타 보안 수단을 통해서만 접근 제한 구역에 들어갈 수 있습니다.

### Waarschuwing

Dit apparaat is bedoeld voor installatie in gebieden met een beperkte toegang. Toegang tot dergelijke gebieden kunnen alleen verkregen worden door gebruik te maken van speciaal gereedschap, slot en sleutel of andere veiligheidsmaatregelen.

## 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

電池更換不當會有爆炸危險。請只使用同類電池或製造商推薦的功能相當的電池更換原有電池。請按製造商的說明處理廢舊電池。

### 警告

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



**Warnung**

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

**Attention**

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

**¡Advertencia!**

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

**אזהרה !**

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

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة استبدال البطارية بطريقة غير صحيحة عليك استبدال البطارية فقط بنفس النوع أو ما يعادلها كما أوصت به الشركة المصنعة تخلص من البطاريات المستعملة وفقا لتعليمات الشركة الصانعة

**경고!**

배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

**Waarschuwing**

Er is ontplofingsgevaar 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りません。

### 警告

此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。

### 警告

此裝置連接的電源可能不只一個，必須切斷所有電源才能停止對該裝置的供電。

### 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.

### אם קיים יותר מספק אחד

### אזהרה!

ליחידה יש יותר מחיבור אחד של ספק. יש להסיר את כל החיבורים על מנת לרוקן את היחידה.

قد يكون لهذا الجهاز عدة اتصالات بوحدات امداد الطاقة.  
يجب إزالة كافة الاتصالات لعزل الوحدة عن الكهرباء

경고!

이 장치에는 한 개 이상의 전원 공급 단자가 연결되어 있을 수 있습니다. 이 장치에 전원을 차단하기 위해서는 모든 연결 단자를 제거해야만 합니다.

Waarschuwing

Deze eenheid kan meer dan één stroomtoevoeraansluiting bevatten. Alle aansluitingen dienen verwijderd te worden om het apparaat stroomloos te maken.

### **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.

バックプレーンの電圧

システムの稼働中は危険な電圧または電力が、バックプレーン上にかかっています。

修理する際にはご注意ください。

警告

当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

警告

當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

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

¡Advertencia!

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

Attention

Lorsque le système est en fonctionnement, des tensions électriques circulent sur le fond de panier. Prendre des précautions lors de la maintenance.

## מתח בפנל האחורי

אזהרה !

קיימת סכנת מתח בפנל האחורי בזמן תפעול המערכת. יש להיזהר במהלך העבודה.

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

경고!

시스템이 동작 중일 때 후면판 (Backplane)에는 위험한 전압이나 에너지가 발생  
합니다. 서비스 작업 시 주의하십시오.

Waarschuwing

Een gevaarlijke spanning of energie is aanwezig op de backplane wanneer het  
systeem in gebruik is. Voorzichtigheid is geboden tijdens het onderhoud.

## 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

设备安装必须符合本地与本国电气法规。

警告

設備安裝必須符合本地與本國電氣法規。

Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!

La instalación del equipo debe cumplir con las normas de electricidad locales y  
nacionales.

#### Attention

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

#### תאום חוקי החשמל הארצי

אזהרה !

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمثل للقوانين المحلية والوطنية المتعلقة  
بالكهرباء

경고!

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

#### Waarschuwing

Bij installatie van de apparatuur moet worden voldaan aan de lokale en nationale elektriciteitsvoorschriften.

### Product Disposal



#### Warning!

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

#### 製品の廃棄

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

#### 警告

本产品的废弃处理应根据所有国家的法律和规章进行。

#### 警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

#### Warnung

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

¡Advertencia!

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

Attention

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

## סילוק המוצר

אזהרה !

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

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

경고!

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

Waarschuwing

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

## 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.

ファン・ホットスワップの警告

シャーシから冷却ファン装置を取り外した際、ファンがまだ回転している可能性があります。ファンの開口部に、指、ドライバー、およびその他のものを近づけないで下さい。

警告

当您从机架移除风扇装置，风扇可能仍在转动。小心不要将手指、螺丝起子和其他物品太靠近风扇

**警告**

當您從機架移除風扇裝置，風扇可能仍在轉動。小心不要將手指、螺絲起子和其他物品太靠近風扇。

**Warnung**

Die Lüfter drehen sich u. U. noch, wenn die Lüfterbaugruppe aus dem Chassis genommen wird. Halten Sie Finger, Schraubendreher und andere Gegenstände von den Öffnungen des Lüftergehäuses entfernt.

**¡Advertencia!**

Los ventiladores podran dar vuelta cuando usted quite el montaje del ventilador del chasis. Mantenga 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.

**אזהרה !**

כאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאווררים עדיין עובדים. יש להרחיק למרחק בטוח את האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

من الممكن أن المراوح لا تزال تدور عند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع ومفكات البراغي وغيرها من الأشياء بعيدا عن الفتحات في كتلة المروحة.

**경고!**

새시로부터 팬 조립품을 제거할 때 팬은 여전히 회전하고 있을 수 있습니다. 팬 조립품 외관의 열려있는 부분들로부터 손가락 및 스크류드라이버, 다른 물체들이 가까이 하지 않도록 배치해 주십시오.

**Waarschuwing**

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

安裝此產品時，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）。

### 警告

安裝此產品時，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

Bei der Installation des Produkts, die zur Verfügung gestellten oder benannt Anschlusskabel, Stromkabel und Netzteile. Verwendung anderer Kabel und Adapter kann zu einer Fehlfunktion oder ein Brand entstehen. Elektrische Geräte und Material Safety Law verbietet die Verwendung von UL-oder CSA-zertifizierte Kabel, UL oder CSA auf der Code für alle anderen elektrischen Geräte als Produkte von Supermicro nur bezeichnet gezeigt haben.

### ¡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.

**חשמליים ומתאמי AC****אזהרה!**

כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתאמים AC אשר נועדו וסופקו לשם כך. שימוש בכל כבל או מתאם אחר יכול לגרום לתקלה או קצר חשמלי. על פי חוקי שימוש במכשירי חשמל וחוקי בטיחות, קיים איסור להשתמש בכבלים המוסמכים ב- UL או ב- CSA (כשאר מופיע עליהם קוד של UL/CSA) עבור כל מוצר חשמלי אחר שלא צוין על ידי סופרמיקרו בלבד.

عند تركيب الجهاز يجب استخدام كابلات التوصيل، والكابلات الكهربائية ومحوالات التيار المتردد التي . أن استخدام أي كابلات ومحوالات أخرى يتسبب في حدوث عطل أو حريق. تم توفيرها لك مع المنتج الأجهزة الكهربائية ومواد قانون السلامة يحظر استخدام الكابلات CSA أو UL معتمدة من قبل لأي أجهزة كهربائية أخرى غير المنتجات المعينة من قبل Supermicro (التي تحمل علامة UL/CSA)

**경고!**

제품을 설치할 때에는 제공되거나 지정된 연결케이블과 전원케이블, AC 어댑터를 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 UL 또는 CSA에서 인증한 케이블 (전선 위에 UL/CSA가 표시)들의 사용을 금지합니다.

**Waarschuwing**

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.

**Notes**

## 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 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

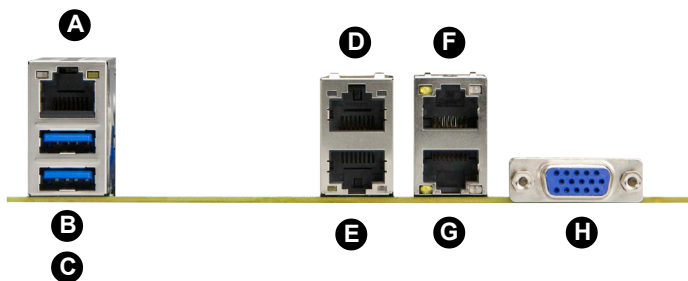


Figure 4-1. Rear I/O Ports

Back Panel I/O	
A. IPMI LAN	E. LAN Port 1, 1GbE
B. USB 3.0 Port 1	F. LAN Port 4, 10Gb Base T
C. USB 3.0 Port 0	G. LAN Port 3, 10Gb Base T
D. LAN Port 2, 1GbE	H. VGA Port

## 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.

Recommended Population (Balanced)				
DIMMA1 Slot	DIMMB1 Slot	DIMMA2 Slot	DIMMB2 Slot	Total System Memory
4GB	4GB			8GB
4GB	4GB	4GB	4GB	16GB
8GB	8GB			16GB
8GB	8GB	8GB	8GB	32GB
16GB	16GB	16GB	16GB	64GB

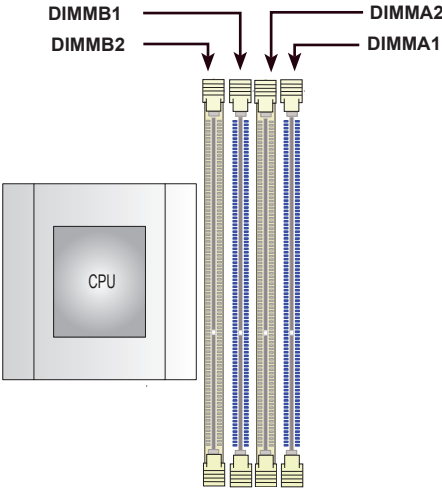


Figure 4-2. Memory Slot Labels

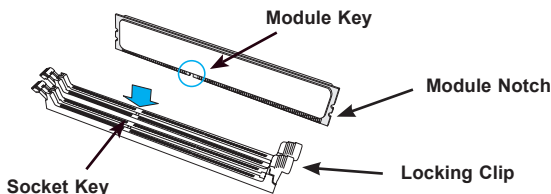
## Memory Installation Guidelines

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

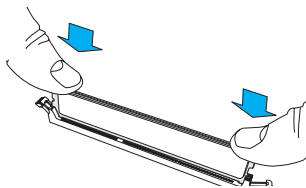
- Always use DDR4 DIMM modules of the same size, type and speed. Mixing memory modules of different types and speeds is not allowed.
- The motherboard will support one DIMM module installed. However, for best memory performance, install DIMM modules in pairs.

## 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.



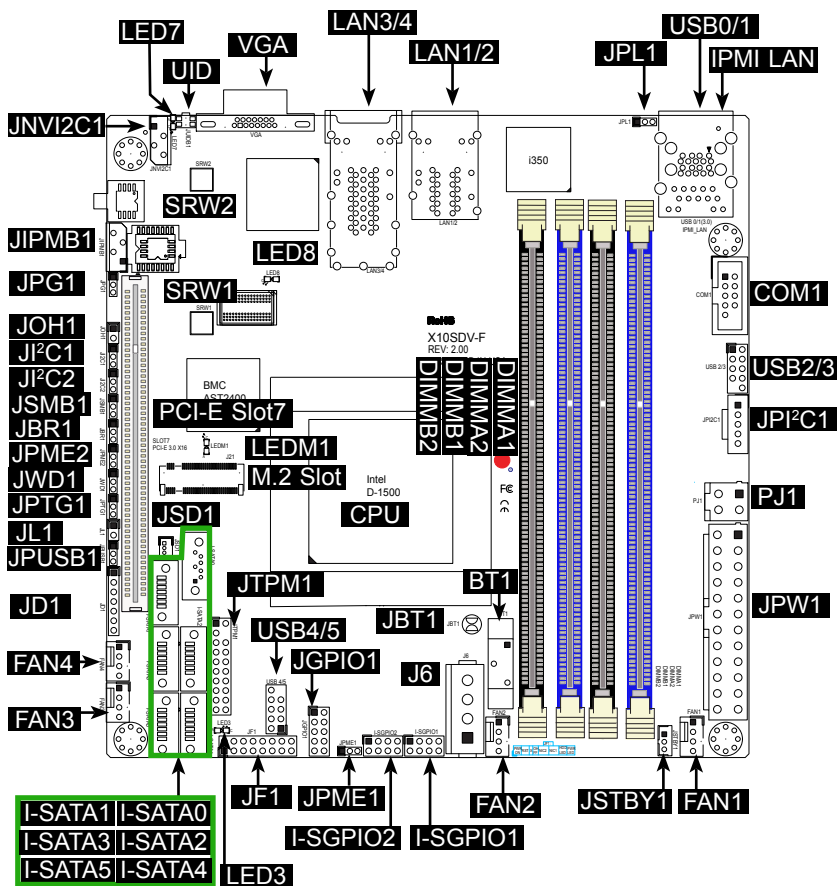
2. Install the DIMM module straight down into the socket until it is securely seated in the socket. The side clips will automatically lock the module into place.



## 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.

## 4-6 Motherboard Details



**Figure 4-3. X10SDV-TLN4F Motherboard Layout**

**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

Headers/Connectors	
Connector	Description
BT1	Onboard Battery
COM1	COM1 Header
FAN1 ~ FAN4	CPU/System Cooling Fans (FAN4 is on PCB 2.00 only)
IPMI LAN	Dedicated IPMI LAN Port
I-SATA0 ~ I-SATA5	Intel Serial ATA Ports (I-SATA0 supports SuperDOM)
I-SGPIO1, I-SGPIO2	Serial Link General Purpose I/O Headers
JGPIO1	General Purpose I/O Expander Header
J6	4-pin Power Connector for HDD use (To provide power from the motherboard to onboard HDD devices.)
J21	M.2 Slot (Shared with I-SATA0 when a SATA device is installed in M.2)
JD1	Speaker (Pins 1-3: Power LED, Pins 4-7: Speaker)
JF1	Front Panel Control Header
JIPMB1	4-pin External SMBus I2C Header (for an IPMI Card)
JL1	Chassis Intrusion Header
JNVI2C1	NVMe I2C Header
JOH1	Overheat LED Header
JPI2C1	Power Supply SMBus I2C Header (On PCB 2.00 only)
JPW1	24-pin ATX Main Power Connector
JSD1	SATA DOM (Device_On_Module) Power Connector
JSMB1	SMBus Header
JSTBY1	Standby Power Header
JTPM1	Trusted Platform Module (TPM)/Port 80 Connector
JUIDB1	Unit Identifier (UID) Button
LAN1~LAN2 LAN3~LAN4	Gigabit Ethernet (RJ45) Ports 10G Ethernet (RJ45) Ports
PJ1	4-pin 12V DC Power Connector (To provide alternative power for special enclosure when the 24-pin ATX power is not in use.)
SLOT7	PCI-E 3.0 x16 Slot
SRW1, SRW2	M.2 Holding Screws
USB 0/1	Back panel USB 3.0 Ports
USB 2/3, USB 4/5	Front Access USB 2.0 Ports
VGA	Back panel VGA Port

Jumpers		
Jumper	Description	Default
JBR1	BIOS Recovery	Pins 1-2 (Normal)
JBT1	CMOS Clear	Open: Normal, Short: Clear CMOS
J1 <sup>2</sup> C1/J1 <sup>2</sup> C2	SMB to PCI-Exp. Slots	Pins 2-3 (Disabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1	LAN1/LAN2 Enable	Pins 1-2 (Enabled)
JPME1	ME Recovery	Pins 1-2 (Normal)
JPME2	Manufacturing Mode	Pins 1-2 (Normal)
JPTG1	10Gb Ethernet Enable	Pins 1-2 (Enabled)
JPUSB1	USB Wakeup	Pins 1-2 (Enabled) (For USB0/1 Only)
JWD1	Watch Dog Enable	Pins 1-2 (Reset)

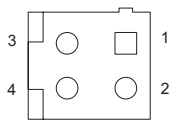
LED Indicators			
LED	Description	Color/State	Status
LEDM1	BMC Heartbeat LED	Green: Blinking	BMC: Normal
LED3	Power LED	Green: On	System Power On
LED7	UID Switch LED	Blue: On	Unit Identified
LED8	Overheat/PWR Fail/Fan Fail LED	Red: Solid on/ Blinking	Solid On: Overheat, Blinking: PWR Fail or Fan Fail

# 4-7 Connector Definitions

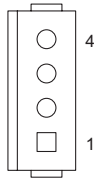
## Power Connectors

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

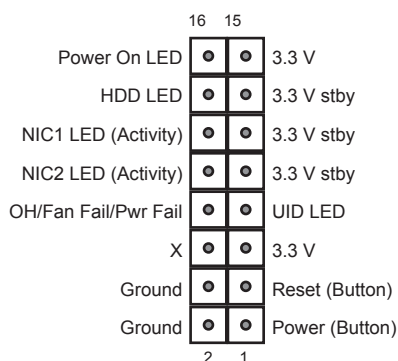


12V DC Power Pin Definitions (PJ1)	
Pin#	Definition
1-2	GND
3-4	12V



4-Pin HDD Power Pin Definitions (J6)	
Pin#	Definition
1	12V
2-3	GND
4	5V

## 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.

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

### 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.

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

### 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.

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

### 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.

LAN1/LAN2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	3.3V Standby
10/12	NIC Activity LED

### 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.

HDD LED Pin Definitions (JF1)		HDD LED Status	
Pin#	Definition	State	Definition
13	3.3 V Stby	Off	No Activity
14	HDD LED	Blinking	HDD Busy

### Power LED

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

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

## 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.

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

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

### 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.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM_Control

### Chassis Intrusion

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

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

### 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 I<sup>2</sup>C connection on your system.

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

### 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.

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

**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.

Trusted Platform Module Header (JTPM1) Pin Definitions			
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME#	4	No Pin
5	LRESET#	6	+5V (X)
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	NC	14	NC
15	+3V_DUAL	16	SERIRQ
17	GND	18	GND
19	3.3V	20	NC

**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.

OH/Fan Fail LED (JOH1) Pin Definitions	
Pin#	Definition
1	3.3V
2	OH Active

OH/Fan Fail LED (JOH1) Pin Definitions	
State	Message
Off	Normal
Solid	Overheat

**Speaker (JD1)**

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

Speaker Connector Pin Definitions	
Pin Setting	Definition
Pins 1-3	Power LED
Pins 4-7	Speaker

**Standby Power**

The Standby Power header is located at JSTBY1 on the motherboard. See the table on the right for pin definitions.

Speaker Connector Pin Definitions	
Pin Setting	Definition
1	+5V Standby
2	Ground
3	No connection



### 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.

Serial Link General-Purpose Headers (SGPIO) Pin Definitions			
Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	NC

### 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.

GPIO Expander Pin Definitions			
Pin#	Definition	Pin	Definition
1	P3V3	2	GND
3	GP0	4	GP1
5	GP2	6	GP3
7	GP5	8	GP5
9	GP6	10	GP7

### 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.

SMBus Header	
Pin#	Definition
1	Data
2	Ground
3	Clock

### 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 (I<sup>2</sup>C) Connector

Power System Management Bus (I<sup>2</sup>C) Connector (JPI<sup>2</sup>C1) monitors the power supply, fan and system temperatures. See the table on the right for pin definitions.

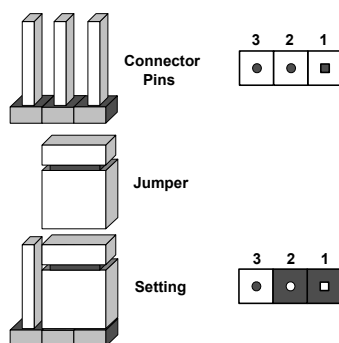
Power SMBus Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	Power Fail
4	Ground
5	+3.3V

## 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.



### 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**

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

<b>VGA Enable/Disable Jumper Settings</b>	
Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

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

Use Jumpers I<sup>2</sup>C1/I<sup>2</sup>C2 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.

<b>PCI Slot SMB Enable Jumper Settings</b>	
Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled (Default)

**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.

<b>Watch Dog Jumper Settings</b>	
Setting	Definition
Pins 1-2	Reset (default)
Pins 2-3	NMI
Open	LAN pairs set to default mode without reset or NMI

**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.

<b>GbE LAN Enable Jumper Settings</b>	
Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

### 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 Recovery Jumper Settings	
Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	ME Recovery

### 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.

Manufacturing Mode Jumper Settings	
Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	Manufacturing Mode

### 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.

BIOS Recovery Jumper Settings	
Setting	Definition
Pins 1-2	Normal
Pins 2-3	BIOS Recovery

### 10Gb Ethernet Enable/Disable

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

10Gb Enable/Disable Jumper Settings	
Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

### 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.

GbE LAN Enable Jumper Settings	
Pin#	Definition
1-2	Enabled (Default)
2-3	Disabled

### 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.

USB Wake-up Jumper Settings	
Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

## 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.



Activity LED		
Color	Status	Definition
Off	No Connections	
Yellow	Flashing	Active

Link Speed LED	
Color	Definition
Off	No Connection or 10 Mbps
Amber	1 Gbps
Green	100 Mbps

### BMC Heartbeat LED

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

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

### 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.

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

### 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.

Overheat/PWR Fail/Fan Fail LED Settings	
Color/State	Definition
Solid	Overheat
Blinking	PWR Fail or Fan Fail

**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.

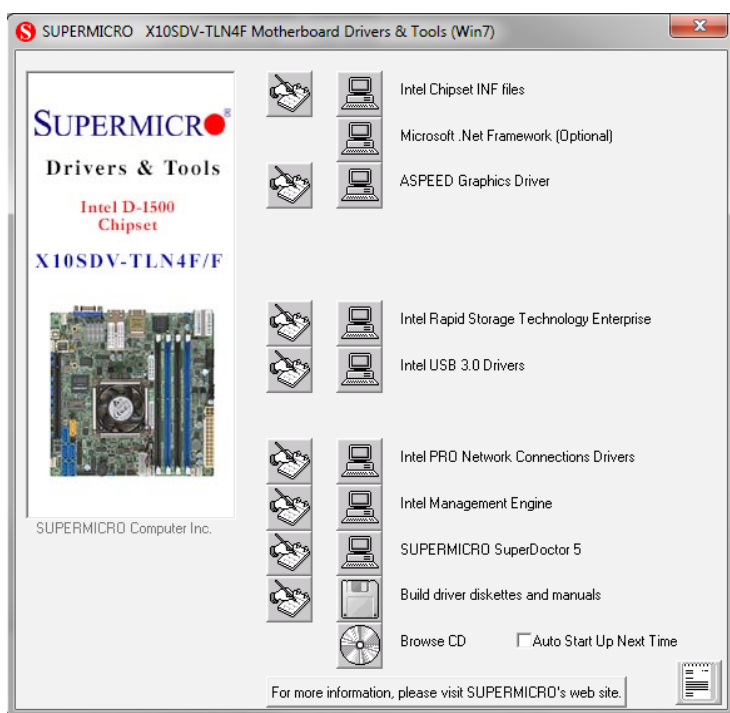
## 4-11 Installing Software

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**

**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.



Figure 4-6. SuperDoctor 5 Interface Display Screen (Health Information)

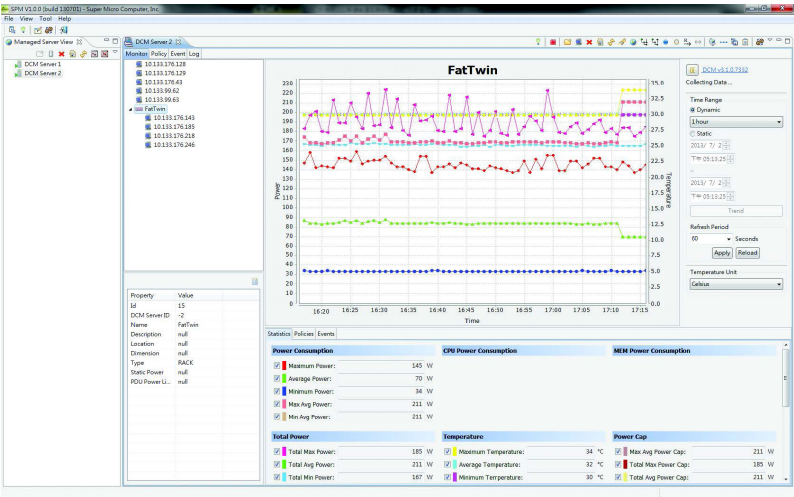


Figure 4-7. SuperDoctor 5 Interface Display Screen (Remote Control)

**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](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 polarities. 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.

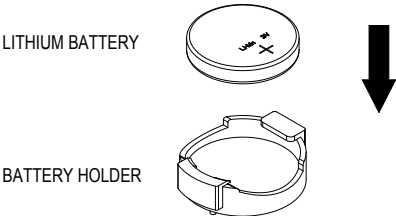


Figure 4-8. Installing the Onboard Battery

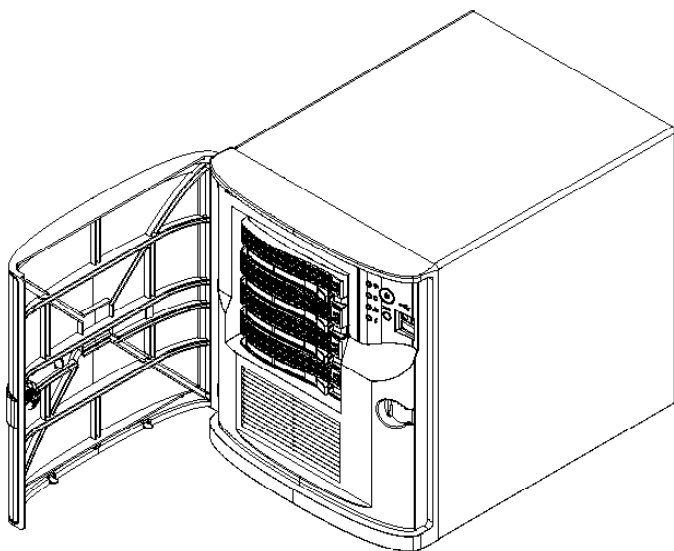
Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency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

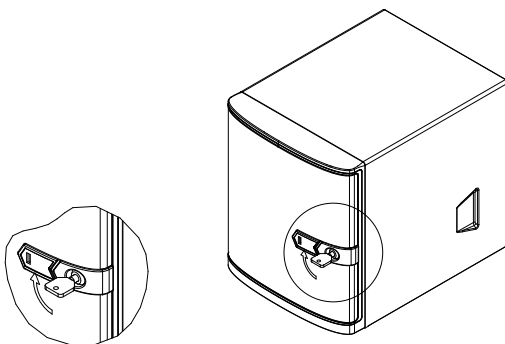
1. Use the operating system to power down the system, following the on-screen prompts.
2. After the system has completely shut-down, carefully grasp the head of the power cord and gently pull it out of the back of the power supply.
3. Disconnect the cord from the power strip or wall outlet.

## 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).

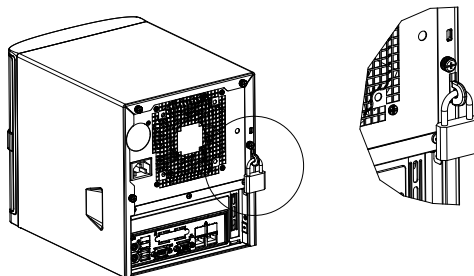


Figure 5-3. Rear Bezel Lock

## 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.

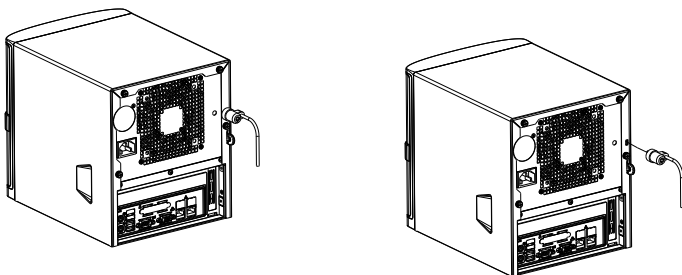


Figure 5-4. Inserting a Kensington Cable Device (Not Included)

## 5-3 Removing the Chassis Cover

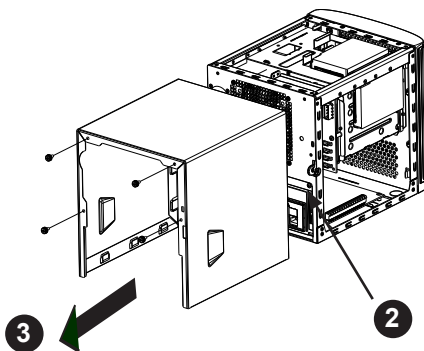


Figure 5-5. Removing the Chassis Cover

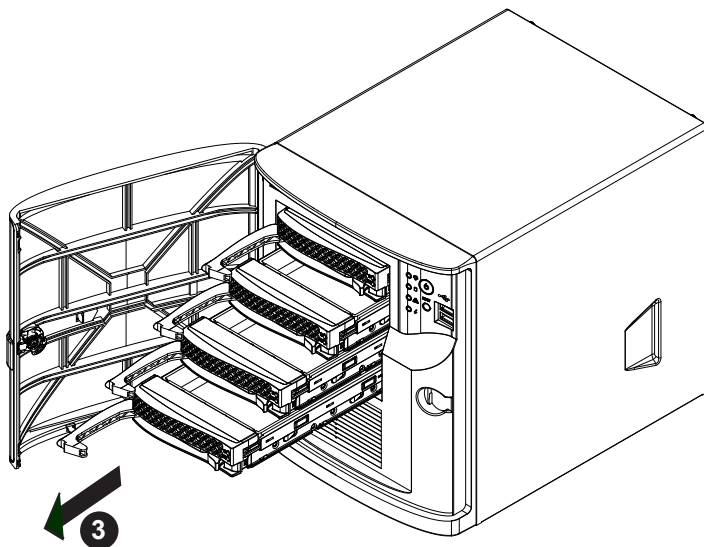
### *Removing the Chassis Side Cover*

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 chasses, 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

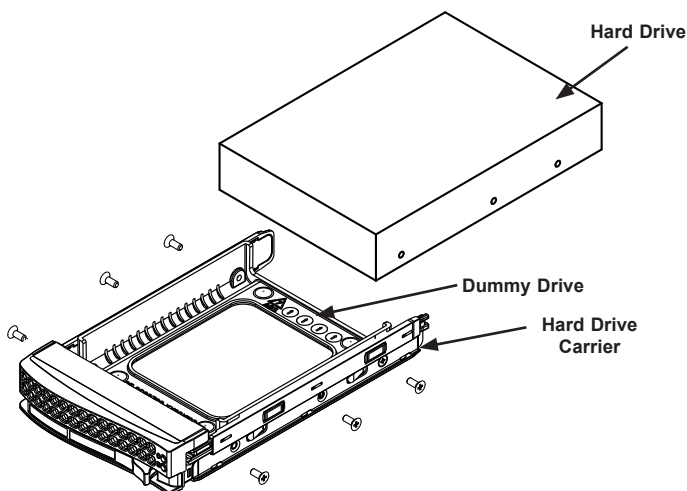


**Figure 5-6. Removing the Hard Drive Carrier from the Drive Cage**

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.

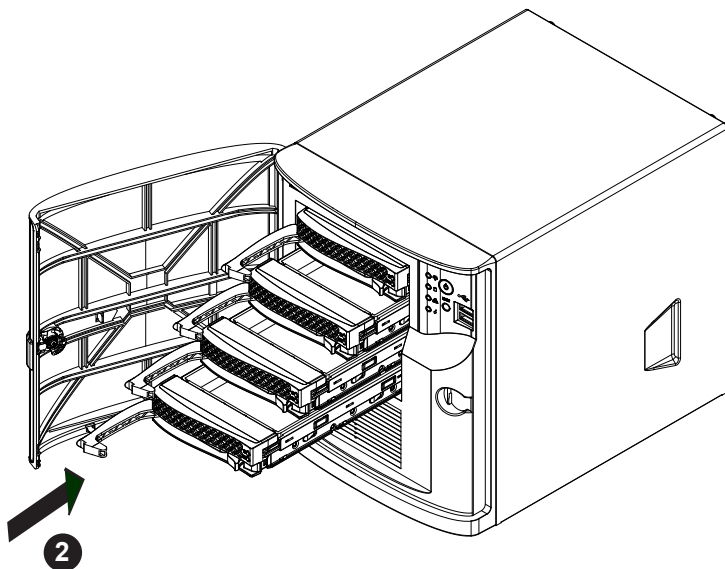


**Figure 5-7. Installing a Hard Drive into Hard Drive Carrier**

***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.





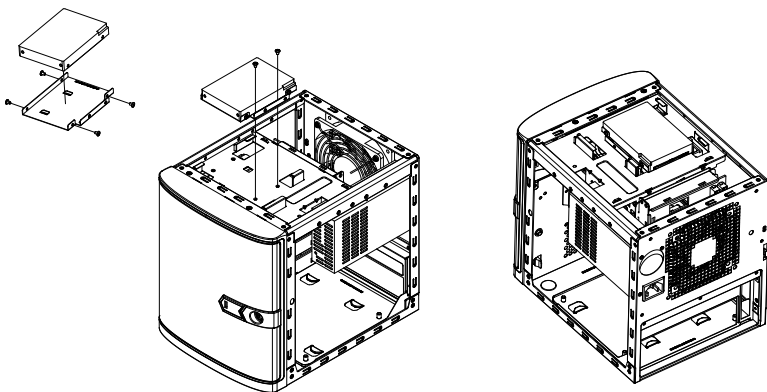
**Figure 5-8. Installing the Hard Drive Carrier into the Hard Drive Cage**

### ***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.

## 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.

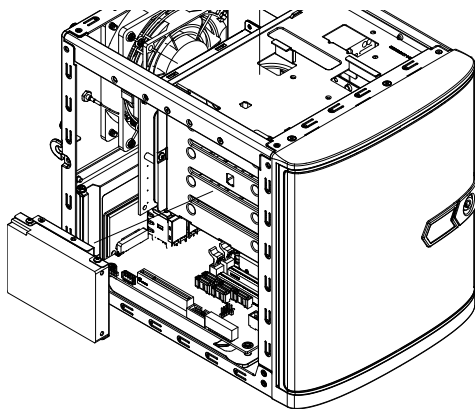


**Figure 5-9. Installing the Top Mounted Fixed Hard Drive**

### *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.

## Installing the Side Mounted Fixed Hard Drive



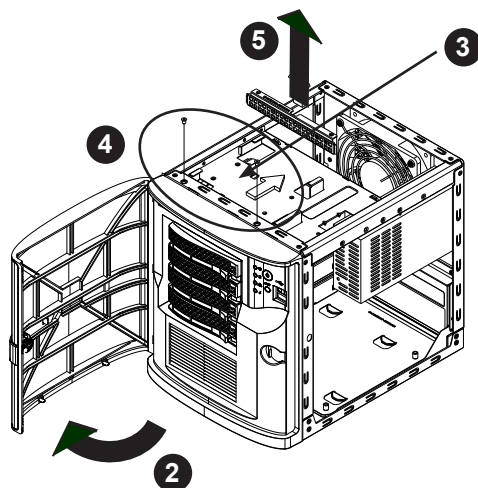
**Figure 5-10. Installing the Side Mounted Fixed Hard Drive**

### ***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.

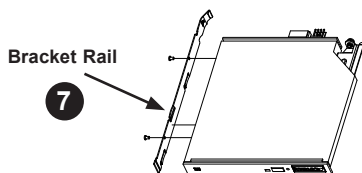


**Figure 5-11. Configuring the Chassis for the DVD Drive**

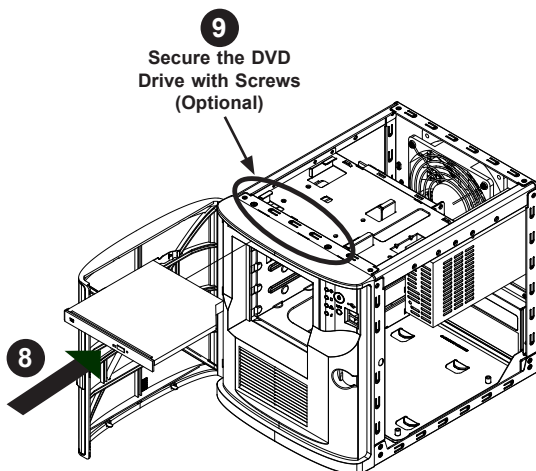
### *Installing the DVD Drive*

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.



**Figure 5-12. Securing the Bracket Rail to the DVD Drive**

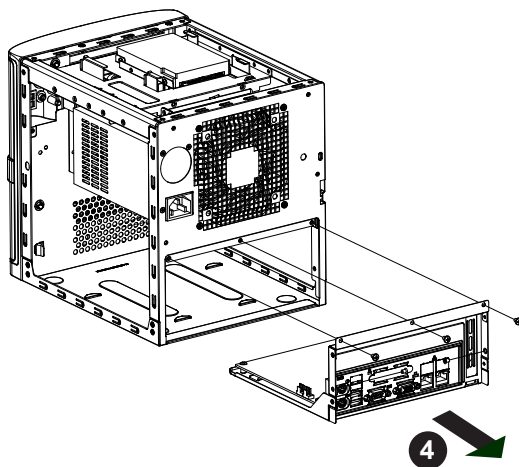


**Figure 5-13. Installing the DVD Drive**

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

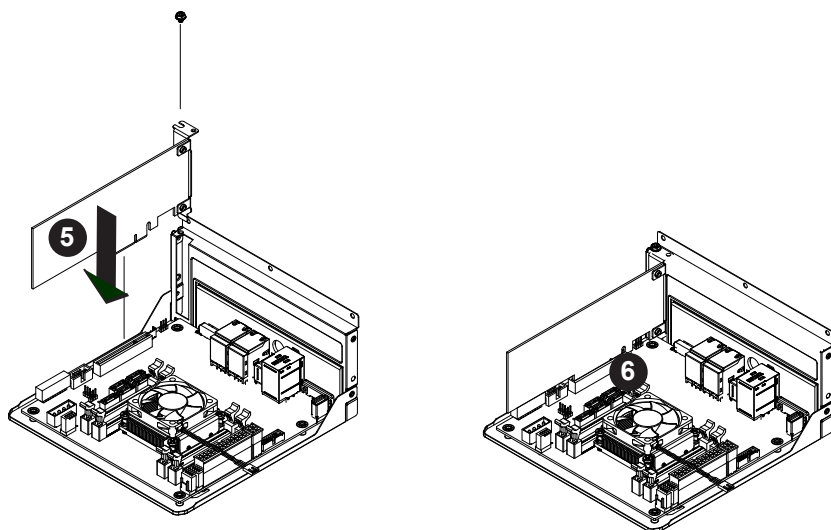
The SC721 chassis includes one PCI slot for a low profile expansion card. It is installed by removing the chassis tray that holds the motherboard and rear I/O shield.



**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.

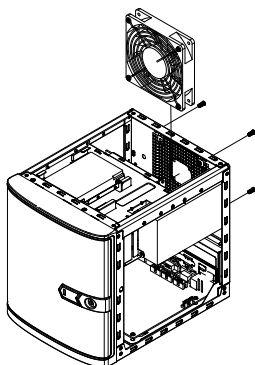


**Figure 5-15. Installing the Expansion Card**

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**

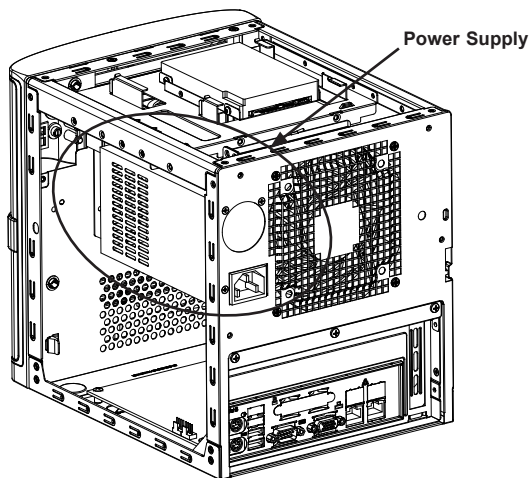
### *Installing the Exhaust Fan*

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.



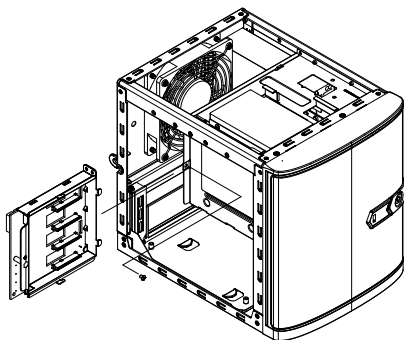
**Figure 5-17. Removing the Power Supply**

### *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.



**Figure 5-18. Replacing the Backplane and Mounting Bracket**

### ***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.

## 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.

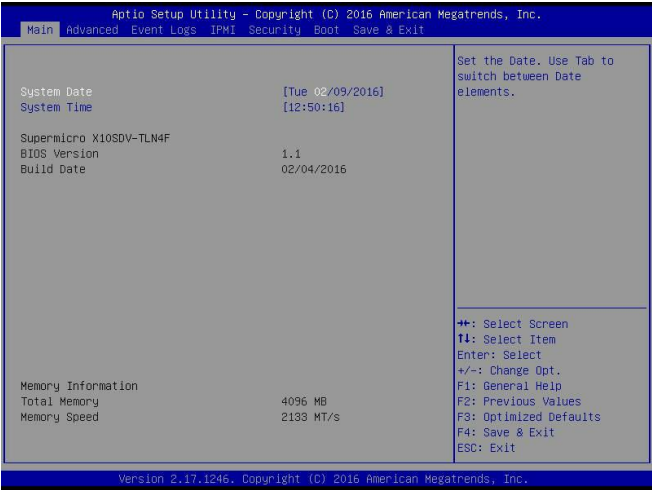
## How to Start the Setup Utility

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.

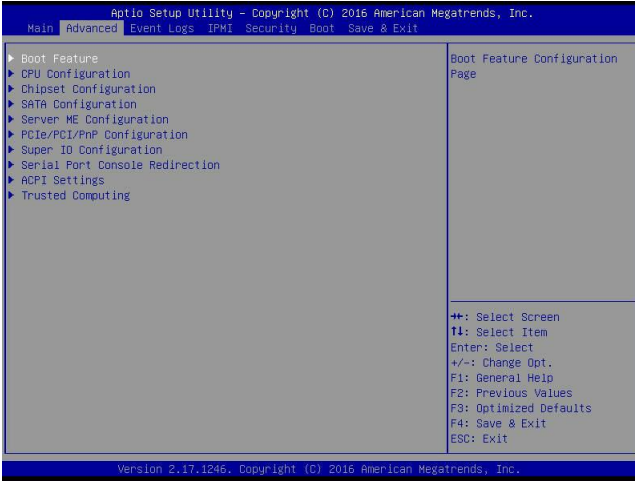
The following BIOS items are also displayed:

**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 Electro-magnetic 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 (Retention) 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

## ► **PCIe/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 the 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 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 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 data 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

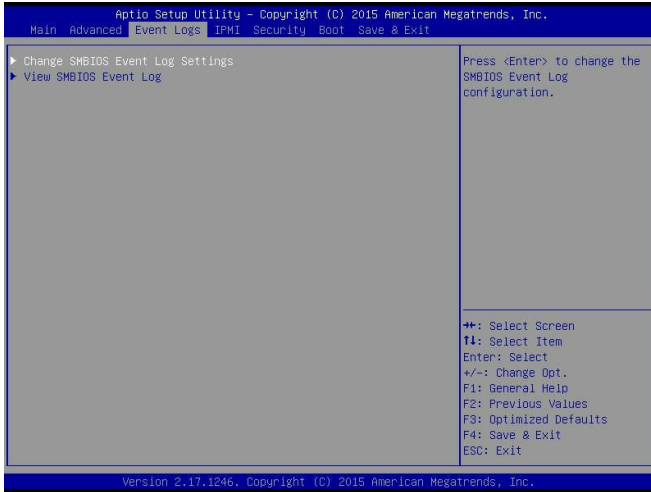
### Intel TXT (LT-SX) Configuration

#### 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**.

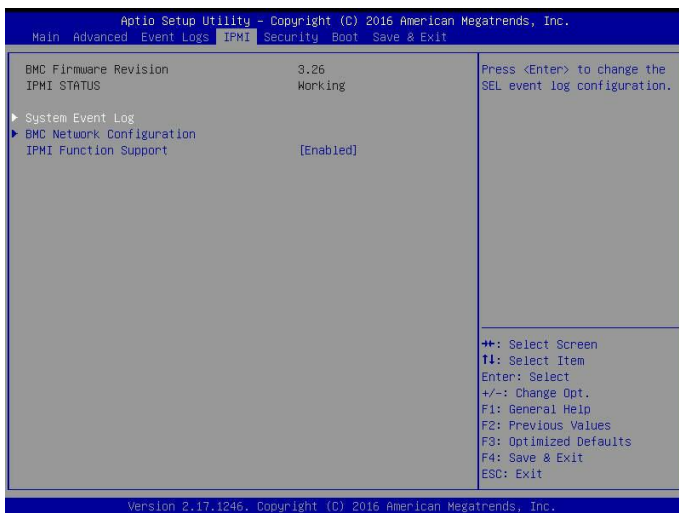
**Note:** After making changes on a setting, be sure to reboot the system for the changes to take effect.

**►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**

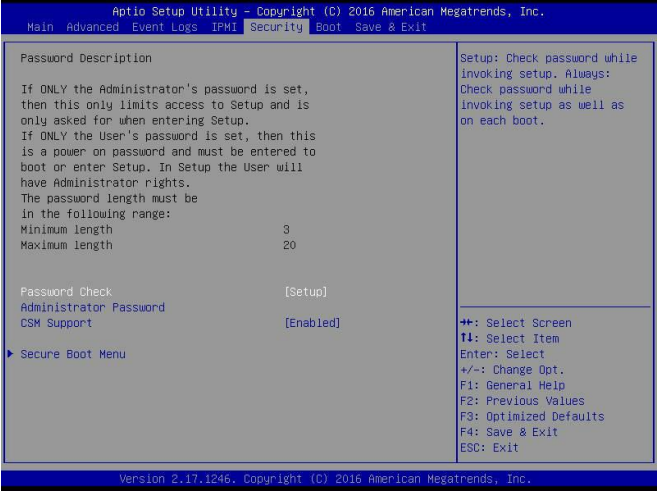
This item displays the Gateway IP address for this computer. This should be in decimal and in dotted quad form (i.e., 172.31.0.1).

**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**

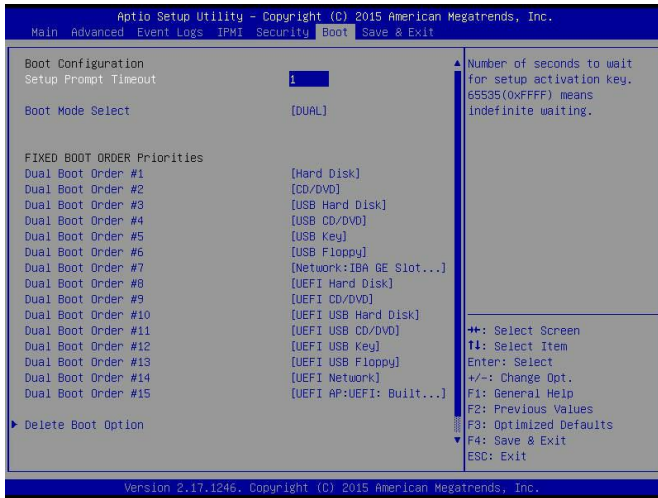
Select Yes to load the DBT from the manufacturer's defaults. Select No to load the DBT from a file. The options are Yes and No.

**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

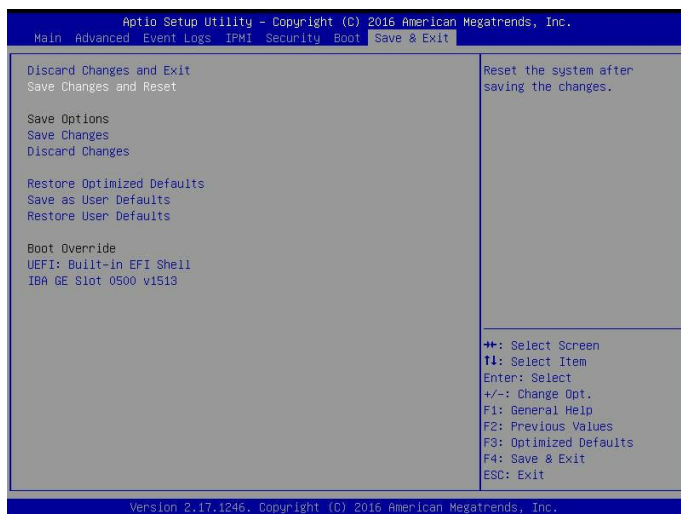
#### ► **UEFI Applicatoin Boot Priorities**

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 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

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

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**Notes**