MESOS Storage Series

M4600H

Ultra Density & Fully Redundant 4U Disk Expansion Unit

User's Guide

Date Modified: January 2, 2013 4:57 pm Document Version: 1.0.0

Conventions

Several different typographic conventions are used throughout this manual. Refer to the following examples for common usage.

Bold type face denotes menu items, buttons and application names.

Italic type face denotes references to other sections, and the names of the folders, menus, programs, and files.

<**Enter**> type face denotes keyboard keys.

WARNING!

Warning information appears before the text it references and should not be ignored as the content may prevent damage to the device.

CAUTION!

CAUTIONS APPEAR BEFORE THE TEXT IT REFERENCES, SIMILAR TO NOTES AND WARNINGS. CAUTIONS, HOWEVER, APPEAR IN CAPITAL LETTERS AND CONTAIN VITAL HEALTH AND SAFETY INFORMATION.

Note:

Highlights general or useful information and tips.

Acronyms

TERM	DEFINITION
HDD	Hard Disk Drive
PSU	Power Supply Unit
SIM	SAS Interface Module
ISIM	Internal SAS Interface Module
HDD BP	Hard Disk Drive Backplane
CMA	Cable Management Arm

Safety Information

Important Safety Instructions

Read all caution and safety statements in this document before performing any of the instructions.

Warnings

Heed safety instructions: Before working with the server, whether using this manual or any other resource as a reference, pay close attention to the safety instructions. Adhere to the assembly instructions in this manual to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this manual. Use of other products / components will void the UL listing and other regulatory approvals of the product and will most likely result in non-compliance with product regulations in the region(s) in which the product is sold.

System power on/off: The power button DOES NOT turn off the system AC power. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before opening the chassis, adding, or removing any components.

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

Electrostatic discharge (ESD) and ESD protection: ESD can damage drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground any unpainted metal surface on the server when handling parts.

ESD and handling boards: Always handle boards carefully. They can be extremely sensitive to electrostatic discharge (ESD). Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that can be gripped with fingertips or with a pair of fine needle nosed pliers. If the jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper

with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool used to remove a jumper, or the pins on the board may bend or break.

Revision History

Refer to the table below for the updates made to this manual.

DATE	CHAPTER	UPDATES

Copyright

Version 1.0 / January 9, 2013

Disclaimer

The information in this document is subject to change without notice. The manufacturer makes no representations or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose. Furthermore, the manufacturer reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of the manufacturer to notify any person of such revision or changes.

For the latest information and updates please refer to www.QuantaQCT.com

All the illustrations in this technical guide are for reference only and are subject to change without prior notice.

About the M4600H

Chapter 1

1.1. Introduction

The M4600H 4U JBOD is a 4U high system with 1 front panel module and three hard disk drive boards. This chapter provides an overview of package contents, front panel controls, connectors, LEDs and power consumption.

These guidelines provide instructions for trained service technicians installing one or more systems in a rack cabinet.

For the latest version of this technical guide, see www.QuantaQCT.com.

System Features

Specifications

Enclose Form Factor:

4U rack mount chassis

HDD Support:

6Gb/s 3.5” or 2.5” SAS or SATA hot-swap HDD (up to 60)

Host Interface:

6Gb mini-SAS port per SIM (x4)

Supported HBA Card:

Hot-Swap and Redundancy

Controller Module:

- Hot-swappable SAS Interface Module (SIM) (x2)
- Hot-swappable Internal SAS Interface Module (ISIM) (x4)

Disk Drive:

Hot-swap HDD (x60 bays)

Cooling Fan:

- Total 7+1 redundant main fans
- One built-in fan in each power supply unit

Power Supply:

1400W redundant power supplies, 240 VAC

Monitoring and Notification

LED Indicator:

- Power LED

- System ID/ Status LED
- HDD Active and ID/ Status LED
- Internal SAS Interface Module Status LED

Firmware Management:

SCSI enclosure service (SES-2)

OS Support:

- Windows
- Linux

System Dimensions

Dimensions (H x W x D):

Without Cable Management Arms:

- 175.3 mm x 447.0 mm x 909.0 mm
- 6.9” x 17.6” x 35.8”

With Cable Management Arms:

- 175.3 mm x 447.0 mm x 1103.1 mm
- 6.9” x 17.6” x 43.4”

Weight:

Wihtout HDDs:

- 37.0 kg
- 81 lbs

With HDDs fully loaded:

- 85 kg
- 187 lbs

Environment

Operating Temperature:

5°C to 40°C (41°F to 104°F)

Humidity:

50% to 93% relative humidity

Altitude:

33°C/ 3200m

Operational Vibration:

5 Hz ~ 350 Hz, 0.26 Grms

Regulations:

Safety Regulations

1.2. Package Contents

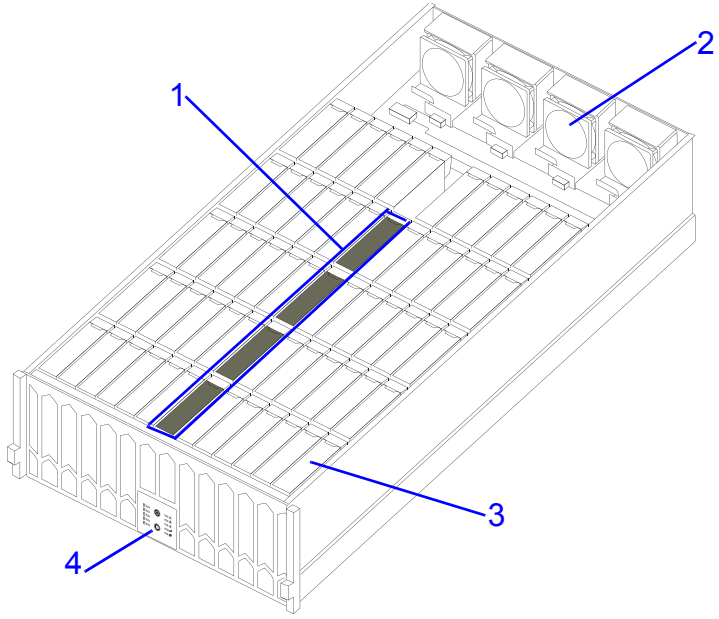
- 1 x JBOD storage system
- 2 x power cord
- 1 x mini-USB cable
- Rail kit
- Cable management arm

1.3. A Tour of the System

These sections show the major components found on the M4600H 4U JBOD system.

System

Component Overview

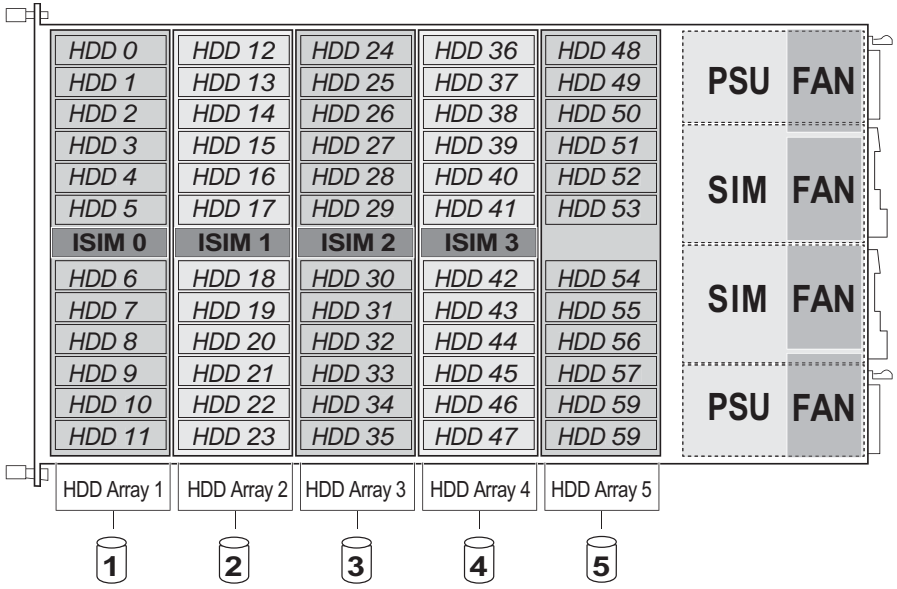


System Component Overview

System Components Overview

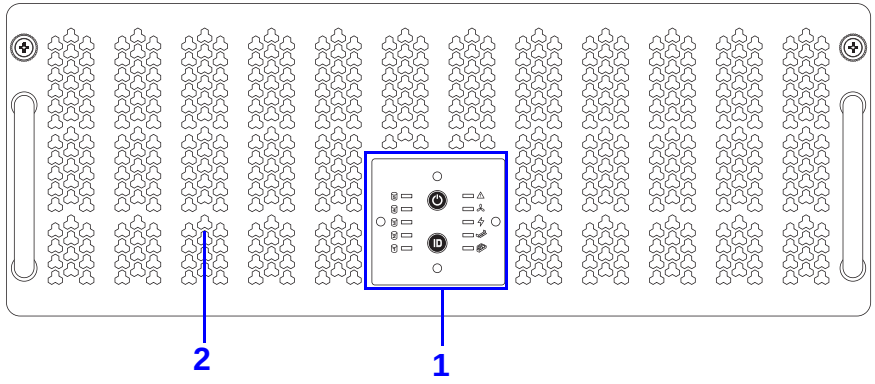
No.	Component
1	Internal SAS interface module (x4)
2	Fan module (x4)
3	HDD (x60)
4	Control panel

Component Placement



Component Placement Schema

System Front View

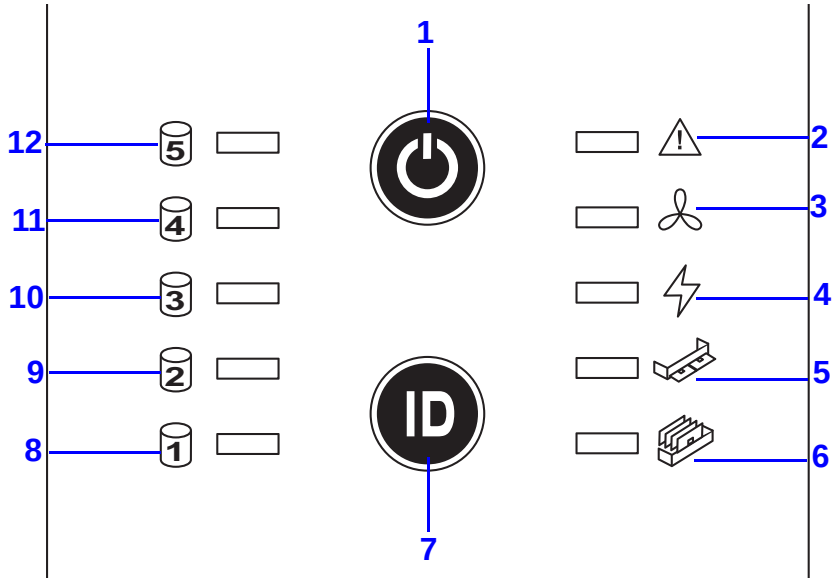


System Front View

System Front View

No.	ITEM
1	Control panel
2	Front grill

Control Panel



Control Panel

Note:
See the HDD array definition in section *"Component Placement"*.

Control Panel

No.	Icon	Item
1		Power button with LED

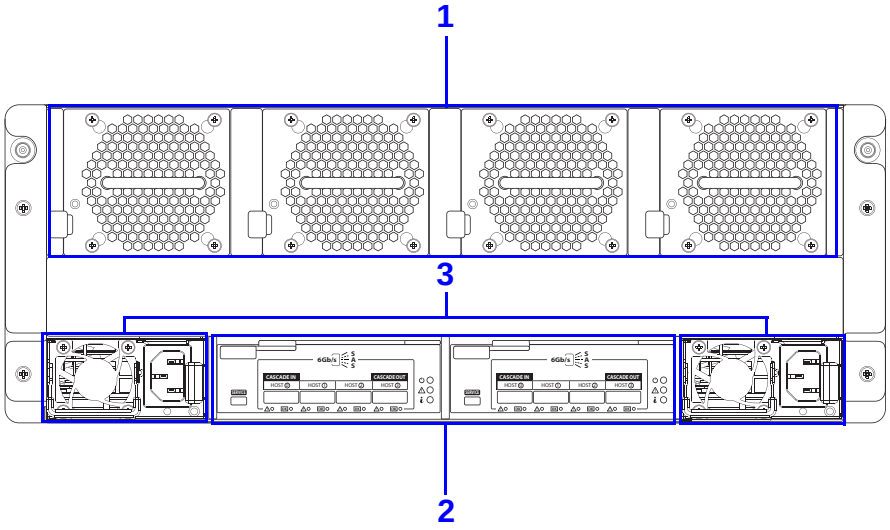
Control Panel (Continued)

No.	Icon	Item
2		System status LED
3		Fan status LED
4		PSU status LED
5		SIM status LED
6		ISIM status LED
7		ID button with LED
8		HDD array 1 LED
9		HDD array 2 LED

Control Panel (Continued)

NO.	ICON	ITEM
10	3	HDD array 3 LED
11	4	HDD array 4 LED
12	5	HDD array 5 LED

System Rear View

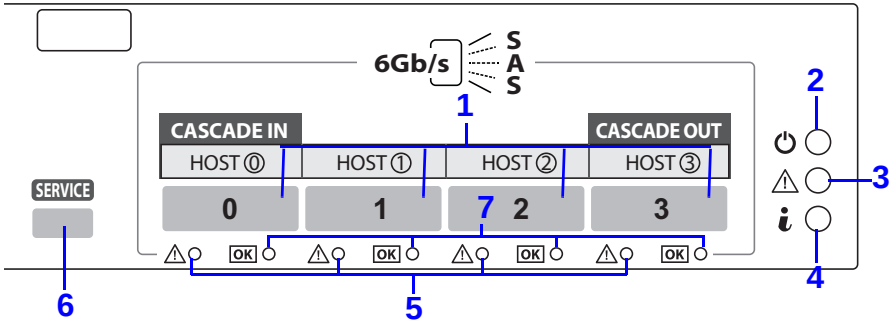


System Rear View

System Rear View

NO.	ITEM
1	Fan module (x4)
2	SIM module (x2)
3	Power supply unit (x2)

SIM Module



SIM Module

SIM Module Features

No.	Icon	Item
1		MiniSAS port (x4)
2	⏻	System power LED
3	⚠	SIM status LED

SIM Module Features

No.	Icon	Item
4	ⓘ	SIM ID LED
5	⚠	MiniSAS port status LED (x4)
6		Service ort
7	OK	MiniSAS port activity LED (x4)

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LED Status Definitions

The LED status is defined as follows:

LED Status

MODULE NAME	LED	COLOR	CONDITION	DESCRIPTION
Front Panel (Enclosure)	System Power	Green	On	System power on
			Off	System power off
	Identify LED	Blue	On	Enclosure identifier, not identified
			Off	Not identified
	System Status	Amber	On	System fault
			Off	System good
	Fan Status	Amber	On	Fan fault
			Off	Fan good
	PSU Status	Amber	On	PSU fault
			Off	PSU good
	SIM Status	Amber	On	SIM fault
			Off	SIM good
	ISIM Status	Amber	On	ISIM fault
			Off	ISIM good
	HDD Status (1 to 5)	Amber	On	HDD row# fault
			Off	HDD row# good

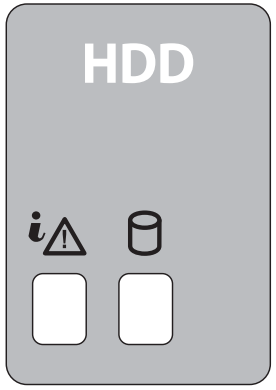
LED Status (Continued)

MODULE NAME	LED	COLOR	CONDITION	DESCRIPTION
Hard Drive Tray	Active (driven by hard drive)	Green	On	HDD ready for access
			Blink	During spin up or accessing HDDs
			Off	HDD not ready
	Identify	Blue	Blink	HDD identifier
			On	Ready for remove
			Off	Normal
	Status	Amber	On	Hard drive failed or port disable
			Off	Normal
	Hot Spare	Purple	On	Hot spare indicator is turned on
	Cons Check	Blue->purple->blue->purple	On	Consistency check In progress indicator is turned on
	Rebuild/Remap	Blue->amber->blue->amber	Blink	Rebuild/remap indicator is turned on
Power Supply /Cooling Module	Power Supply Status	Amber	On	SPS failed
			Off	SPS healthy
	Cooling Fans Status	Amber	On	Any fan failure
			Off	All fans healthy

LED Status (Continued)

MODULE NAME	LED	COLOR	CONDITION	DESCRIPTION
SIM	Power	Green	On	Power on
			Off	Power off
	Status	Amber	On	SIM fault
			Off	Power off, or disabled by other SIM
	Identify	Blue	Blink	SIM identifier
			Off	Normal
	SAS Link/ Status	Green/Amber	Green=On, Amber=Off	SAS link up
			Green=Off, Amber=Off	SAS link down
			Green=Blink, Amber=Off	SAS link with activities
			Green=Blink, Amber=On	SAS link with activities but physical link down
ISIM	Power	Green	On	Power on
			Off	Power off
	Status	Amber	On	ISIM fault
			Off	Power off, or disabled by the other ISIM
	Identity	Blue	Blink ISIM	identifier
			Off	Normal

HDD LEDs

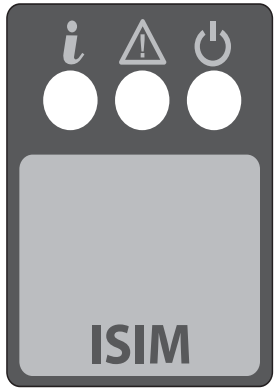


HDD LEDs

HDD LEDs

NO.	ICON	ITEM
1		HDD status/ ID LED
2		HDD activity LED

ISIM LEDs



ISIM LEDs

ISIM LEDs

NO.	ICON	ITEM
1		ISIM D ED
2		ISIM status LED
3		Power LED

Safety Information

Chapter 2

2.1. Server Safety Information

To reduce the risk of bodily injury, electrical shock, fire, and equipment damage, read this document and observe all warnings and precautions in this guide before installing or maintaining your server product.

In the event of a conflict between the information in this document and information provided with the product or on the website for a particular product, the product documentation takes precedence.

Your server should be integrated and serviced only by technically qualified persons.

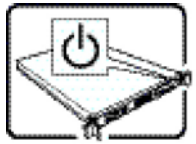
You must adhere to the guidelines in this guide and the assembly instructions in your server manuals to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products / components will void the UL Listing and other regulatory approvals of the product, and may result in noncompliance with product regulations in the region(s) in which the product is sold.

Safety Warnings and Cautions

To avoid personal injury or property damage, before you begin installing the product, read, observe, and adhere to all of the following safety instructions and information. The following safety symbols may be used throughout the documentation and may be marked on the product and / or the product packaging.

CAUTION	Indicates the presence of a hazard that may cause minor personal injury or property damage if the CAUTION is ignored.
WARNING	Indicates the presence of a hazard that may result in serious personal injury if the WARNING is ignored.
	Indicates potential hazard if indicated information is ignored.
	Indicates shock hazards that result in serious injury or death if safety instructions are not followed.
	Indicates hot components or surfaces.

	Indicates do not touch fan blades, may result in injury.
	Indicates to unplug all AC power cord(s) to disconnect AC power.
	Please recycle battery.
	The rail racks are designed to carry only the weight of the server system. Do not use rail-mounted equipment as a workspace. Do not place additional load onto any rail-mounted equipment.
	Indicates two people are required to safely handle the system.
	**Restricted Access Location:** The server is intended for installation only in a Server Room or Computer Room where both these conditions apply: ■ access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken; and ■ access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the location.

	The power button on the system does not turn off system AC power. To remove AC power from the system, you must unplug each AC power cord from the wall outlet or power supply. The power cord(s) is considered the disconnect device to the main (AC) power. The socket outlet that the system plugs into shall be installed near the equipment and shall be easily accessible.
	Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Dispose of used batteries according to manufacturer's instructions.

Intended Application Uses

This product was evaluated as Information Technology Equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environments (such as medical, industrial, residential, alarm systems, and test equipment), other than an ITE application, may require further evaluation.

Site Selection

The system is designed to operate in a typical office environment. Choose a site that is:

- Clean, dry, and free of airborne particles (other than normal room dust).
- Well-ventilated and away from sources of heat including direct sunlight and radiators.
- Away from sources of vibration or physical shock.
- Isolated from strong electromagnetic fields produced by electrical devices.
- In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm.
- Provided with a properly grounded wall outlet.
- Provided with sufficient space to access the power supply cord(s), because they serve as the product's main power disconnect.
- Provided with either two independent AC power sources or two independent phases from a s single source.

Equipment Handling Practices

Reduce the risk of personal injury or equipment damage:

- Conform to local occupational health and safety requirements when moving and lifting equipment.
- Use mechanical assistance or other suitable assistance when moving and lifting equipment.
- To reduce the weight for easier handling, remove any easily detachable components.

Power and Electrical Warnings

CAUTION!

The power button, indicated by the stand-by power marking, DOES NOT completely turn off the system AC power, 5V standby power is active whenever the system is plugged in. To remove power from system, you must unplug the AC power cord from the wall outlet. Your system may use more than one AC power cord. Make sure all AC power cords are unplugged. Make sure the AC power cord(s) is / are unplugged before you open the chassis, or add or remove any non hot-plug components.

CAUTION!

Do not attempt to modify or use an AC power cord if it is not the exact type required. A separate AC cord is required for each system power supply.

CAUTION!

The power supply in this product contains no user-serviceable parts. Do not open the power supply. Hazardous voltage, current and energy levels are present inside the power supply. Return to manufacturer for servicing.

CAUTION!

When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing it from the server.

CAUTION!

When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing it from the server.

Power Cord Warnings

If an AC power cord was not provided with your product, purchase one that is approved for use in your country.

CAUTION!

To avoid electrical shock or fire, check the power cord(s) that will be used with the product as follows:

- Do not attempt to modify or use the AC power cord(s) if they are not the exact type required to fit into the grounded electrical outlets.
- The power cord(s) must meet the following criteria: The power cord must have an electrical rating that is greater than that of the electrical current rating marked on the product.

CAUTION!

The power cord must have safety ground pin or contact that is suitable for the electrical outlet.

CAUTION!

The power supply cord(s) is / are the main disconnect device to AC power. The socket outlet(s) must be near the equipment and readily accessible for disconnection.

CAUTION!

THE POWER SUPPLY CORD(S) MUST BE PLUGGED INTO SOCKET-OUTLET(S) THAT IS /ARE PROVIDED WITH A SUITABLE EARTH GROUND.

System Access Warnings

CAUTION!

TO AVOID PERSONAL INJURY OR PROPERTY DAMAGE, THE FOLLOWING SAFETY INSTRUCTIONS APPLY WHENEVER ACCESSING THE INSIDE OF THE PRODUCT:

- Turn off all peripheral devices connected to this product.
- Turn off the system by pressing the power button to off.
- Disconnect the AC power by unplugging all AC power cords from the system or wall outlet.
- Disconnect all cables and telecommunication lines that are connected to the system.
- Retain all screws or other fasteners when removing access cover(s). Upon completion of accessing inside the product, refasten access cover with original screws or fasteners.
- Do not access the inside of the power supply. There are no serviceable parts in the power supply. Return to manufacturer for servicing.
- Power down the server and disconnect all power cords before adding or replacing any non hot-plug component.
- When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing the power supply from the server.

CAUTION!

Unless you are adding or removing a hot-plug component, allow the system to cool before opening the covers. To avoid the possibility of coming into contact with hot component(s) during a hot-plug installation, be careful when removing or installing the hot-plug component(s).

CAUTION!

To avoid injury do not contact moving fan blades. If your system is supplied with a guard over the fan, do not operate the system without the fan guard in place.

Rack Mount Warnings

The following installation guidelines are required by UL for maintaining safety compliance when installing your system into a rack.

The equipment rack must be anchored to an unmovable support to prevent it from tipping when a server or piece of equipment is extended from it. The equipment rack must be installed according to the rack manufacturer's instructions.

Install equipment in the rack from the bottom up, with the heaviest equipment at the bottom of the rack.

Extend only one piece of equipment from the rack at a time.

You are responsible for installing a main power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the server(s).

To avoid risk of potential electric shock, a proper safety ground must be implemented for the rack and each piece of equipment installed in it.

Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained.

Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Electrostatic Discharge (ESD)

CAUTION!

ESD CAN DAMAGE DRIVES, BOARDS, AND OTHER PARTS. WE RECOMMEND THAT YOU PERFORM ALL PROCEDURES AT AN ESD WORKSTATION. IF ONE IS NOT AVAILABLE, PROVIDE SOME ESD PROTECTION BY WEARING AN ANTISTATIC WRIST STRAP ATTACHED TO CHASSIS GROUND -- ANY UNPAINTED METAL SURFACE -- ON YOUR SERVER WHEN HANDLING PARTS.

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Other Hazards

Battery Replacement

CAUTION!

THERE IS THE DANGER OF EXPLOSION IF THE BATTERY IS INCORRECTLY REPLACED. WHEN REPLACING THE BATTERY, USE ONLY THE BATTERY RECOMMENDED BY THE EQUIPMENT MANUFACTURER.

CAUTION!

DISPOSE OF BATTERIES ACCORDING TO LOCAL ORDINANCES AND REGULATIONS.

CAUTION!

DO NOT ATTEMPT TO RECHARGE A BATTERY.

CAUTION!

DO NOT ATTEMPT TO DISASSEMBLE, PUNCTURE, OR OTHERWISE DAMAGE A BATTERY.

Cooling and Airflow

CAUTION!

CAREFULLY ROUTE CABLES AS DIRECTED TO MINIMIZE AIRFLOW BLOCKAGE AND COOLING PROBLEMS. FOR PROPER COOLING AND AIRFLOW, OPERATE THE SYSTEM ONLY WITH THE CHASSIS COVERS INSTALLED. OPERATING THE SYSTEM WITHOUT THE COVERS IN PLACE CAN DAMAGE SYSTEM PARTS. TO INSTALL THE COVERS:

- Check first to make sure you have not left loose tools or parts inside the system.
- Check that cables, add-in cards, and other components are properly installed.
- Attach the covers to the chassis according to the product instructions.

Regulatory and Compliance Information

Chapter 3

3.1. Product Regulatory Compliance Markings

This product is marked with the following product certification markings:

Product Regulatory Compliance Markings

REGULATORY COMPLIANCE	REGION	MARKING
cULus Listing Marks	USA / Canada	
CE Mark	Europe	
FCC Marking (Class A)	USA	This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.
VCCI Marking (Class A)	Japan	この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。VCCI-A

Product Regulatory Compliance Markings (Continued)

BSMI Certification Number & Class A Warning	Taiwan	 D43039 警告使用者： 這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策
GOST R Marking	Russia	
ICES Canada		This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.
Recycling Package Mark	Other than China	

3.2. Electromagnetic Compatibility Notices

FCC Verification Statement (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals, that are not shielded and grounded may result in interference to radio and TV reception.

Europe (CE Declaration of Conformity)

This product has been tested in accordance too, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

VCCI (Japan)

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

English translation of the notice above:

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

BSMI (Taiwan)

The BSMI Certification Marking and EMC warning is located on the outside rear area of the product

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策

Regulated Specified Components

To maintain the UL listing and compliance to other regulatory certifications and/or declarations, the following regulated components must be used and conditions adhered to. Interchanging or use of other component will void the UL listing and other product certifications and approvals.

Updated product information for configurations can be found on the site at the following URL: http://www.QuantaQCT.com

If you do not have access to the Web address, please contact your local representative.

- Add-in cards: must have a printed wiring board flammability rating of minimum UL94V-1. Add-in cards containing external power connectors and/or lithium batteries must be UL recognized or UL listed. Any add-in card containing

modem telecommunication circuitry must be UL listed. In addition, the modem must have the appropriate telecommunications, safety, and EMC approvals for the region in which it is sold.

- Peripheral Storage Devices: must be UL recognized or UL listed accessory and TUV or VDE licensed. Maximum power rating of any one device is 19 watts. Total server configuration is not to exceed the maximum loading conditions of the power supply.

Restriction of Hazardous Substances (RoHS) Compliance

Quanta® Computer Inc. has a system inplace to restrict the use of banned substances in accordance with the European Directive 2002/95/EC. Compliance is based on declaration that materials banned in the RoHS Directive are either (1) below all applicable threshold limits or (2) an approved / pending RoHS exemption applies.

RoHS implementation details are not fully defined and may change.

Threshold limits and banned substances are noted below:

- Quantity limit of 0.1% by mass (1000 PPM) for:
  - Lead
  - Mercury

  - Hexavalent Chromium
  - Polybrominated Biphenyls Diphenyl Ethers (PBDE)
- Quantity limit of 0.01% by mass (100 PPM) for:
  - Cadmium

End of Life / Product Recycling

Product recycling and end-of-life take-back systems and requirements vary by country. Contact the retailer or distributor of this product for information about product recycling and / or take-back.