SC815 Chassis Series

USER’S MANUAL

1.1b
About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SC815 1U chassis. Installation and maintenance should be performed by experienced technicians only.

Supermicro's SC815 1U chassis features a unique and highly-optimized design for Xeon and Opteron platforms. The chassis is equipped with a 330W, 500W, 560W, 650W, 700W, 710W, 720W or 750W high-efficiency power supply, or Gold Level 720W system for superb power savings. High-performance fans provide ample optimized cooling, latest generation memory modules and four hot-swappable 3.5" drive bays offers maximum storage capacity in a 1U form factor. Optional LCD front bezels are also available for customization requirements. Bulk package and quick release slide rails are available for HPC and datacenter use.

This document lists compatible parts available when this document was published. Always refer to the our website for updates on supported parts and configurations.

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 Organization

Chapter 1: Introduction
The first chapter provides a checklist of the main components included with this chassis and describes the main features of the SC815 chassis. This chapter also includes contact information.

Chapter 2: Standardized Warning Statements for AC/DC Systems
This chapter lists warnings, precautions, and system safety. You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed before installing and servicing this chassis.

Chapter 3: Chassis Components
Refer here for details on this chassis model including the fans, bays, airflow shields, and other components.

Chapter 4: System Interface
Refer to this chapter for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 5: Chassis Setup and Installation
Refer to this chapter for detailed information on this chassis. You should follow the procedures given in this chapter when installing, removing, or reconfiguring your chassis.

Chapter 6: Rack Installation
Refer to this chapter for detailed information on chassis rack installation. You should follow the procedures given in this chapter when installing, removing or reconfiguring your chassis into a rack environment.

Appendices
This section lists compatible cables, power supply specifications, and compatible backplanes. Not all compatible backplanes are listed. Refer to our Web site for the latest compatible backplane information.

Appendix A: Power Supply Specifications
Appendix B: BPN-SAS-815TQ Backplane Specifications
Appendix C: BPN-SAS3-815TQ Backplane Specifications

Table of Contents

Preface
About This Manual ........................................................................................................ iii

Chapter 1 Introduction
1-1 Overview ............................................................................................................. 1-1
1-2 Shipping List ........................................................................................................ 1-1
1-3 Contacting Supermicro .................................................................................... 1-3
1-4 Returning Merchandise for Service .................................................................. 1-4

Chapter 2 Standardized Warning Statements for AC/DC Systems
2-1 About Standardized Warning Statements ....................................................... 2-1
Warning Definition ................................................................................................... 2-1
Installation Instructions .......................................................................................... 2-4
Circuit Breaker ......................................................................................................... 2-5
Power Disconnection Warning ............................................................................... 2-6
Equipment Installation ............................................................................................ 2-8
Restricted Area ........................................................................................................ 2-9
Battery Handling ................................................................................................... 2-10
Redundant Power Supplies ..................................................................................... 2-12
Backplane Voltage ................................................................................................ 2-13
Comply with Local and National Electrical Codes ............................................. 2-14
Product Disposal .................................................................................................... 2-15
Hot Swap Fan Warning .......................................................................................... 2-16
DC Power Supply .................................................................................................. 2-18
DC Power Disconnection ....................................................................................... 2-20
Hazardous Voltage or Energy Present on DC Power Terminals ...................... 2-21

Chapter 3 Chassis Components
3-1 Overview ......................................................................................................... 3-1
3-2 Components ..................................................................................................... 3-1
Backplane ............................................................................................................... 3-1
Fans ......................................................................................................................... 3-1
Mounting Rails ....................................................................................................... 3-1
Power Supply .......................................................................................................... 3-2
Air Shroud .............................................................................................................. 3-2
3-3 Where to get Replacement Components ....................................................... 3-2

Chapter 4 System Interface
4-1 Overview ......................................................................................................... 4-1
4-2 Control Panel Buttons ...................................................................................... 4-2
Chapter 5 Chassis Setup and Maintenance

5-1 Overview ................................................. 5-1
5-2 Removing the Chassis Cover and Front Bezel ........................................... 5-2
  The Front Bezel (Optional) ........................................ 5-3
5-3 Installing Hard Drives ............................................................................... 5-4
5-4 Installing the DVD Drive ......................................................................... 5-7
5-5 Installing the Motherboard ....................................................................... 5-8
  Permanent and Optional Standoffs ......................................................... 5-8
  Expansion Card Setup ............................................................................. 5-10
5-6 Installing the Air Shroud .......................................................................... 5-12
5-7 System Fans ........................................................................................... 5-14
5-8 Power Supply .......................................................................................... 5-16
  Power Supply Failure ............................................................................... 5-16
5-9 Routing the PCA Cables ......................................................................... 5-18

Chapter 6 Rack Installation

6-1 Overview ................................................................................................. 6-1
6-2 Unpacking the System ............................................................................ 6-1
6-3 Preparing for Setup .................................................................................. 6-1
  Choosing a Setup Location ....................................................................... 6-1
  Rack Precautions ...................................................................................... 6-2
  General Server Precautions .................................................................... 6-2
  Rack Mounting Considerations ............................................................... 6-2
    Ambient Operating Temperature ......................................................... 6-2
    Reduced Airflow .................................................................................... 6-3
    Mechanical Loading .............................................................................. 6-3
    Circuit Overloading ............................................................................... 6-3
    Reliable Ground ..................................................................................... 6-3
  Identifying the Sections of the Rack Rails .............................................. 6-4
  Locking Tabs ............................................................................................ 6-4
  The Inner Rail Extension (Optional) ......................................................... 6-5
  Outer Rack Rails ....................................................................................... 6-6

Appendix A SC815 Power Supply Specifications
Appendix B BPN-SAS-815TQ Backplane Specifications
Appendix C BPN-SAS3-815TQ Backplane Specifications
Chapter 1

Introduction

1-1 Overview

Supermicro’s SC815 1U chassis features a unique and highly-optimized design. The chassis is equipped with a high efficiency power supply. High performance fans provide ample optimized cooling for FB-DIMM memory modules and four hot-swap drive bays offer maximum storage capacity in a 1U form factor.

1-2 Shipping List

Please visit the following link for the latest shipping lists and part numbers for your particular chassis model http://www.supermicro.com

<table>
<thead>
<tr>
<th>SC815 Chassis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>--------------------------------</td>
</tr>
<tr>
<td>SC815T-563(CB)(UB)</td>
</tr>
<tr>
<td>SC815T-330(CB)(UB)</td>
</tr>
<tr>
<td>SC815TQ-720(CB)(UB)</td>
</tr>
<tr>
<td>SC815TQ-710(U)(B)</td>
</tr>
<tr>
<td>SC815TQ-R706WB</td>
</tr>
<tr>
<td>SC815TQ-R700 (CB)(UB)(WB)</td>
</tr>
<tr>
<td>SC815TQ-R654CB</td>
</tr>
</tbody>
</table>
## SC815 Chassis

<table>
<thead>
<tr>
<th>Model</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC815TQ-600</td>
<td>4x SAS/SATA, CB: 1x FF, UB: 1 FH UIO: 1x FF, 1x LP, 600W (Digital Switching)</td>
</tr>
<tr>
<td>SC815TQ-R563</td>
<td>4x SAS/SATA, CB: 1x FF, UB: 1 FH UIO: 1x FF, 1x LP, 560W, Redundant (Gold Level)</td>
</tr>
<tr>
<td>SC815TQ-R500</td>
<td>4x SAS/SATA, CB: 1x FF, UB: 1 FH UIO: 1x FF, 1x LP, 500W, Redundant (Platinum Level)</td>
</tr>
<tr>
<td>SC815TQC-R700</td>
<td>4x SAS/SATA, CB: WB, 700W</td>
</tr>
<tr>
<td>SC815TQC-R504</td>
<td>4x SAS/SATA, CB: WB, 500W</td>
</tr>
<tr>
<td>SC815TQ-R654CB</td>
<td>4x SAS/SATA, 1x FF, 650W DC</td>
</tr>
<tr>
<td>SC815TQ-R650C</td>
<td>4x SAS/SATA, CB: WB, 650W</td>
</tr>
</tbody>
</table>

Legend:
- **FF**: Full-height, full-length
- **FH**: Full-height, half-length
- **LP**: Low-profile

### 1-3 Contacting Supermicro

#### Headquarters
- **Address**: Super Micro Computer, Inc.
  980 Rock Ave.
  San Jose, CA 95131 U.S.A.
- **Tel**: +1 (408) 503-8000
- **Fax**: +1 (408) 503-8008
- **Email**: marketing@supermicro.com (General Information)
  support@supermicro.com (Technical Support)
- **Website**: [www.supermicro.com](http://www.supermicro.com)

#### Europe
- **Address**: Super Micro Computer B.V.
  Het Sterrenbeeld 28, 5215 ML
  's-Hertogenbosch, The Netherlands
- **Tel**: +31 (0) 73-6400390
- **Fax**: +31 (0) 73-6416525
- **Email**: sales@supermicro.nl (General Information)
  support@supermicro.nl (Technical Support)
  rma@supermicro.nl (Customer Support)
- **Website**: [www.supermicro.nl](http://www.supermicro.nl)

#### Asia-Pacific
- **Address**: Super Micro Computer, Inc.
  3F, No. 150, Jian 1st Rd.
  Zhonghe Dist., New Taipei City 235
  Taiwan (R.O.C)
- **Tel**: +886-(2) 8226-3990
- **Fax**: +886-(2) 8226-3992
- **Email**: support@supermicro.com.tw
- **Website**: [www.supermicro.com.tw](http://www.supermicro.com.tw)
1-4 Returning Merchandise for Service

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

For faster service, RMA authorizations may be requested online (http://www.supermicro.com/support/rma/).

Whenever possible, repack the chassis in the original Supermicro carton, using the original packaging material. If these are no longer available, be sure to pack the chassis securely, using packaging material to surround the chassis so that it does not shift within the carton and become damaged during shipping.

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

During the warranty period, contact your distributor first for any product problems.
Chapter 2

Standardized Warning Statements for AC/DC Systems

2-1 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 appendix in its entirety before installing or configuring components in the Supermicro chassis.

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

Warning Definition

Warning!

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

警告の定義

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

此警告符号代表危险。

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

此警告符号代表危险。

您正处于可能身体可能会受损伤的工作环境中。在您使用任何设备之前，请注意触电的危险，并要熟悉防范事故发生的标准工作程序。请依照每一注意事项后的号码找到相关的翻译说明内容。
Warning
WICHTIGE SICHERHEITSHINWEISE


BEWAHREN SIE DIESE HINWEISE GUT AUF.

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

GUARDE ESTAS INSTRUCCIONES.

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

CONSERVEZ CES INFORMATIONS.

تحذير: هذه الرمز يعني خطر انك في حالة يمكن أن تتسبب في إصابة جسدية.
قبل أن تعمل على أي معدات، تكون 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 전기와 관련된 위험요소들을 확인하시고 사용에 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 letsels 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

قانونية بهدف منح بينة عن ما إذا كان هناك أي تنشئة قانونية متعلقًا بمعالجة البيانات الشخصية أو المعلومات الحساسة. ينبغي تطوير هذه المكونات في السياق القانوني المحلي أو الدولي، مثل معايير خصوصية ويتهاك، والقوانين المتعلقة بتقنية المعلومات، والقوانين المتعلقة بحقوق الطاعون.
Installation Instructions

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

설치 손서
시스템을 전원에 연결하기 전에 설치 안내를 읽으십시오.

포르투갈어
Leia as instruções de instalação antes de conectar o sistema a a rede de alimentação.

주의!
시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

Waarschuwing
Raadpleeg de installatie-instructies voordat u het systeem op de voedingsbron aansluit.
Chapter 2: Warning Statements for AC/DC Systems

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.

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.
Equipment Installation

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

¡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.

¡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.
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.

Alarmen

Warnung


Attention

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

¡Advertencia!

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

Battery Handling

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.
Redundant Power Supplies

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

冗长电源装置
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该部件供电。

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

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

Attention
Cette unite 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.

警告
此装置连接的电源可能不止一个，必须切断所有电源才能停止对该装置的供电。

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

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。

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.
Comply with Local and National Electrical Codes

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

Product Disposal

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

Warning

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.

Warning

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

Warning

Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.
Chapter 2: Warning Statements for AC/DC Systems

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

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

Hot Swap Fan Warning
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.

¡Advertencia!
Los ventiladores podrán 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 retirez le bloc ventilateur du châssis. Prenez garde à ce que doigts, tournevis et autres objets soient éloignés du logement du bloc ventilateur.

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。

Warning
When you remove the fans from the chassis, it is possible that the fans might still be turning. Keep your fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

Warning
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.
### DC Power Supply

**Warning!**

When stranded wiring is required, use approved wiring terminations, such as closedloop or spade-type with upturned lugs. These terminations should be the appropriate size for the wires and should clamp both the insulation and conductor.

**Warnung**

Wenn Litzenverdrahtung erforderlich ist, sind zugelassene Verdrahtungsabschlüsse, z.B. für einen geschlossenen Regelkreis oder gabelförmig, mit nach oben gerichteten Kabelschuhen zu verwenden. Diese Abschlüsse sollten die angemessene Größe für die Drähte haben und sowohl die Isolierung als auch den Leiter festklemmen.

**警告**

需要使用绞线连接时，请使用经认可的连接端子，如闭环端子或具有接线柱的铲型端子。这些端子的大小应与线缆相吻合，并且可以将绝缘部分和导体夹紧固定。

**주의!**

꼬인 배선이 요구 될 때에는 페즈로나 드로우부가 위로 둔어 나온 Spade형태의 승인된 배선 터미네이션들을 사용하세요.

**Advertencia!**

Cuando se necesite hilo trenzado, utilizar terminales para cables homologados, tales como las de tipo "bucle cerrado" o "espada", con las lengüetas de conexión vueltas hacia arriba. Estos terminales deberán ser del tamaño apropiado para los cables que se utilicen, y tendrán que sujetar tanto el aislante como el conductor.

**Waarschuwing**

Wanneer geslagen bedrading vereist is, dient u bedrading te gebruiken die voorzien is van goedgekeurde aansluitingspunten, zoals het gesloten-lus type of het grijperschop type waarbij de aansluitpunten omhoog wijzen. Deze aansluitpunten dienen de juiste maat voor de draden te hebben en dienen zowel de isolatie als de geleider vast te klemmen.
**DC Power Disconnection**

**Warning!**
Before performing any of the following procedures, ensure that power is removed from the DC circuit.

警告
次の手順を開始する前に、DC回路から電源が切断されていることを確認してください。

警告
進行以下任一操作程序前，請確保直流電路已斷電。

Warnung
Vor Ausführung der folgenden Vorgänge ist sicherzustellen, daß die Gleichstromschaltung keinen Strom erhält.

¡Advertencia!
Antes de proceder con los siguientes pasos, comprobar que la alimentación del circuito de corriente continua (CC) esté cortada (OFF).

Attention
Avant de pratiquer l'une quelconque des procédures ci-dessous, vérifier que le circuit en courant continu n'est plus sous tension.

**Hazardous Voltage or Energy Present on DC Power Terminals**

**Warning!**
Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.

警告
直流電源終端可能產生危險的電壓或能量。終端不使用時，請務必蓋上機蓋。當蓋上機蓋，確認不絕緣導體無法使用。

警告
直流電源終端可能會產生危險的電壓或能量。終端不使用時，請務必蓋上機蓋，機蓋蓋上後，請確保導體未絕緣部分無法使用。

Warnung
In mit Gleichstrom betriebenen Terminals kann es zu gefährlicher Spannung kommen. Die Terminals müssen abgedeckt werden, wenn sie nicht in Betrieb sind. Stellen Sie bei Benutzung der Abdeckung sicher, dass alle nicht isolierten, stromführenden Kabel abgedeckt sind.
¡Advertencia!
Puede haber energía o voltaje peligrosos en los terminales eléctricos de CC. Reemplace siempre la cubierta cuando no estén utilizándose los terminales. Asegúrese de que no haya acceso a conductores descubiertos cuando la cubierta esté colocada.

Attention
Le voltage ou l'énergie électrique des terminaux à courant continu peuvent être dangereux. Veillez à toujours replacer le couvercle lors les terminaux ne sont pas en service. Assurez-vous que les conducteurs non isolés ne sont pas accessibles lorsque le couvercle est en place.

주의!

DC전원 단자들에 위험한 전압이나 에너지가 발생할 수 있습니다.
단말기를 운영하지 않을 때에는 덮개로 다시 덮어 놓아 주십시오. 덮개가 제자리에 있어야만 결연되지 않은 도체들의 접근을 막을 수 있습니다.

Waarschuwing
Op DC-aansluitingspunten kunnen zich gevaarlijke voltages of energieën voordoen. Plaats altijd de afsluiting wanneer de aansluitingspunten niet worden gebruikt Zorg ervoor dat blootliggende contactpunten niet toegankelijk zijn wanneer de afsluiting is geplaatst.
Chapter 3: Chassis Components

3-1 Overview

This chapter describes the most common components included with your chassis. Some components listed may not be included or compatible with your particular chassis model. For more information, see the installation instructions detailed later in this manual.

Chassis may include one slim CD-ROM bay and/or four hard drive bays. Most chassis models include a DVD-ROM. Hard drives must be purchased separately. For the latest shipping lists, visit our website at: www.supermicro.com.

This chassis accepts a 1U backplane, four fans (with an optional fifth fan) and one (sometimes two) power supplies. SC815 models come in silver and black.

3-2 Components

Backplane

Each SC815 chassis comes with a 1U backplane. Your backplane supports SAS/SATA. For more information regarding compatible backplanes, view the appendices found at the end of this manual. In addition, visit our website for the latest information: http://www.supermicro.com.

Fans

The SC815 chassis accepts four system fans with an optional fifth and on some models a sixth fan. System fans for SC815 chassis are powered from the serverboard. These fans are 1U high and are powered by 3-pin connectors.

Mounting Rails

The SC815 can be placed in a rack for secure storage and use. To setup your rack, follow the step-by-step instructions included in this manual.
Power Supply
Each SC815 chassis model includes a high-efficiency power supply rated between 330, 560, 650, 700, 710 or 720 Watts. In the unlikely event that your power supply fails, replacement is simple and can be done without tools.
"R" model chassis include a redundant, hot-swappable power supply.

Air Shroud
Air shrouds are shields, usually plastic, that funnel air directly to where it is needed. Always use the air shroud included with your chassis.

3-3 Where to get Replacement Components
Though not frequently, you may need replacement parts for your system. To ensure the highest level of professional service and technical support, we strongly recommend purchasing exclusively from our Supermicro Authorized Distributors / System Integrators/Resellers. A list of Supermicro Authorized Distributors/System Integrators/Reseller can be found at: www.supermicro.com. Click the Where to Buy link.
Chapter 4

System Interface

4-1 Overview

There are several LEDs on the control panel as well as others on the drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. This chapter covers these buttons, and explains the meanings of all LED indicators and the appropriate responses you may need to take.

Figure 4-1. Chassis Control Panel

Note: Your control panel may differ from the control panel pictured above. See the following pages for further information.
4-2  Control Panel Buttons

There may be up to three push-buttons located on the front of the chassis. These are (in order from left to right) a reset button and a power on/off button.

**Reset:** The reset button is used to reboot the system.

**Power:** The main power switch is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system. Therefore, you must unplug system before servicing.

4-3  Control Panel LEDs

The control panel located on the front of the SC815 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take. Your chassis model will have some, but not all of the LEDs listed.

**Universal Information LED:** The Universal Information LED is used to indicate fan failure, power failure, overhear condition, or to identify the unit within a large rack installation. The feature requires a motherboard that supports the Universal Information LED.

When this LED blinks red quickly, it indicates a fan failure and when blinking red slowly a power failure. This LED will be blue when used for UID (Unit Identifier). When on continuously red, it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. See the table below for descriptions of the LED states.

<table>
<thead>
<tr>
<th>State</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast Blinking Red (1x/sec)</td>
<td>Fan Fail</td>
</tr>
<tr>
<td>Solid Red</td>
<td>CPU Overheat</td>
</tr>
<tr>
<td>Slow Blinking Red (1x/4 sec)</td>
<td>Power Fail</td>
</tr>
<tr>
<td>Solid Blue</td>
<td>Local UID Button Depressed</td>
</tr>
<tr>
<td>Blinking Blue</td>
<td>IPMI-Activated UID</td>
</tr>
</tbody>
</table>

**Note:** Deactivating the UID LED must be performed in the same way it was activated. (If the UID LED was activated via IPMI, you can only turn the LED off via IPMI and not with the UID button.)
4-4 Drive Carrier LEDs

Your chassis supports either SAS or SATA.

SAS/SATA Drives

Each SAS/SATA drive carrier has two LEDs.

- **Green:** Each Serial ATA drive carrier has a green LED. When illuminated, this green LED (on the front of the SATA drive carrier) indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.

- **Red:** The red LED indicates a SAS/SATA drive failure. If one of the SAS/SATA drives fail, you should be notified by your system management software.

4-5 Power Supply LEDs and Overheat Indicators

This chassis provides several options which may include hot-swappable, cold-swappable, and redundant power supplies. Some power supplies include an LED in the rear with the following definitions:

### 450W and 650W Power Supplies

<table>
<thead>
<tr>
<th></th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid Green</td>
<td>System is on.</td>
</tr>
<tr>
<td>Solid Amber</td>
<td>System is off and plugged in.</td>
</tr>
<tr>
<td>Blinking Amber</td>
<td>Internal temperature has reached 63C and will shut down if the temperature reaches 70C.</td>
</tr>
</tbody>
</table>

Solid Green: When illuminated, the green LED indicates that the power supply is on.

Solid Amber: When illuminated, the amber LED indicates the power supply is plugged in and turned off, or the system is off but in an abnormal state.

Blinking Amber: When blinking, this system power supply temperature has reached 63C. The system automatically power down when the power supply temperature reaches 70C and restarts when the power supply temperature goes below 60C.
All Other Power Supplies

Solid Green: When illuminated, this green LED indicates that the power supply is on.

Solid Amber: When illuminated, the amber LED indicates the power supply is plugged in and turned off, or the system is off but in an abnormal state.

4-6 Overheating

The section lists actions that should be taken in the unlikely event the server overheats.

All Other Power Supply LEDs

<table>
<thead>
<tr>
<th>State</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid Green</td>
<td>System is on.</td>
</tr>
<tr>
<td>Solid Amber</td>
<td>System is off and plugged in.</td>
</tr>
</tbody>
</table>

Overheat Temperature Setting

Some backplanes allow the overheat temperature to be set at 45, 50, or 55 by changing a jumper setting. For more information, download the backplane user manual at www.supermicro.com. To access the manuals on the Website, click support, and then click the manuals link.

Overheating Condition

If the Server Overheats, do the Following:

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

2. Confirm that the chassis covers are installed properly.

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

4. Verify that the heatsinks are installed properly.
Chapter 5

Chassis Setup and Maintenance

5-1 Overview

This chapter covers the steps required to install components and perform maintenance on the chassis. The only tool you will need to install components and perform maintenance is a Phillips screwdriver. Print this page to use as a reference while setting up your chassis.

Review the warnings and precautions listed in the manual before setting up or servicing this chassis. These include information in Chapter 2: System Safety and the warning/precautions listed in the setup instructions.
5-2 Removing the Chassis Cover and Front Bezel

Removing the Chassis Cover

1. Power down the system and remove the power cord from the rear of the power supply. Remove both power cords if your system includes a redundant power supply.

2. Press the release tabs to remove the cover from the locked position. Press both tabs at the same time.

3. Once the top cover is released from the locked position, slide the cover toward the rear of the chassis.

4. Lift the cover off the chassis.

Warning: Except for short periods of time, do NOT operate the server without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

The Front Bezel (Optional)

If your system has an optional front bezel attached to the chassis, you must remove it to access the drive bays. A filter located within the bezel can be removed for cleaning or replacement. It is recommended that you keep a maintenance log and frequently replace the filter. The filter’s condition will affect the airflow throughout the whole system.

Removing the Front Bezel

1. Unlock the bezel lock.

2. Press the release knob to retract the bezel pins

3. Carefully remove the bezel with both hands.
5-3 Installing Hard Drives

Removing Hard Drive Carriers from the Chassis

1. Press the release button on the drive carrier. This extends the drive carrier handle.
2. Use the handle to pull the drive carrier out of the chassis.

The drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays.

Warning: Except for short periods of time (swapping hard drives), do not operate the chassis without the drive carriers.

Installing a Hard Drive to the Hard Drive Carrier

1. Remove the two screws securing the dummy drive to the carrier.
2. Remove the dummy drive from the carrier.
Chapter 5: Chassis Setup and Maintenance

3. Install a new drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.

4. Secure the hard drive by tightening all six (6) screws.

5. Replace the drive tray into the chassis. Make sure the close the drive carrier handle.

SC815 chassis models include space for one optional DVD drive.

### 5-4 Installing the DVD Drive

1. Power down the system and unplug the power cord from the rear of the power supply. Open the chassis cover as described in Section 5-3.

2. Secure the left rail (A) to the left side of the DVD drive using two screws (B).

3. Attach the right rail (C) to the right side of the DVD drive using two screws (D).

4. Carefully slide the DVD drive and into the chassis.

5. Plug the power cord into the power supply and power up the system.
5-5 Installing the Motherboard

![Figure 5-9 Chassis Standoffs]

**Permanent and Optional Standoffs**

Standoffs prevent short circuits by securing space between the motherboard and the chassis surface. The SC815 chassis includes permanent standoffs in locations used by most motherboards. These standoffs accept the rounded Phillips head screws included in the SC815 accessories packaging.

Some motherboards require additional screws for heatsinks and/or general components. Optional standoffs are included for these motherboards. To use an optional standoff, you must place the hexagonal screw through the bottom of the chassis and secure the screw with the hexagonal nut (rounded side up).

**Installing the Motherboard**

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, and precautions.

2. Power down the system and remove the power cord from the rear of the power supply. Remove both power cords if your system includes a redundant power supply. Remove the chassis cover as described in Section 5-3. Open the chassis cover.

3. If necessary, remove the riser card. To do this, remove the two screws holding the card in place and lift the card from the chassis.

4. As required by your motherboard, install standoffs in any areas that do not have a permanent standoff:
   A. Place a hexagonal standoff screw through the bottom of the chassis.
   B. Secure the screw with the hexagonal nut (rounded side up).

5. Lay the motherboard on the chassis aligning the permanent and optional standoffs.

6. Secure the motherboard to the chassis using the rounded, Phillips head screws. Do not exceed eight pounds of torque per square inch, when tightening down the motherboard.

7. Secure the CPU(s), heatsinks, and other components to the motherboard, chassis, and/or backplane as needed.

8. Reconnect the power cord(s), power up the system and replace the chassis cover.

![Figure 5-10. Chassis with a Riser Card ("U" Models Only)]
Expansion Card Setup

The SC815 chassis includes PCI slots for expansion cards and expansion cards. "C" models (like SC815TQ-600CB) include one full height slot. "W" model chassis include two full-height expansion slots and one low-profile expansion slot. Other models include a full-height, full-length PCI slot and one low-profile PCI slot.

Note: You must use a riser card to install expansion cards into any SC815 chassis. Riser cards are sold separately. For the latest compatibility and performance information, visit our website at: http://www.supermicro.com.

"C" Model Chassis: One Full-Height, Full-Length PCI Slot

"W" Model Chassis: Two Full-Height, Full-Length and One Low-Profile PCI Slots

Figure 5-11. PCI Card Slot Variations

Installing an Expansion Card

1. Confirm that you have the correct riser card for your chassis model and the add-on card includes a standard bracket.

2. Remove the chassis cover.

3. Install the riser card onto the bracket. Insert the card and bracket into the appropriate slot on the motherboard. Secure the riser bracket to the chassis using screws as illustrated.

4. Choose the PCI slot in which to place the add-on card.

5. In that slot, open the PCI slot panel lever and slide the PCI slot panel sideways.

6. From inside the chassis, remove the PCI slot panel panel.

7. Slide the add-on card into the riser card and attach the add-on card bracket in place of the PCI slot panel.

8. Secure the add-on card by closing the I/O panel lever.

9. Connect cables to the add-on card if necessary.
5-6 Installing the Air Shroud

Air shrouds concentrate airflow to maximize fan efficiency. The SC815 chassis air shroud does not require screws to set up.

**Figure 5-12. Air Shroud (Fan Side)**

**Figure 5-13. Air Shroud with the Optional Flap Removed**

1. Power down the system and remove the power cord from the rear of the power supply. Remove both power cords if your system includes a redundant power supply. Remove the chassis cover as described in Section 5-3.

2. If your motherboard uses between 9 and 16 DIMMS, skip this step. If your motherboard uses 8 DIMMS, you must remove the optional flap. To do so:
   a. With the fan side facing you, hold the air shroud with your left hand on the main shroud component and right hand on the optional flap.
   b. Gently twist with your right hand by lifting the fan side and lowering the other end of the optional flap.

3. Place the air shroud in your chassis with the fan side touching the edge of the fans.

4. Reconnect the power cord(s), power up the system and replace the chassis cover.

**Checking the Airflow in the Chassis**

1. Make sure there are no objects to obstruct airflow in and out of the chassis. In addition, if you are using a front bezel, make sure the bezel's filter is replaced periodically.

2. Do not operate the chassis without drive carriers in the drive bays. Use only recommended chassis parts.

3. Make sure no wires or foreign objects obstruct air flow through the chassis. Pull all excess cabling out of the airflow path or use shorter cables.

4. The control panel LEDs inform you of system status. See “Chapter 3: System Interface” for details on the LEDs and the control panel buttons.
5-7 System Fans

Figure 5-14. System Fan

Four heavy duty fans provide cooling for the chassis. These fans circulate air through the chassis as a means of lowering the chassis internal temperature.

In models with counter-rotating fans, each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels.

In chassis that provide an additional open fan housing, an additional system fan may be added for optimal cooling.

Adding a System Fan

1. Power down the system and remove the power cord from the rear of the power supply. Remove both power cords if your system includes a redundant power supply. Remove the chassis cover as described in Section 5-3.

2. Remove the dummy fan from the fan tray.

3. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.

4. Connect the fan wires to the fan headers on the serverboard.

5. Reconnect the power cord(s), power up the system and check that the fan is working properly before replacing the chassis cover.

Figure 5-15. Chassis Fans (Note additional fan options)

The SC815 chassis includes four pre-installed fans. One or two extra slots are available so that additional fans may be added.

Replacing a System Fan

1. If necessary, open the chassis while the power is running to determine which fan has failed. Never run the server for an extended period of time with the chassis open.

2. Power down the system and remove the power cord from the rear of the power supply. Remove both power cords if your system includes a redundant power supply. Remove the chassis cover as described in Section 5-3.

3. Remove the failed fan’s wiring from the serverboard.

4. Lift the failed fan from the chassis and pull it completely out from the serverboard.

5. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.

6. Reconnect the fan wires to the exact same chassis fan headers as the previous fan.

7. Reconnect the power cord(s), power up the system and check that the fan is working properly before replacing the chassis cover.
5-8 Power Supply

Depending on your chassis model the SC815 chassis has a 330, 560, 600, 650, 700, 710 or 720 Watt power supply. This power supply is auto-switching capable. All power supplies with the exception of the 710 power supply, automatically sense and operate at a 100V to 240V input voltage. The 710 DC power supply operates at -36DC to -75DC. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

Power Supply Failure

If the power supply unit fails, the system will shut down the power supply unit and you will need to replace it. A power supply failure is indicated by a flashing red (0.25Hz) LED indicator. Replacement power supply units can be ordered directly from Supermicro (see contact information in the Preface). As there is only one power supply unit in the SC815 Chassis, power must be completely removed from the server before removing and replacing the power supply unit for whatever reason.

Replacing the Power Supply

1. Power down the server and unplug the power cord. If your chassis includes a redundant power supply (at least two power modules), you can leave the server running and remove only one power supply.

2. Push the release tab (on the back of the power supply) as illustrated.

3. Pull the power supply out using the handle provided.

4. Replace the failed power module with the same model.

5. Push the new power supply module into the power bay until you hear a click.

6. Reconnect the power cord, power up the system and replace the chassis cover.
5-9  Routing the I²C Cables

It is necessary to correctly route the I²C cables to avoid interference due to noise on the I²C lines. Using tie wraps, secure the I²C cables to the large black power switching cable to keep it close to the power supply and away from the motherboard.
Chapter 6
Rack Installation

6-1 Overview

This chapter provides a quick setup checklist to get your chassis up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time.

6-2 Unpacking the System

You should inspect the box the chassis was shipped in and note if it was damaged in any way. If the chassis itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold your chassis. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

6-3 Preparing for Setup

The box your chassis was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

• Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).

• Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

• This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).
Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

General Server Precautions

- Review the electrical and general safety precautions that came with the components you are adding to your chassis.
- Determine the placement of each component in the rack before you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug hard drives and power supply modules to cool before touching them.
- Always keep the rack’s front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer’s maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
6-4 Rack Mounting Instructions

This section provides information on installing the SC815 chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

NOTE: This rail will fit a rack between 26" and 33.5" deep.

Identifying the Sections of the Rack Rails

The chassis package includes two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.

![Figure 6-2. Identifying the Sections of the Rack Rails (right side rail shown)](image)

The Inner Rail Extension (Optional)

The inner rails are pre-attached and do not interfere with normal use of the chassis if you decide not to use a server rack. Attach the inner rail extension to stabilize the chassis within the rack. If you are not using a rack, you do not have to install the inner rail extensions.

Installing the Inner Rails

1. Place the inner rack extensions on the side of the chassis aligning the hooks of the chassis with the rail extension holes. Make sure the extension faces "outward" just like the pre-attached inner rail.
2. Slide the extension toward the front of the chassis.
3. Secure the chassis with two screws as illustrated. Repeat steps for the other inner rail extension.

![Figure 6-1. Identifying the Sections of the Rack Rails](image)

Locking Tabs

Both chassis rails have a locking tab. The tabs lock the server into place when installed and pushed fully into the rack. These tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Warning: do not pick up the server by the front handles. They are designed to pull the system from a rack only.
Outer Rack Rails

Outer rails attach to the server rack and hold the server in place. The outer rails for the SC815 chassis extend between 30 inches and 33 inches.

*Installing the Outer Rails to the Rack*

1. Attach the short bracket to the outside of the long bracket. You must align the pins with the slides. Also, both bracket ends must face the same direction.

2. Adjust both the short and long brackets to the proper distance so that the rail fits snugly into the rack.

3. Secure the long bracket to the front side of the outer rail with two M5 screws and the short bracket to the rear side of the outer rail with three M5 screws.

4. Repeat steps 1-3 for the left outer rail.

*Figure 6-3. Assembling the Outer Rails*

---

*Installing the Chassis into a Rack*

1. Confirm that chassis includes the inner rails and rail extensions. Also, confirm that the outer rails are installed on the rack.

2. Line chassis rails with the front of the rack rails.

3. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (it may be necessary to depress the locking tabs when inserting). When the server has been pushed completely into the rack, the locking tabs will "click" into the locked position.

4. (Optional) Insert and tightening the thumbscrews that hold the front of the server to the rack.

Note: Figure is for illustrative purposes only. Always install servers into racks from the bottom up.

*Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.*
Figure 6-5. Installing into an Open Rack

Note: figures are for illustrative purposes only. Always install servers into racks from the bottom up.

**Installing the Chassis into a Mid-Mount Position (Telco) Rack**

1. Use the two L-shaped brackets on either side of the chassis (four total).

2. Determine how far the chassis will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on your server, remove it.

3. Attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the telco rack.

4. Finish by sliding the chassis into the rack and tightening the brackets to the rack.
## Appendix A

### SC815 Power Supply Specifications

This appendix lists power supply specifications for your chassis system.

<table>
<thead>
<tr>
<th>Power Supply Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MFR Part #</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td><strong>Input Voltage Range</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td><strong>Rated AC Voltage</strong></td>
</tr>
<tr>
<td><strong>+5V standby</strong></td>
</tr>
<tr>
<td><strong>DC Output</strong></td>
</tr>
<tr>
<td><strong>+12V</strong></td>
</tr>
<tr>
<td><strong>+5V</strong></td>
</tr>
<tr>
<td><strong>+3.3V</strong></td>
</tr>
<tr>
<td><strong>-12V</strong></td>
</tr>
</tbody>
</table>

PDB: Power Distribution Board.
## Power Supply Specifications

<table>
<thead>
<tr>
<th>MFR Part #</th>
<th>650W/PDB (Redundant)</th>
<th>600W</th>
<th>560W</th>
<th>560W (C Models)</th>
<th>330W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated AC Voltage</td>
<td>100 - 240V 50 - 60Hz 8 - 4 Amp</td>
<td>100 - 240V 50 - 60Hz 8.5 - 4 Amp</td>
<td>100 - 240V 50 - 60Hz 8.5 - 4 Amp</td>
<td>100-240 V, 50-60 Hz, 4.5 Amp max</td>
<td></td>
</tr>
<tr>
<td>+5V standby</td>
<td>3 Amp</td>
<td>3 Amp</td>
<td>3 Amp</td>
<td>3 Amp</td>
<td></td>
</tr>
<tr>
<td>DC Output</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+12V</td>
<td>54 Amp</td>
<td>43.6 Amp</td>
<td>43.6 Amp</td>
<td>27 Amp @ 100-180 Vac, 31 Amp @ 180-240 Vac</td>
<td></td>
</tr>
<tr>
<td>+5V</td>
<td>25 Amp</td>
<td>25 Amp</td>
<td>25 Amp</td>
<td>18 Amp</td>
<td></td>
</tr>
<tr>
<td>+3.3V</td>
<td>12 Amp</td>
<td>21 Amp</td>
<td>21 Amp</td>
<td>15 Amp</td>
<td></td>
</tr>
<tr>
<td>-12V</td>
<td>0.5 Amp</td>
<td>0.6 Amp</td>
<td>0.6 Amp</td>
<td>0.5 Amp</td>
<td></td>
</tr>
</tbody>
</table>
To avoid personal injury and property damage, carefully follow all the safety steps listed below when accessing your system or handling the components.

B-1  ESD Safety Guidelines

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

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

• Touch a grounded metal object before removing a component from the antistatic bag.

• Handle the backplane 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 card and peripherals back into their antistatic bags when not in use.

B-2  General Safety Guidelines

• Always disconnect power cables before installing or removing any components from the computer, including the BPN-SAS-815TQ backplane.

• Disconnect the power cable before installing or removing any cables from the BPN-SAS-815TQ backplane.

• Make sure that the BPN-SAS-815TQ backplane is securely and properly installed on the motherboard to prevent damage to the system due to power shortage.
An Important Note to Users

All images and layouts shown in this user’s guide are based upon the latest PCB Revision available at the time of publishing. The card you have received may or may not look exactly the same as the graphics shown in this manual.

Introduction to the BPN-SAS-815TQ Backplane

The BPN-SAS-815TQ backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance. This manual reflects BPN-SAS-815TQ Revision 1.00, the most current release available at the time of publication. Always refer to the Supermicro website at www.supermicro.com for the latest updates, compatible parts and supported configurations.

Front Connectors

1. Power Connectors (4-pin): JP10
2. CD-ROM/Floppy Drive Power Connector: J9 and J10
3. JTAG JP47
4. Upgrade Connector: JP46
5. MG9071 Chip
6. Sideband JP51
7. I2C Connector JP44
8. ACT_IN JP26
9. SAS Port #0 J5
10. SAS Port #1 J6
11. SAS Port #2 J7
12. SAS Port #3 J8
B-6  Front Connector and Pin Definitions

1. Backplane Main Power Connectors
The 4-pin connectors, designated JP10 provide power to the backplane. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+12V</td>
</tr>
<tr>
<td>2 and 3</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>+5V</td>
</tr>
</tbody>
</table>

2. CD-ROM/Floppy 4-Pin Connectors
The 4-pin connectors, designated J9 and J10, provide power to the CD-ROM and floppy drives. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V</td>
</tr>
<tr>
<td>2 and 3</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>+12V</td>
</tr>
</tbody>
</table>

3. - 4. JTAG Connector and Upgrade Connector
The JTAG connector, designated JP47, and the upgrade connector, designated JP46, are diagnostic purposes. These connectors should be used by a certified and experienced technician.

4. MG9071 Chip
The MG9071 is an enclosure management chip that supports the SES-2 controller and SES-2 protocols.

6. Sideband Headers
The sideband headers are designated JP51. For SES-2 to work properly, you must connect an 8-pin sideband cable. See the table to the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Controller ID (SB6)</td>
</tr>
<tr>
<td>2</td>
<td>Backplane Addressing (SB5)</td>
</tr>
<tr>
<td>3</td>
<td>GND (SB2)</td>
</tr>
<tr>
<td>4</td>
<td>Reset (SB4)</td>
</tr>
<tr>
<td>5</td>
<td>SDA (SB1)</td>
</tr>
<tr>
<td>6</td>
<td>GND (SB3)</td>
</tr>
<tr>
<td>7</td>
<td>SCL (SB0)</td>
</tr>
<tr>
<td>8</td>
<td>Backplane ID (SB7)</td>
</tr>
<tr>
<td>9</td>
<td>No Connection</td>
</tr>
<tr>
<td>10</td>
<td>No Connection</td>
</tr>
</tbody>
</table>

7. I²C Connectors
The I²C Connectors, designated JP44, are used to monitor HDD activity and status. See the table on the right for pin definitions.

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

8. Activity LED Header
The activity LED header, designated JP26, is used to indicate the activity status of each SAS drive. For the Activity LED Header to work properly, connect using a 10-pin LED cable.

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ACT IN#0</td>
</tr>
<tr>
<td>2</td>
<td>ACT IN#1</td>
</tr>
<tr>
<td>3</td>
<td>ACT IN#2</td>
</tr>
<tr>
<td>4</td>
<td>ACT IN#3</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
</tr>
<tr>
<td>6</td>
<td>ACT IN#4</td>
</tr>
<tr>
<td>7</td>
<td>ACT IN#5</td>
</tr>
<tr>
<td>8</td>
<td>ACT IN#6</td>
</tr>
<tr>
<td>9</td>
<td>ACT IN#7</td>
</tr>
<tr>
<td>10</td>
<td>Empty</td>
</tr>
</tbody>
</table>

9. - 12. SAS Ports
The SAS ports are used to connect the SAS drive cables. The four ports are designated #0 - #4. Each port is also compatible with SATA drives.
**B-7  Front Jumper Locations and Pin Definitions**

To modify the operation of the backplane, 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. Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

**Jumper Settings**

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Jumper Setting</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP18</td>
<td>Open: Enabled</td>
<td>Buzzer reset*</td>
</tr>
<tr>
<td></td>
<td>Closed: Disabled</td>
<td></td>
</tr>
<tr>
<td>JP29</td>
<td>Open: Default</td>
<td>MG9071 chip reset</td>
</tr>
<tr>
<td></td>
<td>Closed: Reset</td>
<td></td>
</tr>
</tbody>
</table>

*The buzzer sound indicates that a condition requiring immediate attention has occurred.

_The buzzer alarm is triggered by the following conditions:_

1. Hard drive failure
2. Fan failure
3. System temperature over 45º Celsius.

---

**Appendix B: BPN-SAS-815TQ Backplane Specifications**

**I²C and SGPIO Modes and Jumper Settings**

This backplane can utilize I²C or SGPIO. I²C is the default mode and can be used without making changes to your jumpers. The following information details which jumpers must be configured to use SGPIO mode or restore your backplane to I2C mode.

**I²C Setting (Default)**

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Jumper Setting</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP33</td>
<td>Pins 2-3</td>
<td>Controller ID</td>
</tr>
<tr>
<td>JP34</td>
<td>Pins 1-2:ID#0</td>
<td>Backplane ID</td>
</tr>
<tr>
<td>JP40</td>
<td>Open</td>
<td>I²C Reset SD OUT</td>
</tr>
<tr>
<td>JP42</td>
<td>Pins 2-3</td>
<td>Backplane ID SDIN</td>
</tr>
<tr>
<td>JP50</td>
<td>Closed</td>
<td>I²C Reset</td>
</tr>
</tbody>
</table>

**SGPIO Setting**

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Jumper Setting</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP33</td>
<td>Pins 1-2</td>
<td>Controller ID</td>
</tr>
<tr>
<td>JP34</td>
<td>Pins 1-2:ID#0</td>
<td>Backplane ID</td>
</tr>
<tr>
<td>JP40</td>
<td>Closed</td>
<td>I²C Reset SD OUT</td>
</tr>
<tr>
<td>JP42</td>
<td>Pins 1-2</td>
<td>Backplane ID SDIN</td>
</tr>
<tr>
<td>JP50</td>
<td>Open</td>
<td>I²C Reset</td>
</tr>
</tbody>
</table>

**B-8  Front LED Indicators**

*Figure B-4. Front LED Indicators*

<table>
<thead>
<tr>
<th>LED</th>
<th>State</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>D3</td>
<td>On</td>
<td>Overheat or drive failure</td>
</tr>
</tbody>
</table>
B-9 Rear Connectors and LED Indicators

<table>
<thead>
<tr>
<th>Rear SAS/SATA Connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rear Connector</strong></td>
</tr>
<tr>
<td>SAS #0</td>
</tr>
<tr>
<td>SAS #1</td>
</tr>
<tr>
<td>SAS #2</td>
</tr>
<tr>
<td>SAS #3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rear LED Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rear Connector</strong></td>
</tr>
<tr>
<td>SAS #0</td>
</tr>
<tr>
<td>SAS #1</td>
</tr>
<tr>
<td>SAS #2</td>
</tr>
<tr>
<td>SAS #3</td>
</tr>
</tbody>
</table>

Figure B-5. Rear Connectors and LED Indicators
This chapter offers guidelines for personal and equipment safety, and notes about the BPN-SAS3-815TQ version documented in this manual.

C-1 ESD Safety Guidelines

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

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

• Touch a grounded metal object before removing a component from the antistatic bag.

• Handle the backplane 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 card and peripherals back into their antistatic bags when not in use.

C-2 General Safety Guidelines

• Always disconnect power cables before installing or removing any components from the computer, including the backplane.

• Disconnect the power cable before installing or removing any cables from the backplane.

• Make sure that the backplane is securely and properly installed on the motherboard to prevent damage to the system due to power shortage.
C-3 Version Information

The BPN-SAS3-815TQ backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance. This manual reflects BPN-SAS3-815TQ, Revision 1.00, the most current release available at the time of publication. Refer to the Supermicro website at www.supermicro.com for the latest updates, compatible parts and supported configurations.

C-4 Rear Connector Locations

This manual covers BPN-SAS3-815TQ enabling SAS3 drives with 12Gbps speeds.

The following connectors are on the side of the backplane that faces the rear of the chassis. They are marked by silkscreen labels.

Figure C-1. Rear Connectors

2. Peripheral power: J9 and J10 (4 pin) 8. ACT_IN JP26 (10 pin)
3. JTAG JP47 (10 pin) 9. SAS Port #0 J5
4. Upgrade: JP46 (6 pin) 10. SAS Port #1 J6
5. MG9071 Chip 11. SAS Port #2 J7
6. Sideband JP51 (10 pin) 12. SAS Port #3 J8
C-5  Rear Connector Definitions

1. Backplane Main Power Connectors
   The 4-pin connectors, designated JP10, provide power to the backplane.
   
<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+12V</td>
</tr>
<tr>
<td>2 and 3</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>+5V</td>
</tr>
</tbody>
</table>

2. Peripheral Drive 4-Pin Connectors
   The 4-pin connectors, designated J9 and J10, provide power to DVD or other peripheral drives.
   
<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V</td>
</tr>
<tr>
<td>2 and 3</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>+12V</td>
</tr>
</tbody>
</table>

3. - 4. JTAG Connector and Upgrade Connector
   The JTAG connector, designated JP47, and the upgrade connector, designated JP46, are for diagnostic purposes. These connectors should be used by a certified and experienced technician.

5. MG9071 Chip
   The MG9071 is an enclosure management chip that supports the SES-2 controller and SES-2 protocols.

6. Sideband Headers
   The sideband header is designated JP51. For SES-2 to work properly, you must connect an 8-pin sideband cable.
   
<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Backplane Addressing (SB5)</td>
<td>1</td>
<td>Controller ID (SB6)</td>
</tr>
<tr>
<td>4</td>
<td>Reset (SB4)</td>
<td>3</td>
<td>GND (SB2)</td>
</tr>
<tr>
<td>6</td>
<td>GND (SB3)</td>
<td>5</td>
<td>SDA (SB1)</td>
</tr>
<tr>
<td>8</td>
<td>Backplane ID (SB7)</td>
<td>7</td>
<td>SCL (SB0)</td>
</tr>
<tr>
<td>10</td>
<td>No Connection</td>
<td>9</td>
<td>No Connection</td>
</tr>
</tbody>
</table>

7. I2C Connectors
   The I2C Connectors, designated JP44, are used to monitor HDD activity and status.

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

8. Activity LED Header
   The Activity LED header, designated JP26, is used to indicate the activity status of each SAS drive. To enable, connect using a 10-pin LED cable.

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ACT IN#0</td>
</tr>
<tr>
<td>2</td>
<td>ACT IN#1</td>
</tr>
<tr>
<td>3</td>
<td>ACT IN#2</td>
</tr>
<tr>
<td>4</td>
<td>ACT IN#3</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
</tr>
<tr>
<td>6</td>
<td>ACT IN#4</td>
</tr>
<tr>
<td>7</td>
<td>ACT IN#5</td>
</tr>
<tr>
<td>8</td>
<td>ACT IN#6</td>
</tr>
<tr>
<td>9</td>
<td>ACT IN#7</td>
</tr>
<tr>
<td>10</td>
<td>Empty</td>
</tr>
</tbody>
</table>

9. - 12. SAS Ports
   The SAS ports are used to connect cables to SAS3 drives, enabling 12Gbps speeds. The four ports are designated #0 - #4. Each port is also compatible with SATA drives.
I2C and SGPIO Modes and Jumper Settings

This backplane can utilize I2C or SGPIO. SGPIO is the default mode and can be used without making changes to your jumpers. Use the following settings for I2C mode.

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP33</td>
<td>Pins 1-2</td>
<td>Controller ID</td>
</tr>
<tr>
<td>JP34</td>
<td>Pins 1-2:ID#0</td>
<td>Backplane ID</td>
</tr>
<tr>
<td>JP40</td>
<td>Closed</td>
<td>I2C Reset SD OUT</td>
</tr>
<tr>
<td>JP42</td>
<td>Pins 1-2</td>
<td>Backplane ID SDIN</td>
</tr>
<tr>
<td>JP50</td>
<td>Open</td>
<td>I2C Reset</td>
</tr>
</tbody>
</table>

**SGPIO Jumpers (Default)**

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP33</td>
<td>Pins 1-2</td>
<td>Controller ID</td>
</tr>
<tr>
<td>JP34</td>
<td>Pins 1-2:ID#0</td>
<td>Backplane ID</td>
</tr>
<tr>
<td>JP40</td>
<td>Closed</td>
<td>I2C Reset SD OUT</td>
</tr>
<tr>
<td>JP42</td>
<td>Pins 1-2</td>
<td>Backplane ID SDIN</td>
</tr>
<tr>
<td>JP50</td>
<td>Open</td>
<td>I2C Reset</td>
</tr>
</tbody>
</table>

**I2C Jumpers**

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP33</td>
<td>Pins 2-3</td>
<td>Controller ID</td>
</tr>
<tr>
<td>JP34</td>
<td>Pins 1-2:ID#0</td>
<td>Backplane ID</td>
</tr>
<tr>
<td>JP40</td>
<td>Open</td>
<td>I2C Reset SD OUT</td>
</tr>
<tr>
<td>JP42</td>
<td>Pins 2-3</td>
<td>Backplane ID SDIN</td>
</tr>
<tr>
<td>JP50</td>
<td>Closed</td>
<td>I2C Reset</td>
</tr>
</tbody>
</table>

**General Jumpers**

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Settings</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP18</td>
<td>Open: Enabled</td>
<td>Buzzer Reset</td>
</tr>
<tr>
<td></td>
<td>Closed: Disabled</td>
<td></td>
</tr>
<tr>
<td>JP29</td>
<td>Open: Default</td>
<td>MG 9071 Chip Reset</td>
</tr>
<tr>
<td></td>
<td>Closed: Reset</td>
<td></td>
</tr>
</tbody>
</table>
C-7 Rear LED Indicators

![Rear LEDs Diagram]

**Figure C-3. Rear LEDs**

<table>
<thead>
<tr>
<th>LED</th>
<th>State</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>D3</td>
<td>On</td>
<td>Overheat or Drive Failure</td>
</tr>
</tbody>
</table>

C-8 Front Connectors and LED Indicators

The front of the backplane has four sockets to connect disk drives, along with LEDs indicators.

![Front Connectors Diagram]

**Figure C-4. Front Connectors**

<table>
<thead>
<tr>
<th>Drive Number</th>
<th>Label</th>
<th>HDD Activity LED (blue)</th>
<th>Failure LED (red)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS #0</td>
<td>J1</td>
<td>D12</td>
<td>D5</td>
</tr>
<tr>
<td>SAS #1</td>
<td>J2</td>
<td>D13</td>
<td>D6</td>
</tr>
<tr>
<td>SAS #2</td>
<td>J3</td>
<td>D14</td>
<td>D7</td>
</tr>
<tr>
<td>SAS #3</td>
<td>J4</td>
<td>D15</td>
<td>D8</td>
</tr>
</tbody>
</table>
Disclaimer (cont.)

The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.