Express5800

NEC

NEC Express Server
Express5800 Series

Express5800/E120d-1
EXP298
User's Guide

Model Number: N8100-1925F

Chapter 1   General Description

Chapter 2   Preparations

Chapter 3   Setup

Chapter 4   Appendix

Documents Provided with This Product

Documents for this product are provided as accompanying booklets (📖) and as electronic manuals (📄) stored within EXPRESSBUILDER DVD (💿).

📖	Precautions for Use	Describes points of caution to ensure the safe use of this server. **Read these cautions before using this server.**
📖	Getting Started	Describes how to use this server, from unpacking to operations. Refer to this guide as you begin for an overview of this server.

💿 EXPRESSBUILDER

📄 User's Guide

Chapter 1: General Description	Overviews, names, and functions of the server's parts
Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and ideal location for this server
Chapter 3: Setup	System BIOS configurations and summary of EXPRESSBUILDER
Chapter 4: Appendix	Specifications and other information

📄 Installation Guide (Windows)

Chapter 1: Installing Windows	Installation of Windows and drivers, and important information for installation
Chapter 2: Installing the Bundled Software	Installation of bundled software, such as NEC ESMPRO and Universal RAID Utility

📄 Maintenance Guide

Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2: Convenient Features	Useful features and the detail of system BIOS settings, RAID Configuration Utility, and EXPRESSBUILDER
Chapter 3: Appendix	Error messages and Windows Event Logs

📄 Other documents

Provides the detail of NEC ESMPRO, Universal RAID Utility, and the other features.

Contents

Notations Used in This Document

Notations used in the text

In addition to safety-related symbols urging caution, 3 other types of notations are used in this document. These notations have the following meanings.

Important	Indicates critical items that must be followed when handling the server or operating software. If the procedures described are not followed, **server failure, data loss, and other serious malfunctions could occur**.
Note	Indicates items that must be confirmed when handling the server or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drives

Unless otherwise stated, optical disk drives (ODD) described in this document refer to the following.

- **USB DVD-ROM drive**

Hard disk drives

Unless otherwise stated, hard disk drives (HDD) described in this document refer to both of the following.

- **Hard disk drives (HDD)**
- **Solid state drive (SSD)**

Removable media

Unless otherwise stated, removable media described in this document refer to both of the following.

- **USB memory**
- **Flash FDD**

Abbreviations of Operating Systems (Windows)

Windows Operating Systems are referred to as follows.
Refer to *Chapter 1 (1.2 Supported Windows OS)* in *Installation Guide (Windows)* for detailed information.

Notations in this document	Official names of Windows
Windows Server 2008 R2	Windows Server 2008 R2 Standard
	Windows Server 2008 R2 Enterprise
Windows Server 2008 *1	Windows Server 2008 Standard
	Windows Server 2008 Enterprise
Windows Server 2003 R2 x64 Edition	Windows Server 2003 R2 Standard x64 Edition
	Windows Server 2003 R2 Enterprise x64 Edition
Windows Server 2003 R2 *2	Windows Server 2003 R2 Standard
	Windows Server 2003 R2 Enterprise
Windows Server 2003 *2	Windows Server 2003 Standard
	Windows Server 2003 Enterprise
Windows 7	Windows 7 Professional 64-bit(x64) Edition
	Windows 7 Professional 32-bit(x86) Edition
Windows Vista	Windows Vista Business 64-bit(x64) Edition
	Windows Vista Business 32-bit(x86) Edition
Windows XP	Windows XP Professional x64 Edition
	Windows XP Professional
Windows PE *3	Windows Preinstallation Environment

*1: Includes 64-bit and 32-bit Editions unless otherwise stated.
   The following appears on EXPRESSBUILDER.

   - Windows Server 2008 64-bit Edition: Windows Server 2008 x64
   - Windows Server 2008 32-bit Edition: Windows Server 2008 x86

*2: Unless otherwise stated, Windows Server 2003 R2 and Windows Server 2003 are collectively referred to as Windows Server 2003.

*3: Used as an installation platform only.

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Regulatory Notices

FCC Statement

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

Industry Canada Class A Emission Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CE Statement

This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (EN55022).

BSMI Statement

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。

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EEE Yönetmeliğine Uygundur.

	Disposing of your used product
	In the European Union
	EU-wide legislation as implemented in each Member State requires that used electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes Information and Communication Technology (ICT) equipment or electrical accessories, such as cables or DVDs.
	When disposing of used products, you should comply with applicable legislation or agreements you may have. The mark on the electrical and electronic products only applies to the current European Union Member States.
	Outside the European Union
	If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority and ask for the correct method of disposal.

Vietnam RoHS information relevant for Vietnam market

Complying with "CIRCULAR,No.30/2011/TT-BCT（Hanoi,August 10 2011）,

Temporary regulations on content limit for certain hazardous substances in electrical products"

台湾電池規制(廃棄物清理法

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Latest editions

This document was created based on the information available at the time of its creation. The screen images, messages, and procedures **may differ from the actual screens, messages, and procedures.** Substitute as appropriate when content has been modified.

The most recent version of User's Guide, as well as other related documents, is also available for download from the following website.

http://www.nec.com/

⚠ Precautions for Use (Be Sure to Read)

The following provides information required to use your server safely and properly. For details of names in this section, refer to *Names and Functions of Parts* in this document.

Safety precautions

Follow the instructions in this document for the safe use of NEC Express server.

This User's Guide describes hazardous parts of the server, possible hazards, and how to avoid them. Server components with possible danger are indicated with a warning label placed on or around them (or, in some cases, by printing the warnings on the server).

In User's Guide or on warning labels, **WARNING** or **CAUTION** is used to indicate a degree of danger. These terms are defined as follows:
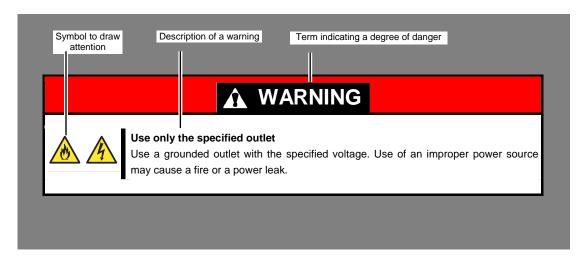
| ⚠ **WARNING** | Indicates there is a risk of death or serious personal injury |
| ⚠ **CAUTION** | Indicates there is a risk of burns, other personal injury, or property damage |

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	Attention	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type.	(Example) (Electric shock risk)
	Prohibited Action	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example) (Do not disassemble)
	Mandatory Action	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example) (Disconnect a plug)

(A label example used in this User's Guide)

Symbol to draw attention | Description of a warning | Term indicating a degree of danger

⚠ WARNING

Use only the specified outlet
Use a grounded outlet with the specified voltage. Use of an improper power source may cause a fire or a power leak.

Symbols used in this document and on warning labels

Attentions

	Indicates the presence of electric shock hazards.		Indicates the presence of mechanical parts that can result in bodily injury.
	Indicates the presence of a hot surface or component. Touching this surface could result in bodily injury.		Indicates the presence of mechanical parts that can result in pinching or other bodily injury.
	Indicates there is a risk of explosion.		Indicates the presence of laser beam that cause blindness.
	Indicates there is a risk of fire or fumes.		Indicates a general notice or warning that cannot be specifically identified.

Prohibited Actions

	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.		Do not touch the server with wet hand. Otherwise, an electric shock may be caused.
	Do not touch the component specified by this symbol. Otherwise, an electric shock or burn may be caused.		Do not use the server in the place where water or liquid may pour. Otherwise, an electric shock or fire may be caused.
	Do not place the server near the fire. Otherwise, a fire may be caused.		Indicates a general prohibited action that cannot be specifically identified.

Mandatory Actions

	Unplug the power cord of the server. Otherwise, an electric shock or fire may be caused.		Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.
	Make sure equipment is properly grounded. Otherwise, an electric shock or fire may be caused.		

Safety notes

This section provides notes on using the server safely. Read this section carefully to ensure proper and safe use of the server. For symbols, refer to *Safety precautions*.

General

	⚠ **WARNING**
🚫	**Do not use the server for services where human life may be at stake or high reliability is required.** This server is not intended for use in medical, nuclear, aerospace, mass transit or other applications where human life may be at stake or high reliability is required, nor is it intended for use in controlling such applications. We disclaim liability for any personal injury and property damages caused by such use of this server.
🔥 🔌	**Do not use the server if any smoke, odor, or noise is present.** If smoke, odor, or noise is present, immediately turn off the server and disconnect the power plug from the outlet, then contact the store where you purchased the product or your maintenance service company. Using the server in such conditions may cause a fire.
⚡ 🚫	**Do not insert needles or metal objects.** Do not insert needles or metal objects into ventilation holes in the server or openings in the optical disk drive. Doing so may cause an electric shock.
🚫	**Use a rack that conforms to the designated standard** This server can be mounted onto a 19-inch rack that conforms to EIA standards. Do not mount the server onto any rack that does not conform to EIA standards. Doing so may cause a server malfunction, personal injury, or damage to peripheral devices. For more information about racks that can be used with the server, consult with your maintenance service company.
🔥 🚫	**Use the server only under the specified environment** Do not install the server rack in any environment that is not suitable for installation. Installation in an unsuitable environment is harmful for the server and other systems installed in the rack and may cause fire or personal injury due to the rack falling. For a detailed explanation on installation environments or seismic reinforcement, consult with the instruction manual supplied with the rack or your maintenance service company.

	⚠ **CAUTION**
🔥 ⚡ 🚫	**Keep water or foreign matter away from the server.** Do not let any liquid such as water or foreign materials including pins or paper clips enter the server. Failure to follow this warning may cause an electric shock, a fire, or failure of the server. When such things accidentally enter the server, immediately turn off the power and disconnect the power plug from the outlet. Do not disassemble the server, and contact the store where you purchased the product or your maintenance service company.

Rack installation

⚠ **CAUTION**

Do not attempt to carry or install the server alone

More than two people are required to carry or install the rack. Otherwise, the rack may fall, resulting in personal injury or damage to peripheral devices. In particular, tall racks such as a 44U rack become unstable unless steadied with a stabilizer. Make sure that two or more people hold the rack to carry or install the rack.

Do not install with the load weight distributed unevenly

To avoid unevenly distributing the load of the rack and server, install a stabilizer or connect multiple racks to distribute the weight. Otherwise, the rack may fall, resulting in personal injury.

Do not install components alone, and check the door hinge pins of the rack

Two or more people are required to install the rack components such as the door or rails. When installing the door, make sure that both upper and lower hinge pins are held in place. Incomplete attachment may cause components to fall off as well as personal injury.

Do not extend any device from the rack that is not stabilized

When extending a device from the rack, make sure that the rack is stable (by using a stabilizer or seismic reinforcement). Otherwise, the rack may fall, resulting in personal injury.

Do not extend more than one device out of the rack

Extending multiple devices from the rack may cause the rack to fall, resulting in personal injury. Extend only one device at one time.

Do not exceed the rated capacity of the power supply when connecting devices

To prevent burn injuries, fire, and damage to the server, make sure the load on the branch circuit that supplies power to the rack will not exceed the rated load. For inquiries regarding the installation or wiring of the power supply system, consult with the company that performed the installation or wiring, or the power company that services your area.

Power supply and power cord use

⚠ **WARNING**

Do not hold the power plug with a wet hand.

Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.

Do not connect the ground wire to a gas pipe.

Never connect the ground wire to a gas pipe. Failure to follow this warning may cause a gas explosion.

⚠ CAUTION
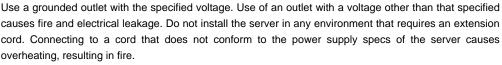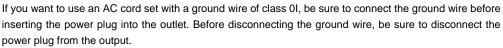
Plug in to a proper power source.

Use a grounded outlet with the specified voltage. Use of an outlet with a voltage other than that specified causes fire and electrical leakage. Do not install the server in any environment that requires an extension cord. Connecting to a cord that does not conform to the power supply specs of the server causes overheating, resulting in fire.

If you want to use an AC cord set with a ground wire of class 0I, be sure to connect the ground wire before inserting the power plug into the outlet. Before disconnecting the ground wire, be sure to disconnect the power plug from the output.

Do not connect many cords into a single outlet by using extension cords.

The electric current exceeding the rated flow overheats the outlet, which may cause a fire.

Insert the power plug into the outlet as far as it goes.

Heat generation resulting from a halfway inserted power plug (imperfect contact) may cause a fire. Heat will also be generated if condensation is formed on dusty blades of the halfway inserted plug, increasing the possibility of fire.

Do not use any unauthorized interface cable.
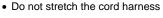
Use only the interface cables provided with the server. Electric current that exceeds the amount allowed could cause fire. Also, observe the following precautions to prevent electrical shock or fire caused by a damaged power cord.

- Do not stretch the cord harness
- Do not bend the power cord.
- Do not twist the power cord
- Do not step on the power cord.
- Uncoil the power cord before use
- Do not secure the power cord with staples or equivalents

- Do not pinch the power cord
- Keep chemicals away from the power cord
- Do not place any object on the power cord
- Do not alter, modify, or repair the power cord
- Do not use a damaged power cord (replace the damaged power cord with a power cord of the same standard. For information on replacing the power cord, contact the store where you purchased the product or a maintenance service company)

Preparation of Power Strip

Prepare Power Strip or socket-outlet near the equipment and it shall be easily accessible, otherwise it is hard to disconnect AC power promptly.

⚠ CAUTION

Do not use the attached power cord for any other devices or usage.

The power cord that comes with your server is designed aiming to connect with this server and to use with the server, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

Do not pull out a cable by gripping the cable part.

Pull a cable straight out by gripping the connector part. Pulling a cable by gripping the cable part or applying extra pressure to the connector part may damage the cable part, which may cause a fire or electric shock.

Installation, relocation, storage, and connection

⚠ CAUTION

Do not attempt to lift the server by yourself

Some servers weigh up to 15 kg depending on the server components. Carrying the server by yourself may damage your back. At least two people should securely hold the server from the bottom when carrying it.

Do not install the server in any place other than specified.
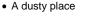
Do not install the server in the following places or any place other than specified in this User's Guide. Failure to follow this instruction may cause a fire.

- A dusty place
- A humid place such as near a boiler
- A place exposed to direct sunlight
- An unstable place

Do not use the server in an environment where corrosive gas is present

Do not install the server in a place subject to corrosive gases including sodium chloride, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, or ozone. Do not install the server in an environment that contains dust, chemicals that accelerate corrosion such as NaCl or sulfur, or conductive materials. Failure to follow this warning may cause the wiring on the printed wiring board to short-circuit, leading to fire. If you have any questions, contact the store where you purchased the product or a maintenance service company.

Do not install the server while the cover is removed

Do not install the server to a rack while the cover or other relevant items removed. Not only will the cooling effect within the server decrease, causing the server to malfunction, but also may allow dust to enter the server, resulting in fire or electrical shock.

Do not get your fingers caught in the rails

When mounting/removing the server onto/from the rack, be careful to avoid getting your fingers caught in the rails or cutting your fingers on the rails.

⚠ CAUTION

Do not apply any weight on the server when it is extended from the rack

Do not apply force on the server when it is extended from the rack. Doing so cause the frames to bend, which makes it impossible to be mounted on the rack. It also may cause the server to fall, resulting in personal injury.

Do not attempt to connect or disconnect the interface cable while the power cord is plugged into an outlet

Be sure to unplug the power cord from a power outlet before connecting/disconnecting any interface cable to/from the server. If the server is off-powered but its power cord is plugged to a power source, touching a cable or connector may cause an electric shock or a fire resulted from a short circuit.

Use only the specified interface cable.

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire.
Also, observe the following notes on using and connecting an interface cable.

- Do not use any damaged cable connector.
- Do not step on the cable.
- Do not place any object on the cable.
- Do not use the server with loose cable connections.
  Do not use any damaged cable.

Cleaning and working with internal devices

⚠ WARNING

Do not disassemble, repair, or alter the server.

Never attempt to disassemble, repair, or alter the server on any occasion except as described in this document. Failure to follow this warning may cause not only malfunction of the server but also an electric shock or fire.

Do not attempt to remove lithium, NiMH, or Li-ion batteries.

The server contains the lithium, NiMH, or Li-ion battery (some optional devices have a lithium, NiMH, or Li-ion battery installed). Do not remove the battery. Placing a battery close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead battery, contact the store you purchased the product or your maintenance service company. Do not attempt to disassemble the server to replace or recharge the battery by yourself.

Disconnect the power plug before cleaning the server.

Be to power off the server and disconnect the power plug from a power outlet before cleaning or installing/removing internal optional devices. Touching any internal device of the server with its power cord connected to a power source may cause an electric shock even of the server is off-powered.
Occasionally disconnect the power plug from the outlet and clean the plug with a dry cloth. Heat will be generated if condensation is formed on a dusty plug, which may cause a fire.

⚠ CAUTION

High temperature

Components including internal hard disk drives in the server are extremely hot just after the server is turned off. Allow the surface to cool before installing/removing.

Secure cables or cards in place

Be sure to secure the power cord, interface cables, and cards in place. Incomplete installation causes a loose connection, resulting in smoke or fire

Electric shock

The hard disk drives support hot swapping. If replacing a component when the electrical current is being supplied, use extreme caution not to get electric shock by touching terminal parts of the internal components.

During operation

⚠ CAUTION

Do not pull out or remove the server from the rack.

Do not pull the server out of the rack or remove it from the rack. In addition to causing equipment to not function properly, separating the server from the rack may result in personal injury.

Avoid contact with the server during thunderstorms.

Do not touch any part of the server including the cables when a thunderstorm is approaching. Also, do not connect or disconnect any devices. There may be a risk of electric shock from lightning strike.

Keep animals away from the server.

Keep animals such as pets away from the server. Pet hair or other waste enters the server, which may cause a fire or electric shock.

Do not leave the optical disk drive tray open.

Dust may get in the server when the tray is open, which may result in a malfunction. In addition, bumping the open tray could cause personal injury.

Do not remove the server from the rack while it is operating.

Do not pull out or remove the server from the rack while the server is running. In addition to causing equipment to not function properly, separating the server from the rack may result in personal injury.

Do not place any object on top of servers.

Separating the server from the rack may result in personal injury and damage to nearby personal belongings.

Do not get yourself caught in the fan
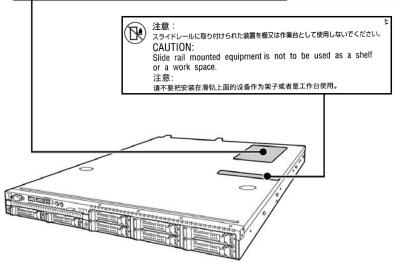
Keep your hands and hair away from the cooling fan at the rear of the server during operation. Failure to observe this warning may cause your hands or hair to catch in the fan, resulting in personal injury.

Warning labels

Warning label are attached on or near the components with potential hazards (This label is either attached or printed on the component.) to draw attention from users to potential hazards involved in handling the server. (Do not remove or black out this label and keep it clean). If no label is attached or printed on the server, or if there is a label coming off or stained, contact your sales representative.

External view

Handling precautions (for proper operations)

Be sure to observe the following precautions for the proper functioning of the server. Ignoring the precautions may cause server malfunction or failure.

- **Do not use any cell phone or PHS and switch off them near the server. Electric waves from such devices can cause server to malfunction.**
- **Install the server in an appropriate place. For details about the installation location, refer to *Chapter 2 Preparations (2. Installation and Connection)*.**
- **Before connecting/removing cables to/from peripheral devices, make sure that the server is off and unplug the power cord, if they are non plug-and-play devices.**
- **Connect the provided power cord to a 100/200 VAC outlet.**
- **Make sure that the access LED on the server is off before turning off the power or ejecting an optical disk.**
- **Wait for at least 30 seconds before connecting power cord to power outlet after disconnecting it.**
- **If any Uninterruptible Power Supply unit is connected, set it to wait for at least 30 seconds before turning on the server after power off.**
- **Do not press the POWER switch to turn on the server before the POWER LED (amber) is unlit.**
- **Wait for at least 30 seconds before turning on the server after turning off the server.**
- **Turn off the server and unplug the power cord before moving it.**
- **Regularly clean the server to prevent various types of failure. (Refer to *Chapter 1 Maintenance (2. Daily Maintenance)* in "*Maintenance Guide*" for details about cleaning.)**
- **Momentary voltage drop may occur due to lightning strike. To prevent this, use of UPS is recommended.**
- **We do not guarantee that any copy-protected CD that does not conform to standards will play on the server's optical disk drive.**
- **In the following cases, check and adjust the system clock before operation.**
  - After transportation
  - After storage
  - After the server is used following a period of disuse, in which storage conditions did not conform to those that guarantee server operations (temperature: 10℃ to 40℃; humidity: 20% to 80%).
- **Check the system clock approximately once per month. Use of a time server (NTP server) is recommended if high accuracy timing is required by the system.**
- **Observe the storage conditions (Temperature: –10°C to 55°C, Humidity: 20% to 80%, No condensation of moisture) to store the server.**
- **Do not power off or reset the server, nor disconnect the power cord before POST completes.**
- **If this server, internal optional devices, and media set for the backup devices (tape cartridges) are moved from a cold place to a warm place in a short time, condensation will occur and cause malfunctions and failures when these are used in such state. To protect important stored data and property, make sure to wait for a sufficient period to use the server and components in the operating environment.**
  Reference: Time effective at avoiding condensation in winter (more than 10°C differences between the room temperature and atmospheric temperature)
  Disk devices: Approximately 2 to 3 hours   Tape media: Approximately 1 day
- **For optional devices, we recommend you use our NEC products. Even if they are successfully installed or connected, installation of unsupported devices can cause the server to malfunction or even failure. You will be charged to repair failure or damage caused by use of such products even within warranty period.**

- **If installing into a rack, please be sure to use the slide rail installed in this server (outer rail and inner rail). When it's used by wrong combination, the rail can't be removed.**

Rack Mount Instructions

 - The following or similar rack-mount instructions are included with the installation instructions:

A) 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.

B) 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.

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

D) 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 over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

E) 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)."
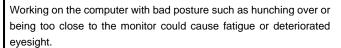
Tips for your health and safety

Using a computer extensively may affect different parts of your body. Here are tips you should follow while working on a computer to minimize strain on your body.
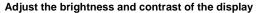
Keep proper posture

The basic body position for using a computer is sitting straight with your hands on the keyboard parallel with the floor, and your eyes directed slightly downward toward the monitor. With the proper posture described above, no unnecessary strain is applied on any part of your body, in other words when your muscles are most relaxed.

Working on the computer with bad posture such as hunching over or being too close to the monitor could cause fatigue or deteriorated eyesight.

Adjust the angle of your display

Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. Working without adjusting the display to a comfortable angle makes it difficult for you to maintain a proper posture and you will get tired easily. Adjust the viewing angle before use.

Adjust the brightness and contrast of the display
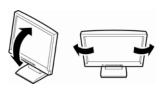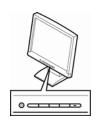
Display screens have functions to control brightness and contrast. The most suitable brightness/contrast depends on age, individuals, and environment, so adjust it to suit your preferences. A too bright or too dark display is bad for your eyes.

Adjust the angle of keyboard

Some keyboards are ergonomically designed, which allow the angle to be adjusted. Adjusting the angle of the keyboard is effective to reduce tension on your shoulders, arms, and fingers.

Clean your equipment

Keeping your equipment clean is important not only for the appearance but also for functional and safety reasons. A dusty monitor makes it difficult to see the display contents, so clean it regularly.

Take rest breaks

When you feel tired, take a break. Light exercise is also recommended.

1

NEC Express5800 Series
Express5800/E120d-1

General Description

This chapter introduces the features of this server and the name of each part.

1. Introduction

2. Accessories
Verify the condition of your server's accessories.

3. Features
This section describes the server's features and the server management.

4. Names and Functions of Parts
This section describes the name of each part contained in this server.

1. Introduction

Thank you for purchasing this NEC Express5800 Series product.

This high performance server is powered by the latest microprocessor "Intel® Xeon® processor.

NEC's latest technology and architectures realize high-power and high-speed operation that cannot be matched by existing servers.

The server is designed with consideration of not only reliability but also expandability, which enables you to use it as a network server.

Read this document before using the server thoroughly to fully understand handling of Express5800 Series Server and appreciate its functions to the maximum extent.

𝟤. Accessories

The carton box contains various accessories which are required for setup or maintenance. **Make sure you have them all** for future use.

- **Slide Rails(outer rail) removal tool**
- **EXPRESSBUILDER[*1]**
- **PL Guide**
- **Getting Started**
- **Cable Tie(For power cord fixing)**

*1 Documents are stored in EXPRESSBUILDER. Adobe Reader is required to read the documents so make sure you have it installed in your PC.

Make sure you have all accessories and inspect them. If an accessory is missing or damaged, contact your sales representative.

| Important | **The chassis serial number plate and maintenance label is located on the server. If the serial number does not match the number on the warranty, you may not be guaranteed against failure even within the warranty period. Contact your sales representative if they do not match.** |

3. **Features**

The server has the following features:

High performance

- Intel® Xeon® processor
  - N8101-606F: E5-2407 (2.20GHz 4Core)
  - N8101-607F: E5-2430L (2GHz 6Core)
  - N8101-608F: E5-2450L (1.8GHz 8Core)
- Turbo Boost Technology feature
- Hyper Threading Technology feature *1
- High-speed memory access (DDR3 1600 supported) *2
- High-speed disk access (SATA/SAS 6Gbps supported)
- High-speed 1000BASE-T/100BASE-TX/10BASE-T (2 ports) interface (1Gbps/100Mbps/10Mbps supported)

High reliability
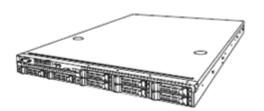
- Processor throttle-ring feature
- Memory monitoring feature (error correction/error detection)
- Memory degeneracy feature (logical isolation of a failed device)
- Memory x4 SDDC feature
- Memory throttle-ring feature
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- RAID System (Disk Array) (An option card is required.)
- Auto rebuild feature (hot swapping supported)
- BIOS password feature

Management Utilities

- NEC ESMPRO
- ExpressUpdate
- Remote controlling feature (EXPRESSSCOPE Engine 3)
- RAID System management utility (Universal RAID Utility)
- Hard disk drive monitoring
- Power supply monitoring

Power saving and noiseless design

- Power consumption monitoring feature
- Power control feature
- 80 PLUS® Gold certified high efficiency power supply
- Fan control appropriate to environment, work load, and configuration
- Enhanced Intel SpeedStep® Technology supported

Expandability

- Many option slot
- PCI Express 3.0 (x8 lanes, x16slots): 1 slot (Low profile)
- PCI Express 3.0 (x8 lanes, x8slots): 1 slot (Low profile)
- Large capacity memory of up to 384 GB *3
- Can upgrade to multi-processor system with up to two processors
- 2.5-inch drive bay (for hard disk drives): 8 slots
- USB2.0 interface (Front: 2 ports, rear: 4 ports, internal: 2 ports)
- Two ports for standard LAN, One port for management LAN

Ready to use

- No cable connection is required to install a hard disk drive (hot swap supported).
- Slide rails can be installed with one-touch.

Many built-in Features

- El Torito Bootable CD-ROM (no emulation mode) format supported
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature
- Power switch mask
- Connector for display unit provided on front panel
- Baseboard Management Controller (BMC) conforming to IPMI v2.0

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis (T&D) utility

Easy setup

- EXPRESSBUILDER (setup utility)
- BIOS Setup utility (SETUP)

Maintenance features

- Off-line Tools
- Memory dump feature using DUMP Switch
- Feature to back up and restore BIOS/BMC settings using EXPRESSSCOPE Profile Key

*1:   Unsupported on Xeon$^{®}$ processor E5-2407 embedded models.

*2:   Processor core speed depends on processor type, number and type of DIMMs installed, and operating voltage (1.35/1.5 V).

*3:   In 2-CPU configuration. Up to 192 GB in 1-CPU configuration.

3.1   **Management Features**

The hardware components of the server provide operation control/reliability features as shown below. You can manage the server comprehensively by using NEC ESMPRO Agent stored in EXPRESSBUILDER. You can also monitor the server states from a management PC on network where *NEC ESMPRO Manager* is installed.

The features available on this server are as shown in the table below.

Function		Availability	Description
Hardware			Shows physical hardware information.
	Memory bank	○	Shows physical memory information.
	Device info	○	Shows information specific to the server.
	CPU	○	Shows physical CPU information.
System		○	Shows logical CPU information and monitors the load factor. Shows logical memory information and monitors the status.
I/O device		○	Shows information on I/O devices (serial ports, keyboard, mouse, and video).
System environment			Monitors temperatures, fans, voltage, power supply, and others.
	Temperature	○	Monitors the temperature inside of the chassis.
	Fan	○	Monitors the fans.
	Voltage	○	Monitors the voltage inside of the chassis.
	Power supply	○	Monitors the power supply unit.
Software		○	Shows service, driver, and OS information.
Network		○	Shows network (LAN) information and monitors packets.
BIOS		○	Shows BIOS information.
Local polling		○	Monitors the values of MIB items obtained.
Storage		○	Monitors controllers and storage devices including hard disk drives.
File system		○	Shows the file system configuration and monitors the free space.
RAID System		○	Monitors the following RAID Controllers: • Optional RAID Controller (N8103-149/150/151/160)
Others*		○	Monitors OS stall using the Watch Dog Timer.
		○	Performs alert processing after an OS STOP error occurs.

○: Supported. △: Partially supported. ×: Unsupported.

*: Not displayed on the NEC ESMPRO Manager screen.

> **Tips**   NEC ESMPRO Manager and NEC ESMPRO Agent are supplied with the server as standard. For how to install them and use each software component, refer to the explanation of the component.

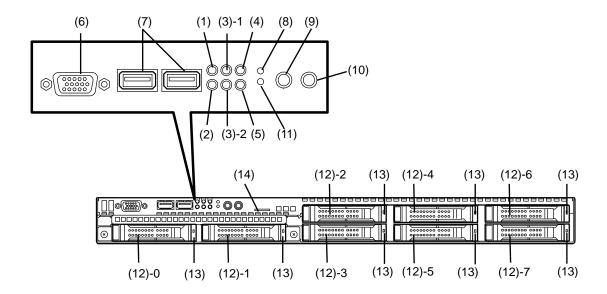## *3.2*   **Firmware and Software Version Management**

Use of NEC ESMPRO Manager and ExpressUpdate Agent allows you to manage versions of firmware and software as well as update them by applying update packages.

This feature automatically updates modules without stopping the system just by specifying the updating packages from NEC ESMPRO Manager.

4. Names and Functions of Parts

This section describes the names of the server parts.

4.1 Front View

(6)   (7)   (1) (3)-1 (4)   (8)   (9)

(2)   (3)-2 (5)   (11)

(14)   (12)-2   (13)   (12)-4   (13)   (12)-6   (13)

(12)-0   (13)   (12)-1   (13)   (12)-3   (13) (12)-5   (13)   (12)-7   (13)

(10)

(1) POWER LED
This LED lights when Power is on. (See page 37.)

(2) Disk Access LED
This LED indicates status of internal hard disk drive.
(See page 39.).

(3) LINK/ACT LED
This LED turns on when the server is connected to the
network. (See page 39.)

(4) Unit ID (UID) LED
This LED turns on when UID Switch is pressed. Commands
from the software also cause it to turn on or flash.
(See page 39.)

(5) STATUS LED
This LED indicates the server status. (See page 38.)

(6) Display connector
Connect a display unit. (See page 91.)

(7) USB connectors
These connectors are used to connect devices that support
the USB interface. (See page 91.).

(8) BMC RESET Switch
The switch to reset BMC of this server. Use the switch only
when there is a problem with EXPRESSSCOPE Engine 3
(BMC).
To use this switch, press it at least five seconds.

(9)   Unit ID (UID) Switch
The switch to turn on and off UID LED.
Pressing the switch once turns on UID LED and pressing
again turns off the LED. (See page 48.)

(10) POWER Switch
The switch to turn the server on and off. Press once to turn
on the server. POWER LED lights when it is on. Press it
again to turn off the server. Hold down the switch for 4
seconds or longer to forcibly turn off the server.
(See page 95.)

(11) DUMP(NMI) Switch
When DUMP Switch is pressed, memory dump is
performed.

(12) Hard Disk Drive bay
The bay where HDD are installed. The sequential numbers
indicate the corresponding slot numbers. All bays include
Dummy Trays.

(13) DISK LED
The LED provided for each HDD.
This LED indicates hard disk drive status. (See page 40.)
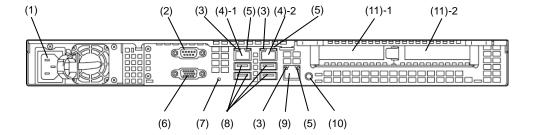
(14) Pull-out Tab
A label indicating the part number and serial number of the
server is located on this tab.

4.2   **Rear View**

(1) AC Inlet

Connect the power cord. (See page 91.)

(2) Serial port A (COM 1) connector

This connector is used to connect devices that support a serial interface.

(3) LINK/ACT LED

The LED indicates the access status of LAN.
(See page 41.)

(4) LAN connectors

1000BASE-T/100BASE-TX/10BASE-T supported network connectors. (See page 41.)

The sequential numbers indicate the corresponding port numbers.

*It isn't sometimes agree with portnumber on the OS.

(5) SPEED LED (100/10 LED)

The LED indicates the transfer speed of LAN ports.
(See page 41.).

(6) Display connector

The connector to connect a display unit.

(7) DC POWER LED

This LED lights when Power is on.. (See page 42.)

(8) USB connectors

These connectors are used to connect devices that support the USB interface. (See page 91.)

(9) Management LAN connector

A Management LAN connector which supports 100BASE-TX/10BASE-T. This port cannot be used as a data transmission port. (See page 91.)

(10) UID Switch/LED

The switch to turn on and off UID LED.
Pressing the switch once turns on UID LED and pressing again turns off the LED. (See page 39.)
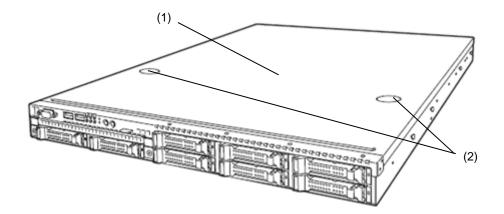
(11) Slot for PCI board addition

Slot to install a Option PCI baord.

(11)-1 Low-profile PCI board
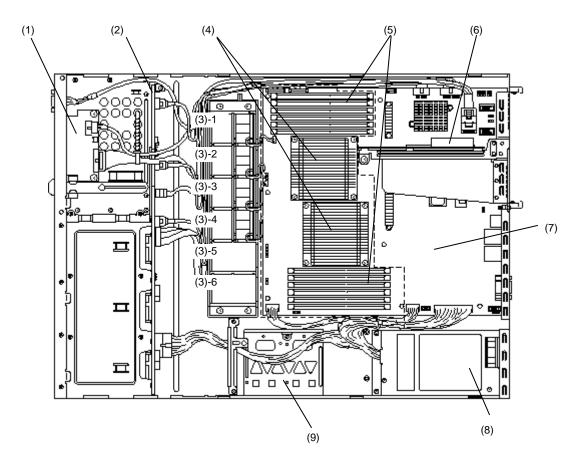
(11)-2 Low-profile PCI baord

4.3   External View

(1)   Top Cover
(2)   Release Button.

4.4 Internal View

(1) **Front Panel Board**

(2) **Backplane**

(3) **Cooling Fan**

    -1   FAN1

    -2   FAN2

    -3   FAN3

    -4   FAN4

    -5   FAN5 (optional)

    -6   FAN6 (optional)
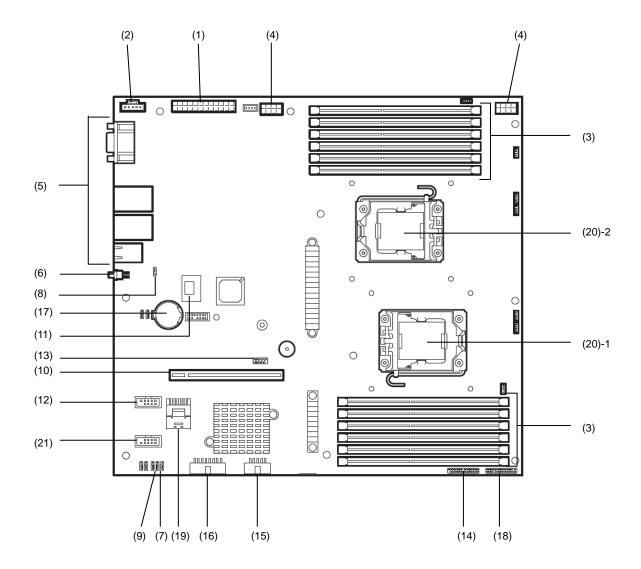
    FAN1 to FAN4 are factory installed.

    FAN5 to FAN6 are required in 2-CPU configuration.

(4) **Processor (Optional)**

(5) **DIMM (optional)**

(6) **PCI Riser Card**

(7) **Motherboard**

(8) **Power Supply Unit**

(9) **Battery tray for RAID Controller**

4.5   Motherboard

(1) Power connector

(2) PM-BUS connector

(3) DIMM socket

(4) Power connector(CPU)

(5) Outside connection connector
(See page 32.)

(6) UID switch

(7) Clear CMOS Jumper switch

(8) RAID configuration Jumper switch

(9) Clear Password Jumper switch

(10) PCI Riser Card connector
For the supported board specifications, refer to *Chapter 2 (1.8 PCI Card).*

(11) SPI Flash Mezzanine connector
EXPRESSSCOPE Profile Key (SPI flash memory) has been installed, where BIOS and BMC configuration data is stored. Relocate it when replacing motherboard to inherit configuration data.

(12) Serial port B(COM 2) connector
(Option connector)
COM2 is indicated at on the OS or NEC ESMPRO Agent, but it's no problem .
When using COM2, use [N8117-01A Addition RS-232C Connector Kit].

(13) Internal Flash Memory connector

(14) Front Panel connector

(15) USB connector (front)

(16) VGA connector (front)

(17) Lithium battery

(18) HDD BP connector

(19) SATA connector

(20) Processor(CPU) soket
-1: Processor#1 (CPU#1)
-2: Processor#2 (CPU#2)

(21) USB Option connector

4.6   Status Indicators

This section explains the indication and meanings of the server LEDs.

4.6.1   POWER LED (☀)

POWER LED indicates power ON/OFF status of the server.

POWER LED	Description
On (green)	The server is normally powered on.
On (amber)	BMC is being initialized. When connecting the power cord, the LED goes on amber for 40 seconds. After the amber LED becomes unlit, the server is available for powering on. Do not power on the server while the LED is lit amber.
Off	The server is off-powered. The server is in halt status.

4.6.2   STATUS LED (⚠)

While hardware is operating normally, STATUS LED lights green. STATUS LED is off or lights/flashes amber if there is a hardware failure.

Tips	NEC ESMPRO helps you to check the causes of failures.

STATUS LED	Description	Solution
On (green)	The server is operating normally.	–
Flashing (green)	Memory is in a degraded state	Identify the device in degraded state by using BIOS Setup Utility (SETUP), and replace it as soon as possible.
	Operating while CPU error is detected.	
	In redundant power configuration, power is not supplied to either of power unit.	
Off	The power is off.	Turn on the server.
	POST is in progress.	Wait for a while. STATUS LED will turn green after POST completes.
	Watchdog timer expired.	Turn the power off and then turn it on. If POST screen displays any error message, take notes of the message, and contact your sales representative.
	A PCI system error occurred.	
	A PCI parity error occurred.	
	Memory dump is being requested. (e.g. when DUMP Switch is pressed) Note: It remains green if the dump is caused by software.	Wait until the memory dump is completed.
On (amber)	A temperature alarm was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change, contact your sales representative.
	A CPU error occurred.	Turn the power off and then turn it on. If POST screen displays any error message, take notes of the message, and contact your sales representative.
	Abnormal CPU temperature is detected.	
	A PCI bus error occurred.	
	A voltage alarm was detected.	Contact your sales representative.
	Sensor error was detected.	
	A CPU temperature alarm was detected.	
	An error occurred on Intel® Node Manager (one of the features of EXPRESSSCOPE Engine 3).	
Flashing (amber)	A correctable memory error has often occurred.	Contact your sales representative.
	A fan alarm was detected.	Check if the internal fan cable is properly connected. If the LED indication does not change, contact your sales representative.
	A temperature warning was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change, contact your sales representative.
	A voltage warning was detected	Contact your sales representative.
	One or more hard disk drives are broken.	

4.6.3   **LINK/ACT LED (⊞1, ⊞2)**

LINK/ACT LED on front panel indicates the status of LAN port.

LINK/ACT LED	Description
On (green)	The server is connected with network normally.
Flashing (green)	The server is accessing network.
Off	The server is disconnected from network.

4.6.4   **DISK Access LED (▮)**

DISK Access LED indicates the status of HDDs.

DISK Access LED	Description	Solution
On (green)	Hard disk drive is being accessed.	–
On (amber)	Hard disk drive is failing.	Contact your sales representative.
Flashing green and amber alternately. (only when RAID system is configured)	Rebuild is in progress.	–
Off	Hard disk drive is halted.	–

4.6.5   **UID LED (ID)**

UID LED is provided one each at the front and rear of the server. If you press UID Switch provided at the front or rear of the server, the light turns on. If you press it again, the light turns off. It flashes when commands from software are received. This LED is used to identify the target server among multiple servers installed in a rack. Especially when performing maintenance from behind the server, lighting the LED will help you to identify which server to work with.
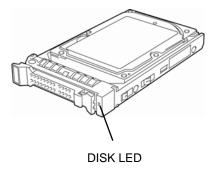
UID LED	Description
On (blue)	The UID switch is pressed.
Off	The UID switch is not pressed.

Tips	You can turn on an LED using remote management software.

4.6.6   LED on a hard disk drive

Each HDD is equipped with DISK LED.

DISK LED
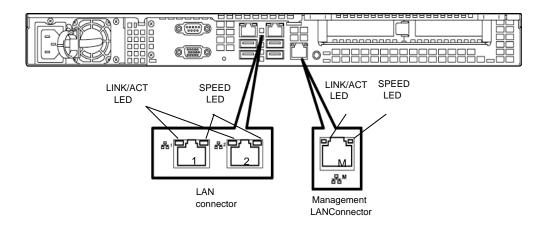
DISK LED	Description	Solution
On (green)	Hard disk drive is being accessed.	–
On (amber)	Hard disk drive is failing.	Contact your sales representative.
Flashing green and amber alternately. (only when RAID system is configured)	Rebuild is in progress. After changing the failed hard disk drive, rebuild process starts automatically (auto rebuild feature).	–
Off	Hard disk drive is halted.	–

Important **Observe the following precautions whenever you use the auto rebuild feature.**
*   **Do not turn off or reboot the server while a HDD is being rebuilt.**
*   **Wait at least 90 seconds before installing a HDD after removing one.**
*   **Do not replace a HDD while another HDD is being rebuilt.**

4.6.7   LEDs for LAN connectors

The three LAN connectors provided at the rear of the server have two LEDs each.

- **LINK/ACT LED (1, 2, M)**

    This LED indicates the state of the LAN port.

LINK/ACT LED	Description
On (green)	The server is connected with network normally.
Flashing (green)	The server is accessing network.
Off	The server is disconnected from network.

- **SPEED LED (1, 2, M)**
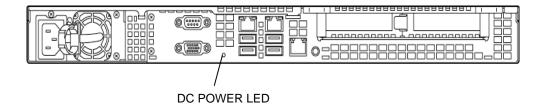
    This LED indicates which network interface is used.

    − Two onboard LANs (1, 2) support 1000BASE-T, 100BASE-TX, and 10BASE-T.
    − Management LAN (M) supports 100BASE-TX and 10BASE-T.

SPEED LED	Description
On (amber)	The port is operating with 1000BASE-T interface.
On (green)	The port is operating with 100BASE-TX interface.
Off	The port is operating with 10BASE-T interface.

4.6.8   DC POWER LED

The DC power LED in rear.

DC POWER LED

DC POWER LED	Descrption	Solution
On (green)	The server is powered on.	–
Off	The server is powered off..	–

2

**NEC Express5800 Series
Express5800/E120d-1**

Preparations

This chapter describes preparations for using this server.

1. Installing Internal Optional Devices

You can skip this section if you did not purchase any optional devices.

2. Installation and Connection

You must place the server in a suitable location and connect some cables following this section.

1.   Installing Internal Optional Devices

This section describes the instructions for installing supported optional devices and precautions. If you did not purchase any optional device requiring installation, you may skip this section.

Important	Use only the devices and cables specified by NEC. You will be charged to repair damages, malfunctions, and failures caused by the use of any devices or cables not specified for use with this server even within the warranty period.

1.1   Safety Precautions

Be sure to observe the following precautions to install and remove optional devices properly and safely.

⚠ WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- Do not disassemble, repair, or modify the server.
- Do not remove the lithium battery, NiMH battery, or Li-ion battery.
- Disconnect the power plug when installing and removing devices.

⚠ CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- Do not drop
- Do not leave the server being pulled out.
- Make sure to complete installation.
- Do not install with the cover removed.
- Do not get your fingers caught.
- High temperature
- Electrical shock

1.2   **Anti-static Measures**

The server contains electronic components sensitive to static electricity. Avoid failures caused by static electricity when installing or removing any optional devices.

Wear a wrist strap (an arm belt or anti-static glove)

Wear a wrist strap on your wrist. If no wrist strap is available, touch an unpainted metal part of the chassis before touching a component to discharge static electricity from your body.

Also discharge static electricity by periodically touching a metal surface while working on the components.

Select a suitable work space

– Work with the server on the anti-static or concrete floor.

– If you work with the server on a carpet where static electricity is likely to be generated, be sure to take anti-static measures beforehand.

Use a work table

Place the server on an anti-static mat to work with.

Clothing

– Do not wear wool or synthetic clothes.

– Wear anti-static shoes.

– Take off any jewels (a ring, bracelet, or wrist watch) before working with the server.

Handling of components

– Keep any component in an anti-static bag until you actually install it to the server.

– Hold any component by its edge to avoid touching any terminals or parts.

– To store or carry any component, place it in an anti-static bag.

1.3   Overview of Installation and Removal

Install/remove components by using the following procedure.

Installing/removing internal components except for hard disk drives should be done after dismounting the server from the rack. It is recommended that more than one person removes the server from the rack.

⚠ **CAUTION**

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Do not drop the server**
- **Do not leave the server pulled out of the rack**
- **Replace the cover after installing components**
- **Beware of high temperatures**
- **Do not get your fingers caught when installing components**

---

1.   If the server is mounted on a rack, use the UID switch to identify the target server.
     Refer to *Chapter 2 (1.4 Confirming Servers (UID Switch))*.

2.   If the server is ON, turn it off.
     Refer to *Chapter 3 (6. Turning Off the Server)*.

3.   Disconnect the power cord from the outlet and the server.

> **Important**   **After disconnecting the power cord from the server, wait for at least 30 seconds before continuing to work because the components on the motherboard might still be operating for about 30 seconds even after the power cord was disconnected.**

4.   Pull out the server from rack and put it on a flat rigid desk when installing or removing the components other than the following two devices:
     Refer to *Chapter 2 (2.1 Installation)* for details.

        Processor(CPU)   PCI Board
        DIMM(Memory)   PCI Controller
                                   Battery for RAID Controller

> **Important**   **Do not leave the server open on the rack.**

     When installing a hard disk drive only, go to step 9.

5.   Remove Top Cover.
     Refer to *Chapter 2 (1.5 Removing Top Cover)*.

6.   Depending on the components to be installed or removed, follow the procedure in order.
     Refer to *Chapter 2 (1.6 Processor(CPU))* to (*1.9 Use of Internal Hard Disk Drives in the RAID System*).

7.   Attach Top Cover.
     Refer to *Chapter 2* (*1.10 Installing Top Cover).*

8.   Mount the server onto the rack.
     Refer to *Chapter 2 (2.1 Installation).*

9.   Install hard disk drives
     Refer to *Chapter 2 (1.11 Hard Disk Drive).*

This is the end of the installation or removal procedures for internal optional devices.
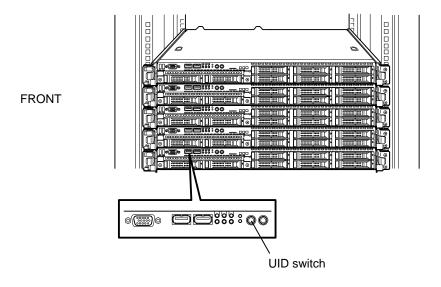
Continue the setup with reference to *Chapter 2 (2.2 Connection).*

1.4   **Confirming Servers (UID Switch)**
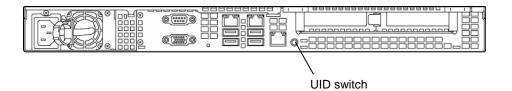
Using UID (Unit ID) Switch helps you to identify the target server.

When the server is working, before you turn the server off or disconnect a cable from the server, **be sure to identify the target server by using UID Switch first.**

To turn UID LED on, press UID Switch. When it is pressed again, the LED will be off.

FRONT

UID switch

REAR

UID switch
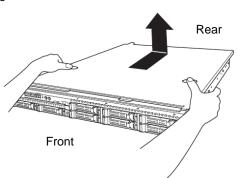
1.5   **Removing Top Cover**

Remove top cover when installing or removing the following component:

Processor(CPU)	PCI Board
DIMM(Memory)	PCI Controller
	Battery for RAID Controller

1.   Refer to steps 1 to 5 in Chapter 2 (1.3 Overview of Installation and Removal) for preparations.

2.   Slide Top Cover to the rear of the server while pressing Release Button.

Rear

Front

3.   Lift the cover, and remove it from the server.

1.6   Processor(CPU)

You can configure the multi-processor system by adding an optional processor.
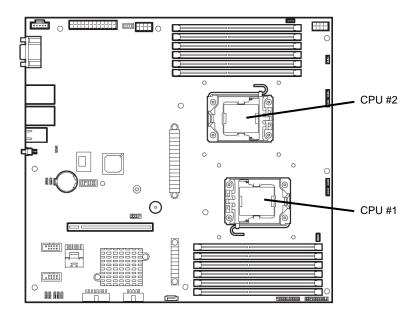
Important	• You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.
	• Make sure to use the processor authorized by NEC. Installing a third-party processor may cause a failure of the processor as well as the motherboard. Repair of the server due to failures or damage resulted from installing such a processor will be charged.
	• Please check available CPU so that CPU of a different frequency isn't intermingled.
	• When adding CPU, please change the installing point of a installed memory. For details, refer to Chapter 2 *(1.7 DIMM)*.
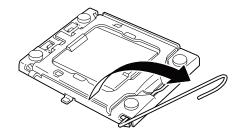
1.6.1   Installation

Follow steps below to install the processor.
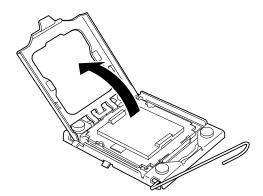
1.   Refer to steps 1 to 6 in Chapter 2 (1.3 Overview of Installation and Removal) for preparations.

2.   Remove the DUCT which cover CPU.

3.   Check the position of a CPU socket where a processor is installed.
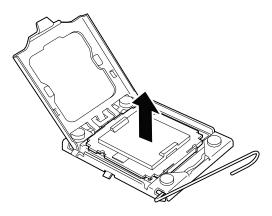
4.   Push down the socket lever once to unlatch it from the hook, then slowly open the lever until it stops.

5.   Lift the plate.

6.   .Remove the protective cover from the CPU socket.
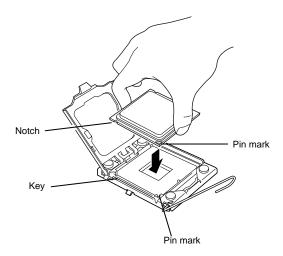
Note	Keep the protective cover for future use. Always attach the CPU protective cover if the processor is removed from the socket.

Important	**Do not touch the socket contacts.**

.

7.   Put the additional processor on the CPU socket slowly and gently.
      For easy installation, hold edges of processor with your thumb and index fingers so that the notch is
      aligned with the key on the CPU socket.

Notch

Pin mark

Key

Pin mark
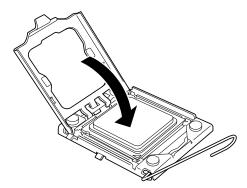
Important

- **Be sure to hold the processor only at the edges.**
- **Pay attention not to touch the bottom of the processor (pin section).**

Note
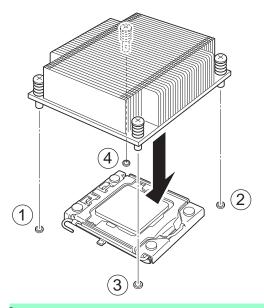
- Insert the processor while aligning the notch on the processor with the key on the CPU socket.
- Bring down the processor straight without tilting or sliding it in the socket.

8. Lightly push the processor to the CPU socket, and close the plate.

9. Close the socket lever to fix it.
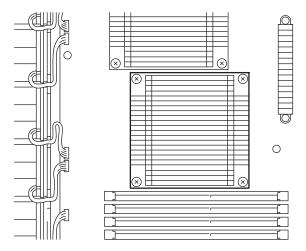
10. Put the heat sink on the processor and fix the heat sink with four screws.
    Temporarily tighten the four screws diagonally, then tighten them securely.
    Make sure that the screw aligns with the screw hole. If not, the screw may damage the motherboard.

Note   Make sure the location to put the heat sink.
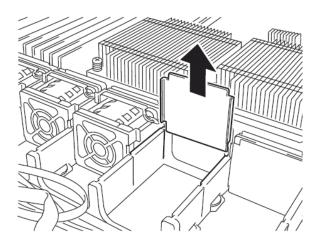
11.   Make sure that the heat sink is installed on a level with the motherboard.
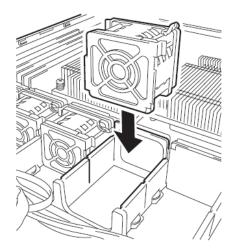
Note	• If the heat sink is not level, remove it, and then install it again. The following probably causes the heat sink not to be level: – The CPU is not positioned correctly. – All screws are not completely tightened. • Do not move the secured heat sink.
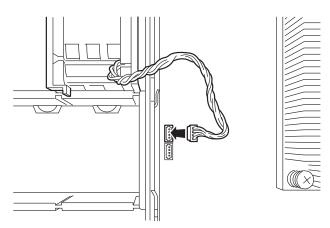
12.   Remove the fan cover from the slot where an additional fan is installed.Install an additional fan provided with Additional CPU Board.

13.   Set an addition fan in a fan bracket.

14.   Connect the fan cable with connector on motherboard.

15.   Continue to install or remove internal optional devices, mount and connect the server, and turn it on.

16.   Run BIOS Setup Utility (SETUP) to confirm the following settings. Refer to *Chapter 3 (2.BIOS Setup Utility (SETUP))* for BIOS Setup Utility.

Advanced → Processor Configuration → Processor Information

[CPU ID]
[L2 Cache RAM]
[L3 Cache RAM]

1.6.2   **Replacement / Removal**

To remove processor (CPU), reverse the installation procedure.

Important	• **Do not remove any processor unless it is failed.**
	• **To remove the heat sink from the processor, first turn the heat sink to the left and right lightly to make sure that the heat sink can be apart from the processor.** **Removing the heat sink with it adhering to the processor may cause the processor and/or CPU socket to be defected.**

1.7   DIMM
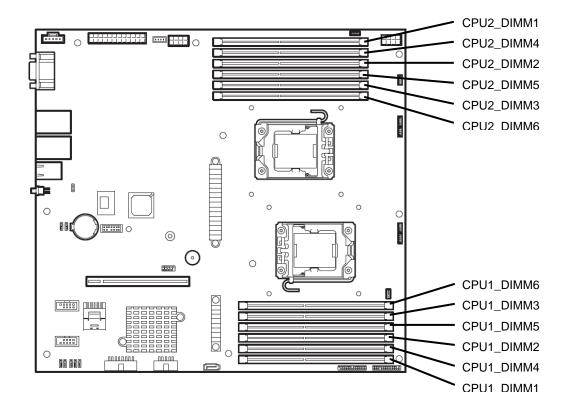
Install a DIMM (Dual Inline Memory Module) to a DIMM socket on the motherboard in the server. The motherboard provides 12 sokets to install DIMMs.

Important	• **You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.**
	• **Use only the specified DIMMs. Installing a DIMM from a third party may damage not only the DIMM but the motherboard. You will be charged to repair failures or damages caused by the use of such products even within the warranty period.**

Tips	Up to 384 GB (32 GB x 12) can be installed in 2-CPU configuration. Up to 192 GB (32 GB x 6) can be installed in 1-CPU configuration. No DIMM is factory installed in standard configuration.

CPU2_DIMM1
CPU2_DIMM4
CPU2_DIMM2
CPU2_DIMM5
CPU2_DIMM3
CPU2 DIMM6

CPU1_DIMM6
CPU1_DIMM3
CPU1_DIMM5
CPU1_DIMM2
CPU1_DIMM4
CPU1 DIMM1

1.7.1   Maximum supported memory size

The maximum available memory size on the server depends on the architecture and OS specs.

List of maximum memory sizes

OS	The maximum memory size supported on each OS	The maximum memory size supported on the server
Microsoft Windows Server 2008 Standard	4GB	4GB
Microsoft Windows Server 2008 Standard (x64) Microsoft Windows Server 2008 R2 Standard (x64)	32GB	32GB
Microsoft Windows Server 2008 Enterprise	64GB	64GB
Microsoft Windows Server 2008 Enterprise (x64) Microsoft Windows Server 2008 R2 Enterprise (x64)	2TB	384GB
Red Hat Enterprise Linux 5 Red Hat Enterprise Linux 5 Advanced Platform Red Hat Enterprise Linux 6	16GB	16GB
Red Hat Enterprise Linux 5 (EM64T) Red Hat Enterprise Linux 5 Advanced Platform (EM64T)	1TB	384GB
Red Hat Enterprise Linux 6.0 (x86_64)	2TB	384GB
SUSE Linux Enterprise Server 11 (EM64T)	512GB	384GB
VMware ESXi 5.0	2TB	384GB

1.7.2   Memory Clock

The server supports the memory clock speed of DDRL3-1066/1333/1600MHz. However, the actual memory clock speed depends on CPU and memory configuration. (The all of DIMMs operate at the same clock speed.)

DIMMs installed on N8101-606F

N code and product name	Memory clock speed
N8102-509F 2GB DDR3-1600 UNB Memory Kit	1066 MHz
N8102-510F 4GB DDR3-1600 UNB Memory Kit	
N8102-511F 8GB DDR3-1600 REG Memory Kit	
N8102-512F 16GB DDR3-1600 REG Memory Kit	
N8102-513F 32GB DDR3-1066 REG Memory Kit	800 MHz

DIMMs installed on N8101-607F

N code and product name		Memory clock speed	
	Number of memory boards per memory channel	Up to 1	2
N8102-509F 2GB DDR3-1600 UNB Memory Kit		1333 MHz	1066 MHz
N8102-510F 4GB DDR3-1600 UNB Memory Kit			
N8102-511F 8GB DDR3-1600 REG Memory Kit		1333MHz	
N8102-512F 16GB DDR3-1600 REG Memory Kit			
N8102-513F 32GB DDR3-1066 REG Memory Kit		800 MHz	

DIMMs installed on N8101-608F

N code and product name		Memory clock speed			
	Memory Voltage	When set to 1.35 V		When set to 1.5 V	
	Number of memory boards per memory channel	Up to 1	2	Up to 1	2
N8102-509F 2GB DDR3-1600 UNB Memory Kit		1333 MHz	1066MHz	1333 MHz	1066 MHz
N8102-510F 4GB DDR3-1600 UNB Memory Kit					
N8102-511F 8GB DDR3-1600 REG Memory Kit		1333 MHz		1600 MHz	
N8102-512F 16GB DDR3-1600 REG Memory Kit					
N8102-513F 32GB DDR3-1066 REG Memory Kit		800 MHz			

1.7.3   DIMM installation order

| Note | • DIMM installation order in 1-CPU configuration differs from that in 2-CPU configuration.
• If CPU2 is not installed, CPU2_DIMM1 to CPU2_DIMM6 are disabled.
• Refer to *List of features supported by additiional memory board* before using memory RAS feature. |

In 1-CPU configuration, install two DIMMs starting from the smallest slot number.

In 2-CPU configuration, alternately install two DIMMs starting from the smallest slot number of each CPU.

Installation order depends on combination of DIMMs to be installed. See the table below to find allowable combination of DIMMs, and install DIMMs starting from the largest capacity and from the smallest slot number.

N code	N8102-				
	509F	510F	511F	512F	513F
N8102-509F 2GB DDR3-1600 UNB Memory Kit	○	○	×	×	×
N8102-510F 4GB DDR3-1600 UNB Memory Kit	○	○	×	×	×
N8102-512F 16GB DDR3-1600 REG Memory Kit	×	×	○	○	○
N8102-513F 32GB DDR3-1066 REG Memory Kit	×	×	○	○	○
N8102-513F 32GB DDR3-1066 REG Memory Kit	×	×	○	○	○
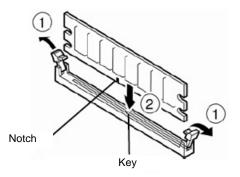
○: Allowed to be install together.   ×: Not allowed to be install together.

1.7.4   Installation

Install a DIMM by using the following procedure.

1. Refer to steps 1 to 6 in Chapter 2 (1.3 Overview of Installation and Removal) for preparations.

2. Push the DIMM straight into the socket.
   When a DIMM is inserted into the socket,
   the lever automatically closes.

Notch

Key

Important	• **Make sure the direction of the DIMM. The DIMM has a notch, preventing being incorrectly inserted.** • **Do not apply too much pressure when pushing a DIMM into the socket. Doing so can damage the socket or terminal part.**

3. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.

4. Confirm that no error messages are displayed in POST screen.
   If any error messages are displayed, refer to *Chapter 3 (2.BIOS Setup Utility (SETUP))* for BIOS Setup Utility.

5. Run BIOS Setup Utility, and select **Memory Configuration** and then **Memory Information** from the **Advanced** menu. Make sure the capacity of added DIMM is displayed properly.
   Refer to *Chapter 3 (2.BIOS Setup Utility (SETUP))* for BIOS Setup Utility.

6. Select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**.
   After that, select **Save Changes and Exit** to reboot.

1.7.5   Removal / Replacement

To remove DIMM, reverse the installation procedure.

Be sure to install dummy cover to the slots from where DIMMs are removed.

Note	When removing a defective DIMM, check error messages displayed at POST or NEC ESMPRO and check the DIMM socket where the defective DIMM is installed.

Take the steps below after replacing or removing DIMMs.

1. Confirm that no error messages are displayed on POST. If any error message is displayed, refer to *Chapter 3 (1. Post Error Message)* in "*Maintenance Guide*".

2. Run BIOS Setup Utility, select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**. After that, select **Save Changes and Exit** to reboot.

1.8   **PCI Card**

This server provides a riser card.   The riser card can connect two PCI card of one Low Profile PCI card and one RAID controller.

Important	**You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures).***

1.8.1   **Notes**

Read the following notes when installing or removing a PCI card.

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.

- Available type of PCI card depends on riser card. Make sure the card type before connecting it to riser card.

- The server does not provide LED connector to indicate disk access.

- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on OS or RAID Configuration Utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

PCI device	Bus number	Device number	Function number
Onboard LAN1	8	0	0
Onboard LAN2	8	0	1
PCI Slot (Slot1) (Low Profile)	16	0	×
PCI Slot (Slot2) (Low Profile)	32	0	×

- If a bootable device such as a PCI card or USB device is added, the boot order may change.
  In BIOS Setup Utility, select **Hard Drive BBS Priorities** from **Boot** menu, and then specify a higher priority for the boot device.
  Boot → **Hard Drive BBS Priorities** → Check the display
  If the boot device is an HDD under an optional RAID Controller, the display is (Bus *xx* Dev 00) PCI RAID Adapter. Note that the value for *xx* changes depending on the PCI slot where a RAID board is installed.

- For a RAID Controller, LAN card (network boot), or Fibre Channel controller, if no hard disk drive on which an OS is installed is connected, set the option ROM for that slot to **Disabled**. Refer to *Chapter 3 (2.BIOS Setup Utility (SETUP))* for BIOS Setup Utility.

1.8.2   Supported boards and available slots

The following tables list supported boards and slots available for them. For details of the features of each board, refer to the manual supplied with it.

Product number	Product name	Slot number	PCIe 3.0 #1	PCIe 3.0 #2	Remarks
		PCI slot performance *1	x8 lane	x8 lane	
		Socket type *2	X16 socket	x8 socket	
		Transfer bandwidth (per lane) *1	8 Gb/s		
		Slot size	Low Profile		
		Available card size	180 mm max.		
N8103-149	RAID Controller (512 MB, RAID 0/1) (PCI EXPRESS 2.0 (x8))		–	√	Dedicated to connecting internal hard disk drive. Additional battery N8103-154 can be mounted.
N8103-150	RAID Controller (512 MB, RAID 0/1/5/6) (PCI EXPRESS 2.0 (x8))		–	√	
N8103-151	RAID Controller (1 GB, RAID 0/1/5/6) (PCI EXPRESS 2.0 (x8))		–	√	Dedicated to connecting internal hard disk drive. Additional battery N8103-154 can be mounted. MegaRAID CacheCade N8103-156 can be mounted.
N8103-152	RAID Controller(1 GB, RAID 0/1/5/6) (PCI EXPRESS 3.0 (x8))		—	√	Dedicated to connecting internal hard disk drive. Flash BackUp Unit is mounted as standard.
N8103-160	RAID Controller (1 GB, RAID 0/1/5/6) (PCI EXPRESS 2.0 (x8))		√	√	Dedicated to connecting external devices. Additional battery N8103-162 can be mounted. Up to two additional batteries can be mounted.
N8103-142	SAS Controller (PCI EXPRESS 2.0 (x8))		√	√	Dedicated to connecting external devices.
N8190-153	Fibre Channel Controller (8 Gbps/Optical) (PCI EXPRESS 2.0 (x8))		√	√	Dedicated to connecting external Fibre Channel devices.
N8190-154	Fibre Channel Controller (2ch) (8 Gbps/Optical) (PCI EXPRESS 2.0 (x8))		√	√	Dedicated to connecting external Fibre Channel devices.
N8104-138	1000BASE-T Adapter (1ch) (PCI EXPRESS 2.0 (x1))		√	√	For additional LAN port. Card type: PCI Express 2.0(x4)
N8104-132	1000BASE-T Adapter (2ch) (PCI EXPRESS 2.0 (x1))		√	√	For additional LAN port. Card type: PCI Express 2.0(x4)
N8104-133	1000BASE-T Adapter (4ch) (PCI EXPRESS 2.0 (x2))		√	√	For additional LAN port. LAN cable with modular cover cannot be used.
N8104-128	10GBASE Adapter (SFP+/2ch) (PCI EXPRESS 2.0 (x8))		√	√	For additional LAN port. Prepare SFP module N8104-129 if needed. Up to one in RHEL6.
N8104-131	10G Converged Network Adapter (2ch)(10Gbps/Optical) (PCI EXPRESS 2.0 (x8))		√	√	For additional DCB/FCoE. SFP+ module has been attached to the server. FC bus redundancy is supported by StoragePathSavior. Teaming/bonding with LAN is not available. As LAN of N8104-131, use, in 1 system, only 1 port.
N8117-01A	Additional RS-232C connector kit *3		√	√	For additional serial port B (RS-232C)

√: Can be mounted, –: Cannot be mounted

*1   Data transfer rate of PCI slot = Transfer bandwidth × Number of lanes
      <Example> x8 lane = 64 Gbps (one-way)
*2   Connector size. Cards exceeding the number of sockets cannot be connected.
      <Example> x4 socket can connect with x1 and x4 cards, but not x8 card.
*3   Use RS-232C cable (B).

* For details of functions of each card, refer to the Technical Guide.
* The card performance described in the parentheses after the Product name indicates the maximum operation performance of the card.
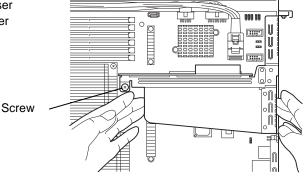
1.8.3   Installation

Install a riser card to a PCI card in the following procedure.

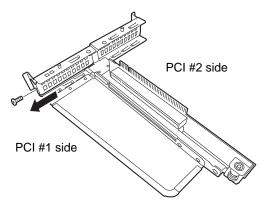| Important	When installing a PCI card, make sure the connector of the board fits the connector of the riser card.
Note	• If the battery for RAID controller is installed, refer to *(1.8.6 Battery for RAID Controller).*

1.   Refer to steps 1 to 6 in Chapter 2 (1.3 Overview of Installation and Removal) for preparations.

2.   Remove the screw securing the PCI riser card. Hold the both ends of the PCI riser card and lift it off.

Screw
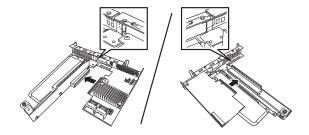
3.   Confirm the installation position with the reference to the table on *1.8.2 Supported boards and available slots.*

4.   Remove the screw from the PCI riser card and remove the blank cover.

PCI #2 side

PCI #1 side

Note	Keep the removed blank cover for future use.

5.   Install a PCI card to the PCI riser card. When installing the card, position the terminal part of the PCI card to the PCI riser card slot and insert it.
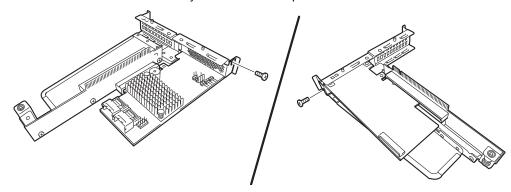
Important	Do not touch the terminal part of riser card or PCI card and the signal pins of electric parts installed on the board. Installing boards with dirt or oil can cause malfunction.
Note	• Make sure that the head of a PCI card bracket is seated into the fixed slot. • If you have trouble installing the card, remove the card once and try again. If you apply excessive pressure on the card, a PCI card or riser card might break.

6.   Fix the PCI card with the screw you removed at step 4.

7.   Connect the PCI riser card to the
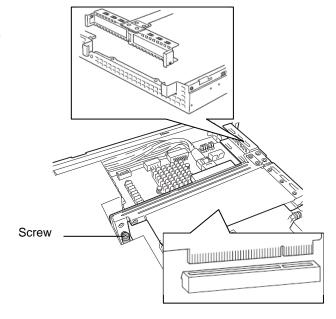   motherboard slot and fix the card with the
     screw.
     When connecting the card, position the
     terminal part of the PCI riser card to the
     slot on the motherboard and insert it.

Screw

8.   Continue to install or remove internal optional devices, mount and connect the server, and turn it on.

9.   Make sure that no error messages are displayed on POST screen.
     For details on POST error messages, refer to *Chapter 3 (1. POST Error Message)* in "*Maintenance
     Guide*".

10. Start the configuration utility installed on the mounted board to set up the board.
     Availability or startup and operation procedure of the utility depends on board. For details, refer to the
     manual that comes with the board. **If a PCI card including RAID Controller and LAN adapter which
     connects to any bootable device is added, the boot priority might be changed to the default
     setting**. In that case, configure the boot priority in **Boot** menu of BIOS Setup Utility. For details, refer to
     Chapter 3 (2.BIOS Setup Utility (SETUP)) for how to specify it.

1.8.4   **Removal**

To remove a PCI card, reverse the installation procedure.

Run SETUP and change boot order in **Boot** menu. Refer to *Chapter 2 (1. System BIOS)* in "*Maintenance
Guide*" for how to specify it.

If using the server while the card is removed, attach the blank cover that comes with the riser card.

1.8.5   Installing RAID Controller

This section describes how to install an optional RAID Controller to the slot dedicated to RAID Controller.

(1) When using the optional RAID controller (N8103-149/150/151)

For details, refer to the manual that comes with optional RAID Controller (N8103-149/150/151).

When installing more than 5 Hard Disks, K410-269(00) Intaernal SAS/SATA cable of an option is needed.
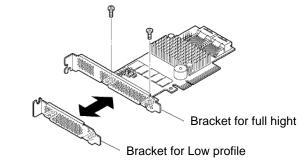
Important	• **You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.** • **Do not change the mode to hibernate while building a RAID System.**

Note	• When installing an optional RAID Controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot *xx* ROM** (*xx* is PCI slot number) is set to **Enabled**. • When connecting a RAID Controller, set the boot priority to 8th or higher in the Boot menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID Controllers cannot be launched.

Take the following procedure to install RAID Controller (N8103-149/150/151).

1. Refer to steps 1 to 6 in Chapter 2 (1.3 Overview of Installation and Removal) for preparations.

2. Remove the two screws and remove PCI Riser Card.

Bracket for full hight

Bracket for Low profile

3. Remove the screw securing the PCI riser card. Hold the both ends of the PCI riser card and lift it off.

Screw

4.   Remove the screw from the PCI riser
     card and remove the blank cover..

PCI #2 side

PCI #1 side

| Note | Keep the removed blank cover for future use. |
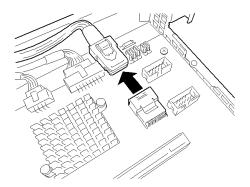
5.   Fix on the Riser Card with screw you
     removed at step 3.

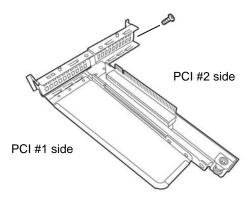| Note | When installing N8103-156 Premium Feature Key in the N8103-151 RAID controller, refer to the manual of a RAID controller. |
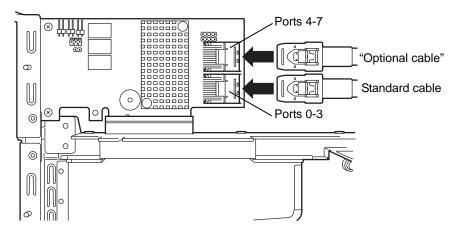
6.   Remove the SAS/SATA cable from SATA
     connector of Motherboard.

7.   Connect SAS/SATA cable to RAID
     Controller.

   7-1.   When four or less hard disk drives are installed:

           Connect SAS/SATA cable removed in Step 6 to connector (Ports 0-3) on RAID Controller.

   7-2.   When five or more hard disk drives are installed:

           Connect SAS/SATA cable removed in Step 8 to connector (Ports 0-3) on RAID Controller.

           Connect K410-269(00)intaernal SAS/SATA cable of an option to connector (Ports 4-7) on RAID
           Controller.

Ports 4-7

"Optional cable"

Standard cable

Ports 0-3

Connect another end of SAS/SATA cable that has been connected to connector (Ports 4-7) on RAID Controller, to the connector on backplane.

8. Connect the PCI riser card to the motherboard slot and fix the card with the screw.
    When connecting the card, position the terminal part of the PCI riser card to the slot on the motherboard and insert it.

Screw

9. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.

(2) When using the optional RAID controller (N8103-152)

For details, refer to the manual that comes with optional RAID Controller (N8103-152).

When installing more than 5 Hard Disks, K410-269(00) Intaernal SAS/SATA cable of an option is needed.

Important	• **You must avoid static electricity to work with the procedure below. For details, refer to** *Chapter 2 (1.2 Anti-static Measures)*. • **Do not change the mode to hibernate while building a RAID System.**

Note	• When installing an optional RAID Controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot *xx* ROM** (*xx* is PCI slot number) is set to **Enabled**. • When connecting a RAID Controller, set the boot priority to 8th or higher in the Boot menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID Controllers cannot be launched.

Take the following procedure to install RAID Controller (N8103-152).

1. Refer to steps 1 to 6 in Chapter 2 (1.3 Overview of Installation and Removal) for preparations.

2. Remove the two screws and remove PCI Riser Card.

Bracket for full hight

Bracket for Low profile

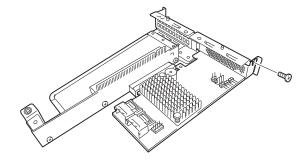3. Remove the screw securing the PCI riser card. Hold the both ends of the PCI riser card and lift it off.

Screw

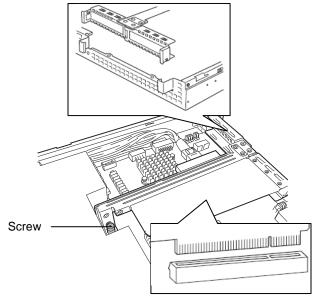4. Remove the screw from the PCI riser card and remove the blank cover.

PCI #2 side

PCI #1 side

Note   Keep the removed blank cover for future use.
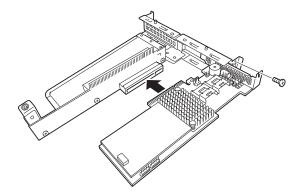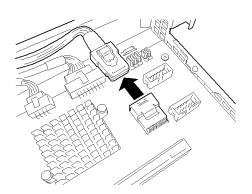
5. Fix on the Riser Card with screw you removed at step 4.

6.   Remove the SAS/SATA cable from SATA
     connector of Motherboard.

7.   Connect SAS/SATA cable to RAID
     Controller.

  7-1.   When four or less hard disk drives are installed:

          Connect SAS/SATA cable removed in Step 6 to connector (Ports 0-3) on RAID Controller.

  7-2.   When five or more hard disk drives are installed:

          Connect SAS/SATA cable removed in Step 8 to connector (Ports 0-3) on RAID Controller.
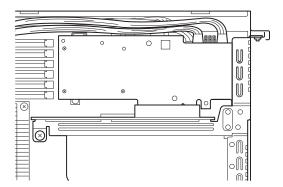
          Connect K410-269(00) Intaernal SAS/SATA cable of an option to connector (Ports 4-7) on RAID
          Controller.

8.   Connect the PCI riser card to the
     motherboard slot and fix the card with the
     screw.
     When connecting the card, position the
     terminal part of the PCI riser card to the
     slot on the motherboard and insert it.

1.8.6   **Battery for RAID Controller**

When installing a RAID controller with an additional battery, data loss is able to be avoided from accidents including temporary blackout. The model of the battery to be used depends on the RAID controller.

- For N8103-149/150/151, use N8103-154 Additional Battery
- For N8103-160, use N8103-162 Additional Battery

(1) Handing precautions
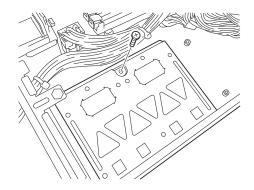
Below are the precautions to be observed whenever using the battery. Be sure to observe the following, otherwise property such as data or other devices might be destroyed.

- Use the battery that supports the RAID Controller used.
- The battery is a very delicate electronic device. Before installation, touch the metal frame part of the server to discharge the static electricity from your body.
- Do not drop or bump the battery.
- For recycling and disposing the battery, refer to the user's guide that comes with it.
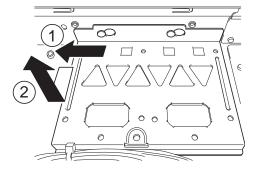
(2) Installing Battery (N8103-154/162)
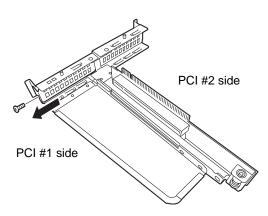
Follow the steps below to install a battery for RAID Controller.

1.   Refer to steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.

2.   Remove one screw and remove Battery Tray for RAID controller.
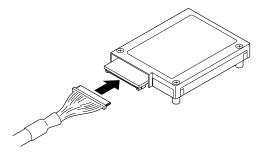
3.   Slide to the direction of an arrow(1) and remove Battery Tray while sliding like an arrow(2).

4.   Connect the battery control cable that comes with the additional battery to the additional battery.
     When connecting the cable, pay attention to the shape of connector.
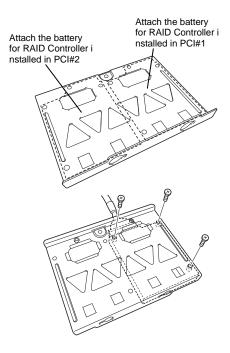
Note	The battery control cable and the connector of additional battery have a black marking. Connect a cable so that Black marking will fit the connector.
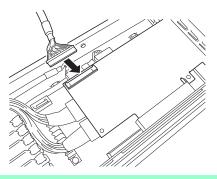
5. Install the additional battery to the battery tray by using 3 screws. The installation position of the battery depends on installed RAID Controller. See the figure on the right.

Attach the battery for RAID Controller installed in PCI#2

Attach the battery for RAID Controller installed in PCI#1

6. For removing the battery for the RAID Controller, reverse the step2, 3.

7. Connect the battery control cable to the RAID controller

Note	The battery control cable and the connector of RAID controller have a black marking.
	Connect a cable so that Black marking will fit the connector.
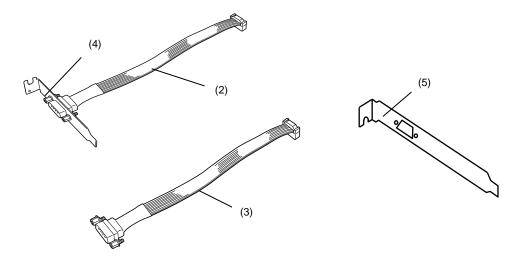
(3) Removal

For removing the battery for the RAID Controller, reverse the installation procedure.

1.8.7   RS-232C Connector Kit(N8117-01A)

This section describes how to install an optional RS-232C Connector Kit
For details, refer to the manual that comes with optional RS-232C Connector Kit (N8117-01A).
Packing box contains the items shown in the table below. Check these items.
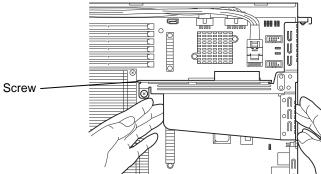
No.	Item	Specification	Quantity	Remarks
(1)	RS-232C Connector Kit User's Guide	856-125671-002	1	
(2)	RS-232C cable(A)	804-063264-020	1	
(3)	RS-232C cable(B)	804-062746-820	1	
(4)	PCI bracket (1)	243-112122-001	1	Attached to the cable
(5)	PCI bracket (2)	243-112122-002	1	For Full-height PCI slot
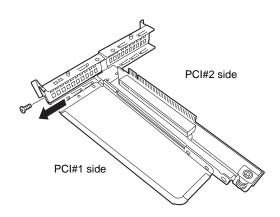
This server is used by combination of (3) and (4).

Install the RS-232C Connector Kit in the following procedures.

1. Refer to steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations
2. Remove the screw securing the PCI riser card. Hold the both ends of the PCI riser card and lift it off.

Screw
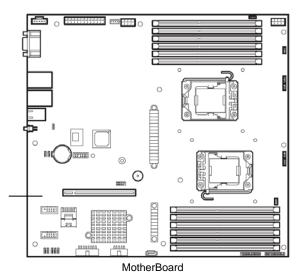
3. Remove the screw from the PCI riser card
    and remove the blank cover

PCI#2 side

PCI#1 side
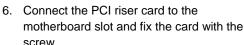
| Note | Keep the removed blank cover for future use. |
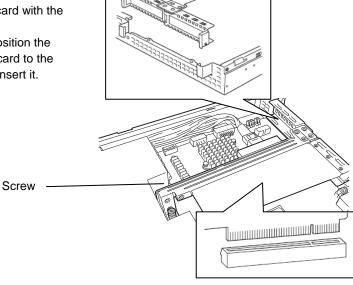
4. Secure the PCI Bracket with the screw removed in Step 3.

5. Route the cable so that it does not disturb
    any other PCI boards, and connect the
    cable to COM connector on mother board.

Sirial Port
B Connector

MotherBoard

6. Connect the PCI riser card to the
    motherboard slot and fix the card with the
    screw.
    When connecting the card, position the
    terminal part of the PCI riser card to the
    slot on the motherboard and insert it.

Screw

7. Make sure that the slot cover which have been removed, tool, and/or screws are not left inside the server. Then, reassemble the server.

8. After installation, some server needs configuration for COM port by BIOS Setup Utility. Configure the COM port according to the User's Guide.

    The example of setting the device to need setting is described as follows.

    a. Power on the server. Press **F2** on POST screen to start BIOS SETUP.

    b. Select [Advanced] → [Serial Port Configuration], and set [Serial Port B] to [Enabled].

        When [Enabled] is set, [Base I/O Address] and [Interrupt] menus are displayed.

        The factory-set values are shown below.

        Base I/O Address   :   2F8
        Interrupt   :   IRQ 3

1.9   **Use of Internal Hard Disk Drives in the RAID System**

This section describes how to use the internal hard disk drives in the RAID System.

Important	**If you use hard disk drives in the RAID System or change the RAID level, initialize the hard disk drives. If the hard disk drive contains valuable data, be sure to backup the hard disk drive before installing the RAID Controller and configuring the RAID System.**

Note	In the RAID System, use hard disk drives that have the same specifications (capacity, rotational speed, and standard) for each Disk Array.

Tips	Logical Drives can be created even with only one Physical Device.

To build a RAID System, There is a way to use a Option RAID controller(N8103-149/150/151) in addition to the way to use on-board RAID Controller(LSI Embedded MegaRAID™).

If using internal hard disk drives in RAID System with an optional RAID Controller (N8103-149/150/151) installed in the server, the SATA cable needs to be rewired.
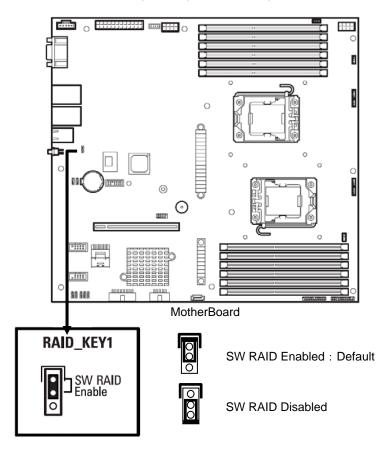
Tips	When using SAS hard disk drives, RAID Controllers must be connected.

To build a RAID System, change jumper switch settings on motherboard, as shown below.

Important	**You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures).***

To use onboard RAID Controller, change setting of RAID configuration jumper on motherboard.

MotherBoard

RAID_KEY1

SW RAID Enable

SW RAID Enabled : Default

SW RAID Disabled

Warning: If [RAID_key1] has been set to [Enabled] in MB before replacement and that parameter on MB after replacement is set to [Disabled], booting the server will destroy the data.

1.9.1　　Connecting cables

Refer to the figures below for how to connect cables.

If using optional RAID Controller

When installed with less than 4 hard disk drives.

Connect SAS/SATA cable connected to motherboard to Port0-3 of RAID controller.

When installed with more than 5 hard disk drives.

Connect SAS/SATA cable connected to motherboard to Port0-3 of RAID controller.

Connect optional SAS/SATA cable to Port4-7 of RAID controller.

Optional RAID Controller	Backplane	Hard Disk Drive
Ports 0-3	SATA 0	SLOT 0
	SATA 1	SLOT 1
	SATA 2	SLOT 2
	SATA 3	SLOT 3
Ports 4-7	SATA 4	SLOT 4
	SATA 5	SLOT 5
	SATA 6	SLOT 6
	SATA 7	SLOT 7

1.9.2　　Notes on Building RAID System

Note the following points when setting up a RAID System.

- The number of hard disk drives required varies in each RAID level.
- If the optional RAID Controller "N8103-149" is used, the RAID System cannot be built in RAID5/RAID6/RAID50/RAID60.

RAID level	The minimum number of hard disk drives required to set up a RAID System	
	N8103-149	N8103-150/151
RAID 0	1	1
RAID 1	2	2
RAID 5		3
RAID 6		3
RAID 10	4	4
RAID 50		6
RAID 60		6

- In the RAID System, all the hard disk drives in a group (pack) must have the same capacity, interface type, and rotational speed.
- If you intend to install the OS to the RAID System, the process from RAID configuration to OS installation can be easily completed by using EXPRESSBUILDER. If you wish to install the OS manually, use RAID System Configuration utility (WebBIOS). The utility can be run during POST which starts immediately after the server is turned on. For details, refer to the manual supplied with the optional RAID Controller (N8103-149/150/151).
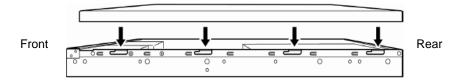
Important	• **Do not change the mode to hibernate while building a RAID System.** • **Build a Disk Array in the RAID System using hard disk drives that have the same specifications (capacity, rotational speed, and standard).**
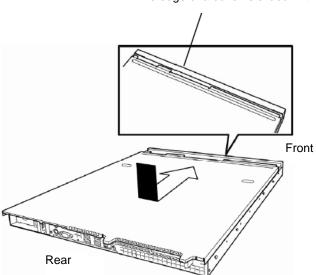
1.10 Installing Top Cover

After all internal optional devices are installed, replace Top Cover.

1.   Put Top Cover straight on the server chassis so that it can be surely engaged with the chassis frame.

2.   Slide Top Cover toward the front of the server.

Front   Rear

The edge of a cover is slided in the Chassis.

Front

Rear

1.11 Hard Disk Drive

Expansion Bays for hard disk drives are provided at the front of the server.
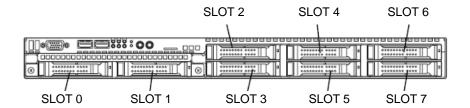
A hard disk drive mounted in a dedicated drive tray can be purchased. Install the hard disk drive on the server with it mounted in the drive tray.

Important	**Use hard disk drives specified by NEC. Installing a third-party hard disk drive might cause a failure of the server and it.**

Note the following precautions to install hard disk drives.

- For onboard connection, hard disk drives having different capacities, types, or rotational speeds cannot be installed together.
- In the RAID System, all the hard disk drives in a group (pack) must have the same capacity, type, and rotational speed.
- If using hard disk drives in a RAID System, jumper settings or a change of cables may be required.

Bays can accommodate up to 8 hard disk drives.
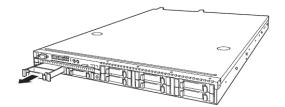
1.11.1 Installation

Install a hard disk drive by using the following procedure.

Note	In the RAID System, use hard disk drives that have the same specifications (capacity, rotational speed, and standard) for each Disk Array.
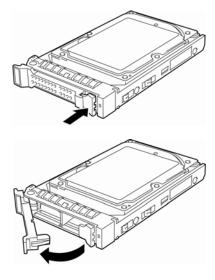
1. Refer to Chapter 2 (1.3 Overview of Installation and Removal) for preparations.

2. Locate the slot where you install the hard disk drive.
    The server has 8 slots. Install hard disk drives in ascending port number order.

3. Remove the dummy trays.
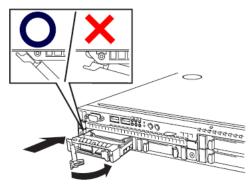
Note	Keep the removed dummy trays for future use.

4. Unlock the handle of the tray.

5. Hold the tray firmly and insert it into the slot.

Note	• Push it all the way until the handle's lock touches the frame. • Hold the tray firmly with both hands.

6. Slowly close the handle.
    The tray is locked making a clicking sound.

Note	When you push the drive into the slot, confirm the handle got hooked on the frame.

7. Turn on the server, run BIOS Setup Utility, and then specify the boot order from **Boot** menu.
    For details, refer to *Chapter 3 (2.BIOS Setup Utility (SETUP)).*

Tips	The saved boot order is cleared when a hard disk drive is added.

1.11.2   **Removal**
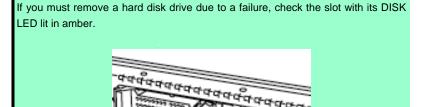
To remove hard disk drive, reverse the installation procedure.

If you transfer or dispose of the removed hard disk drive, refer to *Chapter 1 (1. Transfer, Movement, and Disposal) in "Maintenance Guide"* to erase data.

Important	**NEC assumes no liability for data leakage should the product be transferred to a third party without erasing the data.**

Note	If you must remove a hard disk drive due to a failure, check the slot with its DISK LED lit in amber.

DISK LED

Note	Do not pull the slot out from the handle. Doing so may damage the handle.

Turn on the server, start BIOS Setup Utility, and then specify the boot order from **Boot** menu.
For details, refer to *Chapter 3 (2.BIOS Setup Utility (SETUP)).*

Tips	The saved boot order is cleared when a hard disk drive is added.

1.11.3   **Replacing a hard disk drive in the RAID System (Auto Rebuild)**

In the RAID System, you can use the auto rebuild feature to restore data back to the state before a failure occurred.

The auto rebuild feature is enabled in logical drives set to RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, and RAID60.

The disk array is automatically rebuilt when hot swapping (replacing a hard disk drive while the power on) a failed hard disk drive.

During the auto rebuild, DISK LED on the hard disk drive flashes green and amber alternately to indicate that the auto rebuild is being performed.

Observe the following precautions whenever executing the auto rebuild

- Do not turn off the server until the auto build completes after a hard disk drive fails.
- Leave an interval of at least 90 seconds between a hard disk drive removal and a hard disk drive installation.
- Do not replace a disk during the auto rebuilding of another hard disk drive (during an auto rebuild, DISK LED on the hard disk drive flashes green and amber alternately).

2. Installation and Connection

This section describes how to install the server and connect cables.

2.1 Installation

This server must be mounted to a rack which conforms to EIA standards for use.

2.1.1 Installing Rack

Refer to the manual that comes with your rack for how to install the rack, or consult with your sales representative.

⚠ WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- **Use only in the specified environment.**
- **Do not connect the ground wire to a gas pipe.**

⚠ CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Do not carry or install the server only by a single person.**
- **Do not install the server so that the load may be concentrated on a specific point.**
- **Do not install any components only by a single person. Confirm that hinge pins of the door are completely secured in place.**
- **Do not pull out the server from the rack when the rack is unstable.**
- **Do not leave more than one device being pulled out from the rack.**
- **Do not provide the wiring for the server to exceed the rating of the power supply.**
- **Do not use in the environment where corrosive gas is generated.**

Do not install the rack or server under the following environment. Doing so may cause malfunction of the server.

- Narrow space from which devices cannot be pulled out from the rack completely

- Place that cannot bear the total weights of the rack and devices mounted on the rack

- Place where stabilizers cannot be installed or where the rack can be installed only after the practice of proper earthquake-resistant construction

- Place of uneven or slanting floor

- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)

- Place where intense vibration may be generated

- Place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc) exist
  Place where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals

- Place where chemicals may be accidentally sprayed over

- Place where a carpet not subject to anti-static process is laid

- Place where some objects may be fallen on the rack

- Place near a device generating intense magnetic field (such as TVs, radios, broadcast/communication antennas, power transmission wires, and electromagnetic cranes) is placed.

- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device with large power consumption

- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay).

- Environment where operation of the server is not guaranteed

2.1.2   Installing the server to the rack or removing it from the rack

Mount the server to the rack. (This section also describes the removal procedure.)

⚠ WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use.*

- Do not use any racks out of standards.
- Use only under the specified environment.

⚠ CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- Do not drop.
- Do not leave the server being pulled out.
- Do not install with the cover removed.
- Do not get your fingers caught.

Important   Temperature increases and airflow in the rack

If multiple devices are installed, or if the inside of the rack is not sufficiently ventilated, the internal temperature rises due to the heat emitted from each device, which may result in a malfunction. Review airflow in the rack and room and take sufficient measures so that the internal temperature will not exceed the operational temperature during operation.
Air enters the server from the front and exits from the rear.

Important   When installing into a rack, please be sure to use the slide rail(outer rail and inner rail) installed in this server. When it's used by wrong combination, server can't be removed any more.

(1)   Installation
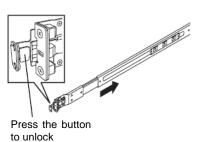
- **Preparation for mounting**
  The left and right slide rails are fixed with tape at the front and side faces to prevent falling off during transportation. Remove the tape before mounting it to the rack.
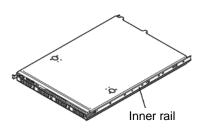
Removing rail assemblies

1.   Remove the slide rails from left and right sides of the server.

2.   While pressing the unlock button at the front of the server, hold the rail and slowly slide it backward.

Press the button to unlock

3.   After removing the outer rail, only the inner rail is screwed to the server.

Inner rail

Important	• **The outer rail removed is used later in the subsequent procedure.**
	• **Be careful not to get your finger caught in the rail.**
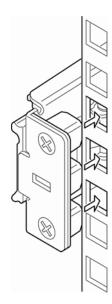
Installing outer rail

1.   Attach the outer rail you previously removed to the rack.

Fit the square-shaped protrusions of the rail to the square holes of a 19-inch rack. Make sure that it makes a clicking sound indicating that it is locked.

The image on the right shows the front right side (front) of the rack. Install to the rear right side and front and rear left sides following the same procedure.

Make sure that the rail assembly is installed at the same height as the other slide rail already installed.
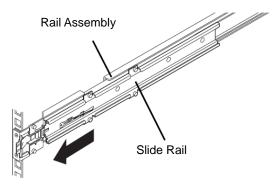
Important	Confirm that the rails are securely locked so that they will not fall off.

Tips	Although the rail assembly may be somewhat unsteady, it is not defective.

Installing the Server
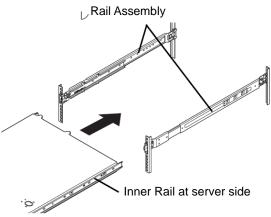
1.   Pull out the sliding rails (bearing portion) of the right and left rail assemblies toward the front of the server.

Rail Assembly

Slide Rail

2.   Securely hold the server and install it in the rack with at least two persons.

Firmly fit the inner rails on the sides of the server into the rail assemblies that are installed on the rack, and then slowly push the server into the rack.

When the server is completely pushed into the rack, the server is locked.

Rail Assembly

Inner Rail at server side

Important	Be very careful not to get your finger caught in the levers or rails.
	Insert both sides of inner rails straight into the rack.
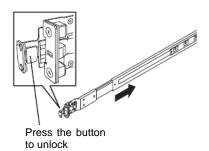
(2)   Removal procedure
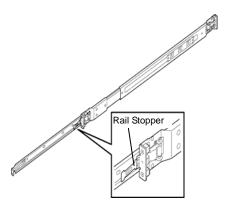
Remove the server from the rack in the following procedure.

Important	At least two persons are required to remove the server from rack.

1. Make sure that the server is turned off and then disconnect the power cord or all interface cables from the server.

2. Slowly pull the server out while pressing the buttons located on either side of the front of the server.

Press the button to unlock

3. Because there are stoppers, the server will come to a stop halfway. Press and hold Rail Stopper on the rails and pull the server out of the rack.

Rail Stopper
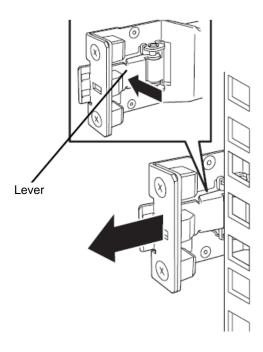
Important	Be careful not to get your fingers caught in the rails or lever.

4. Hold the server firmly and remove it from the rack.

Important	• While more than one person is supporting the bottom part of the server, slowly pull out the server. • Do not apply pressure on the server from top when it is being pulled out. Doing so cause the server to drop.
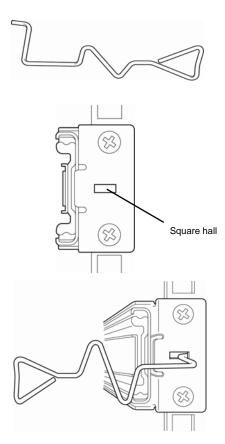
5. When removing the rail from the rack, pull the rail in the direction of the arrows while pressing the lever.

Lever
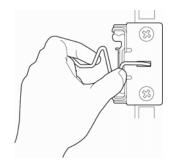
(3) Removing Outer Rail

If multiple rails are installed, it might be impossible to push the unlock lever. If this happens, remove the rail from the rack by using the following procedure.
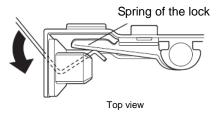
1. Refer to *Chapter 2 (2.1.2) - (2) Removal procedure* to remove the server from the rack.

2. Prepare the designated tool to remove slide rail (outer rail) that comes with the server.

3. Insert the tool into the square hall at the front of a rail as shown in the image on the right.

Square hall
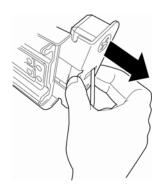
4.   Unlock the rail by pressing the tool in the
      direction as shown in the image on the
      right.

Front view

Spring of the lock
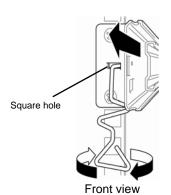
Top view
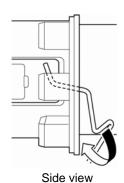
5.   Remove the rail from the rack while it is
      being unlocked.

6.   Insert the tool into the square hole at the
      rear of the rail in the direction described.
      As shown in the image on the right,
      rotate the tool to unlock it.

Square hole

Front view

7.   Remove the rail while it is being unlocked.

Side view

2.2 Connection
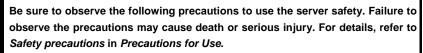
Connect peripheral devices to the server.

Connectors that allow a variety of peripheral devices to be connected are provided at the front and rear of the server. Images on the following pages show the peripheral devices that can be connected in their standard state and their respective connector positions.

⚠ WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- **Do not hold the power plug with wet hands**
- **Do not connect the ground wire to a gas pipe**

⚠ CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*
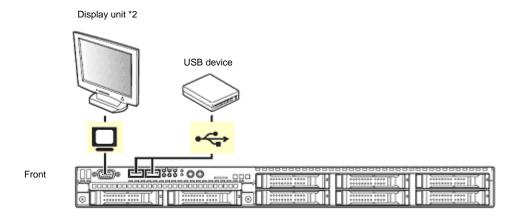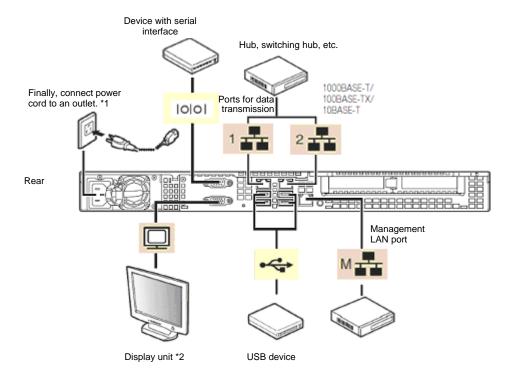
- **Use only the specified outlet to insert.**
- **Do not connect the power cord to an outlet that has an illegal number of connections.**
- **Insert the power plug into the outlet as far as it goes.**
- **Use only the specified power cord**
- **Do not connect or disconnect the interface cable with the power plugged in the outlet.**
- **Use only the specified interface cable**

Display unit *2

USB device

Front

Device with serial
interface

Hub, switching hub, etc.

Finally, connect power
cord to an outlet. *1

Ports for data
transmission

1000BASE-T/
100BASE-TX/
10BASE-T

1

2

Rear

Management
LAN port

M

Display unit *2

USB device
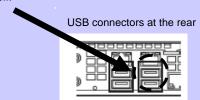
*1   Connect the power cord to a circuit breaker of up to 15 A.
*2   Either one can connect with a display unit.

Tips

2 ports USB connectors at the rear of the server are supplied with power even when DC is off.

USB connectors at the rear

Important

- **Turn off the server and peripheral devices to be connected before connecting. Connecting wit power ON can cause malfunction or failure.**
- **If connecting any peripheral device and its interface cable made by other companies (a third party), contact the store where you purchased them to check if they can be used with the server beforehand. Some devices from a third party cannot be used with the server.**
- **Fix the power cord or interface cable with cable ties.**
- **Organize cables so that they will not contact the door of the rack or the guide rails on the sides.**
- **When extending the server from the rack, disconnect the power cord and interface cables.**
- **Make sure that no pressure is applied on the plug of power cord.**
- **Be sure to use the display unit specified by NEC. The operation is not guaranteed if you install a display unit not specified by NEC.**

Note

If you connect a card to a line, use the card which you have applied for with the certification authority.
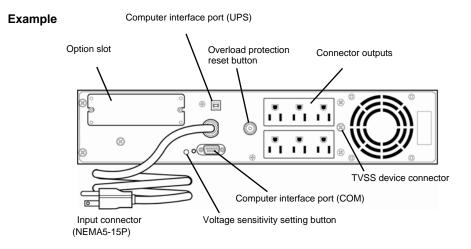
Tips

A leased line cannot be directly connected to the serial port connector.

2.2.1   Connecting to Uninterruptible Power Supply (UPS)

To connect the power cord of the server to a UPS, use the connector output on the rear of the UPS. For details, refer to the manual supplied with the UPS.

Example   Computer interface port (UPS)

Option slot   Overload protection   Connector outputs
                          reset button

                                                              TVSS device connector

                              Computer interface port (COM)

Input connector   Voltage sensitivity setting button
(NEMA5-15P)

When the power cord is connected to a UPS, the BIOS settings may need to be changed in order to link the server with the power supply from the UPS.

To change the settings, select "**Server**" and then select "**Power Control Configuration**" and then "**AC-LINK**" in BIOS Setup Utility, and change the displayed parameters. Select **Power On** to perform automatic operations by using the UPS. For details, refer to *Chapter 3 (2.BIOS Setup Utility (SETUP)).*

3

NEC Express5800 Series
Express5800/E120d-1

Setup

This chapter describes how to set up the server.

1. **Turning on the Server**
   POST (Power-On Self-Test) is explained in this section.

2. **BIOS Setup Utility (SETUP)**
   You can customize the BIOS settings by following the instructions in this section.

3. **EXPRESSSCOPE Engine 3**
   EXPRESSSCOPE Engine 3 provides useful features through Baseboard Management Controller (BMC).

4. **EXPRESSBUILDER**
   EXPRESSBUILDER helps you to install Windows and maintain the server.

5. **Installing Software Components**
   You can install Windows and bundled software by following the instructions in "*Installation Guide (Windows)*".

6. **Turning off the Server**
   Turn off power when not using the server.

1. **Turning on the Server**

Pressing POWER Switch at the front of the server turns on the server.

Turn on the server by using the following procedure.

Tips	• Do not power on the server before amber POWER LED is unlit. • Wait for at least 30 seconds before turning on the server after turning off the server.
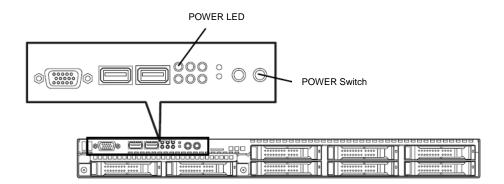
1. Turn on the peripheral devices and display unit.

Note	If the power cord is connected to power control system such as an Uninterruptible Power Supply (UPS), make sure that the power control system is turned on.

2. Press POWER Switch at the front of the server.
    POWER LED is turned on green and after a while, logo appears on the display.

Important	**Do not connect or disconnect USB device while POST is running.**

While logo is being displayed, the self-diagnostic program (POST) runs and diagnoses the hardware. For details, refer to *Chapter 3 (1.1 POST)*.

1.1   **POST**

POST (Power-On Self-Test) is a self-diagnostic program stored in the server as standard. POST automatically runs immediately after the server is turned on and checks the motherboard, memory, and processor (CPU). POST also displays the start-up messages of different utilities during the operation.

<u>**Usually, you do not need to check the contents of POST.**</u> However, check messages displayed at POST in the following cases.

- When introducing a server
- If you suspect a failure
- When you hear beep many times during the time between power ON and OS startup
- When any error message is displayed

1.1.1   **POST sequence**

Explains how POST runs in order.

1. When the server is turned on, POST runs.

   As factory settings, a logo appears on the screen during POST.

Note	Keyboard becomes operable after the logo appears.

2. If **Enabled** is specified for **Password On Boot** in **Security** menu of SETUP, you will be prompted to enter password after the logo is displayed. If you enter the incorrect password three times consecutively, POST aborts. (You can no longer proceed.) In this case, power off the server, and power it on.

Important	**Do not set a password before OS is installed.**

3. If <Esc> key is pressed, the logo disappears and the details of POST are displayed.

Tips	If **Quiet Boot** is **Disabled** from **Boot** menu in BIOS settings, the logo is not displayed without requiring <ESC> key to be pressed.

4. POST displays several types of message. These messages let you know that the installed CPU or connected keyboard and mouse are detected.

5. After a while, the following message is displayed on the screen.

   ```
   Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
   ```

   By pressing the designated function key following messages, you can call the functions below upon completion of POST.

   <F2> key: Run BIOS Setup Utility (SETUP). For information on the SETUP, refer to *Chapter 3 (2.BIOS Setup Utility (SETUP)).*

   <F3> key: Run EXPRESSBUILDER from Internal Flash Memory (optional). For information on EXPRESSBUILDER, refer to *Chapter 3 (4. EXPRESSBUILDER).*

Note	• If the optional Internal Flash Memory is not installed in the system, <F3> key message will not be displayed. • <F3> key must be pressed within 5 seconds of the message being displayed. • Note that the server will not boot from Internal Flash Memory even if it is specified to do so by pressing <F3> key, as long as a bootable CD/DVD-ROM is set on the drive.

<F4> key: Run Offline Tools. For information on Offline Tools, refer to *Chapter 1 Maintenance (7. Offline Tools) in "Maintenance Guide"*.

<F12> key: Boot from network.

6.   If a controller which has its dedicated BIOS such as a RAID Controller board is installed, a message that prompts you to start the dedicated utility to set each board is displayed.

> **Example: If an optional RAID Controller is installed**
>
> ```
> Press <Ctrl> <H> for Web BIOS
> ```
>
> The utility starts by pressing <Ctrl> + <H> keys.
>
> For details on the utility, refer to the manual supplied with each optional board.
>
> Depending on the configuration, the message "Press Any Key" might appear to prompt a key entry. This is a behavior of the BIOS of the optional board. Continue to operate after checking the manual of the optional board.

7.   The OS starts when POST is completed.

1.1.2   POST error messages

When POST detects an error, it displays an error message on the screen or beeps for some errors. For descriptions of error messages, causes, and countermeasures, refer to *Chapter 3 (1. POST Error Message) in "Maintenance Guide"*.

Note	Take notes on the indication displayed on display unit before consulting with your sales representative. Alarm messages are useful information for maintenance.

2.   BIOS Setup Utility (SETUP)

This section describes how to configure Basic Input Output System (BIOS).

Before you install the server and add or remove optional devices, make sure you have read and understood this section to configure properly.

2.1   Overview

BIOS Setup Utility (SETUP) is a utility to do basic hardware settings. This utility is installed in a flash memory in the server as standard and can be run without requiring a media for boot.

BIOS settings were configured with optimal settings before the server was shipped to you. Therefore, in most of cases, you should not need to use the SETUP. **Use only when the case applies to any of cases described in *Chapter 3 (2.4 Cases that Require Configuration)*.**

2.2   Starting and Exiting SETUP Utility

2.2.1   Starting SETUP

Run POST following *Chapter 3 (1.1.1 POST sequence).*

After a while, the following message will be displayed on the lower left of the screen.

```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```

If you press <F2> key at this time, SETUP runs and displays **Main** menu upon completion of POST. (You can also press <F2> key while NEC logo appears to display **Main** menu.)

Tips	If password is set, you will be prompted to enter password at next startup of SETUP. (The timing when prompt appears depends on setting of password.) Up to three password entries are accepted. If you enter incorrect password consecutively three times, the system halts (you can no longer proceed). In this case, power off the server once, then power it on.

2.2.2   Exiting SETUP

To exit SETUP after saving parameters, select **Save & Exit** → **Save Changes and Exit**.
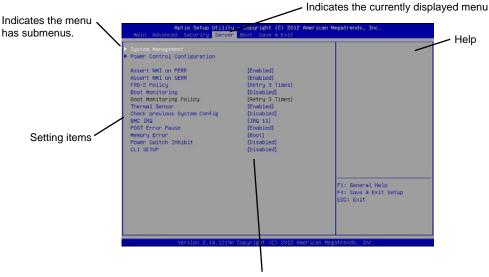
To exit SETUP without saving parameters, select **Save & Exit** → **Discard Changes and Exit**.

Tips	To restore the default value, select **Save & Exit** → **Load Setup Defaults**. (The default value might be different from the factory setting.)

2.3   Description on On-Screen Items and Key Usage

This section shows display examples and how to control the key. Use the keyboard to work with SETUP.

Indicates the currently displayed menu

Indicates the menu has submenus.

Help

Setting items

Parameters (highlighted when selected*)
*: Items that cannot be specified are dimmed.

☐ Cursor keys (<↑>, <↓>)
Select an item displayed on the screen. If characters of an item are highlighted, that means the item is currently selected.

☐ Cursor keys (<←>, <→>)
Select menus including **Main**, **Advanced**, **Security**, **Server**, **Boot**, and **Save & Exit**.

☐ <−> key/<+> key
Change the value (parameter) of the selected item. You cannot use this key when a menu which has ▶ on the left is selected.

☐ <Enter> key
Press this key to confirm the selected parameter.

☐ <Esc> key
Pressing this key takes you to the previous screen. If you keep pressing the key, the following window is displayed. If you select **Yes**, SETUP closes without saving the changed parameters.

Quit without saving?
[Yes]   No

☐ <F1> key
Press this key to display help information. If you need help using SETUP, press this key. Press <Esc> key to go back to the original screen.

□ <F2> key
   If you press this key, the following window appears. If you select **Yes**, the previous parameter(s) are restored.

```
          Load Previous Values?
             [Yes]        No
```

□ <F3> key
   If you press this key, the following window appears. If you select **Yes**, restore the parameters of the currently selected item to the default setting. (**This might be different from the parameters configured before shipment.**)

```
          Load Setup Defaults?
             [Yes]        No
```

□ <F4> key
   If you press this key, the following window appears. If you select **Yes**, the parameter you configured is saved and SETUP closes.

```
        Save configuration and exit?
             [Yes]        No
```

2.4   Cases that Require Configuration

Only if a case applies to any of following cases, use SETUP to change a parameter which was configured as factory setting. Other than cases described below, do not change the settings. A list of SETUP parameters and factory settings are described in *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".

Category	Description	To be changed	Remark
Basic	Change date and time	**Main → System Date** **Main → System Time**	Configurable on OS
	On/Off NumLock on power ON	**Boot → Bootup NumLock State → ON** or **OFF**	
	On/Off the function to display NEC logo during POST	**Boot → Quite Boot → Disabled**	By pressing <Esc> key, prevent the display of the logo.
Memory	Add or change DIMM	**Advanced → Memory Configuration → Memory Retest → Yes**	After rebooting, **Memory Retest** changes **No** automatically.
	Use memory RAS feature	**Advanced → Memory Configuration → Memory RAS Mode → change to RAS mode**	Some of RAS features may not be used depending on DIMM configuration.
Optional board	Disable Option ROM Scan of installed option board	**Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → PCIX Slot Option ROM → Disabled**	*X* is PCI slot number of the installed option board
Boot	Change the boot order of devices	**Boot → Boot Option Priorities →** Change the boot priority	When you use EXPRESSBUILDER, set **CD/DVD** to the highest priority.
	Use remote power on feature (via modem)	**Advanced → Advanced Chipset Configuration → Wake On Ring → Enabled**	
	Use remote power on feature (via RTC alarm)	**Advanced → Advanced Chipset Configuration → Wake On RTC Alarm → Enabled**	
	Use console redirection feature	**Advanced → Serial Port Configuration → Console Redirection Setting →** Change respective setting.	
Security	Set a password	**Security → Administrator Password → Enter a password** (Set a password for Administrator first and then User)	There are two types of password; Administrator and User. Settings for User password is limited compared to for Administrator.
	Restrict bootup by entering password	**Security → Password on Boot → Enabled**	Can be selected when password is set.
UPS Powerlink	When the server is supplied with power from UPS, always turn on the power.	**Server → Power Control Configuration → AC-LINK → Power On**	
	If it is turned off by using POWER switch, leave it OFF even when UPS supplies power.	**Server → Power Control Configuration → AC-LINK → Last State**	
	Keep the power OFF even when UPS supplies power.	**Server → Power Control Configuration → AC-LINK → Stay off**	

Password

If you have set a password, a message prompt you to enter password will be displayed from the next time.

```
        Enter password [                    ]
```

You can attempt password entry up to 3 times. **If you entered a wrong password 3 times, operation stops.** (You cannot operate further.) Turn off the power.

Saving changes

If you finish configuration, select **Save & Exit** and then **Save Changes and Exit** to save changes and exit.

If you wish to exit without saving the changed parameters, select **Save & Exit** and then **Discard Changes and Exit**.

Or if you wish to restore the setting to default values, select **Save & Exit** and then **Load Setup Defaults**.

(**The default value might be different from the factory setting.**)

3.   **EXPRESSSCOPE Engine 3**

3.1   **Overview**

EXPRESSSCOPE Engine 3 provides a variety of features using BMC (Baseboard Management Controller), which is a system management LSI.

Refer to *EXPRESSSCOPE Engine 3 User's Guide* for detailed information.

EXPRESSSCOPE Engine 3 monitors the power supply unit, fans, temperature, and voltage of the server. If you have the management LAN port connected to the network, you can remotely perform the following over a web browser or SSH client:

- Manage the server
- Remotely control the keyboard, video, and mouse (KVM)*
- Remotely access a CD/DVD/floppy disk/ISO image/USB memory*.

* To enable this feature, the optional license for remote management (N8115-04) is required.

To actualize these functions, virtual USB mass storage (Remote FD, Remote CD/DVD, Remote USB Memory, or Virtual Flash) is always connected as USB mass storage.

3.2   **EXPRESSSCOPE Engine 3 Network Configuration**

To enable EXPRESSSCOPE Engine 3 to be used via network, network configuration is required. Below is an example of the configuration procedure which enables EXPRESSSCOPE Engine 3 to be used via a web browser.
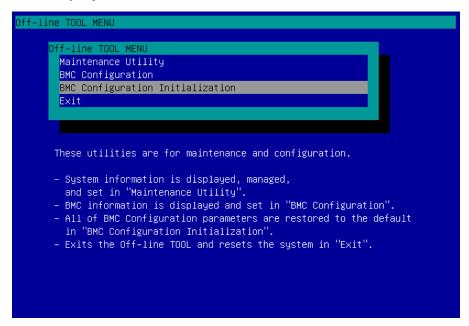
1.   Run POST following *Chapter 3 (1.1.1 POST sequence).* Wait until the following message appears on the lower left of the screen.


```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```


2.   If you press the <F4> key at this time, Offline Tool starts upon completion of POST. You can also press the <F4> key while the NEC logo is being displayed to open the Off-line TOOL MENU screen.

3.   The keyboard selection screen appears. Select your keyboard type.
     After that, the Off-line TOOL MENU screen appears. On this screen, specify the network settings for EXPRESSSCOPE Engine 3.

4.   When the Off-line TOOL MENU appears, select **BMC Configuration**, **BMC Configuration**, **Network**, and then **Property**.

```
Off-line TOOL MENU

        Off-line TOOL MENU
        Maintenance Utility
        BMC Configuration
        BMC Configuration Initialization
        Exit



        These utilities are for maintenance and configuration.

        - System information is displayed, managed,
          and set in "Maintenance Utility".
        - BMC information is displayed and set in "BMC Configuration".
        - All of BMC Configuration parameters are restored to the default
          in "BMC Configuration Initialization".
        - Exits the Off-line TOOL and resets the system in "Exit".
```

Tips	If **Shared BMC LAN** is enabled, Web feature, remote media/KVM feature, or command line interface feature may be interrupted. In this case, wait for a while, and connect with network again.

5.   If **Property** is selected, the following screen is displayed. On this screen, specify Enable if you want to use DHCP, or specify IP Address/Subnet Mask if you do not use DHCP.

```
Network(Property)
Items                          : Values
Connection Type                : [Auto Negotiation]
BMC MAC Address                : 00-11-22-AA-BB-CC
DHCP                           : [Disable]
  IP Address [Required]        : [192.168.0.1]
  Subnet Mask [Required]       : [255.255.255.0]
  Default Gateway              : [192.168.0.2]
  DNS Server                   : [192.168.0.3]
Host Name                      : [HostName]
Domain Name                    : [DomainName]
< OK >
< Cancel >
< Load Default Value >




    Select:[Enter] Cancel:[ESC] Help:[Home or ?]
```

6.   Connect the LAN cable to the management LAN connector in order to connect to the network. It will be available for use if you access EXPRESSSCOPE Engine 3 via Web browser from PC for management according to the setting.

4.   **EXPRESSBUILDER**

EXPRESSBUILDER helps you to install OS or maintain the server.

4.1 **Features of EXPRESSBUILDER**

EXPRESSBUILDER provides the following features.

Features	Descriptions
Setup (Windows reinstallation)	Installs Windows on your server. Easily completes the process from RAID configuration to installation of applications. To use this feature, select **Os installation** on the menu after boot.
Bundled software	Stores various bundled software (such as NEC ESMPRO Agent).
Maintenance	Diagnoses your server system. To use this feature, select **Tool menu** on the top menu after boot.
Document	Stores various documents including this User's Guide.

4.2 **Starting EXPRESSBUILDER**

Set the DVD on the drive and either turn on the server or restart the server by pressing <Ctrl> + <Alt> + <Delete>. EXPRESSBUILDER is booted from DVD.

If you want to install any bundled software or read documents, set the DVD to a computer running OS. Autorun menu appears automatically.

If your server is of pre-installed model, you need not launch EXPRESSBUILDER.

5.   Installing Software Components

Continue to install software components such as OS.
Refer to the following document and follow instructions.

·   Installation Guide (Windows)

Tips	Hibernate function of Windows Server cannot be used. Do not set Hibernate at Windows shutdown.

6. Turning Off the Server

Turn off the server by using the following procedure. If the power cord of the server is connected to a UPS, refer to the documentation supplied with the UPS or the documentation for the application controlling the UPS.

1. Shut down the OS.

2. The server automatically turns off after the OS shuts down.
   Confirm that POWER LED is OFF.

3. Turn off peripheral devices.

Tips	Hibernate function of Windows Server cannot be used. Do not set Hibernate at Windows shutdown.

NEC Express5800 Series
Express5800/E120d-1

4

Appendix

1. **Specifications**

2. **Interrupt Lines**

1. Specifications

Product name			Express5800/E120d-1		
N code			N8100-1925F		
CPU	CPU		N8101-606F	N8101-607F	N8101-608F
			Intel ®Xeon® processor		
			E5-2407	E5-2430L	E5-2450L
	Clock speed		2.20GHz	2GHz	1.80GHz
	Number of CPUs, standard/maximum		0/2		
	3rd cache		10M	15M	20M
	Number of cores (C) / Number of threads (T) per CPU		4C/4T	6C/12T	8C/16T
Chipset			Intel® C602 chipset		
Memory	Capacity, standard/maximum		Not pre-installed /Unbuffered DIMM : 48GB (12x 4GB), Registered DIMM : 384GB (12x 32GB)		
	Memory module		DDR3L-1600 Unbuffered DIMM (2/4GB), DDR3L-1600 Registered DIMM (8/16GB), DDR3L-1066 Registered DIMM (32GB)		
	Maximum operating frequency		1066MHz	1333MHz	1600MHz
	Error check, correction		ECC, x4 SDDC		
	Memory sparing		Non-Supported		
	Memory mirroring		Non-Supported		
Auxiliary storage	Hard disk drive	Internal (standard)	–		
		Internal (maximum)	2.5-inch HDD: SATA 8TB (8x 1TB), SAS 7.2TB (8x 900GB), 2.5-inch SSD: SATA 800GB (8x 100GB), SAS 3.2TB (8x 400GB)		
		Hot swap	Supported		
	Interface / RAID level		SATA 3, 6Gb/s : RAID 0/1/5/6/10/50/60 (Option) SAS 6Gb/s : RAID 0/1/5/6/10/50/60 (Option)		
	Optical disk drive		External drive (option) *1		
	FDD		Option: Flash FDD (1.44MB) *2		
	Expansion bay		None		
Expansion slots	Supported slots		1x PCI Express 3.0 (x8 lane, x16 socket) + 1x PCI Express 3.0 (x8 lane, x8 socket) (Low profile, length 180 mm)		
Graphics	Graphic display / resolution		16,770,000 colors: 640x840, 800x600, 1,024x768, 1,280x1,024		
Interface			1x analog RGB (MiniD-Sub15 pins, 1 x front, 1 x rear) 1x serial port (RS-232C compliant/D-Sub9 pin, serial port A, 1 x rear, optional port can be used up to two ports in total)) 9 x USB 2.0 (2 x front, 4 x rear, 3 x internal)		
Power supply unit			1 x 400 W 80 PLUS® Gold compliant (bipolar grounded outlet) (hot-plug unavailable)		
Redundant power supply			Non-Supported		
Redundant fan			Non-Supported		
External dimensions (width × depth × height)			440.0mm x 615.2mm x 43.6mm (protrusions/ inner rails excluded) 482.0mm x 653.0mm x 44.3mm (protrusions/ inner rails included)		
Weight (Standard/ Max.)			11 kg / 15 kg		
Power consumption			290VA/280W	370VA/360W	
Environmental requirements Temperature/Humidity			Operating: 10 to 40°C*3 / 20 to 80%, Storage: –10～55°C / 20 to 80% (no condensation either when operating or when stored)		
Main accessories			EXPRESSBUILDER(NEC ESMPRO Manager), NEC ESMPRO Agent, User's Guide (electronic document) included), Getting Started, one-touch rack rail		
Installed OS			–		
Supported Oss			VMware ESX™ 4.1 Update 2		

*1   Prepare at least one external DVD-ROM per system for maintenance and OS reinstallation purposes.

*2   Prepare this if required. For the principal uses of a Flash FDD, refer to the notes on Flash FDD in the Maintenance Guide.

*3   When installing an addition battery for RAID controllers by the environment of 40 ℃, HDD/SSD can't be installed into HDD Slot 4-7.

2.   Interrupt Lines

Interrupt lines are assigned as factory settings as shown below. Use this table as a reference when you add optional devices.

- **Interrupt lines**
  As factory settings, interrupt lines are assigned as follows.

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	12	–
1	–	13	Numeric data processor
2	–	14	–
3	COM 2 serial port	15	–
4	COM 1 serial port	16	PCI, USB
5	–	17	PCI
6	–	18	–
7	–	19	SATA, PCI
8	Real-time clock	20	–
9	–	21	–
10	SM Bus, LAN1, LAN2	22	–
11	–	23	USB