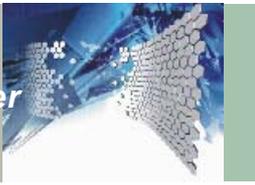**NEXCOM**®

The Digital Infrastructure

Blade Server

NexBlade™ HS420 Series
Service Manual

This manual serves to all NexBlade™ HS420 series models: HS420 / HS420A

2003-06 Edition

PREFACE

Copyright

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Version 1.0

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. 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.

Trademark Recognition

NexBlade™ HS420 (A) is a trademark of NEXCOM International Co., LTD. All other product names used in this manual are the properties of their respective owners and are acknowledged.

Federal Communications Commission (FCC)

This equipment has been tested and verified to comply with Class A limits when configured into a compatible host computer, pursuant to Part 15 of the FCC Rules, CISPR 22, and EN55022. 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 into an outlet on a circuit different from that to which the receiver is connected

- Consult the dealer or an experienced radio/TV technician for help

To ensure EMC compliance with your local regional rules and regulations, the final configuration of your end system product may require additional EMC compliance testing. For more information, please contact your local NEXCOM Representative.

WARNINGS

Turning off the power switch does not turn off power to the HS420 series. Disconnect the HS420 series from its power source and from any telecommunications links, networks, or modems before doing any of the procedures described in this guide. Failure to do this can result in personal injury or equipment damage. Some circuitry in the server may continue to operate even though the power switch on the front panel is off.

This guide is for qualified technical personnel with experience installing and configuring servers.

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

CAUTION

Electrostatic discharge (ESD) can damage server components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

HARD DISK DRIVE CHOOSE WARNING

TUV approved Hard Disk Drive is preferred for TUV compliance Hard Disk drive-Optional, (NWGQ2), generic, four provided, Input Voltage rated 5V dc/1.0A, 12V dc/1.8A maximum, minimum clearance from uninsulated live parts 4.0mm.

Important Notice

The blade server has an auto-switch power supply from 110V to 230V; however, the system may shutdown because of inadequate power input.

Safety and Regulatory Requirements

Intended uses: This product was evaluated for use in computer rack cabinets within computer rooms and similar locations. Other uses require further evaluation.

Declaration of Conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

About This Manual

CHAPTER 1 Introducing the NexBlade 420 series	Provides an overview of the system
CHAPTER 2 Upgrading Components	Provides information on upgrading CPUs, HDDs, memory modules, and installing a riser card for I/O expansion.
CHAPTER 3 NexBlade HS420(A) Specification	Provides detailed specifications for the NexBlade 420 series.
CHAPTER 4 Troubleshooting	Gives troubleshooting procedures for the server.
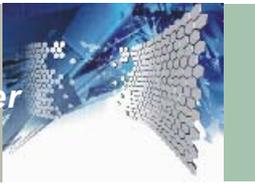
Safety Information

1. Please read these safety instructions carefully.

2. Please keep this Service Manual for later reference.

3. Please disconnect this equipment from AC outlet before cleaning. Don't use liquid or sprayed detergent for cleaning. Use moisture sheet or clothe for cleaning.

4. For pluggable equipment, the socket-outlet shall be installed near the equipment and shall be easily accessible.

5. Please keep this equipment from humidity.

6. Lay this equipment on a reliable surface when install. A drop or fall could cause injury.

7. Do not leave this equipment in an unconditioned environment, or storage temperature above 35°C; it may damage the equipment.

8. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.

9. Make sure the voltage of the power source when connect the equipment to the power outlet.

10. Place the power cord such a way that people can not step on it. Do not place anything over the power cord. The power cord must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product.

11. All cautions and warnings on the equipment should be noted.

12. If the equipment is not use for long time, disconnect the equipment from mains to avoid being damaged by transient over-voltage.

13. Never pour any liquid into ventilation openings; this could cause fire or electrical shock.

14. Never open the equipment. For safety reason, qualified service personnel should only open the equipment.

15. If one of the following situations arises, get the equipment checked by qualified service personnel:

    a. The Power cord or plug is damaged.

    b. Liquid has penetrated into the equipment.

    c. The equipment has been exposed to moisture.

    d. The equipment has not work well or you can not get it work according to user's manual.

    e. The equipment has dropped and damaged.

    f. If the equipment has obvious sign of breakage
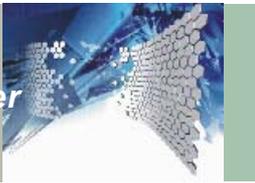
16. Do not place heavy loads on the equipment.

17. Ensure that all removable modules screws are securely fastened.

18. The unit uses a three-wire ground cable, which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

19. Do not hot-swap a Server Blade when transferring files with the CD-ROM or floppy disk drive.

20. **CAUTION:** THE COMPUTER IS PROVIDED WITH A BATTERY-POWERED REAL-TIME CLOCK CIRCUIT. THERE IS A DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH SAME OR EQUIVLENT TYPE RECOMMENDED BY THE MANUFACTURE. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

21. THE COMPUTER IS PROVIDED WITH CD DRIVES COMPLY WITH APPROPRIATE SAFETY STANDARDS INCLUDING IEC 60825.
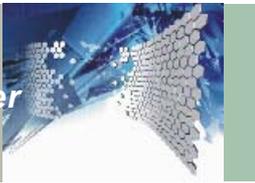
Blade Server

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CHAPTER 1   Introducing NexBlade™ 420 series

About the HS420 Series

NexBlade™ HS420 series is a 4U height, cost-effective server platform designed to run mission-critical applications. The product achieves excellence in terms of its aggregated 20 Intel® Xeon™ computing power and 20Gb network throughput, and high reliable redundant hot swappable power and cooling system. In addition, NexBlade™ HS420 series integrates standard PCI-X expansion feature for the applications require specific add-in cards or controllers by using off-the-shelf components. The HS420 series rack-mount platform includes a rear panel that provides daisy chainable KVM switch and network hubs, allowing user to build larger network systems with minimum cabling. Up to 100 server blades can be installed inside the 42U-rack cabinet. A single set of standard console devices is shared by all the systems within the rack, simplifying the system management.
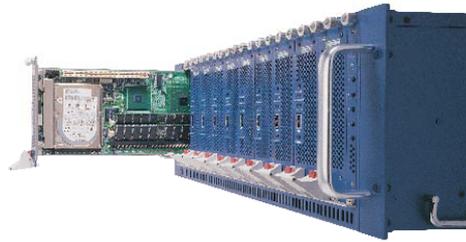
Figure 1 – NexBlade™ HS420 series

The compact design of the HS420 series frees up more space and allows data centers to provide more computing horsepower in the same square footage.

Please see the following page for the comparison of HS420 series models.

For complete specifications of the server and server blades, refer to Chapter 3 on Page 22.

NexBlade™ HS420 Series Models Components Comparison

The figures below show the components of HS420 series:
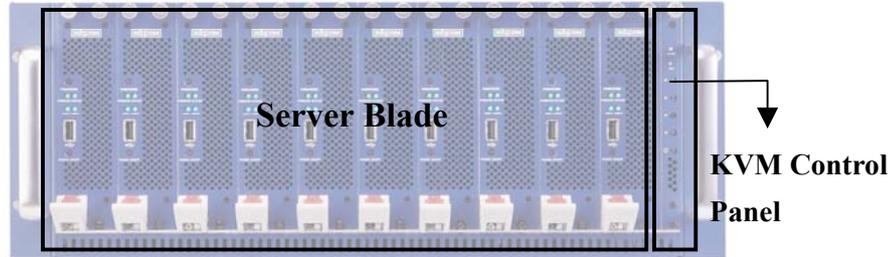
Figure 2 : HS420 Series Front View

Figure 3 : HS420 Series Back View

HS420 series includes HS420 and HS420A models. Table 1 shows the components used in both models.

Model	HS420	HS420A
Chassis	HCK420	HCK420A
Back Plane	MBP410-EL	MBP410
Server Blade	HDB42720	HDB42722
KVM Control Panel	NEXKVM420F	
Basic Management Blade	NEXKVM420R	
Advanced Management Blade	SMB410	
Ethernet Feedthru Blade	CMB410-EL	CMB410
Ethernet Switch Blade	-	GSB410
CDROM/FDD Carrier	NEXIK410	NEXIK410

Table 1 : HS420 Series Models Components Comparison

Components Color Identification

Some of the components are applicable to both HS420 and HS420A models; others are only used in HS420 or HS420A. To prevent miss-handing or incorrect usage, each HS420 series component has its own identity color. Green represents the common components used in both HS420 and HS420A. Yellow color stands for the components only compatible to in HS420. Blue color is for HS420A model only.

Components	HS420	HS420A
Chassis	Yellow	Blue
Back Plane	Yellow	Blue
Server Blade	Yellow	Blue
KVM Control Panel	Green	
Basic Management Blade	Green	
Advanced Management Blade	Green	
Ethernet Feedthru Blade	Yellow	Blue
Ethernet Switch Blade	-	Blue
CDROM/FDD carrier	Green	

Table 2 : Identify HS420 Series Models Components by color

Note: **The identity color on the chassis is shown in upper and lower open edges of the server blade slots.**

Front Panel Features

The HS420 Series front panel consists of one KVM Control Panel module and up to ten Server Blades.
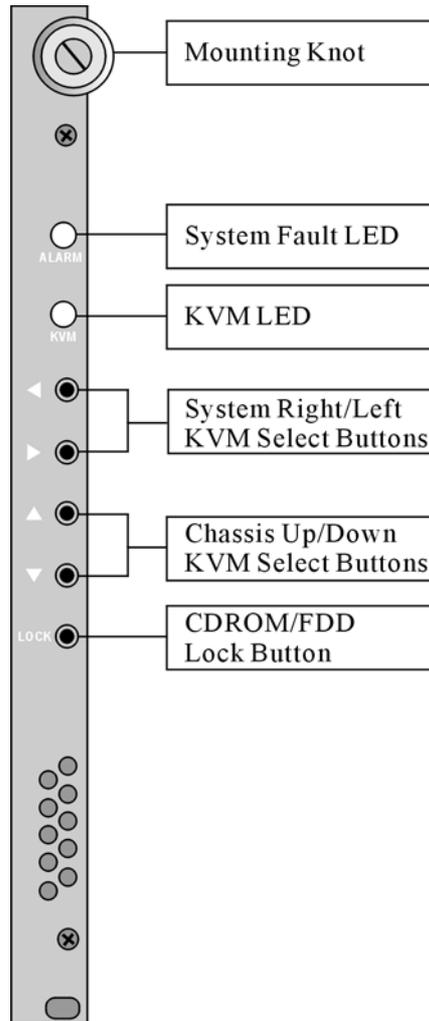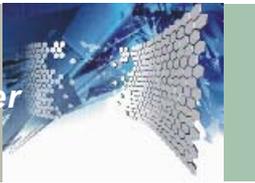
KVM Control Panel

Figure 4 : KVM Control Panel

Button/LED	Function
System Fault LED	When lit, this LED indicates power fault.
KVM LED	When this LED is blue, indicates the KVM Control Panel is power on. When this LED is green, indicates the chassis, which possess the KVM access. When this LED is blinking, indicates the CDROM/FDD devices set to exclusive access mode.
System Right/Left KVM Select Buttons	These buttons only function when the chassis ID is selected as the master. Use these buttons to assign KVM access to selected blade. The left arrow selects blade to the left. The right arrow selects blade to the right.
Chassis Up/Down KVM Select Buttons	These buttons only function when the chassis is configured as master chassis. Use these buttons to assign the KVM access to selected chassis. The up arrow selects chassis above. The down arrow selects chassis below. *Note: These buttons don't operate when the chassis ID is set to single chassis.*
CDROM/FDD Lock Button	Press the button to assign selected server blade the exclusive access to CD-ROM, FDD device when the CD-ROM/FDD carrier blade, NEXIK420 is populated on the chassis. Please refer to NexBlade 420 series user's manual for how to use NEXIK420.

Note!   *Before installing server blades into the chassis, ensure that you set the chassis ID properly. Refer to the User's Manual.*

Server Blade Features

Mounting Knots

KVM access
Button

Indicator LEDs

USB Port

Power Button

Blade Lock and
Handle
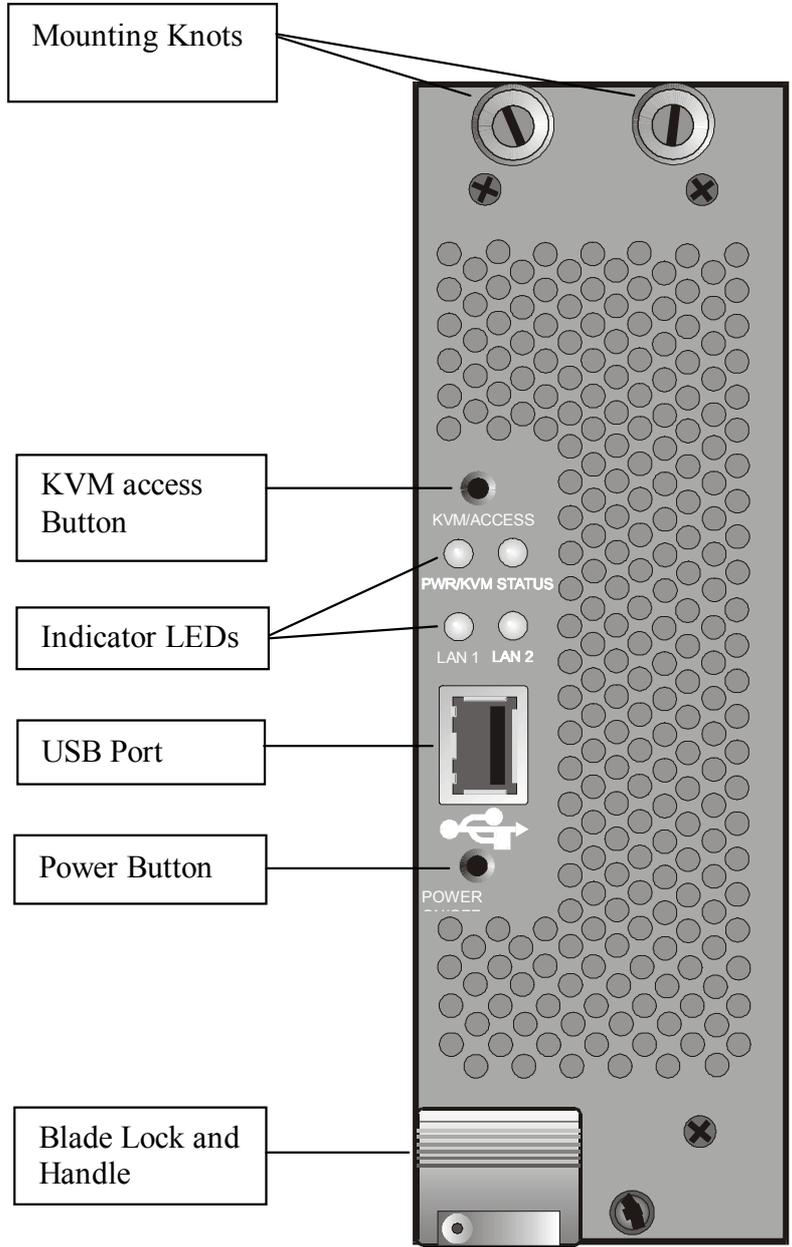
Figure 5 : Server Blade Front Panels

Button/LED	Function
KVM/Access Button	Press down over 5 seconds to obtain the KVM access.
Indicator LEDs	**PWR/KVM LED** – Blue LED indicates the server blade is power on. – Green LED indicates the KVM is selected for operation. **Statue LED** – Orange LED indicates the Hard Disk is active. – Red LED indicates a system fault. **LAN1/LAN2 LED** – Green LED indicates the connection status. – When the LED is flashing, indicates the connection is active.
USB Port	Support USB Version 1.1
Power Button	This button is to turn on and off the blade server.
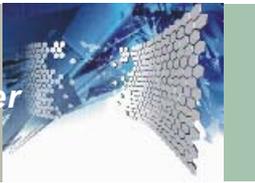
Rear Panel Features

This section describes features of the HS420 series rear panel. The rear panel consists 4 cooling fans, 7 power supply modules, 3 power supply inlets, Basic/Advanced Management Blade, and Ethernet Feedthru Blade/Ethernet Switch Blade.

Power Supply Modules and Power Inlets
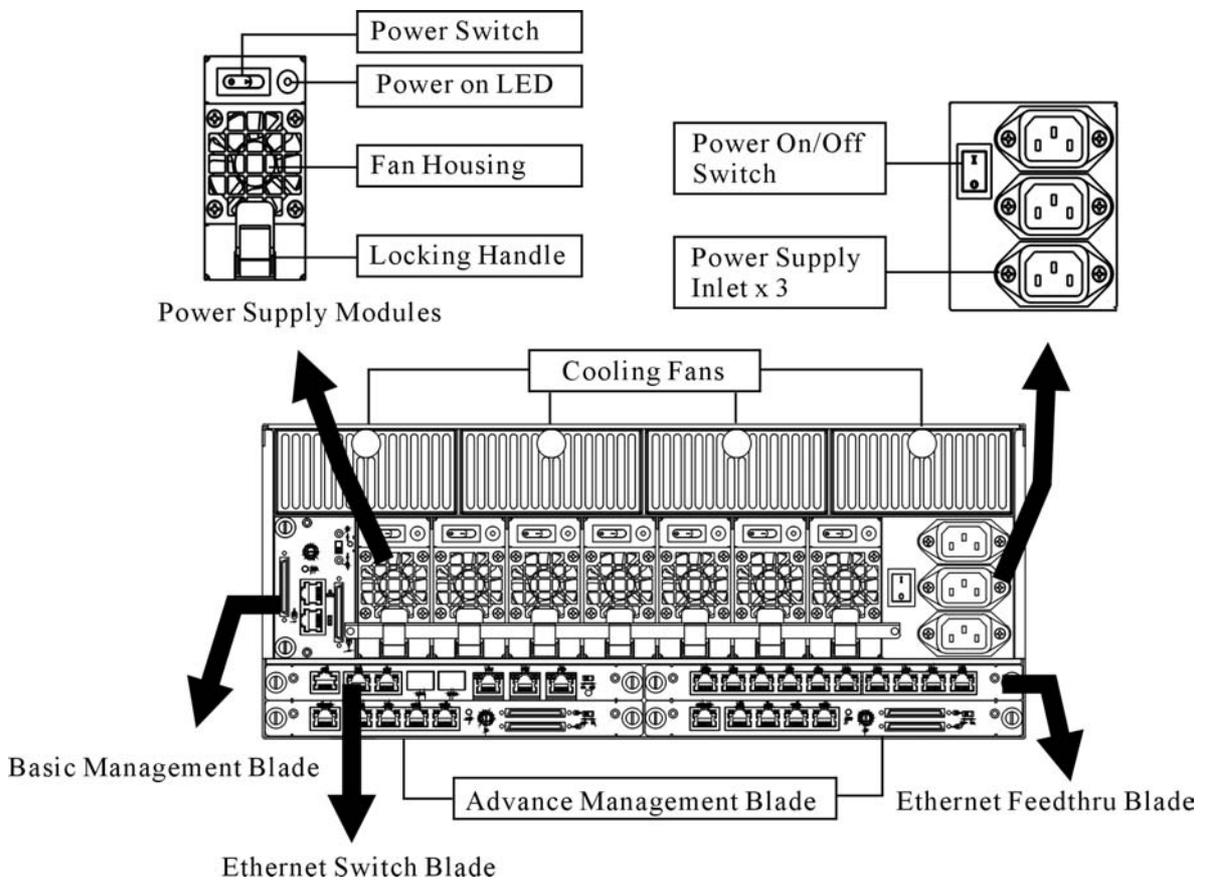
Figure 6 : HS420 Series Rear Panel

Item	Function
Cooling Fan Trays	These trays hold the HS420 series hot-swappable cooling fan units. Each tray includes one blower fan unit.
Power Supply Modules	Hot-swappable power supplies for the whole system. Each power supply module provides 350-watt electric power.
AC Inlet for Power Supplies	These inlets supply AC power to the system. Each inlet supports two to three power supply modules.
Power Switch	Press this main power switch enables you to turn on the HS420 series server. To turn off, press the main power switch over 4 seconds.
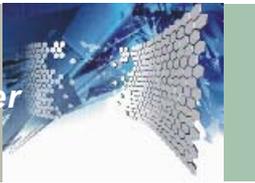
Basic Management Blade and Advanced Management Blade

User can choose either Basic Management Blade or Advanced Management Blade depends on the usage. Both contain KVM Daisy Chain Connectors. Basic Management Blade provides one LAN port and one serial port while Advanced Management Blade endows one Serial console ports, two LAN ports and two Serial ports for remote management function.

Basic Management Blade
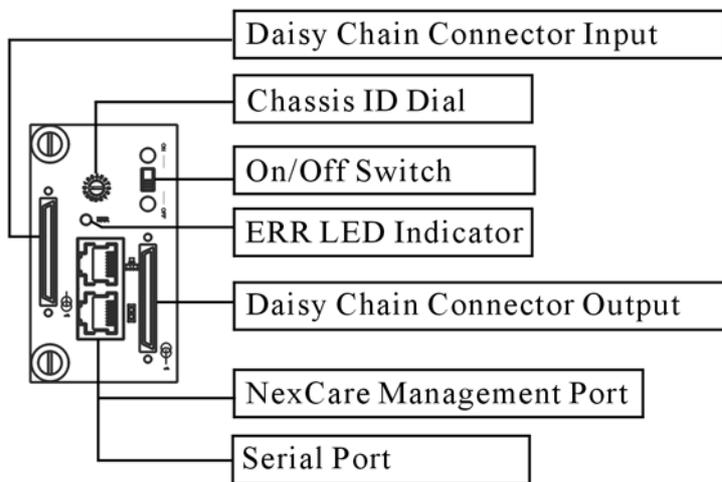
Advance Management Blade

Figure 7 : Basic Management Blade and Advanced Management Blade

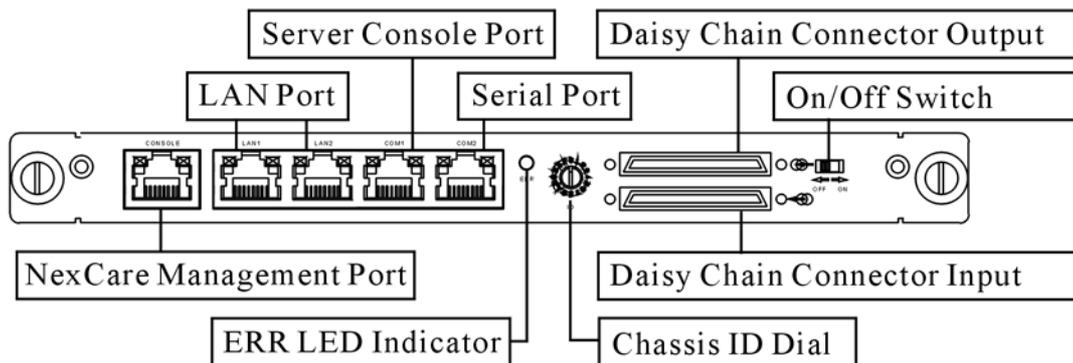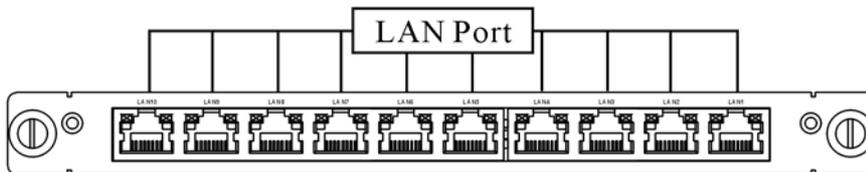| Item	Function
Daisy Chain Connectors	These connectors are exclusively used for chassis daisy chain purposes. Refer to Daisy Chaining on User's Manual, page 28, for more information.
Chassis ID Dial	Use this dial to define the chassis ID of each HS420 series chassis. The values on the dial range from 0 to 15. In the Daisy Chain configuration, at least one chassis must be in ID 0, the other chassis can be in ID 1 to ID 15. The chassis with ID0 is defined as master chassis. Only the master chassis can have the access to KVM select button. The master chassis needs to be physically located at the end node of Daisy Chain. **WARNING:** ID duplication is prohibited and may cause internal damage to your HS420 series server.
On/Off Switch	Turns the management blade on and off. The management blade must be turned on to enable the KVM Control Panel and chassis monitoring function.
ERR LED Light	When lit indicates chassis ID confliction identified.
NexCare Management Port	This RJ-45 port is for managerial functionalities through a LAN/serial interface. Please refer to NexCare User's Manual for more detail.
Serial Port	COM1: This serial port is connected direct from the server blade for serial console, and only responds to the KVM switch selected server blade. COM2: This port allows user to connect external devices by a null modem cable. *Note: When you are using the Basic Management Blade, you will need to connect the port extension cable to the serial RJ45 jack to have the access to two COM ports. The port extension cable comes with two COM port connectors, the black one stands for COM1 function, the other one for COM2 function.*
LAN Port **(Only on Advanced Management Blade)**	The LAN ports support 10/100 Mbps Ethernet for the access to the Server Blade management LAN port.

Ethernet Feedthru Blade and Ethernet Switch Blade

HS420 Series provides user with two types of network blades. Ethernet Feedthru blade provides user with Gigabit LAN port that is connected directly to the blade server. Ethernet Switch blade contains a build-in Gigabit LAN switch, which possesses 2 RJ-45 ports and 2 SFP (Small Form-Factor Pluggable Port). Depending on requirement, user can combine using one Ethernet Feedthru blade and one Ethernet Switch blade together to meet variety tasks. For more detail features of Ethernet Feedthru blade and Ethernet Switch blade, please see figure and table below:

Ethernet Feedthru Blade

Ethernet Switch Blade
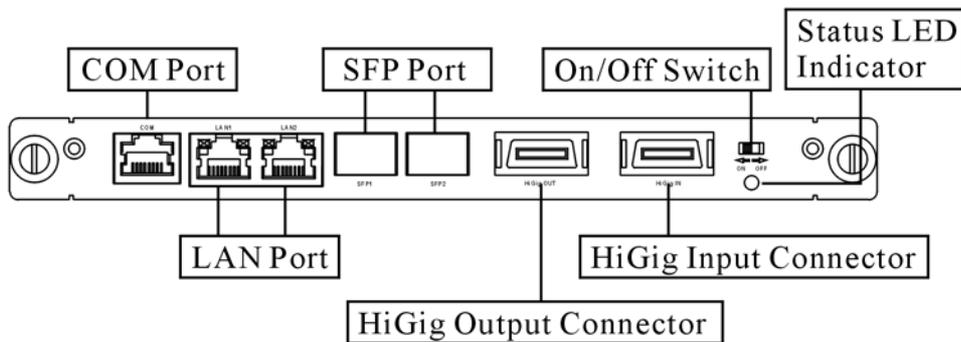
Figure 8 : Ethernet Feedthru Blade and Ethernet Switch Blade

Item	Function
LAN port	Support 10/100/1000Mb link speed to connect to external device for GSB410. Support 1000Mb link speed for CMB410.
COM port	Use this port to control or monitor switch blade.
SFP port (On the Ethernet Switch Blade only)	Small form-factor pluggable port. Allow user to plug in fiber optical module for fiber interface connection.
On/Off Switch (On the Ethernet Switch Blade only)	To turn on and off the Switch Blade.
Status LED Indicator (On the Ethernet Switch Blade Only)	When lit indicates Ethernet switch blade fault. (Please call our certified service person to check your system)
HiGig Expansion Input/Output Connector (On the Ethernet Switch Blade only)	Supported by 10 Gbps HiGig Expansion, to interconnect up to 32 Ethernet Switch Blade.

This concludes Chapter 1. The next chapter covers upgrading the components of NexBlade™ 420 series.

CHAPTER 2   Upgrading Components

Before You Begin

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the screwdriver set and sometimes by hand.

Most of the connections can be disconnected by using your fingers. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid damage to your computer or yourself:

- Always disconnect the unit from the power outlet whenever you are working inside the case.

- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.

- Hold electronic circuit boards (such as the Server Blade) by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.

- Leave all components inside the static-proof packaging that they ship with until they are ready for installation.

- Use correct screws and do not over tighten screws.

Removing a Server Blade

Before you can install a CPU, memory, or HDD, you must first remove the server blade.

Follow these instructions to remove a server blade from chassis:

1. Push the power button on the server blade to turn it off, until the power LED goes off.

2. Loosen the two screws that fasten the server blade to the chassis. Do not remove the screws.

Loosen these
screws
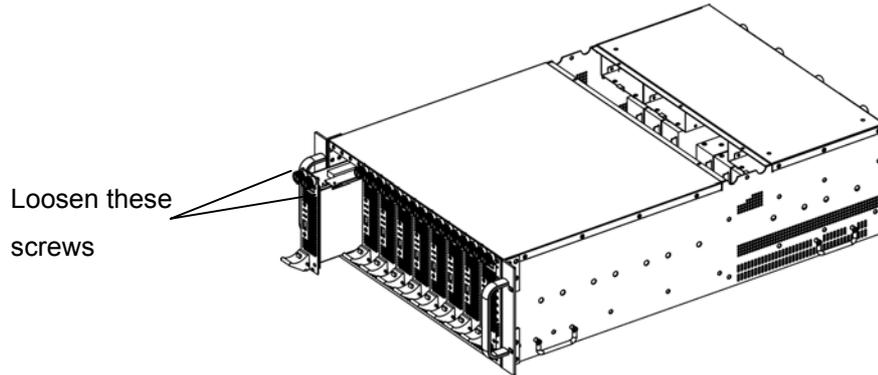
Figure 9 : Remove server blade from the chassis

3. Slide the server blade from the chassis.

4. Once the server blade is removed, lay it on a flat surface.

5. Open the blade cover by loosens 2 screws on the top and one screw on the front panel before replacing or upgrading components. You will need a smaller size screwdriver to remove these screws.
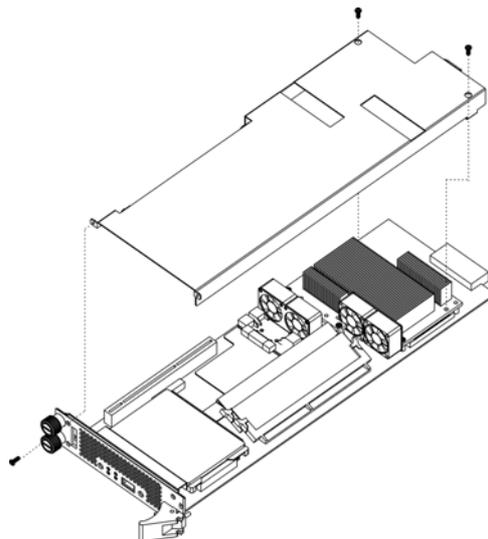
Figure 10 : Open the server blade cover

When you have finished replacing or upgrading components, cover the blade, replace the three screws, and slide it into the HS420 series chassis, before working on the next server blade.

Installing a Microprocessor

Removing heat-sink and cooling fans

Unplug the CPU cooling fan connector from the server blade CPU fan connector inlet:

CPU Fan Cable

CPU Fan Power Connector

Figure 11 : Removing CPU Fan Cable

Loosen 7 screws in the back of the server blade that hold the fan/heat-sink module. When you have finished installing CPUs, replace the 7 screws to fasten the fan/heat-sink module.

Figure 12 : Removing CPU Fan/Heat-sink

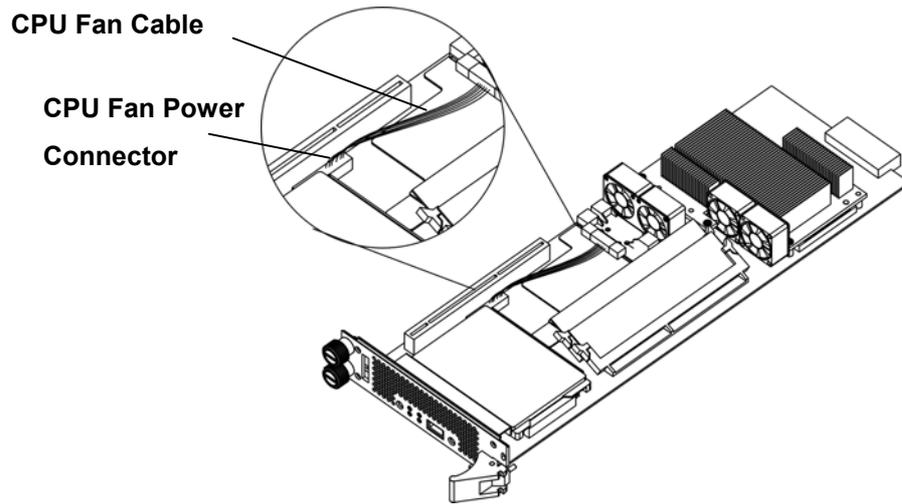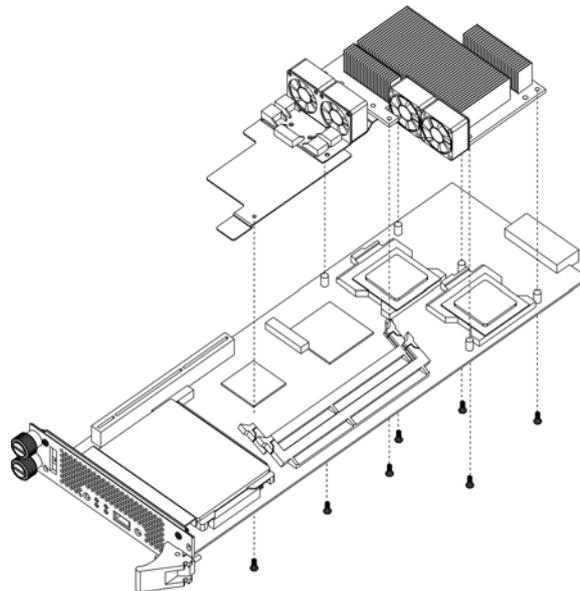## *Installing CPU*

Please remove heat-sink and cooling fans as described on page 16 of this service manual before installing CPUs. If you are using only one CPU, be sure to install it onto the master socket marked number 1 in figure 13. Refer to the following instructions to install CPU onto the server blade:

1. Match the pin-1 corner on the CPU socket and the pin-1 corner on the processor and insert the processor into the socket. Do not use force.
2. Close the CPU locking handle.

Pin 1 Corner

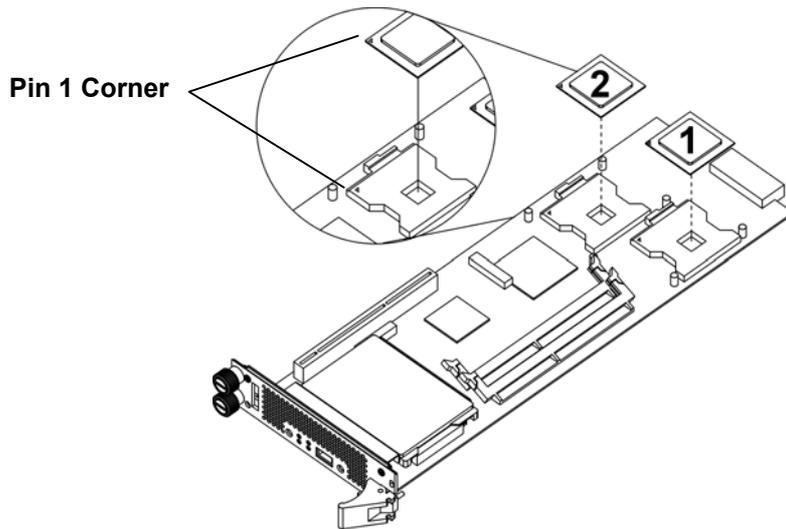**Figure 13 : Installing CPU**

3. After installed CPUs, remember to apply thermal compound on the metal cover of the CPU where the fan/heat-sink module will be directly attached for better thermal conduction, before replace the fan/heat-sink module onto the server blade. Please refer to the following figure for the location to apply thermal compound:
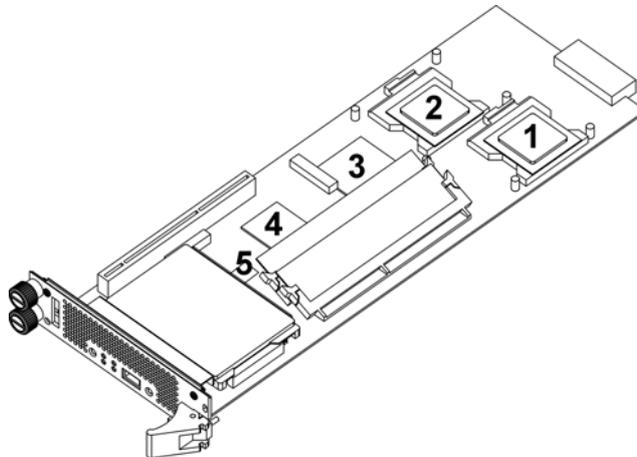
Figure 14 : Location for applying thermal compound
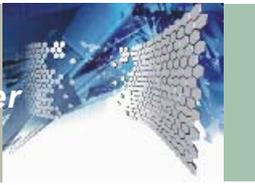
Upgrading the Memory

This section describes installing or upgrading DRAM modules onto the Server Blade. Two server blades are available for HS420 Series: the HDB42720 for HS420 and the HDB42722 for HS420A.

Server Blade	# of Socket	Memory Type	Per Socket Capacity	Total Capacity
HDB42720	2	DDR SDRAM	2 GB	4 GB
HDB42722	2	DDR SDRAM	2 GB	4 GB

Note: The DDR SDRAM used in both HDB42720 and HDB42722 cannot exceed 1.25" height.

Memory Module Socket
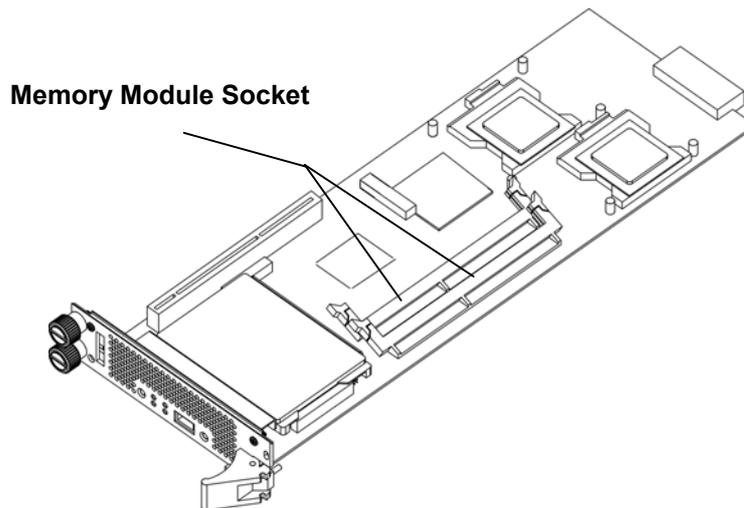
Figure 15 : Memory module socket location

Installing Memory

Before installing the memory modules, be sure to remove the heat-sink and cooling fans as described on page 16 of this service manual. Follow the below steps to install the memory modules.

1. Push the latches on each side of the DIMM socket down.	**Latches**
2. Align the memory module with the socket. The DIMM sockets are keyed with notches and the DIMMs are keyed with cutouts so that they can only be installed correctly. Check that the cutouts on the DIMM module edge connector match the notches in the DIMM socket.	**Cutout** **Latch** **Notch** **Latch**
3. Install the DIMM module into the socket (A) and press it firmly in until it seats correctly (B): The socket latches are levered upwards and latch on to the edges of the DIMM.	**A** **B**

Installing a Hard Disk Drive

This section describes installing a hard disk drive onto the server blade. The HS 420 series accommodates a 2.5-inch IDE hard disk drive.

1. Align the hard disk drive with the hard disk drive bracket, and tighten the two screws.	
2. Tighten the other side of hard disk drive bracket onto the server blade.	
3. Align the IDE connector on the hard disk drive to the server blade IDE connect. Insert the hard disk drive and fasten the two screws to secure the hard drive bracket to the server blade.	
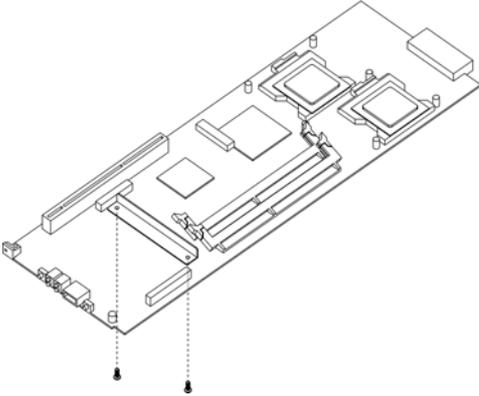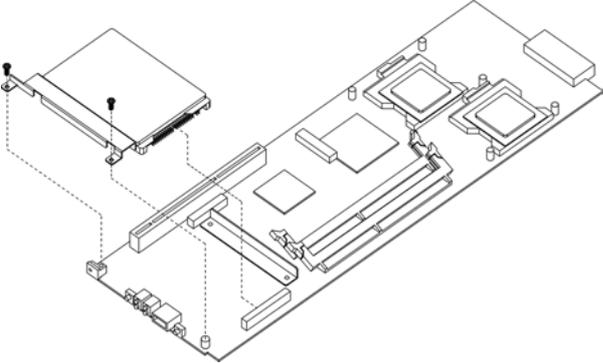
Installing Riser Card and PCI Add-on Card

NexBlade 420 series provides the unique PCI I/O expansion ability. Install the PCI add-on card onto server blade will enable this function. Please follow the bellows steps to install riser card:

1. Loosen the screws on the original server blade front panel plate, and replace with the server blade front panel plate with generic I/O cutout.	
2. Align the PCI add-on card with the riser card slot. The riser card slot is keyed with notches and the PCI add-on card is keyed with cutouts so that they can only be installed correctly. Plug the PCI add-on card firmly into the riser card slot. Lastly, plug a riser card into the slot on the server blade.	
3. After user insert the riser card, replace the blade cover back to the server blade. Be sure to fasten the two screws behind the daughter board to secure the extended riser card.	
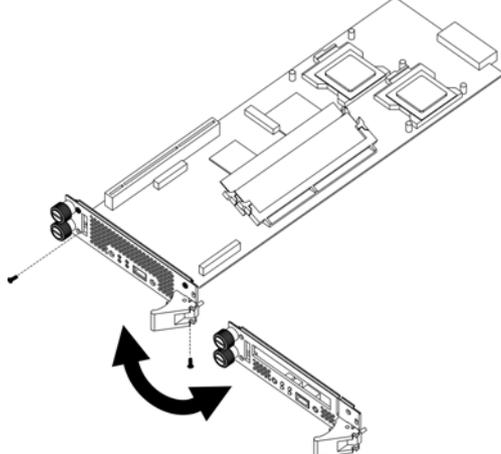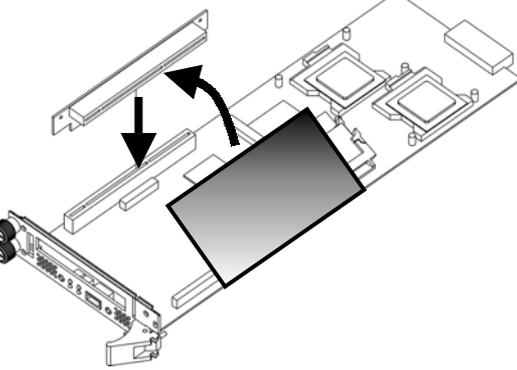
This concludes chapter 2. The next chapter covers NexBlade HS420 series Specification.

CHAPTER 3   NexBlade HS420(A) Specifications

NexBlade HS420 series includes 10 server blades and a KVM control panel in front; 4 cooling fans, 6+1 power supply modules, basic management blade, advance management blade, Ethernet switch blade, and Ethernet feedthru blade in the rear side.
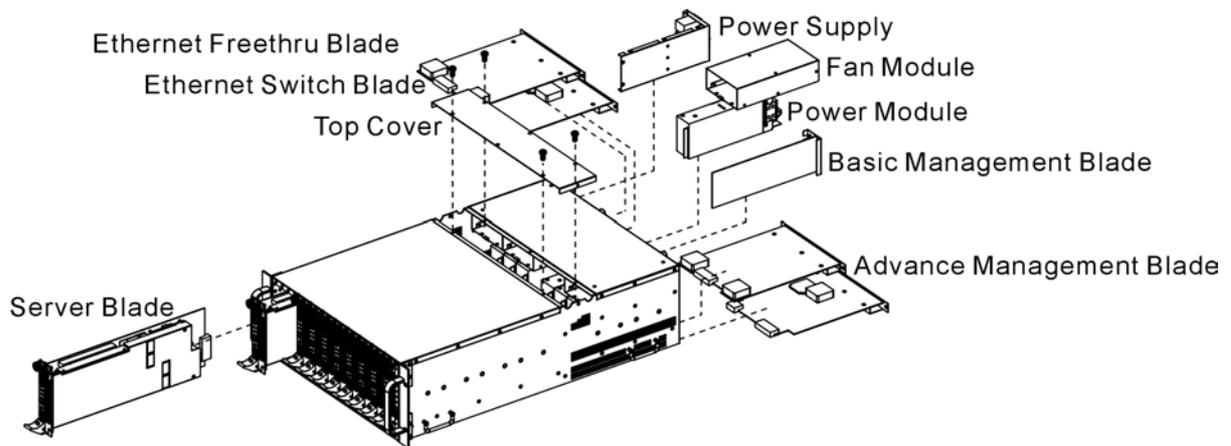
Figure 16 : HS420 series components

Chassis: HCK420(A) Specification

Feature Highlight

1.   Server blade slots: 10

2.   KVM slot: one in the front for KVM control panel (NEXKVM 420F)

3.   Management Blade slot: One basic management blade slot, and two advanced management blade slots for optional advanced management blade. Both with I/O connector and panel.

4.   Network Blade slot: Two network blade slots with options of Gigabit Ethernet Feedthru or Gigabit Ethernet switch.

5.   Power supply: Redundant power module bay x 7

6.   Chassis cooling fan: Removable Fan tray x 4

Dimensions

Physical dimensions: 427.40 (W) x 132.80 (H) x 672.25 (D) mm
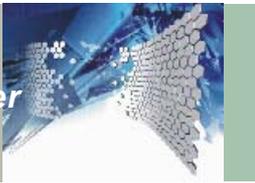
HCK420(A) Dimension
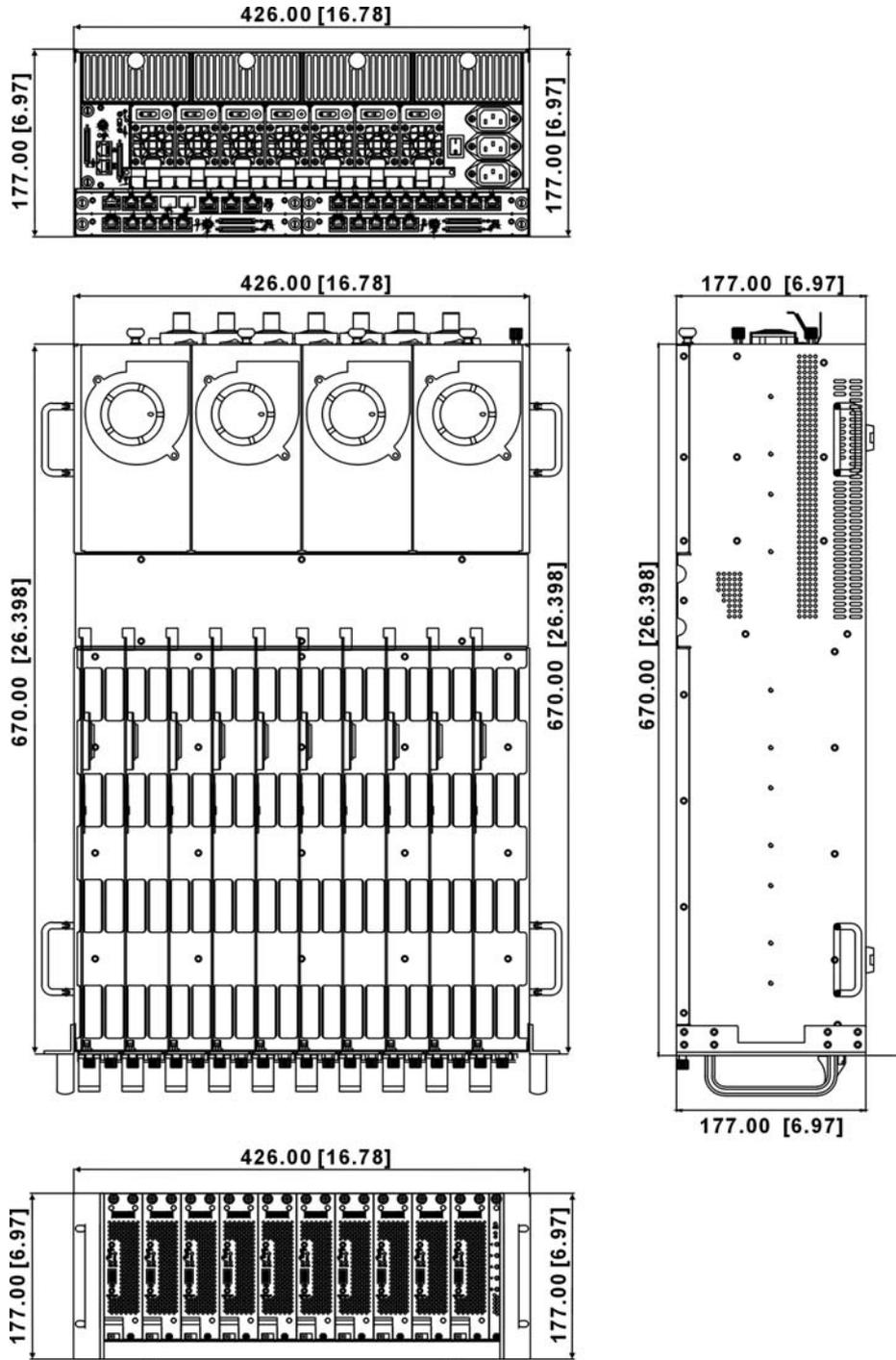
Figure 17 : HS420 series chassis dimension
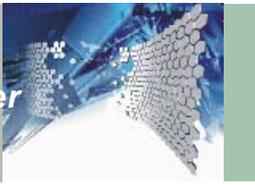
Server Blade: HDB42720 Specification

CPU

- Intel 604-pin F-Type CPU socket x 1
- Single Intel P4 Xeon® processor with 512KB on-die L2 cache, up to 2.4GHz speed
- Intel NetBurst Micro-architecture, support Hyper Threading Technology, and enhanced SIMD (Single Instruction stream Multiple Data) stream instructions

Main Memory

- 184-pin SDRAM DIMM socket x 2
- Support 0-2Gbytes DDR200 ECC SDRAM, up to 4GB

Chipset

- Intel E7500 North Bridge Core Logic Chipset, supports 400 MHz FSB, DDR200 SDRAM
- Intel ICH3 South Bridge Core Logic Chipset, supports two ATA/100 IDE channels, and 2 USB ports.
- Intel P64H2 host bus to PCI-X bridge, 64bit/133MHz PCI-X bus x 2
- Intel ICH3 built-in RTC, 256-Bytes battery backup NVRAM, Re-chargeable type battery

VGA Controller

- C&T69030 Graphics controller with 4MB on-die Video Memory
- Hardware acceleration for 2D/3D
- VGA output x 1, for rear access routed thru backplane

Networking

- Gigabit Ethernet x 2, for re-access routed thru backplane
  - Intel 82546 Gigabit Ethernet Controller
  - Full duplex 10/100/1000Mb Based T port x 2
  - Complied with PCI V2.1, IEEE802.3, 802.3u, 802.3ab
  - Support Wake on LAN, PXE boot

On-board I/O

- 8042 compatible Keyboard Controller, keyboard and mouse port x 1
- PIO port for front access x 1 (2mm pitch 13x2 pin header)
- 16C550 UART for rear access x 1
- 16C550 UART for front access x 1 (2mm pitch 5x2 pin-header)

I/O Expansion

- On-board 64bit/133MHz PCI-X vertical type slot x 1
- Riser card with low profile slot connector x 1

Storage

- On-board IDE connector in 2.0mm pitch 22x2 pin header x 1
- 2.5" IDE HDD bracket x 1
- Optional Disk-On-Module

BIOS

- 4Mbit Intel 82801 FWH FLASH ROM
- Award System BIOS
- Support MPS 1.4
- Support serial console redirection

Dimension

- 127mm(H) x 388mm(L)
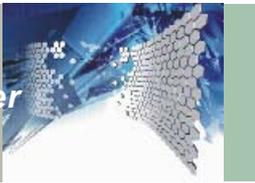
Power Requirement

- 12V Max 10A

Environment

- Operating temperatures : 5°C to 35°C
- Storage temperatures : -20°C to 80°C
- Relative humidity : 10% to 90% (Non-condensing)

Certification

- CE Class A
- FCC Class A
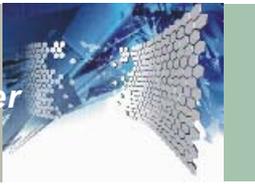
Server Blade: HDB42722 Specification

CPU

- Intel 604-pin F-Type CPU socket x 2
- Duel LV Xeon 2.0 GHz, or signal 2.4GHz Xeon processor, with 512KB on-die L2 cache
- Intel NetBurst Micro-architecture, support Hyper Threading Technology, and enhanced SIMD (Single Instruction stream Multiple Data) stream instructions

Main Memory

- 184-pin SDRAM DIMM socket x 2
- Support 0-2Gbytes DDR200/266 ECC SDRAM, up to 4GB

Chipset

- Intel E7501 North Bridge Core Logic Chipset, supports 400/533 MHz FSB, DDR200/266 SDRAM
- Intel ICH3 South Bridge Core Logic Chipset, supports two ATA/100 IDE channels, and 2 USB ports.
- Intel P64H2 host bus to PCI-X bridge, 64bit/133MHz PCI-X bus x 2
- Intel ICH3 built-in RTC, 256-Bytes battery backup NVRAM, Re-chargeable type battery

VGA Controller

- C&T69030 Graphics controller with 4MB on-die Video Memory
- Hardware acceleration for 2D/3D
- VGA output x 1, for rear access routed thru backplane

Networking

- Gigabit Ethernet x 2, for rear access routed thru backplane using SERDES interface
  - Full duplex 10/100/1000Mb Based T port x 2
  - Complied with PCI V2.1, IEEE802.3, 802.3u, 802.3ab
  - Support Wake on LAN, PXE boot
- Fast Ethernet x 1, for rear access routed thru backplane
  - Intel ICH3 built-in MAC controller
  - Full duplex 10/100Mb Based TX port x 1
  - Complied with PCI V2.1, IEEE802.3, IEEE 802.3u
  - Support Wake on LAN, PXE boot, and IPMI V1.5

On-board I/O

- 8042 compatible Keyboard Controller, keyboard and mouse port x 1
- PIO port for front access x 1 (2mm pitch 13x2 pin header)
- 16C550 UART for rear access x 1
- 16C550 UART for front access x 1 (2mm pitch 5x2 pin-header)

I/O Expansion

- On-board 64bit/133MHz PCI-X vertical type slot x 1
- Riser card with low profile slot connector x 1

Storage

- On-board IDE connector in 2.0mm pitch 22x2 pin header x 1
- 2.5" IDE HDD bracket x 1
- Optional Disk-On-Module

BIOS

- 4Mbit Intel 82801 FWH FLASH ROM
- Award System BIOS
- Support MPS 1.4
- Support serial console redirection

Dimension

- 127mm(H) x 388mm(L)

Power Requirement

- 12V Max 18A

Environment

- Operating temperatures : 5°C to 35°C
- Storage temperatures : -20°C to 80°C
- Relative humidity : 10% to 90% (Non-condensing)

Certification

- CE Class A
- FCC Class A

KVM Control Panel: NEXKVM 420F Specification

Buttons and LEDs

- System Fault LED
    - Lights red when system fault detected
- KVM LED
    - When the chassis assigned with KVM ownership, the LED lights green.
- System Right/Left KVM Select Buttons
    - Upper button moves the KVM ownership to next server blade from right
    - Lower button moves the KVM ownership to next chassis from top
    - No access from slave chassis in daisy chain configuration
- Chassis Up/Down KVM Select Buttons
    - Upper button moves the KVM ownership to next chassis from button
    - Lower button moves the KVM ownership to next chassis from top
    - No access in stand along configuration
    - No access from slave chassis in daisy chain configuration
- CDROM/FDD Lock Button
    - Assign CDROM and FDD exclusively used by designated server blade when using NEXIK420 on your system
    - No access from slave chassis in daisy chain configuration

Basic Management Blade: NEXKVM 420R Specification

KVM Switch

- Keyboard/VGA/Mouse/CDROM/FDD switch function for 10 server blades
- Front access KVM control button to select server blade/chassis

System Management

- Collects the following blade health status:
    - CPU Vcore
    - CPU cooling fan speed
    - CPU temperature
- Collects the following chassis health status:
    - Redundant power modules status
    - Power supply voltage
    - System cooling fans speed
    - Chassis temperature
- Detects the insertion and removal of server blade
- Manipulate remote hard reset, power cycle request on any server blade
- Sends health status or accepts remote control over NexCare management port

KVM Daisy Chain

- Daisy chain KVM signals
- Daisy chain management bus

External I/O Port and Connectors

- Daisy Chain 68-pin connector x 2
- NexCare management port in RJ-45 jack x 1
- Serial console port in RJ-45 x 1
- Power ON/OFF switch x 1
- Chassis ID Dial x 1

Environment

- Operating temperatures : 5°C to 35°C
- Storage temperatures : -20°C to 80°C
- Relative humidity : 10% to 90% (Non-condensing)

Regulation

- CE
- FCC Class A
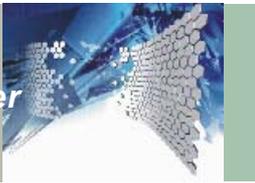
Advance Management Blade: SMB410 Specification

KVM Switch

- Keyboard/VGA/Mouse/Serial Console switch function for 10 server blades
- KVM selection by hot key

System Management

- Motorola Power QUICC II MPC855T microprocessor x 1
- Winbond W83782D hardware monitor x 2
- I2C interface controller x 3
- Collects the following blade health status:
    - CPU Vcore
    - CPU cooling fan speed
    - CPU temperature
- Collects the following chassis health status:
    - Redundant power modules status
    - Power supply voltage
    - System cooling fans speed
    - Chassis temperature
- Detects the insertion and removal of server blade
- Manipulate hard reset, power cycle request on any server blade
- Sends health status or accepts remote control over NexCare management port

KVM Daisy Chain

- Daisy chain KVM signals
- Daisy chain management bus

External I/O Port and Connectors

- Daisy Chain 68-pin connector x 2
- NexCare Management port x 1
- LAN port x 2
- Server Console port x 1
- Serial port x 1
- ERR LED Indicator x 1
- Chassis ID Dial x 1
- Power ON/OFF Switch x 1
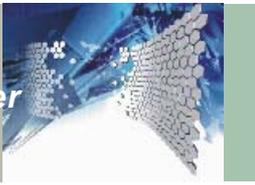
Environment

- Operating temperatures：5°C to 35°C
- Storage temperatures：-20°C to 80°C
- Relative humidity：10% to 90% (Non-condensing)

Regulation

- CE
- FCC Class A
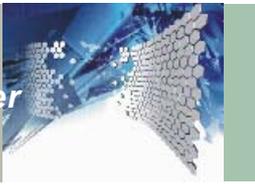
LED definition

The server blade and KVM control panel both have status LED to indicate power, connection or system status. Refer to the following tables for a quick reference to the LED.

Server Blade PWR/KVM LED

Blue LED	Blue LED indicates the server blade is power on.
Green LED	Indicates the KVM is selected for operation.

Server Blade Status LED

Orange LED	Orange LED indicates the Hard Disk is active.
Red LED	Indicates a system fault.

Server Blade LAN1/LAN2 LED

Green LED	Green LED indicates the connection status.
Flashing LED	Indicates the connection is active.

Front KVM Control Panel LED

Blue LED	Blue LED indicates the KVM control panel is power on.
Green LED	Indicates the chassis possess the KVM access.

ERR LED on Basic/Advance Management Blade

When lit indicates Basic/Advance management blade function failure.

Ethernet Switch Blade Status LED

When lit indicates the Ethernet Switch blade function failure.

This concludes chapter 3. The next chapter covers troubleshooting.
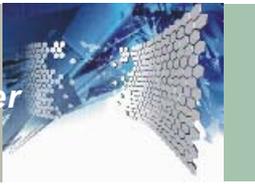
CHAPTER 4 Troubleshooting

General Troubleshooting Tips

This chapter describes locating and solving problems that you may encounter while using your server.

Contacting Your Dealer

If you still have a problem after reading the following sections and the service manual, contact your dealer.

Locating a Problem

Problems with your server can be caused by something as minor as an unplugged power cord or as major as a damaged hard disk. The information in this chapter is designed to help you find and solve minor problems. If you try all the suggested solutions and you still have a problem, make a list of what steps you have taken to correct the problem and contact your dealer.

The problems that you will encounter can be divided into two basic categories: hardware problems and software problems. Hardware problems can be further divided into electrical and mechanical problems. You will know you have a hardware problem if the screen is dark, the server cannot read the disk drives, or you get an error message during the Power-On Self Test (POST).

Software errors can occur at several levels. The ROM BIOS and the operating system can give error messages. On top of this, each application software package has its own set of error messages. It is important to determine whether the software error message you are getting is from the application or the operating system. Once you know this, you can look in the respective manual for a solution to the problem.

Checking Cables and Connections

To check the power cables, and connections:

1. Check the power outlet, the power cord, and any power switches that may affect your server. Check the wall outlet or power strip with an item that you know is functioning properly (a lamp or radio is a convenient item for checking the power). You may also need to check the fuses and breakers in your electric box. If the outlet is controlled by a wall switch, make sure that the switch is on. If your server is plugged into a power strip with an on/off switch, make sure the switch is on.

2. With the server's power switched off, check all cable connections. If the server is connected to any peripheral devices, look for loose or disconnected cables. If the server is too close to a wall, a cable connection may be loose or the cables may be crimped.

Warning! Do not substitute cables for different devices (other than the manufacturer recommended cables) even if they look exactly alike. The wiring inside the cable may be different.

3. When you are certain that you have power available and all connections are good, turn the server on again. If the server still does not start, you may have a hardware problem.

The Power-On Self Test

The Power-On Self Test (POST) runs every time you turn on or reset the server. The POST checks memory, the main-board, the display, the keyboard, the disk drives, and other installed options.

A few seconds after you turn on your server, a copyright message appears on your display screen. A memory test message appears next; as the test continues, memory size increases until all installed memory is tested. Normally, the only test routine visible on the screen will be the memory test.

If failure is detected in an area other than the main-board (such as the keyboard or an adapter card), an error message is displayed on the screen and testing is stopped.

If your system does not successfully complete the POST, but displays a blank screen, emits a series of beeps, or displays an error code, consult your dealer.

Troubleshooting Flowchart

Are the power cords correctly installed?	→	Are the power modules turned on?

Yes ↓

Is the VGA/KB/mouse correctly connected?

Yes ↓

Is the chassis ID set correctly (master/slave/single)?	←	Are KVM Control Panel Module/Management Blades and all Server Blades properly installed?

Yes ↓

Push the power button to start up the system.	**Problem?** →	Refer to the "Power " section in the troubleshooting table.

No problem ↓

Turn on the KVM Control Panel power switch, and Basic/Advance Management blade power switch.	**Problem?** →	Any problem about KVM, and NexCare, check user's manual before contact your vendor. For NEXIK, contact your vendor.

No problem ↓

Turn on the Server Blades sequentially.	**Problem?** →	Refer to "Blade Server" section in troubleshooting table.

Troubleshooting

A few common hardware problems and suggested solutions are presented in the table below:

Power Problems

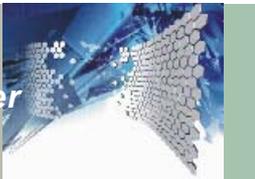| Problem	Solution
Unable to turn on the chassis power	- Ensure AC power cords are securely connected. - Ensure that the power source is functioning. - Make sure the corresponding power cord to the power module. Each power cord supplies power to two power modules. Please refer to Figure 20 on page 33 in the user's manual. - Make sure each blade is seated firmly in the chassis. - Check if the power switch has been stuck. If the above items are okay, contact your vendor.
After turning on the chassis power switches, the power module LED is red or not lit.	- Ensure AC power cords are securely connected. - Ensure that the power source is functioning. - Make sure the power module is turned on. - Avoid the improper installation or miss location, hot-swap the power module. - Connect all three power cords provided to the wall AC outlet. If the power module LED is still red or not lit, the power module is malfunctioning. Contact your vendor for a replacement.
Power module cannot be turned on after hot-swapping	After hot-swap the power module, turn off and on the chassis main power before turning on each power module. Please refer to page 43 on the user's manual for more detail. If using NexCare management software is able to turn on the power modules, contact the vendor for the main power switch malfunctioning.
After turning on the chassis power switches the power module LED flashes and then becomes dim.	Check the voltage switch of the power module is at 110V or 220V, and if it is set according to your country regulation. The power module is malfunctioning. Contact your vendor for a replacement.

The Server Blade cannot boot up.	The Server Blade power LED is dim:
	
	    • Check if the power switch of the Server Blade is turned on.
	
	    • Check if the Server Blade seated at slot properly.
	
	CPU LED is lit
	
	    • Reset the Server Blade by turning it off and on. If it still doesn't work, contact your dealer for support.

Server Blade Problems

Problem	Solution
Can not detect LAN	Check if the LAN device has been set to Disabled by BIOS setup utility Ref to page 47 on the User's Manual for information on BIOS settings.
Can not wake on LAN	- Ensure that the BIOS setting value has been set to the desired LAN port in the Integrated Peripherals BIOS screen. (Refer to page 55 in the User's Manual for information on Integrated Peripherals.) - Ensure that your OS is in ACPI mode. Refer to your OS user's manual or online help for more information. If the problem persists, contact your vendor.
Can not boot from LAN	Ensure that the BIOS default setting value has been set to Enabled in the Integrated Peripherals BIOS Features screen. Refer to page 55 in the User's Manual for more information. If the problem persists, contact your vendor.

General Hardware Problems

Problem	Solution
NexCare utility is not functioning properly	• Ensure the software is well installed. • Ensure the LAN/COM jumpers are set correctly. Please refer to page 7 in the NexCare user's manual. • Check if the LAN/COM cable is properly installed. COM port should use null modem cable. • Check the IP for LAN module.
The display screen is dark.	• Make sure that the monitor is plugged in and is on. • Make sure that the server is not in suspending mode. • Secure the KVM dangle cable • If the display screen is always dark when insert a server blade into different slot, the server blade is malfunctioning. Contact your dealer for support. • If the display screen is always dark when insert every server blade into chassis, the basic/advance management blade is malfunctioning. Contact your dealer for support. • Check if any bend pin on the backplane connectors Contact your dealer for services.
The display is blurring	• Check with different type of monitor if the display quality varies • Identify the hardware version of basic/advance management blade and backplane and report to your dealer for support.
Unable to switch KVM by KVM control buttons	• Ensure the chassis ID is set correctly. Please refer to page 25 in the user's manual for assigning chassis ID. • Ensure the basic/advance management blade is turned on. • The system right/left selection buttons on the KVM control panel are malfunctioning if it only allows selecting the server blade from the left or right. Contact your vender for repairing the KVM control panel.

	• If the KVM control panel is not able to select only one server blade, identified backplane maybe damaged. Contact your vender for services. • If bend pin found on the backplane slot connectors , contact your dealer for services.
The KVM Control Panel LED illuminates Red	Power module maybe malfunctioning. Contact your dealer for support.
The PWR/KVM LED on the server blade is not lit	• The KVM/Access button on the server blade is stuck. Please refer to the service manual to loosen the front panel face plate to readjust the button. • If you hot-swap the server blade, be sure to wait 5~10 seconds before turn on its power. • If you turn off the server blade, wait 5~10 seconds before turn on its power. • If the system is up and running properly but the LED is not lit, the LED is damaged. Contact your dealer for support.
The Status LED on the server blade illuminates Red	• After insert a server blade, wait 5~10 seconds before turn on its power.
Unable to turn on the server blade	• Ensure the CPU, DRAM, and hard disk drive are well installed on the server blade. Please refer to the service manual for the correct installation. • If beep sound is occurred, indicates that DRAM is improperly installed or the memory modules are with wrong type. Check your dealer for approved memory module type. • Hot-swap the server blade and wait 5~10 seconds before turn on its power. • If bend pin found on the backplane slot connectors, contact your dealer to replace the backplane.
USB device is not working	Be sure to enable the USB function in BIOS setup. Refer to page 55 in the user's manual.

Cannot install OS via USB CDROM	• Ensure the USB support has been enabled from BIOS setup utility • Ensure the USB CDROM securely plug into the USB port • Ensure the OS support USB CDROM installation. The OS known to support USB CDROM installation are Windows 2000 with SP3, Windows XP, Windows 2003, RedHat Linux 8.0 or later. • With the proper setting, including the configuration and OS version, if the USB CDROM is failed to install, the problem maybe generated by USB port
How to setup system boot sequence	See the Boot Device Sequence BIOS setup section on page 54 in the user's manual.
The server blade is running unstable	• Ensure the hard disk drive is functional and is securely mounted on the server blade. • Ensure the DRAM is securely installed on the sever blade. • Overheating may cause system crash or reboot. Check if thermal conduction pad applied on the CPU properly before install the CPU fan/heat-sink module. Please refer to page 16 on the service manual for the detail CPU installation process.
Cannot connect to the LAN	• Make sure you have installed the correct LAN driver onto your system. • Check if the LAN cable securely connected • Check the link speed support on destination device. The GSB410 switch blade supports 10/100/1000Mb link speed. CMB410 feed thru blade supports only 1000Mb link speed. • If the LEDs on the Ethernet feedthru blade and the Ethernet switch blade are not lit, contact your dealer for support.
The CD-ROM, FDD on NEXIK420 blade not working properly	• Ensure to enable the CD-ROM, FDD function in BIOS setup. • Ensure to select an operational server blade by KVM control panel. • Check the NEXIK420 blade power is turned on. • If bend pin found on the chassis slot connectors, contact your dealer to replace the backplane.

An incorrect date and time are displayed.	Correct the date and time setting from BIOS SETUP Utility. (You can also set the date and time in Windows 2000/98 by double clicking the clock on the task bar or in the control panel.) If the date and time become incorrect after a short time, your CMOS battery may be depleted. Contact your dealer to change the battery.
The message: **"Invalid system disk, Replace the disk, and then press any key"** appears during boot.	Check and make sure that you do not have a non-bootable floppy diskette inserted in your floppy drive. If your FDD is empty, you may not have an operating system installed on your local hard disk drive. Please install operating system properly and retest.
Irregular beeps during operation of the server and the system halts.	Check if the DRAM module securely installed to the socket and the VGA monitor connected to the KVM port properly. If this does not resolve the issue, Please contact your dealer for support.
An unidentified message is displayed.	Reboot the server and run the BIOS Setup Utility. Confirm the Setup Utility parameters. If the same message is displayed after booting up again, contact your dealer for support.
The system cannot access the Floppy and CD-ROM drive.	Check that the NEXIK420 blade is properly inserted in the chassis.
Cannot save data to diskette.	- Ensure that the disk has been formatted. Consult your operating system manual for information on formatting floppy diskettes. - The diskette is write-protected. Eject the diskette, remove the write protection, and try again. - The diskette if full. Try using another diskette or free up some space on the diskette. If these items are okay, the disk drive is not operating. Contact your dealer for support.

Cannot use the keyboard/mouse.	• Check the KVM dangle cable connection and check KVM devices connection. Test with different KVM dangle cable if available. • Check the keyboard/mouse function with different application to see if there is software incompatibility problem. • Switch KVM to a different server blade, and switch back, leave the keyboard and mouse alone for 5 seconds then check if the keyboard and mouse work properly. If this still doesn't make keyboard mouse work, unplug the keyboard/mouse and test with different keyboard/mouse to check if the keyboard/mouse device defect Switch KVM to different server blade and check if the keyboard/mouse is working properly. If the keyboard mouse work fine after switch KVM, the problem may be caused by server blade malfunctioned. If the keyboard and mouse still not working, the problem may be caused by malfunctioned basic management module, or damaged backplane. Please contact your dealer for support. • If the keyboard/mouse intermittence response from your server, upgrade the LAN driver to V6.5 or later version.

The
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