NEC

User's Guide

NEC Express Server
Express5800 Series

Express5800/T110h-S
EXP333, 333A

10.111.01-101.02
August 2018

Manuals

Manuals for this product are provided as booklets (📖) and electronic manuals (📄) in EXPRESSBUILDER.

📖 Safety Precautions and Regulatory Notices	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. See this guide first and read the outline of this product.

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 suitable 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 precautions for installation
Chapter 2: Installing the Bundled Software	Installation of NEC ESMPRO, Universal RAID Utility, and other bundled software

📄 Maintenance Guide

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

📄 Other manuals

The details of NEC ESMPRO, Universal RAID Utility, and other features

Contents

Conventions Used in This Document

Signs and symbols for safety

WARNING and CAUTION are used in this guide as following meaning.

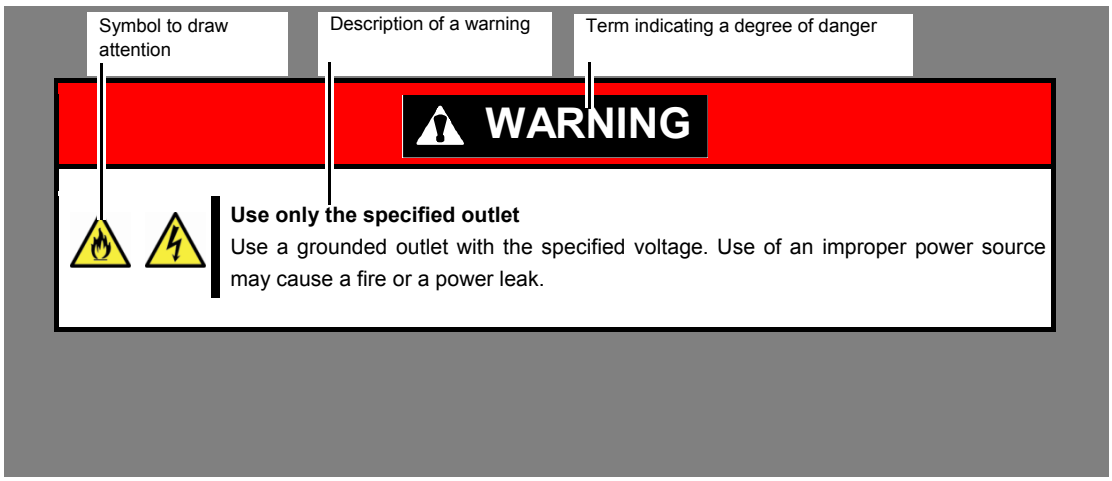
⚠ WARNING Indicates there is a risk of death or serious personal injury

⚠ 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) 
	**Prohibited Action**	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example) 
	**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)

(Example in this guide)



Notations used in the text

In addition to safety-related symbols urging caution, three 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 hardware 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 hardware or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drive

This server is equipped with one of the following drives. These drives are referred to as *optical disk drive* in this document.

- **DVD-ROM drive**
- **DVD Super MULTI drive**

Hard disk drive

Unless otherwise stated, *hard disk drive* described in this document refers to the following.

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

Removable media

Unless otherwise stated, *removable media* described in this document refers to the following.

- **USB flash drive**
- **Flash FDD**

Abbreviations of Operating Systems(Windows)

Windows Operating Systems are referred to as follows.

See *Chapter 1* (*1.2 Supported Windows OS)* in *Installation Guide (Windows)* for detailed information.

Notations in this document	Official names of Windows
Windows Server 2012 R2	Windows Server 2012 R2 Standard
	Windows Server 2012 R2 Datacenter
	Windows Server 2012 R2 Foundation
Windows Server 2012	Widnows Server 2012 Standard
	Widnows Server 2012 Datacenter
Windows Server 2008 R2	Windows Server 2008 R2 Standard
	Windows Server 2008 R2 Enterprise

POST

POST described in this document refers to the following.

- Power On Self-Test

BMC

BMC described in this document refers to the following.

- Baseboard Management Controller

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UEFI NETWORK STACK 2

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This document was created based on the information available at the time of its creation. The screen images, messages and procedures are subject to change without notice. Substitute as appropriate when content has been modified.

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

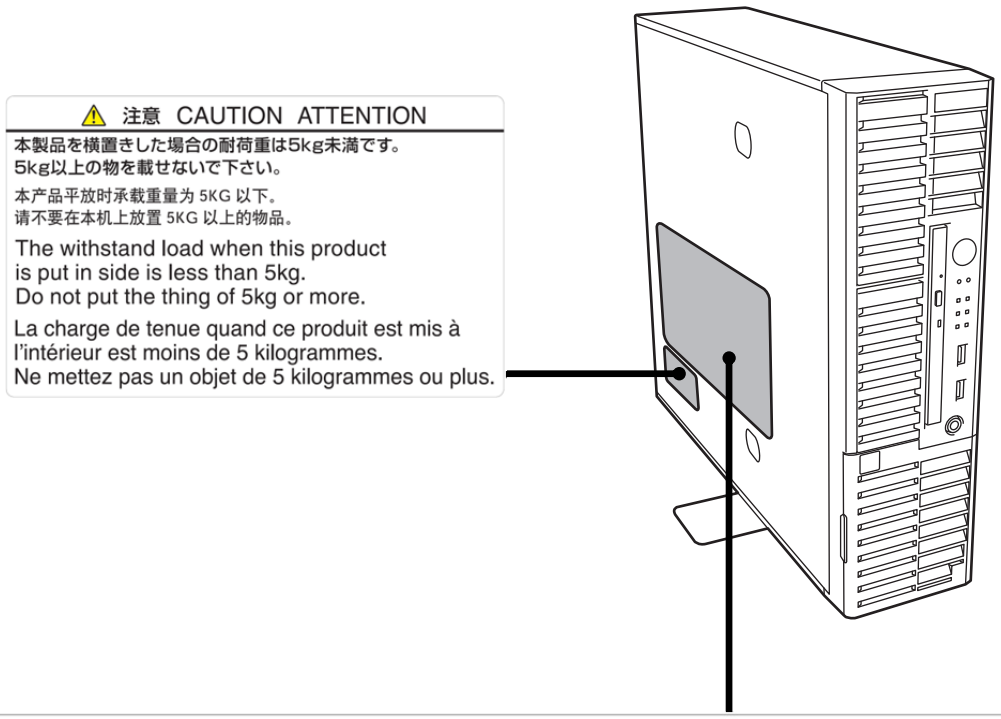
http://www.nec.com/

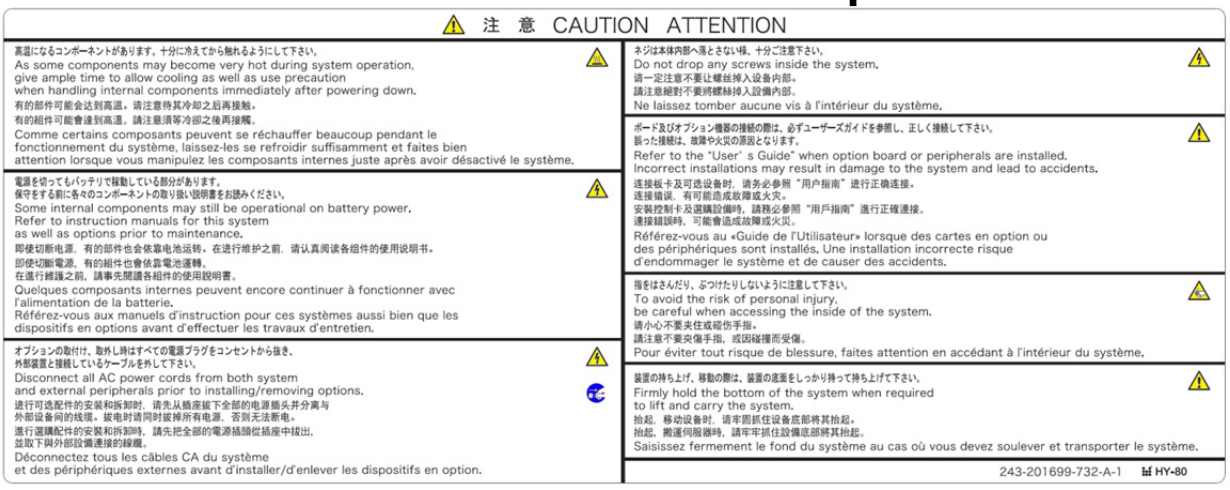
Safety notes

To use this server safely, read thoroughly "*Safety Precautions and Regulatory Notices"* that comes with your server.

Warning labels

Warning labels are attached on or near the components with potential hazards. These labels are either attached or printed on the components. Do not remove or black out this label and keep it clean. If no label is attached or printed on the server contact your sales representative.





Handling precautions

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 phones 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, see *Chapter 2 (2. Installation and Connection)*.
- If a peripheral device is not plug-and-play device, make sure that the server is off and unplug the power cord before connecting/removing cables to/from the device.
- 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 turning on the server after turning off the server. If any Uninterruptible Power Supply (UPS) unit is connected, set it to wait for at least 30 seconds before turning on the server after power off.
- Turn off the server and unplug the power cord before moving it.
- Regularly clean the server to prevent various types of failure. For details, see *Chapter 1 (2. Daily Maintenance)* in "*Maintenance Guide*".
- Momentary voltage drop may occur due to lightning strike. To prevent this, use of UPS is recommended.
- We do not guarantee that the server's optical disk drive will play a copy-protected CD that does not conform to standards.
- 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 the storage conditions did not conform to the conditions that guarantee server operations (temperature: 5 to 40°C (when High Temperature Resistant Kit is installed: 5 to 48°C (it's subject to composition restrictions.)); humidity: 20% to 80%).
- Check the system clock approximately once per month.
- We recommend you store the server at room temperature. Keep the following storage conditions.
  Temperature: −10°C to 55°C, Humidity: 20% to 80% (No condensation of moisture)
- Do not use the server, or removable/backup media such as tape cartridges when moving them from a cold place to a warm place. The condensation will occur and cause malfunctions and failures when these are used in such state. Use the server after waiting sufficiently.
  Reference: Time effective at avoiding condensation in winter (5°C or more 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.

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.

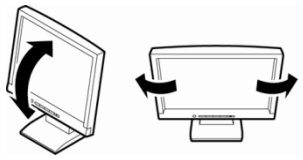
Keep proper posture

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.

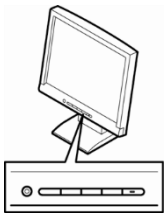
Adjust the angle of your display

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.



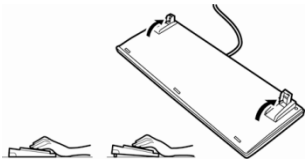
Adjust the brightness and contrast of the display

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.

NEC Express5800 Series
Express5800/T110h-S

1

General Description

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

1. **Introduction**

2. **Accessories**
   Describes the accessories of the server.

3. **Features**
   Describes the features of the server and the server management.

4. **Names and Functions of Parts**
   Describes the name of each part contained in the server.

1. Introduction

Thank you for purchasing this NEC Express5800 Series product.
This high performance server is powered by the latest Intel processor.

- Intel Xeon Processor
- Intel Pentium 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.

- Keyboard
- Mouse
- Rubber Foot
- Bezel Lock Key *1
- Screw for fix to backup device
- Power Cord *3
- SDR Update CD-ROM
- Cable Tie (for securing AC power cord)
- Getting Started
- Safety Precautions and Regulatory Notices

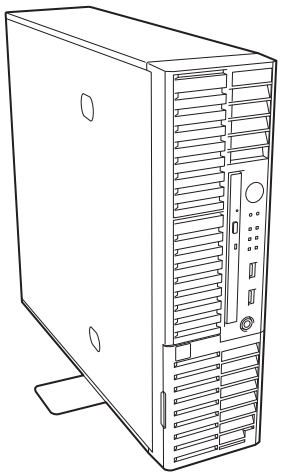
*1 Requires 2.5-inch HDD cage.

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 standard features:



High performance

Intel Xeon, Pentium processor

- High-speed memory access (DDR4 2133 supported)
- High-speed disk access (SATA 6 Gbps, SAS 12 Gbps supported)
- High-speed 1000BASE-T (2 ports) interface
  (1 Gbps/100 Mbps/10 Mbps supported)

High reliability

- Processor throttle-ring feature
- Memory monitoring feature (error correction/error detection)
- Memory degeneracy feature (logical isolation of a failed device)
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- RAID system (disk array)
- BIOS password feature
  Power redundant feature (hot swapping supported)*
  *: N8100-2328F.

Management utilities

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

Power saving and noiseless design

- Power monitoring feature
- Power control feature
- High-efficiency power supply supporting 80 PLUS Platinum
- Fan control appropriate to environment, work load, and configuration
- Enhanced Intel SpeedStep Technology supported

Expandability

- Various IO option slots
  - PCI Express 3.0 (x 16 lanes) : 1 slot (low profile)
  - PCI Express 3.0 (x 4 lanes): 1 slot (low profile)
  - PCI Express 3.0 (x 2 lanes): 1 slots (low profile)
  - PCI Express 3.0 (x 1 lanes): 1 slots (low profile)
- Large memory of up to 64 GB
- Backup device bay provided as standard
- USB 3.0 interface (requires the supporting OS)
- Three LAN connectors (one for management LAN)

Ready to use

- Hard disk drives can be installed with one-touch setup, which requires no cables (hot swap supported)*
  *: 2.5-inch HDD

Various built-in features

- Redundant power supply system supported*
  *: N8100-2328F.
- El Torito Bootable CD-ROM (no emulation mode) format supported
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature
- 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 (OS setup utility)
- BIOS setup utility (SETUP)

Maintenance features

- Off-line tool
- Memory dump feature using the DUMP switch
- Feature to back up and restore BIOS/BMC settings using the EXPRESSSCOPE profile key

3.1 Firmware and Software Version Management

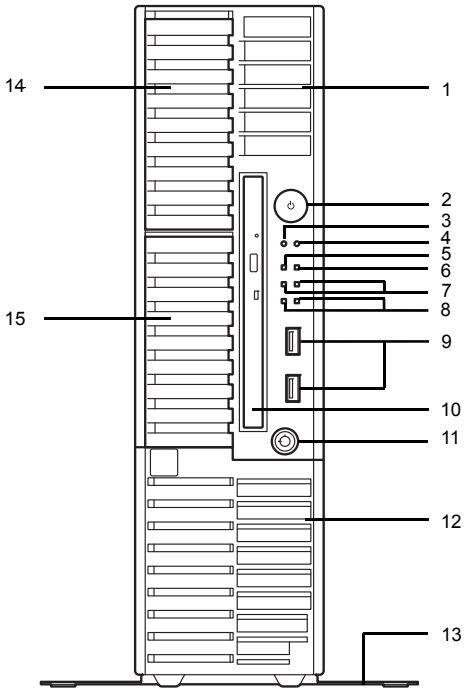
You can manage the version of firmware or software on the server and update them with an update package by using NEC ESMPRO Manager and ExpressUpdate Agent.

This feature automatically updates multiple packages without stopping the system by using NEC ESMPRO Manager.

4. Names and Functions of Parts

The names and the functions of the server's parts are as follows.

4.1 Front of the Server



1 Front Bezel
A cover for protecting the front part of the server.

2 POWER Switch
A switch for turning on/off the server. Press once to turn on the server. The LED lights green when it is on. Press it again to turn off the server. Hold down the switch for four seconds or more to forcibly turn off the server.

3 DUMP Switch
A switch for collecting a memory dump.
Do not press DUMP Switch usually. If DUMP Switch is pressed, the server stops.

4 BMC RESET Switch
A switch for resetting BMC of this server. Use the switch only when there is a problem with EXPRESSSCOPE Engine 3 (BMC).

5 POWER LED (green)
An LED for showing the power status of the server. This LED lights green when the power is ON.

6 POWER Capping LED (green)
An LED for showing the power capping status.

7 STATUS LED 1,2(1:green 2:amber)
LEDs for showing the server status.

8 Global HDD LED 1,2(1:green 2:amber)
LEDs for showing the status of hard disk drives and an optical disk drive.

9 USB Connectors (front)
Connectors for connecting USB 3.0 interface devices.

10 Optical Disk Drive
An optical disk drive for reading a CD/DVD. Either of the following drives can be installed.
– DVD-ROM drive
– DVD SuperMULTI drive
– ODD Bay Cover
The drive provides the following: an eject button to eject the tray; an LED that indicates the drive access; and an eject hole to eject the tray forcibly

11 Key Slot
A slot for Bezel Lock Key. The key can lock Front Door when a 2.5-inch HDD cage is installed.

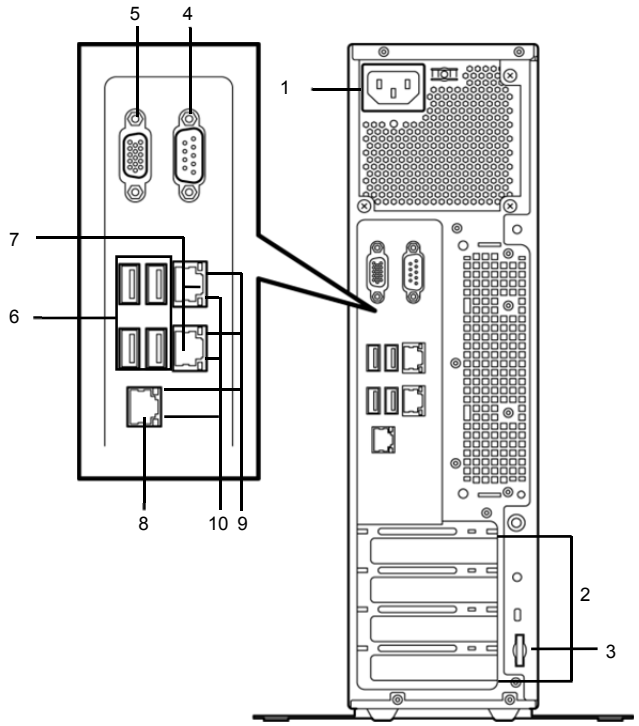
12 Front Door
A door for covering 2.5-inch hard disk drives.

13 Stabilizer
Stabilizers for supporting the server.

14 3.5-inch Expansion Bay 2
A bay for installing 3.5-inch backup device.

15 3.5-inch Expansion Bay 1
A bay for installing 2.5-inch HDD cage (N8154-83F).

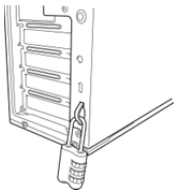
4.2 Rear View



1 AC Inlet
A socket for connecting a power cord.

2 PCI Slots
Slots for installing PCI cards.

3 Chassis Lock Tab
A tab for locking the side cover.



4 Serial Port (COM A) Connector
A connector for connecting serial interface devices. This cannot directly connect to a network line. If the optional N8117-01A Additional RS232C Connector Kit is connected, the connector of N8117-01A is assigned as the serial port B.

5 Display Connector
A connector for connecting a display

6 USB Connectors
Connectors for connecting USB 3.0 interface devices.

7 LAN Connectors
Connectors for connecting to a network (1000BASE-T/100BASE-TX /10BASE-T).
If Shared BMC LAN feature is enabled in ROM Utility, LAN1 connector can also be used as the management LAN connector. Sharing port is not recommended from the point of performance and security.

8 Management LAN Connector
A LAN connector (100BASE-TX) for connecting EXPRESSSCOPE Engine 3. This connector cannot be used as a normal LAN port. This port cannot be used when Shared BMC LAN feature is used.

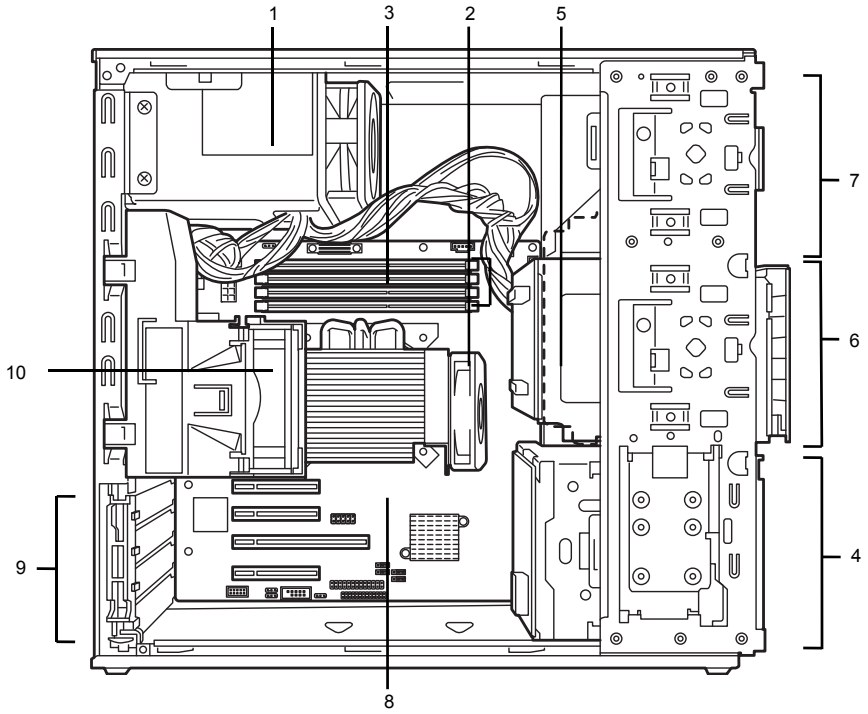
9 LINK/ACT LED (green)
LEDs for showing the access status of LAN

10 SPEED LED (green/amber)
LEDs for showing the transfer speed of LAN ports

11 SPEED LED (green)
A LED for showing the transfer speed of the LAN port used for management

4.3 Internal View

<Non-redundant power supply model>



1 Power Supply Unit

* The figure shows when an non- redundant power supply unit is installed.

2 Cooling Fan (CPU)

3 DIMM Slots

4 Hard Disk Drive Bay

The figure shows the view when 2.5-inch hard disk drives are installed.

5 Optical Disk Drive

6 3.5-inch Expansion Bay 1

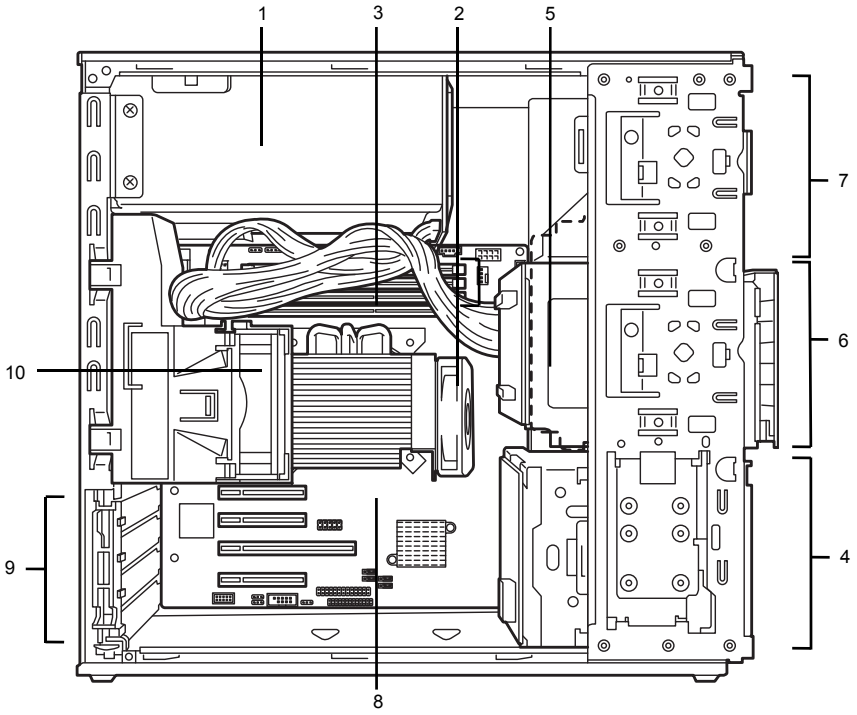
7 3.5-inch Expansion Bay 2

8 Motherboard

9 PCI Slot

10 Cooling Fan (rear)

<Redundant power supply model>



1 Power Supply Unit

* The figure shows when an redundant power supply unit is installed.

2 Cooling Fan (CPU)

3 DIMM Slots

4 Hard Disk Drive Bay

The figure shows the view when 2.5-inch hard disk drives are installed.

5 Optical Disk Drive

6 3.5-inch Expansion Bay 1

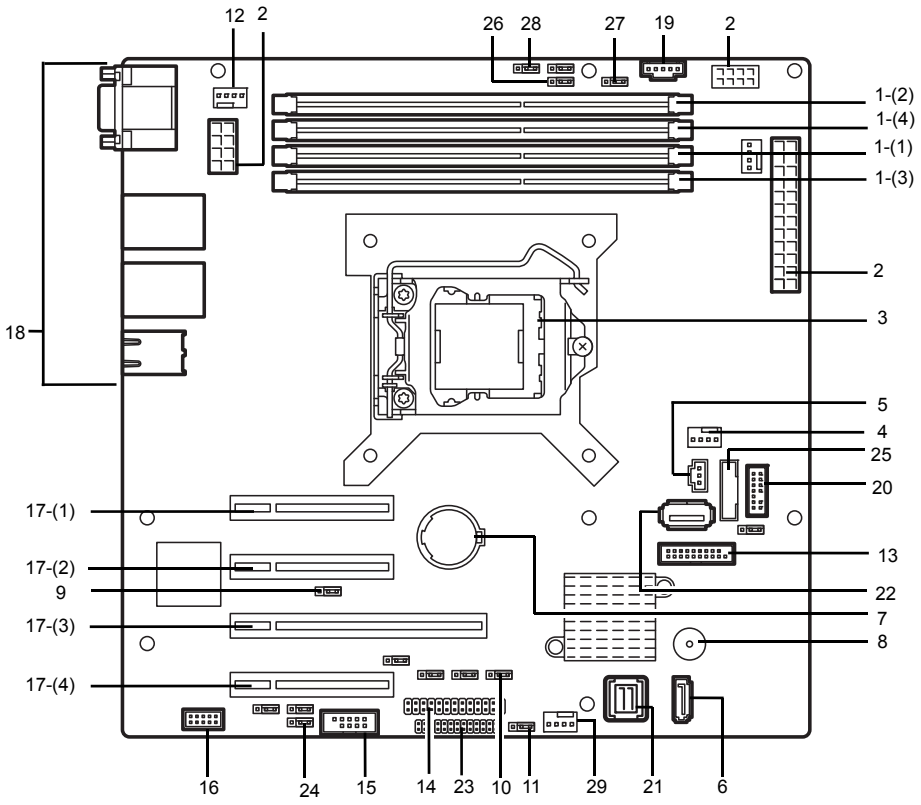
7 3.5-inch Expansion Bay 2

8 Motherboard

9 PCI Slot

10 Cooling Fan (rear)

4.4 Motherboard



1 **DIMM Slots** (the number after hyphen indicates DIMM number)

2 **Power Connector**

3 **CPU Socket**

4 **CPU Cooling Fan Connector (FAN1)**

5 **RAID LED Cable Connector**

6 **Serial ATA Connector (for ODD)**

7 **Lithium Battery**

8 **Buzzer**

9 **Clear CMOS Jumper**

10 **RAID Configuration Jumper**

11 **Clear Password Jumper**

12 **Rear Fan Connector (FAN2)**

13 **USB Connector (for front)**

14 **Front Panel Cable Connector**

15 **Serial Port (COM B) Connector (for N8117-01A)**

16 **SPI Flash Mezzanine Connector**
EXPRESSSCOPE profile key (SPI memory) has been installed, where BIOS and BMC configuration data is stored. Move it when replacing MB to keep using the data.

17 **PCI Card Slots**
(17)-1 PCI EXPRESS x2 (x8 connector)
(17)-2 PCI EXPRESS x1 (x8 connector)
(18)-3 PCI EXPRESS x16 (x16 connector)
(19)-4 PCI EXPRESS x4 (x8 connector)

18 **External Connector**

19 **PMBus Connector**

20 **TPM kit Connector**

21 **Mini-SAS HD Connector**

22 **USB Connector (for internal)**

23 **HDD BP Connector**

24 **Dust Proof Bezel Configuration Jumper**

25 **Dust Proof Sensor Cable Connector**

26 **Fan Configuration Jumper**

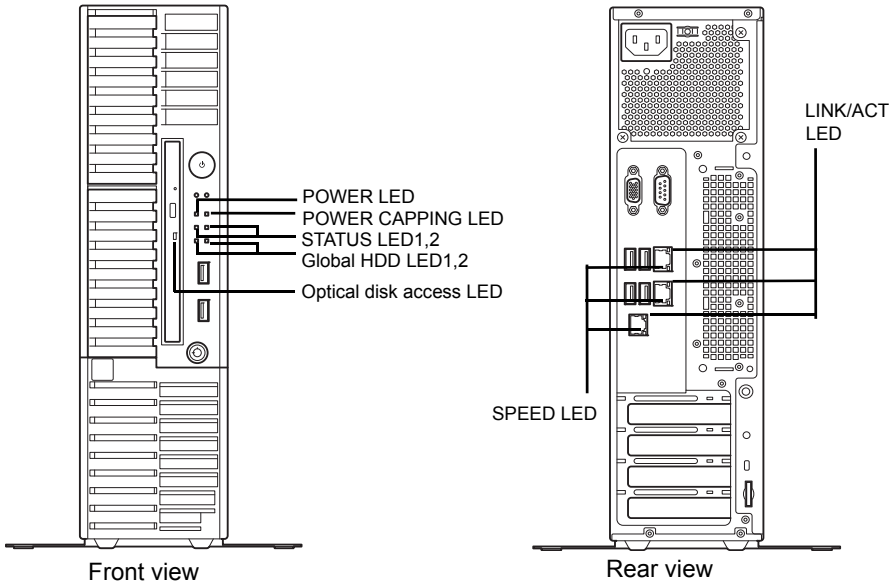
27 **Power Supply Unit Configuration Jumper**

28 **High Temperature Support Option Configuration Jumper**

29 **High Temperature Support Option Fan Connector (FAN4)**

4.5 Indicators

This section explains the meanings of the following LEDs.



4.5.1 POWER LED ( )

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

POWER LED pattern	Description
On (green)	The server is normally powered on.
Off	The server is off-powered.

4.5.2 STATUS LED 1, 2 (1-⚠-2)

While hardware is operating normally, STATUS LED 1 lights green. STATUS LED 2 is off.

STATUS LED 1 is off or STATUS LED 2 lights/flashes amber if there is a hardware failure.

Tips If NEC ESMPRO is installed, you can view error logs to check the causes of failures.

The following table lists STATUS LED patterns, their description and action. If the LED indication does not change even if the action below is performed, contact your sales representative.

STATUS LED 1, 2 pattern		Description	Action
STATUS LED 1	STATUS LED 2		
On (green)	Off	The server is operating normally.	–
On (green)	On (amber)	Initialization of BMC is in progress.	Wait until initialization completes.
Blinking (green)	Off	Memory is in a degraded state	Find the device in degraded state by using BIOS Setup Utility (SETUP), and replace it as soon as possible.
		A correctable memory error has often occurred.	
		Operating while CPU error is detected.	
		In redundant power configuration, power is not supplied to either of power unit.	
Off	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.
		Memory dump is being requested. Note: It remains green if the dump is caused by software.	Wait until the memory dump is completed.
Off	On (amber)	A temperature alarm was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected.
		A CPU error occurred.	Turn the power off and then turn it on. If POST displays any error message, take notes of the message, and contact your sales representative.
		A PCI system error occurred	
		A PCI parity error occurred	
		A PCI bus error occurred.	
		A voltage alarm was detected.	Contact your sales representative.
		Fan error was detected.	
		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).	
Off	Blinking (amber)	Power Supply Unit is failing (in power redundant configuration).	Contact your sales representative.
		A fan alarm was detected.	Check if the internal fan cable is properly connected.
		A temperature warning was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected.
		A voltage warning was detected	Contact your sales representative.
		One or more hard disk drives are failing (Only RAID system configuration).	

4.5.3 Global HDD LED1, 2 (1-  -2)

Global HDD LED indicates the status of HDDs and optical disk drive.

DISK1, 2 LED pattern		Description	ActionSolution
DISK LED 1	DISK LED 2		
Blinking (green)	Off	Hard disk drive is being accessed.	–
Off	On (amber) (only when RAID system is configured)	Hard disk drive is failing.	Contact your sales representative.
Blinking (green)	Blinking (amber) (only when RAID system is configured)	Rebuilding is in progress. When the failed hard disk drive is replaced, rebuilding process starts automatically (auto rebuilding feature).	–
Off	Off	Hard disk drive is halted.	–

Important **Observe the following precautions whenever you use the auto rebuilding 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.**

4.5.4 Power Capping LED

Power Capping LED indicates enabled/disabled status of PowerCapping feature as shown below.

Power Capping LED pattern	Description
On (green)	Power Capping feature is enabled.
Blinking (green)	Power Capping is enabled and power control (capping) is working.
Off	Power Capping feature is disabled.

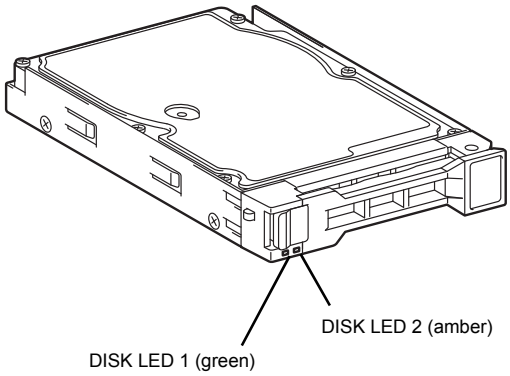
Note Power Capping LED seems to be lit or blinking amber when STATUS LED is lit or blinking amber. The amber STATUS LED indicates a hardware failure. Contact your sales representative.

4.5.5 Optical Disk Access LED

The LED lights/flashes when the media set on the optical disk drive is being accessed.

4.5.6 DISK LED 1, 2

When 2.5-inch HDD cage is installed, each drive has its respective LED (DISK LED).



DISK1, 2 LED pattern		Description	Action
DISK LED 1	DISK LED 2		
Blinking (green)	Off	Hard disk drive is being accessed.	–
Off	On (amber) (only when RAID system is configured)	Hard disk drive is failing.	Contact your sales representative.
Blinking (green)	Blinking (amber) (only when RAID system is configured)	Rebuilding is in progress. When the failed hard disk drive is replaced, rebuilding process starts automatically (auto rebuilding feature).	–
Off	Off	Hard disk drive is halted.	–

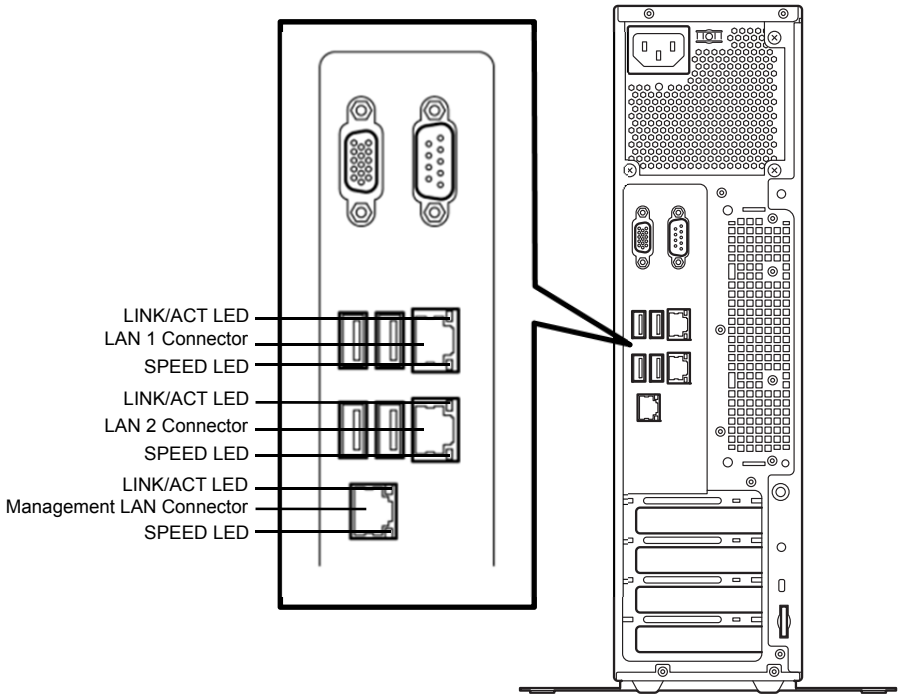
Important

Observe the following precautions whenever you use the auto rebuilding 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.**

4.5.7 LEDs for LAN connectors

The LAN connectors on rear panel have LINK/ACT LED and SPEED LED.



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

  This LED indicates the state of the LAN port.

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

- **SPEED LED (1, 2, M)**

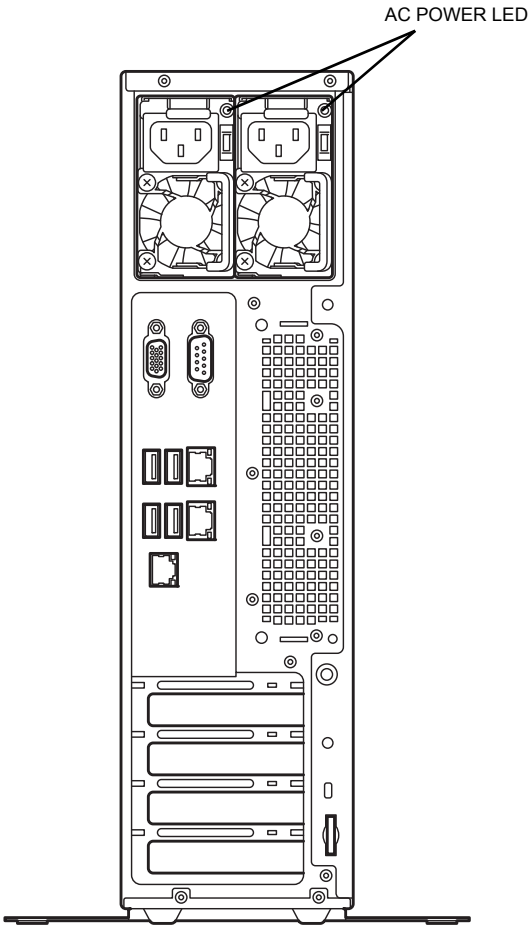
  This LED indicates which network interface is used.

  —The standard LAN ports (1 and 2) support 1000BASE-T, 100BASE-TX, and 10BASE-T.
  —The management LAN port (M) supports 1000BASE-T, 100BASE-TX, and 10BASE-T.

SPEED LED pattern	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.

4.5.8 AC POWER LED on power supply unit

When a redundant power supply unit is installed, the AC POWER LED is available on each power supply unit.



The following table lists AC POWER LED patterns.

AC POWER LED pattern	Description	Action
On (green)	The server is powered on.	–
Blinking (green)	The power cable is connected and AC power is supplied.	–
	Cold Redundant feature is enabled.	–
On (amber)	The power cable is not connected in redundant power configuration.	Connect the power cable.
	Power unit is failing.	Contact your sales representative.
Blinking (amber)	Power unit is failing.	Contact your sales representative.
Off	The power is not supplied to the server.	Connect the power cable. If it is already connected, contact your sales representative.

NEC Express5800 Series
Express5800/T110h-S

2 Preparations

This chapter describes preparations for using this server.

1. **Installing Internal Optional Devices**

   Describes how to install or remove optional devices.

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

2. **Installation and Connection**

   Place the server in a proper location and connect some cables following this section.

1. Installing Internal Optional Devices

This chapter describes the instructions for installing supported optional devices and precautions.
If you did not purchase any optional device requiring installation, you can 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 and Regulatory Notices*.

- **Do not disassemble, repair, or modify the server.**
- **Do not remove the lithium, NiMH, or Li-ion battery.**
- **Do not handle the server while the power plug is inserted into the outlet.**

CAUTION

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

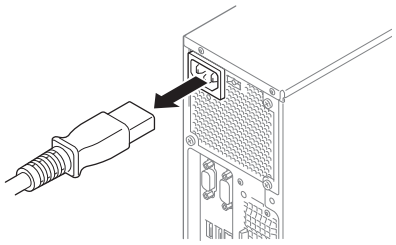
- **Do not attempt to lift the server by gripping the front bezel or vent holes cover.**
- **Make sure to complete installation.**
- **Do not get your fingers caught.**
- **High temperature.**

1.2 Overview of Installation and Removal

Install/remove components by using the following procedure.

1. Turn the server off.
   See *Chapter 3* (6. *Turning off the Server*).

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



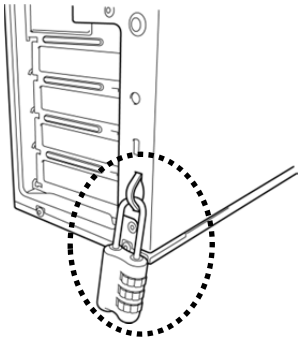
3. Disconnect all cables connected to the connector at the rear.
4. Remove the side cover.
   See *Chapter 2 (1.3. Removing the Side Cover)*.
5. Remove the front bezel.
   See *Chapter 2 (1.4 Removing the Front Bezel)*.
6. Depending on the components to be installed or removed, follow the procedure in order.
   See *Chapter 2 (1.5 TPM Kit* to *1.12 Backup Devices).*
7. Connect cables
   See *Chapter 2 (1.14 Connecting Cables)*.
8. Attach the front bezel.
   See *Chapter 2 (1.15 Attaching the Front Bezel).*
9. Attach the side cover.
   See *Chapter 2 (1.16 Installing the Side Cover)*.

Continue the setup while referring to *Chapter 2 (2.2 Connection)*.

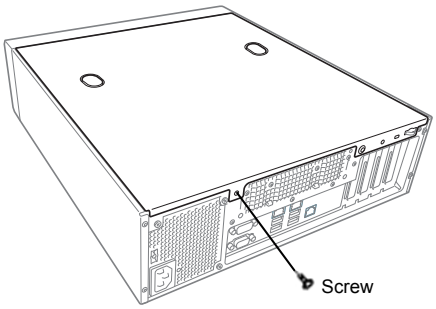
1.3 Removing the Side Cover

Remove the side cover by using the following procedure.

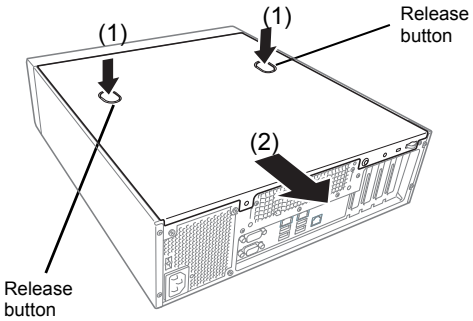
1. See the steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Unlock the chassis, if necessary.

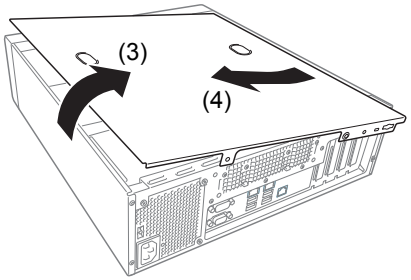


3. Lay the server slowly and gently so that the side cover faces upward and remove a screw.



4. (1) While pressing the two release buttons, (2) slide the cover toward the rear of the server, (3) lift it in the direction shown by the arrow, and then (4) remove the cover in the direction shown by the arrow.

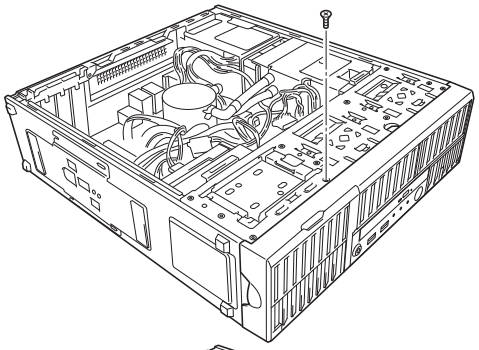




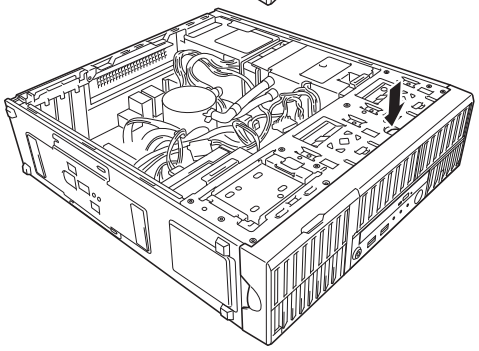
1.4 Removing the Front Bezel

Remove the front bezel by using the following procedure.

1. See the steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Remove the screw.

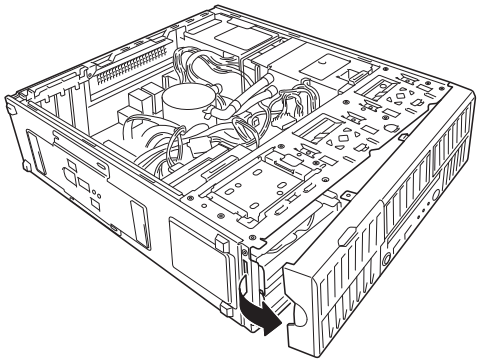


3. Place the server in the direction shown in the figure, and then pull the front bezel slightly toward the front until the tab can be released from the frame.



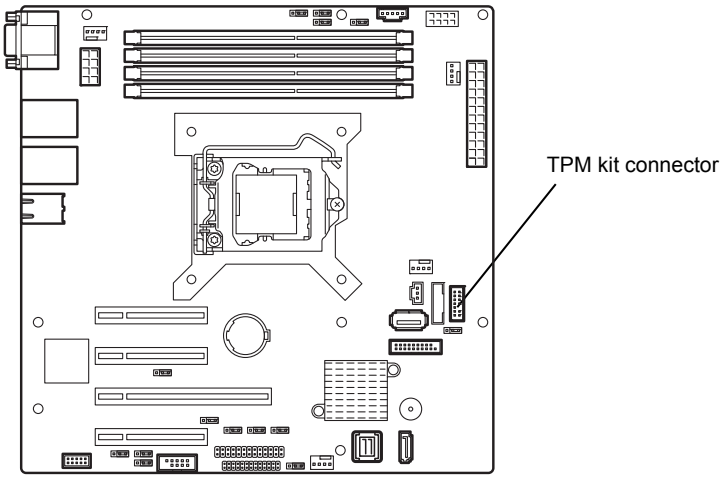
Important **If you pull the front bezel forward too much, you will break the front bezel. Gently slide it to prevent damaging the equipment.**

4. Slide the front bezel forward to release the hooks that engaged with the holes at the front of the server and take it off the server.



1.5 TPM Kit

This section describes the procedure for installing optional TPM (Trusted Platform Module) Kit.

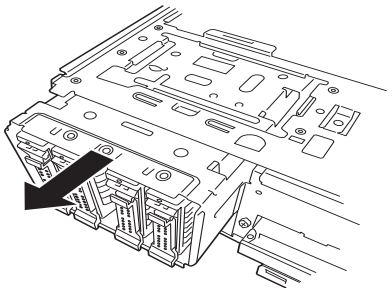


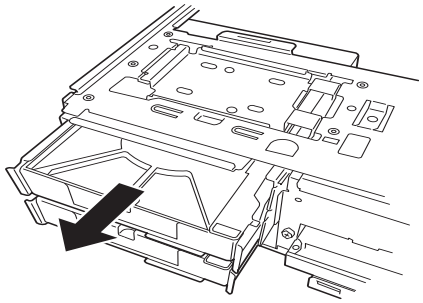
1.5.1 Installation

Install the TPM Kit in accordance with the following procedure.

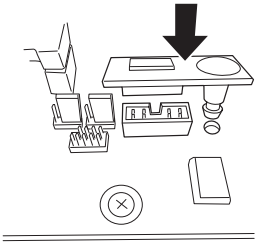
Note The TPM kit once installed cannot be removed.

1. See the steps 1 to 5 in *Chapter 2* (*1.2 Overview of Installation and Removal*) for preparations.
2. Pull the hard disk drive cage toward the front according to the steps in *Chapter 2* (*1.10 HDD Cages*). (For a 3.5-inch hard disk drive cage, only pull the hard disk drive.)





3. Install the TPM Kit and secure it by pushing the nylon rivet that comes with the TPM Kit.



4. Re-assemble the parts that were removed in the steps 1 and 2.

1.6 DIMM

Install a Dual In-line Memory Module (DIMM) to a DIMM slot on the motherboard in the server. The motherboard provides four slots to install DIMMs.

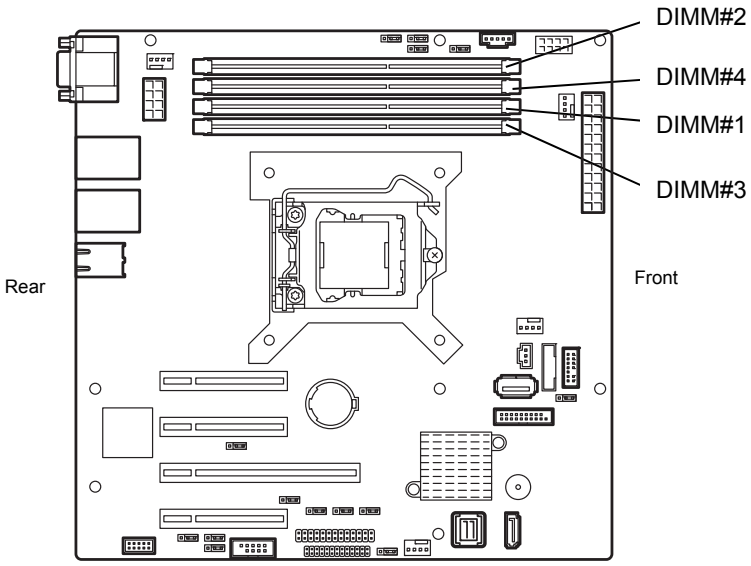
Up to 64 GB (16 GB × 4) of memory can be installed.

Important

- **Use only the DIMMs specified by NEC. Installing a DIMM from a third party may cause the server to fail. You will be charged to repair failures or damages caused by the use of such products even within the warranty period.**
- **To avoid static electricity, see *Chapter 1 (1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices.***

Tips

As about 750 MB of memory is used for PCI resources, the available memory size may be less than the mounted memory size.



Motherboard

This server supports 2-way Interleave mode.

In 2-way interleaved memory system, the data transfer rate of the memory is twice that of a non-interleaved memory system.

1.6.1 Maximum supported memory size

The maximum available memory size on the server depends on the architecture (x86 architecture) and OS specs.

A list of maximum memory sizes

OS	The maximum memory size supported on each OS	The maximum memory size supported on the server
Windows Server 2008 R2 Standard (x64)	32GB	32 GB
Windows Server 2008 R2 Enterprise	2TB	64GB
Windows Server 2012 Standard Windows Server 2012 Datacenter Windows Server 2012 R2 Standard Windows Server 2012 R2 Datacenter	4TB	
VMware ESXi 5.5Update3	4TB	64GB Up to 1TB of the main memory is available to each virtual machine.
VMware ESXi 6.0Update1	6TB	64GB Up to 4TB of the main memory is available to each virtual machine.

1.6.2 Installation order

Install DIMMs one by one in order of increasing memory size into slots in the order of DIMM#1, DIMM#2, DIMM#3, and DIMM#4. If you want to run the server in 2Way Interleave mode, observe the following installation rules:

- Install DIMMs in pairs
- The two DIMMs installed together must be of the same specifications and memory size.
- Install the pairs as DIMM#1 and DIMM#2, or DIMM#3 and DIMM#4. The installation order between the pairs does not matter.

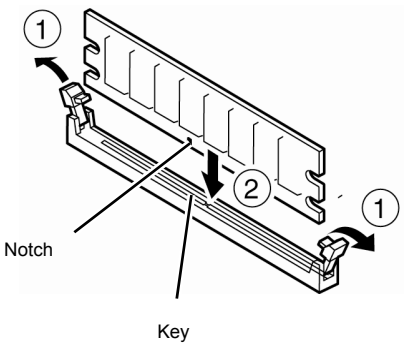
Installation examples

Example	2Way Interleave	DIMM#1	DIMM#2	DIMM#3	DIMM#4
1	Available	4GB DIMM	4GB DIMM	Not installed	Not installed
2	Available	4GB DIMM	4GB DIMM	4GB DIMM	4GB DIMM
3	Not available	4GB DIMM	4GB DIMM	4GB DIMM	Not installed
4	Not available	4GB DIMM	4GB DIMM	Not installed	4GB DIMM

1.6.3 Installation

Install a DIMM by using the following procedure.

1. See the steps 1 to 5 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Hold the server with both hands and slowly and gently lay it so that the left side faces upward
3. Open both levers of the target DIMM slot outward.
4. Hold the DIMM vertically and push it into the slot.
   When the DIMM is inserted correctly, the lever automatically closes.



Important **Do not apply too much pressure when you push a DIMM into the socket.**

Note Align the notch on the DIMM with the key on the slot.

5. Firmly close the lever.
6. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
7. Confirm that no error messages are displayed in POST screen.
   If any error messages are displayed, see *Chapter 3 (1.1.2 POST Error Message)* in "*Maintenance Guide*".
8. Run the BIOS Setup Utility, go to the **Advanced** menu, and check the **Memory Configuration**. Confirm that the added DIMM has been recognized in the BIOS. Confirm that the applicable **DIMM Group Status** is set to "Normal". See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".
9. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
   When using a Windows OS, see *Chapter 1 (6.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
   For other OS, see the manual provided with the operating system or contact your sales representative.

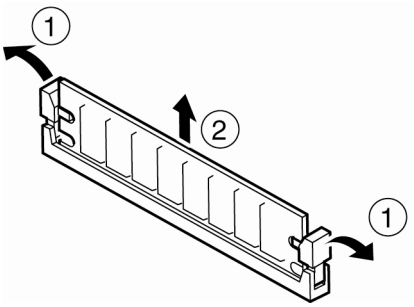
1.6.4 Removal

Remove a DIMM in the following procedure.

Note

- When removing a defective DIMM, check error messages displayed at POST or NEC ESMPRO and check the DIMM slot where the defective DIMM is installed.
- At least one DIMM needs to be installed for the server to operate.

1. See the steps 1 to 5 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Open both levers of the target DIMM slot outward.
   The DIMM is unlocked
3. Remove the DIMM by pulling it out from the slot in a straight direction.



Important **Do not apply too much pressure when you pull a DIMM out from the socket.**

4. Assemble the server.
5. Turn on the server and confirm that no error messages are displayed on POST. If any error message is displayed, see *Chapter 3 (1.1.2 POST Error Message)* in "*Maintenance Guide*".
6. If you replaced a broken DIMM, choose **Yes** in **Memory Configuration**-**Memory Retest** of the **Advanced** menu, and then choose **Save Changes and Exit** to restart.
7. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
   When using a Windows OS, see *Chapter 1 (6.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
   For other OS, see the manual provided with the operating system or contact your sales representative.

1.7 Use of Internal Hard Disk Drives in the RAID System

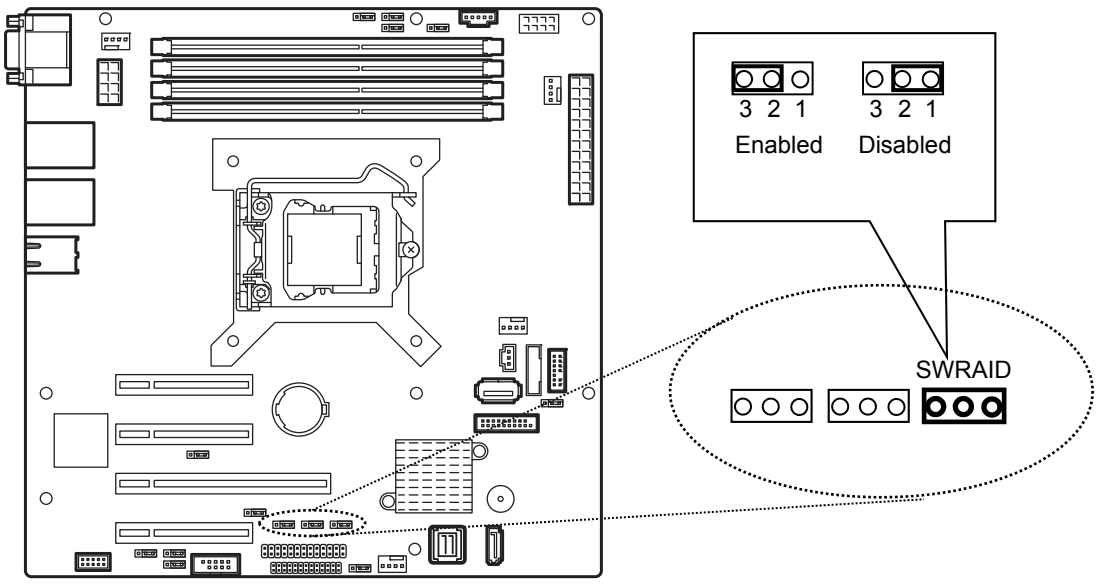
This section describes how to use the hard disk drives installed in the HDD cage at the front of the server in the RAID system.

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 used in the RAID system contains valuable data, be sure to back up 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, change the jumper switch on motherboard and backplane, as shown below.



Motherboard

(a) Using the Software RAID (SW RAID)
Enable SW RAID by changing jumper setting on motherboard.

Jumper on motherboard (SWRAID)
Change jumper setting to 2-3 (Enabled).

(b) Using an optional RAID controller

Jumper on motherboard (SWRAID)
Change jumper setting to 1-2 (Disabled).

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**.

Important **Do not change the mode to hibernate when building a RAID system.**

(c) Installation

For the instruction of installing the optional RAID Controller, see *Chapter 2 (1.9 PCI Card)*.

Important **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.**

(d) Removal

To remove the optional RAID controller, reverse the installation procedure.

If you intend to use with the card removed, be sure to attach the blank cover attached to the riser card.

1.7.1 Notes on setting up a RAID System

Note the following points when setting up a RAID system.

- The number of hard disk drives required varies depending on the RAID level.
- If SW RAID controller or an optional RAID controller (N8103-176/188) is used, the RAID system cannot be built in RAID5/RAID6/RAID50/RAID60.

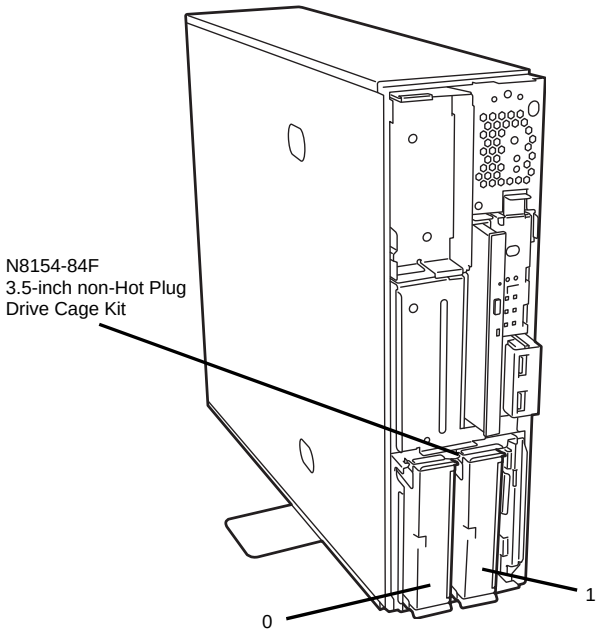
RAID level	The minimum number of hard disk drives required to set up a RAID system		
	SW RAID or N8103-176	N8103-188	N8103-177/178
RAID 0	1	1	1
RAID 1	2	2	2
RAID 5			3
RAID 6			3
RAID 10	4	4	4
RAID 50			6
RAID 60			6

- Use SAS/SATA hard disk drives or SSDs that have the same capacity and rotational speed.
- RAID 10 using a hard disk drive of 2 TB or more cannot be supported if SW RAID controller is used.
- When installing an OS in your RAID system, you can easily complete the setup process, including RAID configuration and OS installation, by using EXPRESSBUILDER.
- If you are installing the OS manually, use the RAID system configuration utility. The utility can be run during POST which starts immediately after the server is turned on. For details of the utility, see *Chapter 2 (5. RAID System Configuration)* in "*Maintenance Guide*" or the manual supplied with the optional RAID controller.

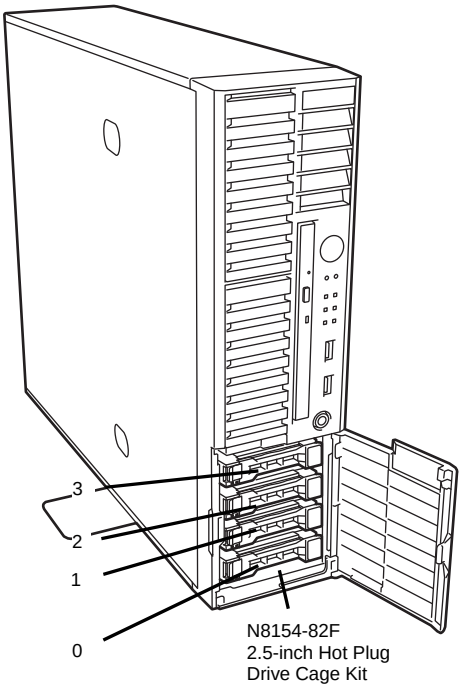
Important
- **Do not change the RAID system mode to hibernate.**
- **A mix of SAS and SATA drives cannot be used within the RAID system.**

HDD slot numbering

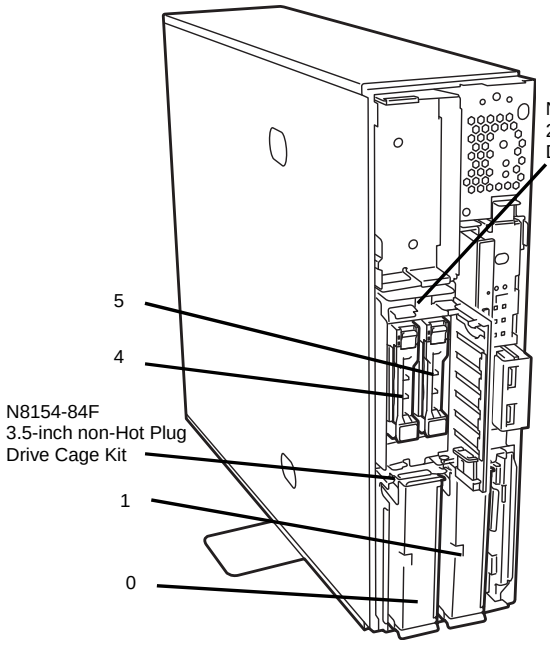
<3.5-inch HDD cage>



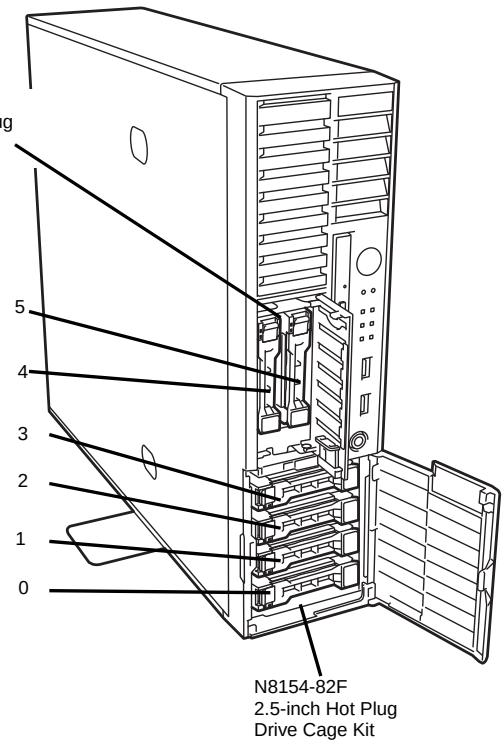
<2.5-inch HDD cage>



<3.5-inch HDD cage and 2.5-inch Hot Plug Drive Cage Kit>



<2.5-inch HDD cage and 2.5-inch Hot Plug Drive Cage Kit>



1.8 Flash Backup Unit for RAID Controller

When using the RAID controller (N8103-176/177/178), the optional FBU is used in order to avoid data loss caused by accidents during a write-back operation.

- For N8103-176/177/178, use N8103-180 Flash Backup Unit

1.8.1 Handling precautions

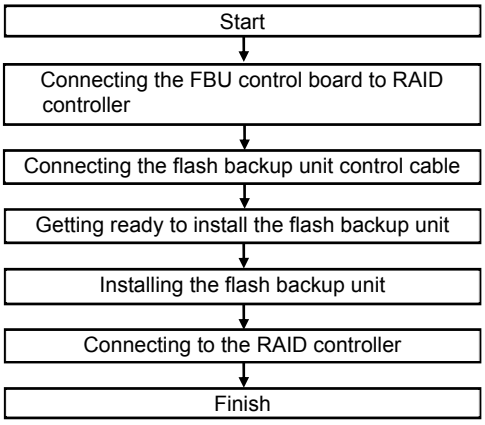
Observe the following precautions to use the extra battery. Ignoring the precautions may damage your assets (data or other devices).

- Use the flash backup unit that supports the RAID controller which is used.
- Before installing the flash backup unit, touch the metal frame part of the server to discharge the static electricity from your body.
- Do not drop or bump the flash backup unit.
- For recycling and disposing the flash backup unit, refer to the manual that comes with it.

1.8.2 Installing the Flash Backup Unit

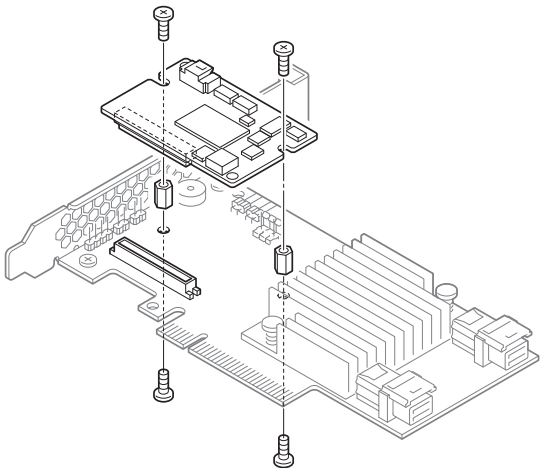
Install the flash backup unit by using the following procedure.

Note Read through the manual supplied with the RAID controller and flash backup unit before installation.



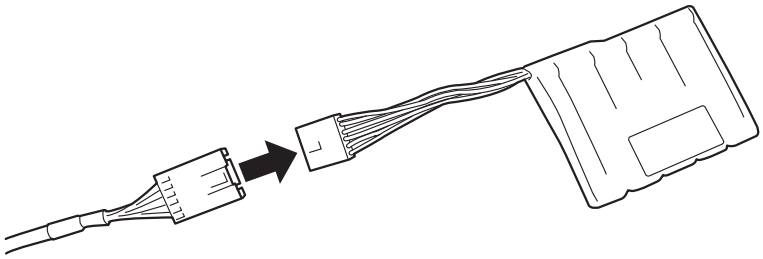
Connecting the FBU control board to RAID controller

Install the control board of the flash backup unit to the RAID controller while referring to the User's Guide for the RAID controller.



Connecting the flash backup unit control cable

To connect the flash backup unit control cable into the flash backup unit, see the following figure. Check the form of the connector and connect the cable straight into the connector.

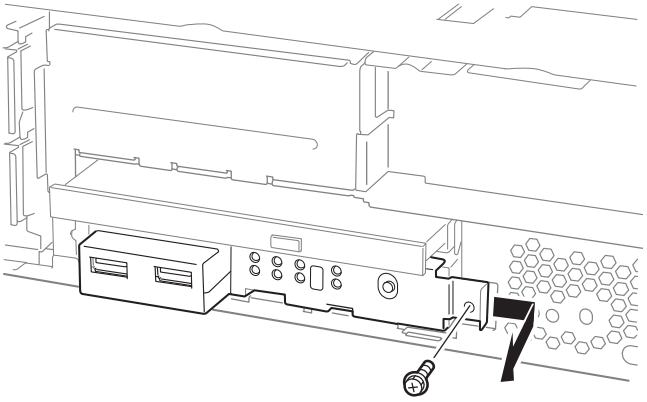


Getting ready to install the flash backup unit

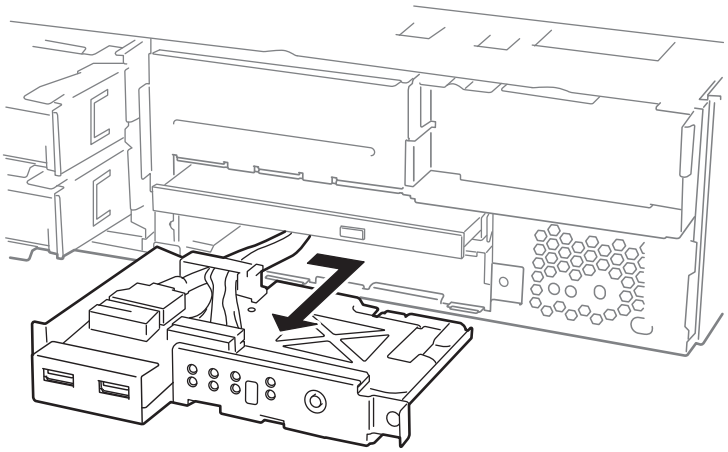
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and the front bezel, see *Chapter 2 (1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel)*.

Installing the flash backup unit

1. Remove one screw from the front panel bracket.

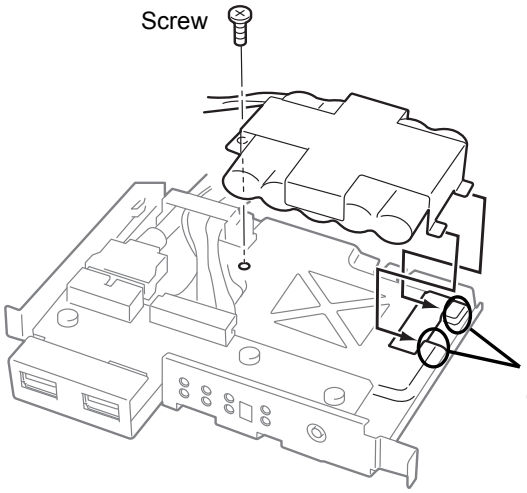


2. Slide the front panel bracket slightly toward the right, and then pull the bracket toward the front to remove it.

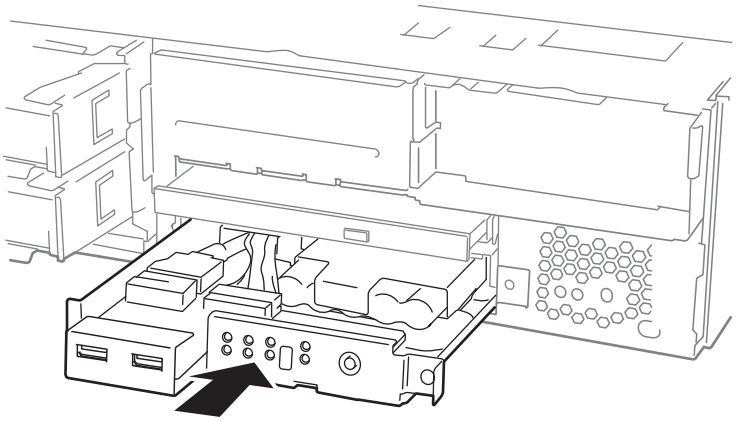


Important **Be careful that the cable does not come out from the connector when pulling the front panel bracket.**

3. Mount the flash backup unit on the RAID controller by using the anchoring bracket that comes with the RAID controller and secure it by using one screw.



4. Draw the cable into the chassis and mount the front panel bracket on the server chassis in the reverse order of the removal procedure.

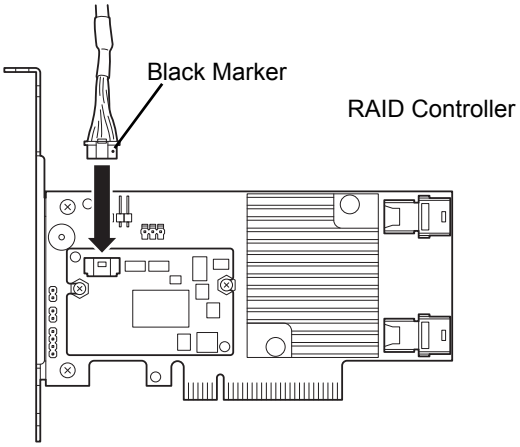


Connecting to a RAID Controller

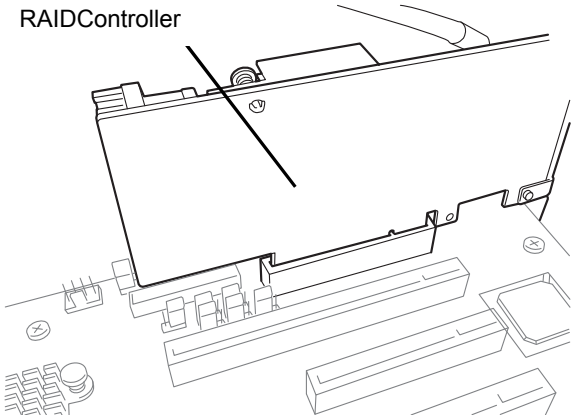
1. Connect another connector of the flash backup unit control cable to the RAID controller. Check the marker of the connector and connect the cable straight into the connector. Be careful not to press it in at an angle when connecting.

Position of the connector

Connect the cable to the connector shown in the figure below.



2. Install the RAID controller into the PCI slot #4 and fix it in place. Be careful not to disconnect the cable.



3. Connect the cables and components that you removed.

1.8.3 Removal

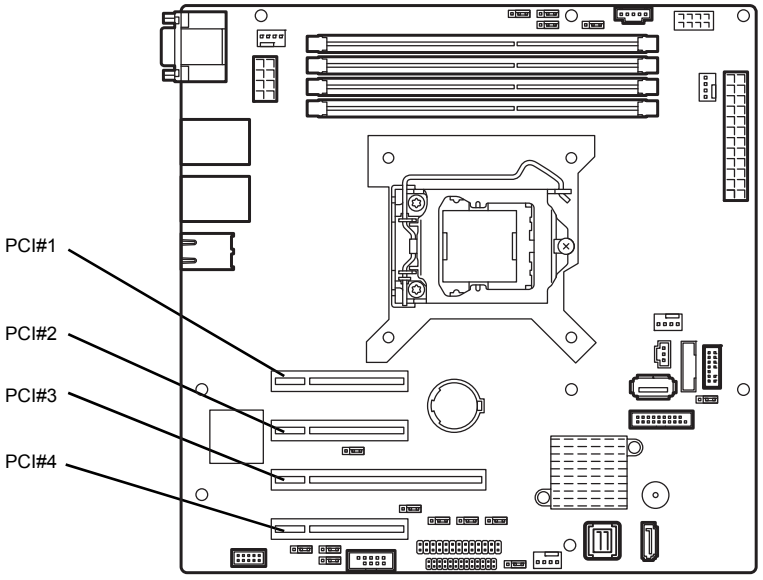
To remove the flash backup unit, reverse the installation procedure.

1.9 PCI Card

This server provides four slots where PCI cards can be installed.

Important

- **To avoid static electricity, see *Chapter 1 (1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices.***
- **When installing PCI cards, see *Chapter 2 (1.9.2 List of optional devices and installation slots)* to prevent mistaking slot numbers.**
- **Configure the Option ROM in [PCI Configuration] according to the application of the installed PCI card. For the configuration instructions, see *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".**
  Disabling the deployment of Option ROM can not only prevent memory consumption but also shorten the startup time.



Motherboard

1.9.1 Notes

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

- Do not touch the terminals of 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.
- The search order for PCI bus slot on boot is as follows.
  Slot 3 → Slot 1 → Slot 4 → Slot 2
- 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 System BIOS utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

PCI device	PCI bus number	Device number	Function number
Onboard NIC1	8Fh	0	0
Onboard NIC2	8Fh	0	1
Slot 1	60h	×	×
Slot 2	30h	×	×
Slot 3	1h	×	×
Slot 4	90h	×	×

- Set **Disabled** for the optional ROM of a LAN device not to be booted by using the BIOS Setup utility.
- If an additional bootable PCI card (such as a RAID Controller, SAS controller, or LAN card) is installed, the boot priority may change. After the installation, set the boot priority in the **Boot** menu of the BIOS Setup utility.
- If a bootable device such as a PCI card or USB device is added, the boot order may change.
  In the BIOS Setup utility, select **Hard Drive BBS Priorities** from the **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 Controller is installed.

1.9.2 List of optional devices and installation slots

Model name	Product name		PCI Express 3.0				Remark	
			PCI#1	PCI#2	PCI#3	PCI#4		
		PCI slot performance*1	X2 lane	X1 lane	x16 lane	x4 lane		
		PCI slot size	Low Profile					
		PCI board socket type*1	x8	x8	x16	x8		
		Size of mountable board	168 mm or less					
N8103-142	SAS controller (card performance: PCI Express 2.0 (x8))		–	○*2	○*2	○	For connecting external devices. Cannot be connected to internal hard disk drives.	
N8103-184	SAS controller (card performance: PCI Express 3.0 (x8))		–	–	○*2	○	For connecting external devices. Cannot be connected to internal hard disk drives.	
N8103-188	RAID controller (RAID 0/1) (card performance: PCI Express 3.0 (x8))		–	–	–	○	For connecting internal hard disk drives Cannot be connected to a Flash Backup Unit.	Cannot be used when a 3.5-inch HDD cage and extra 2.5-inch HDD cage are same time installed.
N8103-176	RAID controller (1GB, RAID 0/1) (card performance: PCI EXPRESS 3.0 (x8))		–	–	–	○	For connecting internal hard disk drives Can be connected to a Flash Backup Unit (N8103-180)	–
N8103-177*3	RAID controller (1GB, RAID 0/1/5/6) (card performance: PCI Express 3.0 (x8))		–	–	–	○		Cannot be used when a 3.5-inch HDD cage is installed.
N8103-178*3	RAID controller (2GB, RAID 0/1/5/6) (card performance: PCI Express 3.0 (x8))		–	–	–	○		
N8104-150	1000BASE-T connection board (1ch) (card performance: PCI Express 2.0 (x1))		○	○	○	○	For additional LAN Card type: PCI Express 2.0(x4)	
N8104-151	1000BASE-T connection board (2ch) (card performance: PCI Express 2.0 (x1))		○	○	○	○	For additional LAN Card type: PCI Express 2.0(x4)	
N8104-152	1000BASE-T connection board (4ch) (card performance: PCI Express 2.0 (x4))		○*2	○*2	–	○	For additional LAN. LAN cables with boot cannot be used.	
N8104-149	10GBASE Adapter (SFP+/2ch) (card performance: PCI Express 2.0 (x8))		–	–	○*2	○	For additional LAN. Prepare SFP+ module N8104-129 if needed.	
N8104-153	10GBASE Adapter (2ch) (card performance: PCI Express 2.0 (x8))		–	–	○*2	○	For additional LAN. The card shape is PCI Express 2.1 (x4).	
N8104-157*5	10GBASE-T connection board (2ch) (card performance: PCI Express 3.0 (x8))		–	–	○*2	○	For additional LAN The card shape is PCI Express 3.0 (x8).	
N8105-48	Graphics Accelerator (card performance: PCI Express 2.0 (x16))		–	–	○*2	–	For connecting dual monitors	
N8117-01A	Expansion RS-232C connector kit*4		○	○	○	○	For additional serial port (RS-232C)	

○ Can be installed – Cannot be installed

*1 Lane: Indicates the transfer performance (transfer bandwidth).
<e.g.> 1 lane = 2.5 Gbps (unidirectional), 4 lanes = 10 Gbps (unidirectional)
Socket: Indicates the connector size. A card up to the number of sockets can be connected.
<e.g.> x4 socket = x1 card, x4 card can be installed. x8 card cannot be installed.

*2 Cannot be used when the high-temperature resistant option is installed.

*3 Cannot be used when N8154-84 3.5-inch HDD cage is mounted.

*4 The N8117-01A expansion RS-232C connector kit contains two types of cables. This server uses the RS-232C cable (B).

*5 Support time is uncertain.

- 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.
- Even if you use PCI cards of a higher performance than the PCI slot, the operation of the device will be that of the PCI slot.

About the standard network

You can use functional equivalents of AFT/SFT/ALB teaming and bonding with the standard network and the following LAN cards:
N8104-150, N8104-151 and N8104-152

(1) PCI slot limitations

See the table below for the limitations on installing PCI cards (due to the number of interrupts that can be processed in the system) depending on the installed processor.

Processor	RAID controller required	PCI slot limitations
Pentium G4400	Yes	● Do not install the following PCI cards. N8103-184 SAS Controller N8104-152 Quad Port 1000BASE-T Adapter ● Up to one card from the following can be installed. N8104-153 Dual Port 10GBASE-T Adapter N8104-149 10GBASE SFP+ Adapter (SFP+/2ch) N8104-151 Dual Port 1000BASE-T Adapter N8104-150 1000BASE-T Adapter ● Up to one card of N8104-153 Dual Port 10GBASE-T Adapter can be installed. ● No limitations for other cards.
	No	● Up to one of either N8103-184 SAS Controller or N8104-152 Quad Port 1000BASE-T Adapter can be installed and up to one card from the following can be installed. Then, no limitations for other cards. N8104-153 Dual Port 10GBASE-T Adapter N8104-149 10GBASE SFP+ Adapter (SFP+/2ch) N8104-151 Dual Port 1000BASE-T Adapter N8104-150 1000BASE-T Adapter ● No limitations when N8103-184 SAS Controller or N8104-152 Quad Port 1000BASE-T Adapter is not installed, except N8104-153 as noted below. ● Up to one card from N8103-184 SAS Controller and N8104-153 Dual Port 10GBASE-T Adapter can be installed.
Xeon E3-1220v5	Yes	● Up to two cards from the following can be installed. N8103-184 SAS Controller (up to one) N8104-152 Quad Port 1000BASE-T Adapter ● Up to one card from N8103-184 SAS Controller and N8104-153 Dual Port 10GBASE-T Adapter can be installed. ● No limitations for other cards.
	No	● Up to one card from N8103-184 SAS Controller and N8104-153 Dual Port 10GBASE-T Adapter can be installed. ● No limitations for other cards.
Other processors	–	● Up to one card from N8103-184 SAS Controller and N8104-153 Dual Port 10GBASE-T Adapter can be installed. ● No limitations for other cards.

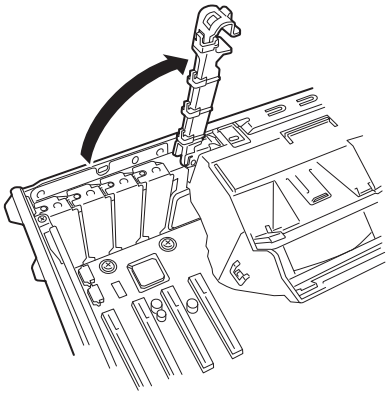
(a) PCI slot limitations for VMware

- Do not install N8104-152 Quad Port 1000BASE-T Adapter when any of the following cards is installed.
  N8104-153 Dual Port 10GBASE-T Adapter
  N8104-149 10GBASE SFP+ Adapter (SFP+/2ch)
- The number of installable N8104-150/-151 is limited up to one.
- For the configuration limitation for VMware ESXi, refer to the following documents.
  VMware ESXi5.5
  https://www.vmware.com/pdf/vsphere5/r55/vsphere-55-configuration-maximums.pdf
  VMware ESXi6.0
  https://www.vmware.com/pdf/vsphere6/r60/vsphere-60-configuration-maximums.pdf

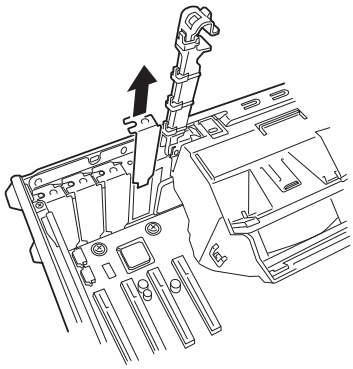
1.9.3 Installation

Install a PCI card to connect to a PCI slot by using the following procedure.

1. Before installation, make sure the switch or jumper settings on the PCI card are proper according to the instruction manual supplied with the card if necessary.
2. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
3. To remove the side cover, see *Chapter 2 (1.3* Removing the Side Cover*)*.
4. Open the PCI slot retention latch.

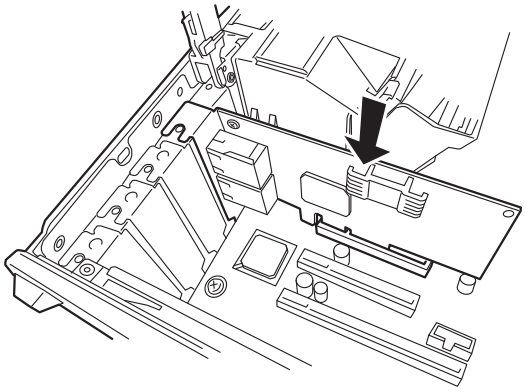


5. Remove the blank cover aligned with the slot where you will install a card.



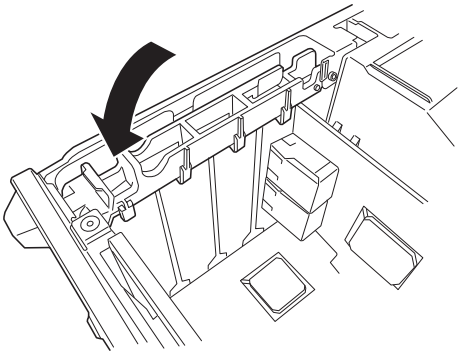
Important **Keep the removed blank cover for future use.**

6. Face the component side of the card toward the bottom of the server. When the rear panel of the card is firmly engaged with the spring, firmly press the card into the slot so that the component parts of the card securely connect to the slot.



Important **If you have trouble installing the card, remove the card once and try again. If you apply excessive pressure on the card, there is a risk of breaking the card.**

7. Close the PCI slot retention latch.
   When it locks, you hear a clicking sound.



8. Assemble the server.
9. Turn on the server and confirm that no error messages are displayed in POST.
   If an error message is displayed, take notes on the message and ask your sales representative.

1.9.4 Configuration after installing

Depending on the type of card installed, you need to use a utility, such as the BIOS setup utility, a setup utility provided with the card, following installation to modify server settings.

Follow the instructions in the manual provided with the card to specify the correct settings.

After turning the server power on, the PCI bus numbers are scanned in ascending order. If the option ROM installed in the card contains a BIOS utility, the startup message (banner) is displayed in ascending order of the PCI bus numbers.

1.9.5 Removal

Remove a PCI card connected to a PCI slot by using the following procedure.

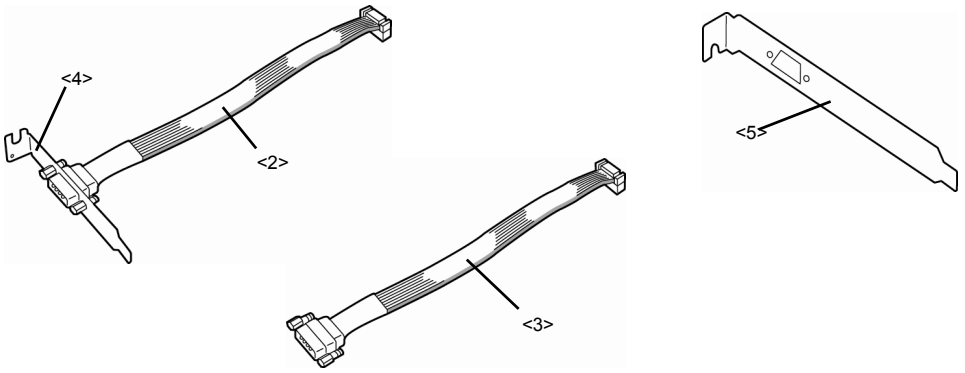
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover, see *Chapter 2 (1.3 Removing the Side Cover)*.
3. See installation step 4 in *Chapter 2 (1.9.3 Installation)* to open the PCI slot retention.
4. Remove the card.
5. Attach the blank cover, and see installation step 7 in *Chapter 2 (1.9.3 Installation)* to close the PCI slot retention.
6. Assemble the server.
7. Turn on the server and confirm that no error messages are displayed in POST.
   If an error message is displayed, take notes on the message and ask your sales representative.

1.9.6 Installing the N8117-01A extra RS-232C connector kit

Install a PCI card to connect to the PCI slot by using the following procedure. For details, refer to the instruction manual supplied with the connector kit.

The component parts for N8117-01A are as follows:

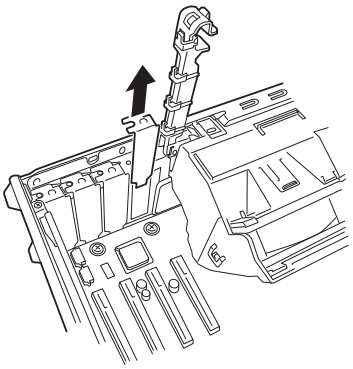
Item no.	Item name	Specification	Amount	Remarks
<1>	RS-232C connector Kit User's Guide	856-125671-002	1	
<2>	RS-232C cable (A)	804-063264-020	1	Not available for this server
<3>	RS-232C cable (B)	804-062746-820	1	
<4>	PCI bracket (1)	243-112122-001	1	Preinstalled to cable
<5>	PCI bracket (2)	243-112122-002	1	For full height PCI



This product uses a combination of items <3> and <4>.

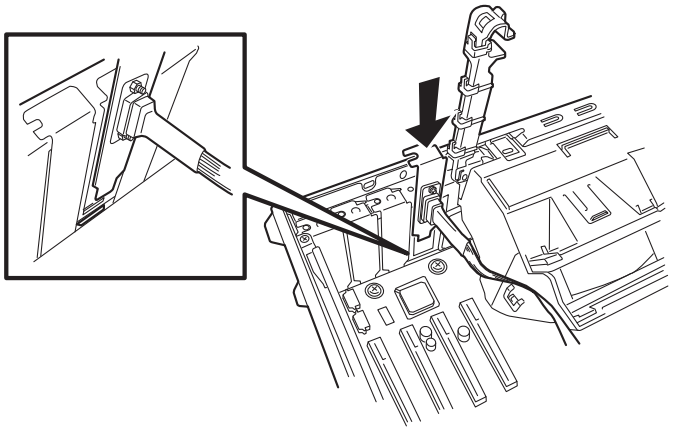
Follow the procedure below to install the kit.

1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover, see *Chapter 2 (1.3 Removing the Side Cover)*.
3. Assemble <3> RS-232C cable (B) and <4> PCI bracket (1).
4. To open the PCI slot retention latch, see *Chapter 2 (1.9.3 Installation)*.
5. Remove the expansion blank cover aligned with the slot where you will install a card.



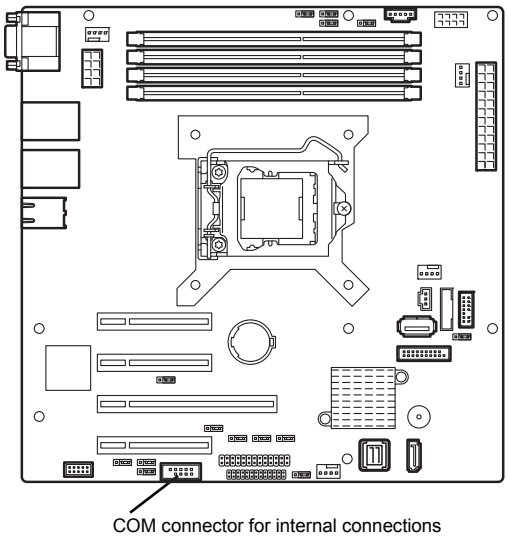
Important **Keep the removed blank cover for future use.**

6. Make sure that you are properly inserting the bracket edge into the frame guide, and attach it securely.



7. Arrange the cable so as not to buffer other PCI cards, and connect to the COM connector used for internal connections in the motherboard.
See the following for the position of the COM connector for internal connections.

Important **Note the direction of the connector when connecting the cable.**

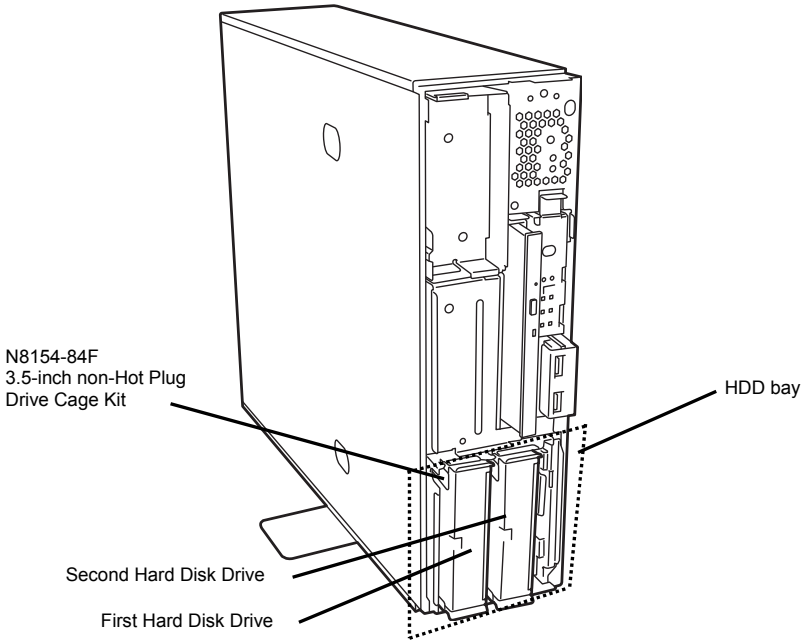


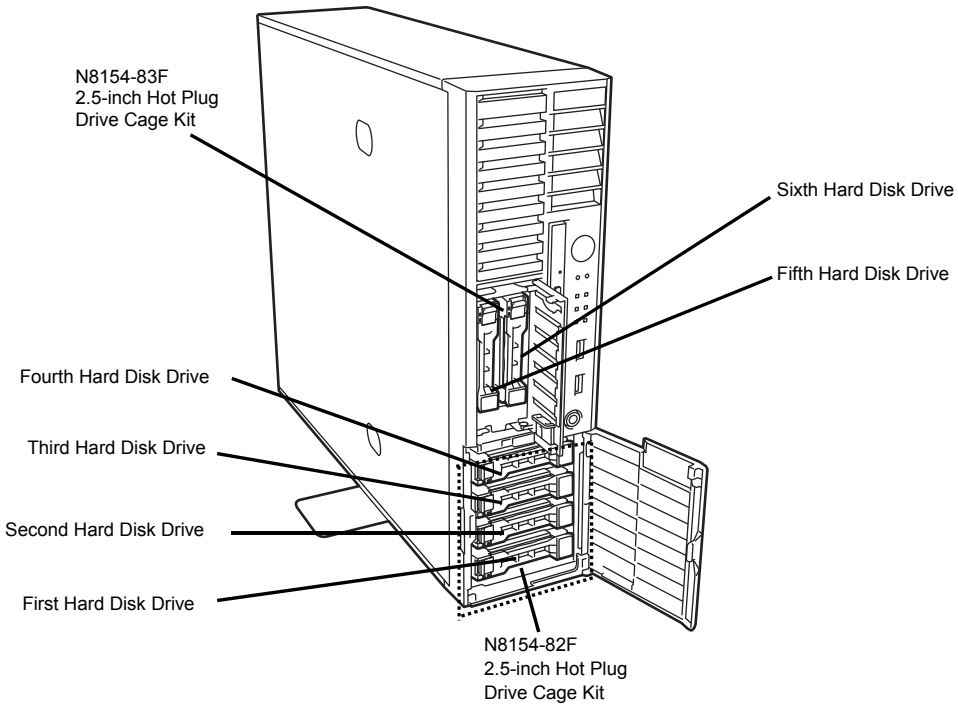
8. Reassemble the server.

1.10 HDD Cages

The N8154-84F 3.5-inch non-Hot Plug Drive Cage Kit (3.5-inch HDD cage) or N8154-82F 2.5-inch Hot Plug Drive Cage Kit (2.5-inch HDD cage) can be installed in the HDD bay in this server. The N8154-83F 2.5-inch Hot Plug Drive Cage Kit (extra 2.5-inch HDD cage) can be installed in 3.5-inch expansion bay 1.

Important **Use hard disk drives provided by NEC.**

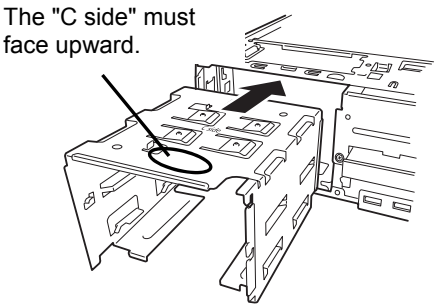




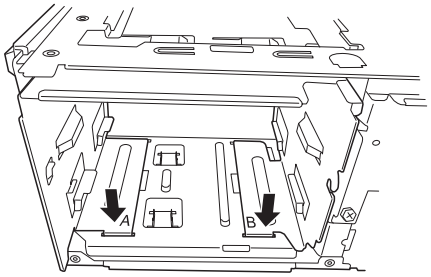
1.10.1 Installing a 3.5-inch HDD cage and hard disk drives

Install a 3.5-inch HDD cage in the server by using the following procedure.

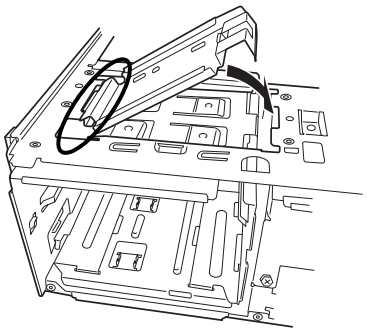
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and the front bezel, see *Chapter 2 (1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel*).
3. Insert the HDD cage into the HDD bay.



4. Push the HDD cage so that its tabs A and B come fit into the slits on the chassis.

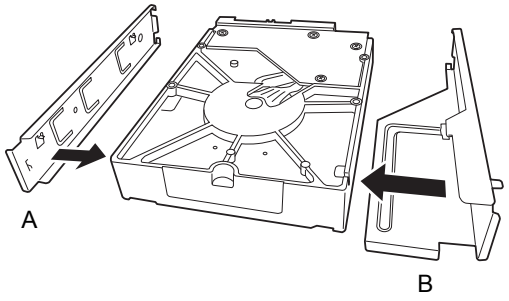


5. Insert one side of the lock plate into the slits of the chassis. Push the lock plate in the direction shown by the arrow to lock the HDD cage.

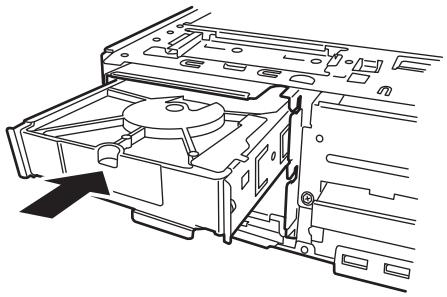


Important Make sure to insert the lock plate into the groove of the chassis correctly. Incorrect installation causes the removal of the side cover to be impossible.

6. Mount the HDD trays that come with the HDD cage from both sides of the 3.5-inch hard disk drive. Mount the tray marked "A" on the left side, and the tray marked "B" on the right side. Mount the hard disk drive so that the flat face of the hard disk drive faces downward.



7. Insert the hard disk drive attached to the tray into the slot of the HDD cage.
   When it is pushed to the end, it locks with a click.



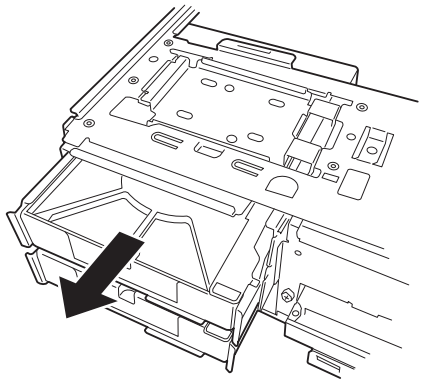
8. Connect the signal cable and the power cable to the hard disk drive. Use the signal cable that come with the HDD cage. Use the power cable connected to the motherboard in advance. For details about cable connection, see *Chapter 2* (*1.14.1 Internal interface cables)*.
9. Attach the front bezel and the side cover you removed in step 2.

1.10.2 Removing hard disk drives

Remove the hard disk drives by using the following procedure.

Important **When disposing of the hard disk drives, follow the instructions described in *Chapter 1* (*1.5 Transfer, movement, and disposal*) in *Safety Precautions and Regulatory Notices*.**

1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and the front bezel, see *Chapter 2 (1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel*).
3. Disconnect the power cable and signal cable from the hard disk drives.
4. Press the part shown in the figure to unlock the HDD tray, and then remove the hard disk drive out from the HDD cage.



5. Assemble the server.

1.10.3 Installing a 2.5-inch HDD cage and hard disk drives

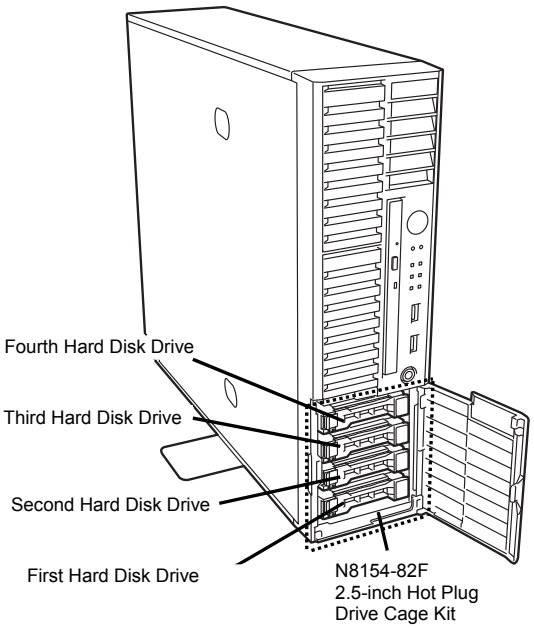
When a 2.5-inch HDD cage is installed in this server, four to six SAS/SATA hard disk drives or SSDs can be installed.

Combining SATA/SAS Hard Disk Drives and SSDs

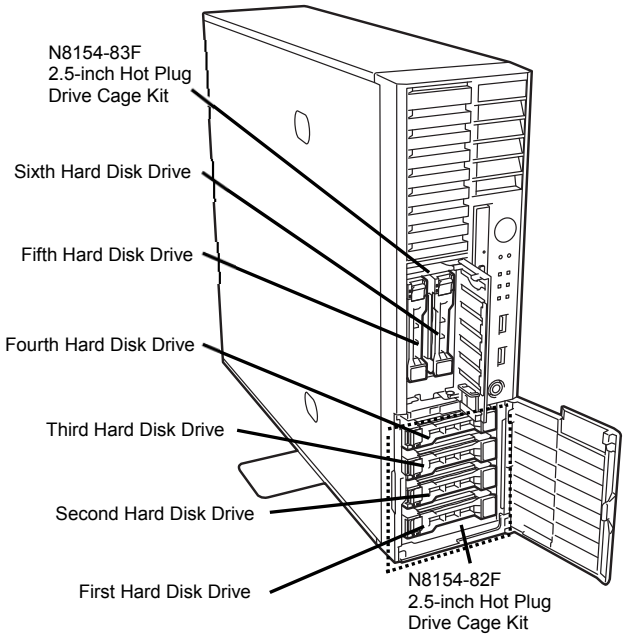
- An optional RAID controller is required to use SAS hard disk drives together with SSDs.
- An optional RAID controller is required to install five or more hard disk drives.
- You cannot mix them within the same RAID array.
- You cannot use SAS hard disk drives that have different rotation speeds within the same RAID array.
- Mount SATA/SAS hard disk drives in order from slot 0, and mount the SSDs to the remaining slots.

The N8154-82F 2.5-inch HDD cage can mount a SAS HDD, and the N8154-83F 2.5-inch extra HDD cage can mount a SATA HDD, and vice versa.

Important **Use hard disk drives provided by NEC.**



<The installation of four hard disk drives>

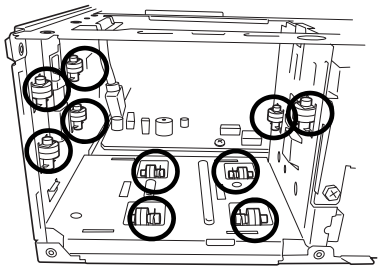


<The installation of six hard disk drives>

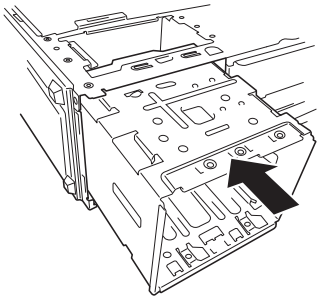
Important **Install the hard disk drives sequentially starting from slot 0.**

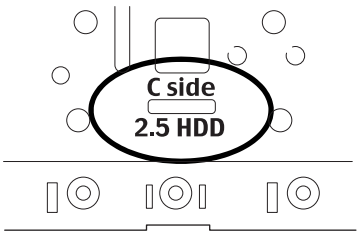
Install a 2.5-inch HDD cage in the server by using the following procedure.

1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and the front bezel, see *Chapter 2 (1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel)*.
3. Mount the rollers that come with the HDD cage on the holes inside the HDD bay (10 places).

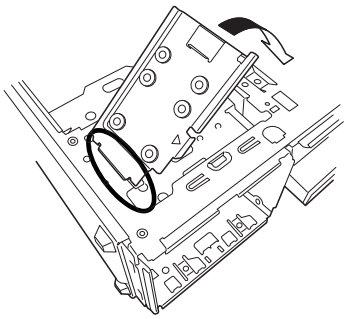


4. Insert the HDD cage into the HDD bay. The "C side" must face upward. Do not push the HDD cage to the end for connecting cables later.





5. Connect the interface cable and power cable to the HDD cage. Use the interface cable that comes with the HDD cage. Use the power cable connected to the motherboard in advance. For details of cable connection, see *Chapter 2* (*2.2.1 Interface cables*) described later.
6. Push the HDD cage to the end. Insert one side of the lock plate into the slit of the chassis. Push the lock plate in the direction shown by the arrow to lock the HDD cage.



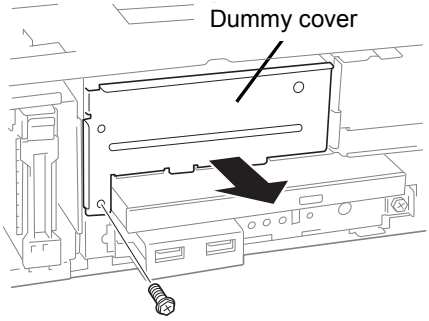
Important Make sure to insert the lock plate into the groove of the chassis correctly. Incorrect installation causes the removal of the side cover to be impossible.

1.10.4 Installing an extra 2.5-inch HDD cage

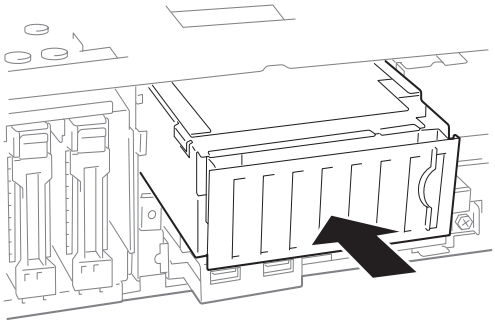
Two hard disks can be added by using an extra 2.5-inch HDD cage (2.5-inch Hot Plug Drive Cage Kit).

Install an extra 2.5-inch HDD cage in the server by using the following procedure.

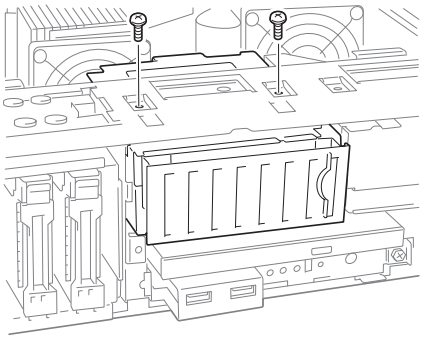
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and the front bezel , see *Chapter 2 (1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel)*.
3. Remove one screw and the dummy cover from the 3.5-inch expansion bay.



4. Insert an extra 2.5-inch HDD cage into the 3.5-inch expansion bay. Do not push the HDD cage to the end for connecting cables later.

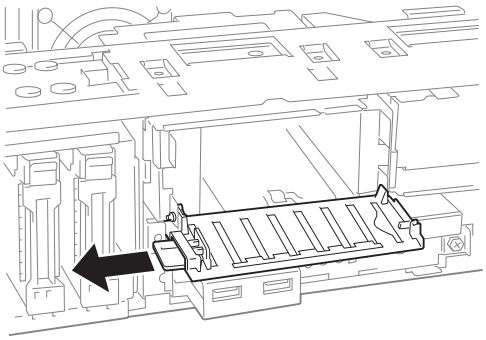


5. Connect the interface cable that comes with the HDD cage and the power cable on the motherboard. For details, see *Chapter 2* (*1.14 Connecting Cables*).
6. Push the HDD cage to the end and secure it with two screws.



7. Attach the front bezel and the side cover.

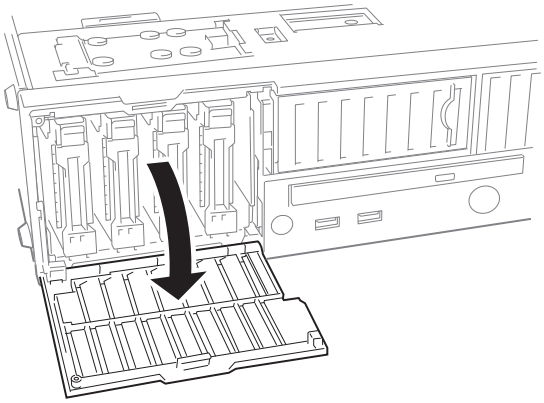
8. Open the front door of the standard 2.5-inch HDD cage. Slide the tab on the bezel of the extra 2.5-inch HDD cage in the direction shown by the arrow, and then remove it from the bezel. Sliding this tab toward the outside of the bezel enables you to lock the bezel of the extra 2.5-inch HDD cage when the front door of the standard 2.5-inch HDD cage is closed.



1.10.5 How to open the extra 2.5-inch HDD cage door

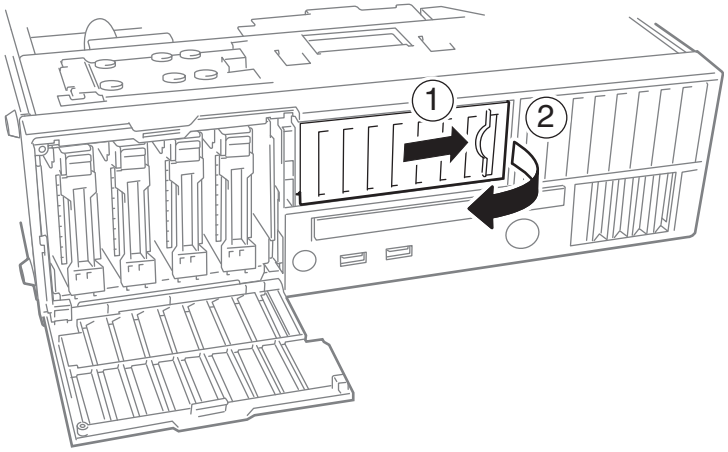
Open the extra 2.5-inch HDD cage in the server by using the following procedure.

1. Unlock and open the door of the 2.5-inch hard disk drive bay.



Note You need to open the 2.5-inch HDD bay door first to open the extra 2.5-inch HDD cage door.

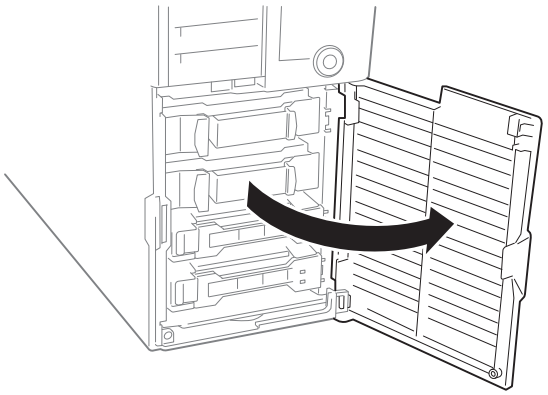
2. Lay down the server horizontally, and then insert your finger into the opening located on the right side of the extra 2.5-inch HDD cage door and push the door to the right (see (1) below) to unlock the door. Pull the door toward the front (see (2) below) to open.



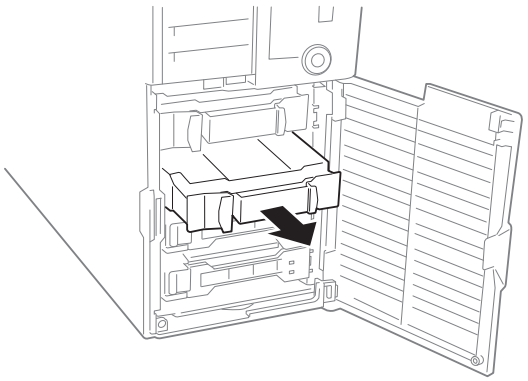
1.10.6 Installing the hard disk drive

Install a 2.5-inch hard disk drive in the server by using the following procedure.

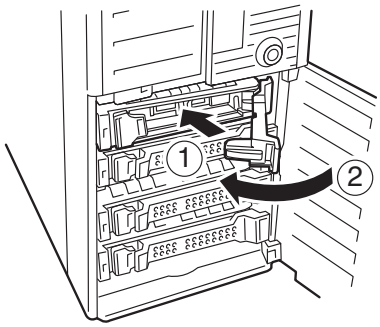
1. Unlock and open the door of the 2.5-inch drive bay.



2. Remove the dummy tray where install the HDD slot.



3. Install the hard disk drives in the HDD cage.
   (1)Fully open the lever on the hard disk drive tray, and then insert the hard disk drive until it comes into contact with back of the HDD cage.
   (2)When finished, close the lever to lock the hard disk drive.



Important

- **Use only the hard disk drives provided by NEC. For details, contact your sales representative.**
- **If you remove two or more hard disk drives while the server is on, the logical drive will be damaged. Remove or replace the hard disk drives one by one.**

Note

Make sure that the orientation of the hard disk drive (tray) is correct before insertion. In addition, make sure that the hook of the lever engages with the frame of the HDD cage when the lever is closed.

4. Close the door and lock it by using the key.

1.11 Optical Disk Drive

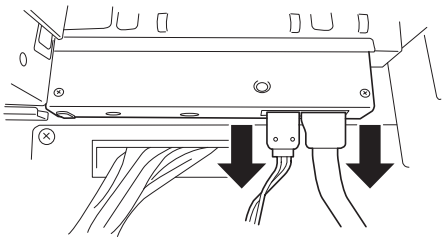
Procedures for replacing the standard optical disk drive with the optional internal DVD Super MULTI drive are described below.

Important **Do not install a third party's drive.**

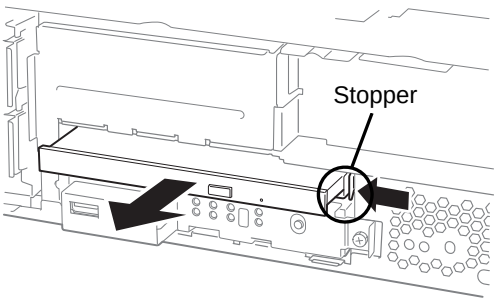
1.11.1 Replacing drives

Follow the procedure below to replace your drive with the optional internal DVD Super MULTI drive.

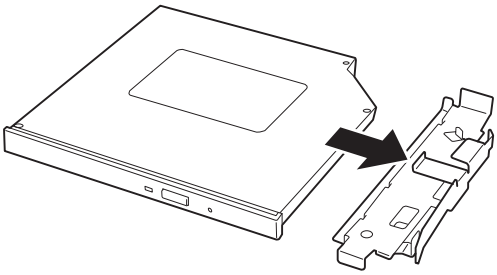
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and the front bezel, see *Chapter 2 (1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel)*.
3. If a device or an extra 2.5-inch HDD cage is installed in the 3.5-inch expansion bay (1), remove it so that you can access the cable connected to the optical disk drive.
4. Disconnect the SATA cable and DC power cable from the optical disk drive.



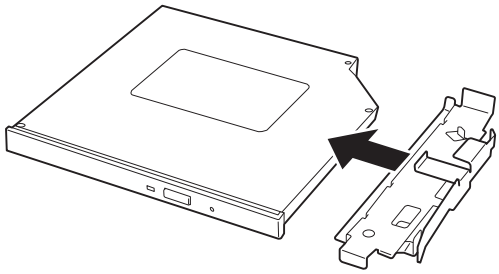
5. Push the stopper on the right side and remove the optical disk drive.



6. Remove the bracket from the optical disk drive.



7. Mount the bracket for the optical disk drive on the DVD SuperMULTI drive.



8. Install the bracket with DVD SuperMULTI drive installed to the server.
9. Connect the SATA cable and DC power cable you disconnected in step 3 to the server.

This completes the installation procedures.

1.11.2 Removal

You can remove the optical disk drive by reversing the installation procedure.

1.12 Backup Devices

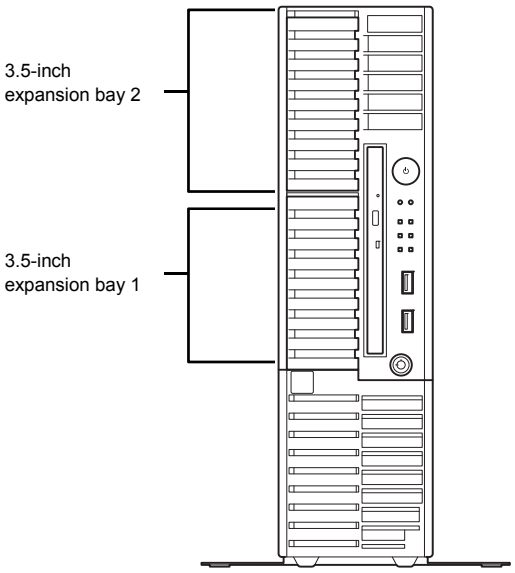
The 3.5-inch expansion bay of the server can contain a backup device such as a magnetic tape drive. In redundant power unit server, install the backup device in 3.5-inch expansion bay 1. Non-redundant power unit server, install the backup device in 3.5-inch expansion bay 2.

Tips

An optional internal USB cable is required to install a backup device.

- K410-352(00) internal USB cable (USB 3.0)

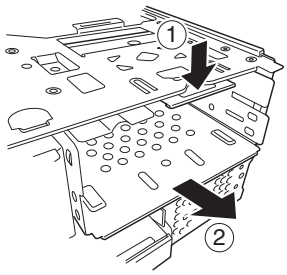
In a server with a redundant power unit or a liquid-cooled server, the backup device cannot be used at the same time as an extra 2.5-inch HDD cage.



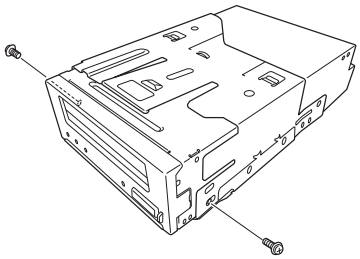
1.12.1 Installation

Install a backup device by using the following procedure.

1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and the front bezel, see *Chapter 2 (1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel)*.
3. Remove the blank cover. Push the tab on the tray and pull out the device tray from the 3.5-inch expansion bay.

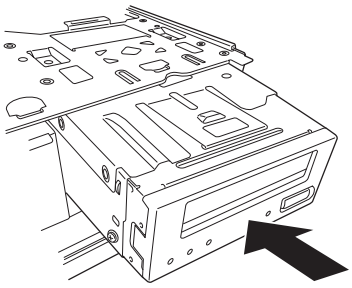


4. Mount the backup device on the device tray. Secure the backup device on the left and right sides by using the two screws that come with the server.



Important **Use two screws supplied with this server to attach the backup device to the tray.**

5. Insert the backup device into chassis.
   Do not push the backup device in completely as the cable has to be connected to the device.



6. Connect the interface cable and power cable to the installed backup device.
   For more information, see *Chapter 2* (*1.14 Connecting Cables)*.
7. Push the device all the way until it locks with a clicking sound.
8. Assemble the server.
9. Install device drivers for installed backup device as needed.
   For more information, refer to the manual provided with the backup device.

1.12.2 Removal

You can remove the backup device by reversing the installation procedure.

1.13 High Temperature Support Option

The N8181-140F high-temperature resistant kit of this server enables you to use this server under the environment of 5°C to 48°C.

When the high-temperature resistant kit is purchased, the following configuration is required.

- SDR is the dedicated setting.
- The cooling fan (for rear) is used as the dedicated fan.
- When N8154-82F 2.5-inch Hot Plug Drive Cage Kit is used, the air duct (for HDD) is added. In this case, length of the card that can be mounted to PCI slots 1 to 3 is limited to 148 mm or shorter.
- Use of N8154-83F 2.5-inch Hot Plug Drive Cage Kit is not allowed.
- The backup device cannot be mounted.

For details, see the User's Guide that comes with N8181-140F High Temperature Resistant Kit.

1.14 Connecting Cables

This section shows an example of internal device cable connection.

1.14.1 Internal interface cables

This section describes the connection of internal interface cables.

Tips The figure shown here primarily describes connections. For more information about the connectors on the motherboard, see *Chapter 1 (4.4 Motherboard)*.

(1) Connecting hard disk drives

This section describes how to connect additional hard disk drives.

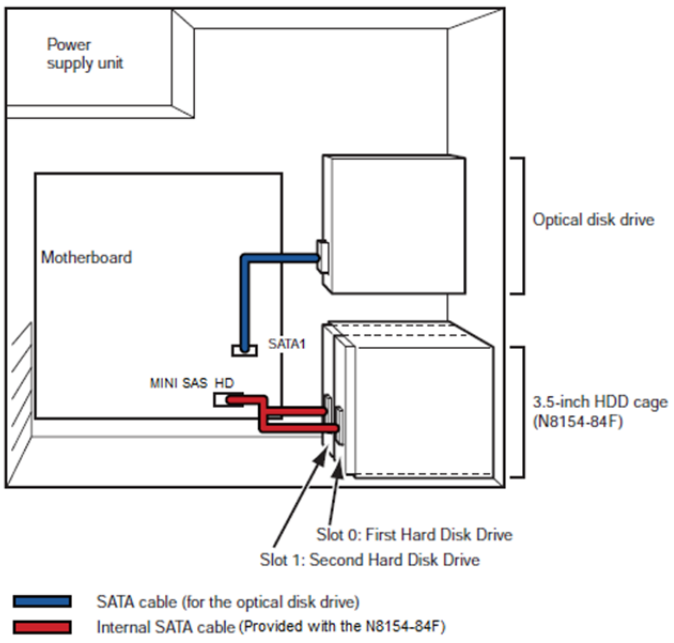
(a) Using 3.5-inch hard disk drives

Connect the cables as in the following figure when adding 3.5-inch hard disk drives. Install the hard disk drives in order from the left side.

Connect the first Hard Disk Drive to SATA0, the second to SATA1.

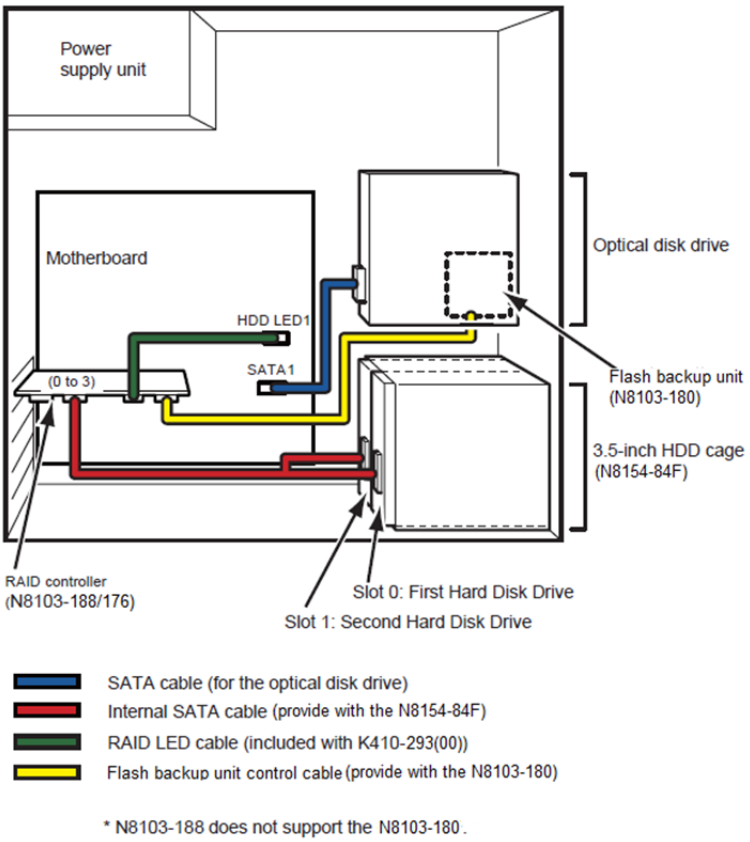
- **Connecting to the miniSAS HD connector on the motherboard**

An internal SATA cable provided with the N8154-84F 3.5-inch non-Hot Plug Drive Cage Kit is required.



You can use the controller on the motherboard to build a RAID system (SW RAID). For more information, see *Chapter 2 (5. RAID System Configuration)* in "*Maintenance Guide*".

- **Adding an optional RAID controller (N8103-188/176)**
  Connecting to a RAID controller (N8103-188/176) requires a SATA cable (provided with the N8154-84F 3.5-inch non-Hot Plug Drive Cage Kit) and RAID LED cable(K410-293(00)) for use with RAID controllers. Install the hard disk drives in order from the left side.

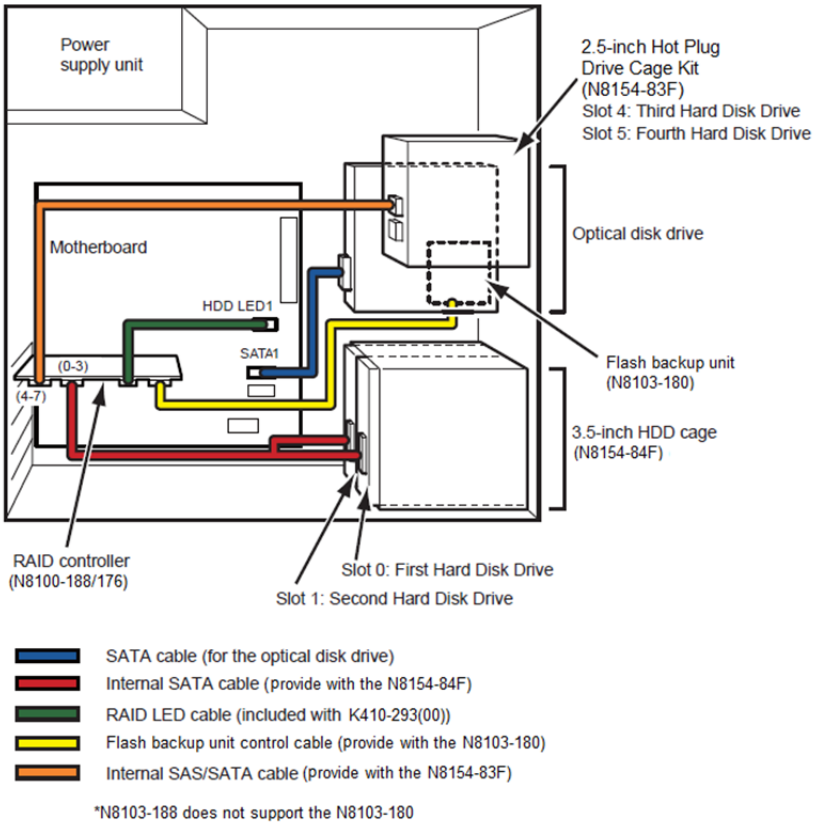


SATA cable (for the optical disk drive)
Internal SATA cable (provide with the N8154-84F)
RAID LED cable (included with K410-293(00))
Flash backup unit control cable (provide with the N8103-180)

* N8103-188 does not support the N8103-180.

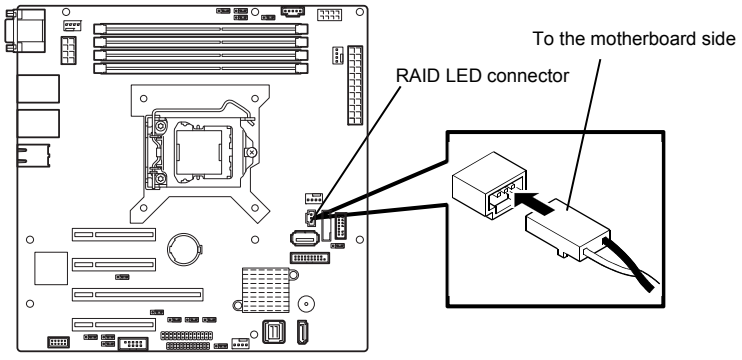
- **Connecting a RAID controller (N8103-176) and an extra 2.5-inch HDD cage (N8154-83F)**
  When a RAID controller (N8103-176) is installed and an 2.5-inch Hot Plug Drive Cage Kit(N8154-83F) is connected, a SATA cable (provided with the N8154-84F 3.5-inch non-Hot Plug Drive Cage Kit), RAID LED cable(K410-293(00)) and a SATA cable (provided with the N8154-83F) are required.

  Install the hard disk drives sequentially starting from the leftmost slot when viewed from the front.

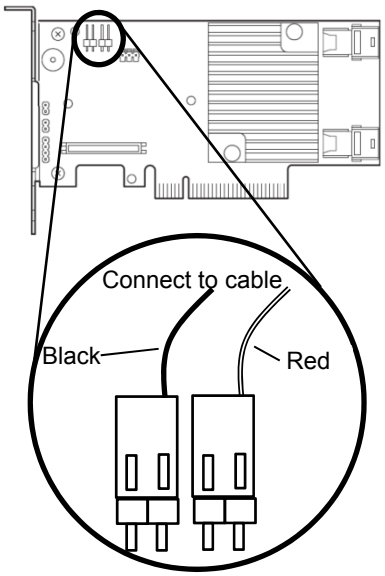


- **About RAID LED cables**
  The Global HDD LED on the front of the equipment shows the access status of hard disk drives that are connected to a RAID controller. To display this status, connect the LED cable that comes with the optional cable K410-293(00).
  Connect the RAID LED connector on the motherboard to the connector on the RAID controller.

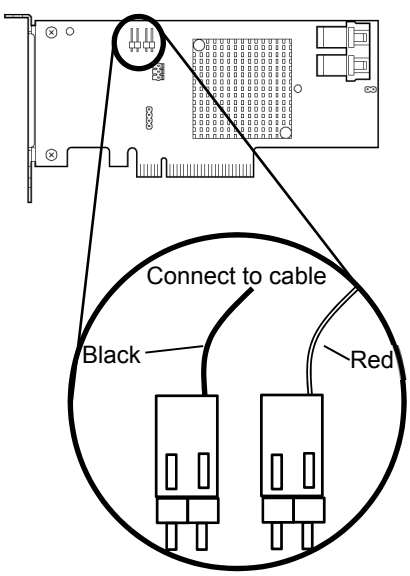
  See the figures below and connect the RAID LED cable to the RAID LED connector of the motherboard.



RAID Controller N8103-176/177/178



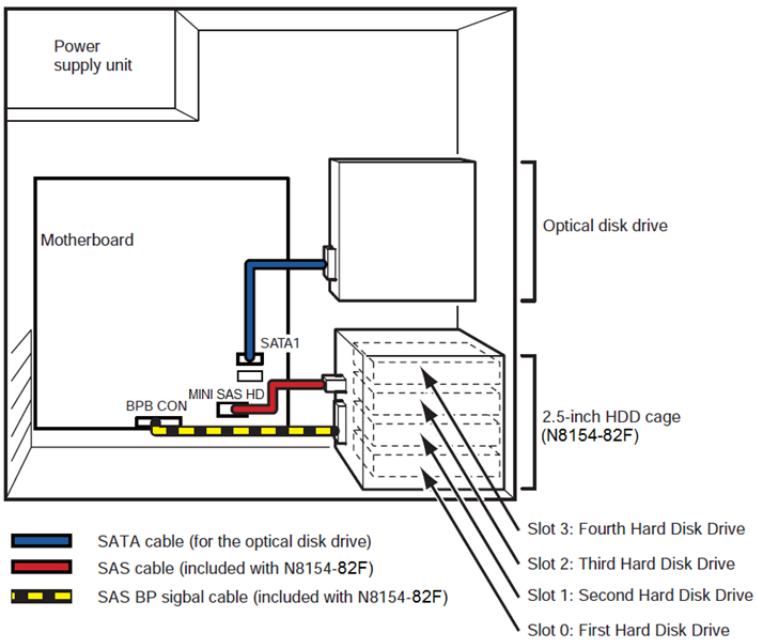
RAID Controller N8103-188



(b) Using 2.5-inch hard disk drives

Connect the cables as in the following figure when adding 2.5-inch hard disk drives. Install the hard disk drives in order from slot 0.

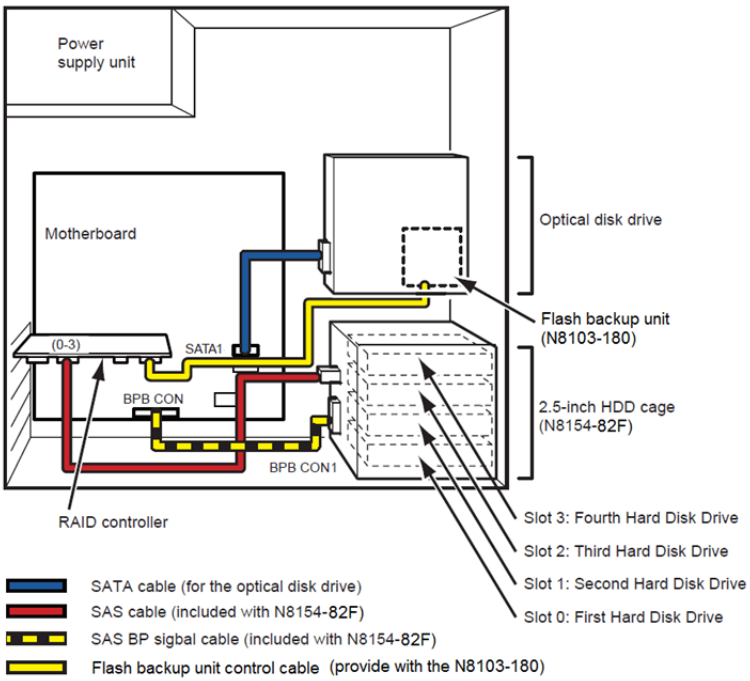
- **Connecting to the MiniSAS HD connector on the motherboard**
  Use the cable that comes with the 2.5-inch Hot Plug Drive Cage Kit. (N8154-82F)
  Install hard disk drives from Slot 0 in ascending order.



- **Adding a RAID controller (N8103-176/177/178/188)**

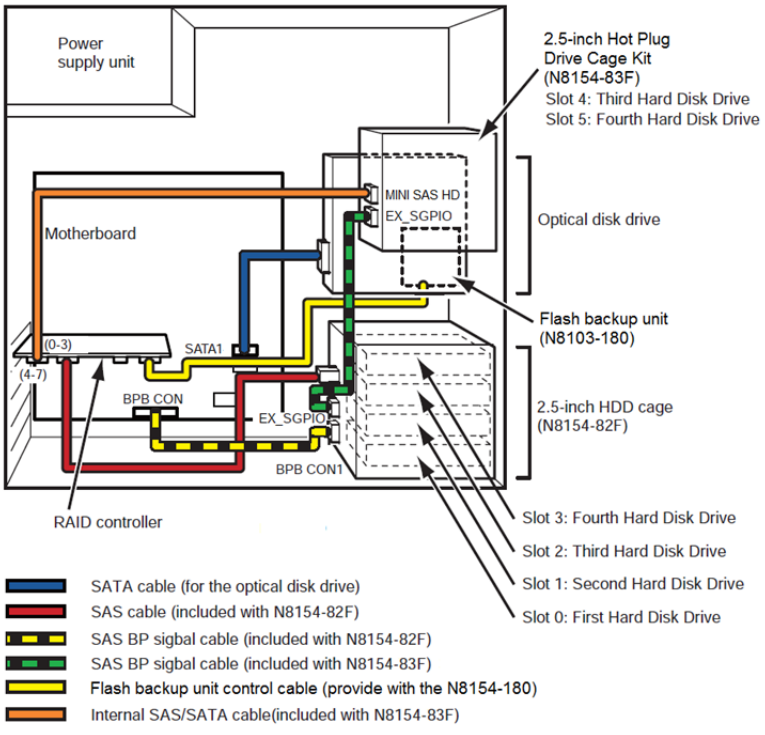
  When SAS or SATA hard disk drives are installed and used in a RAID system with a RAID controller (N8103-176/177/178/188), Use an SATA cable provided with the 2.5-inch Hot Plug Drive Cage and N8154-83F 2.5-inch Hot Plug Drive Cage Kit).

  [Connecting four hard disk drives]



* N8103-188 does not support the extra battery.

  [Connecting six hard disk drives]



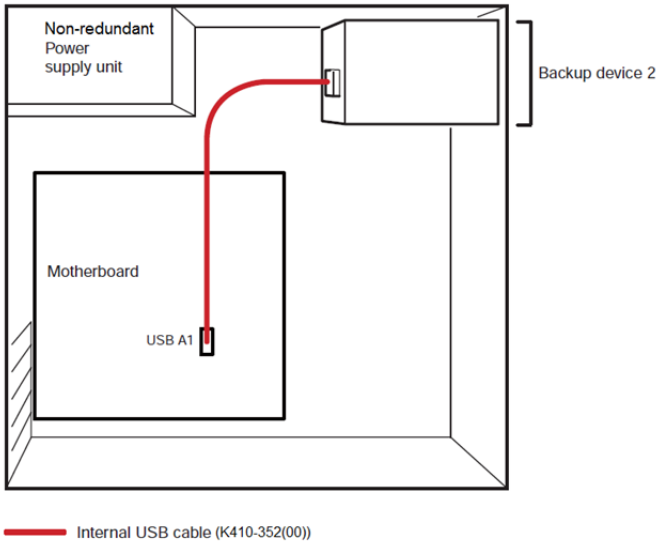
* N8103-188 does not support the extra battery.

(2) Connecting backup devices

The 3.5-inch expansion bay of the server can mount USB devices for internal connection.

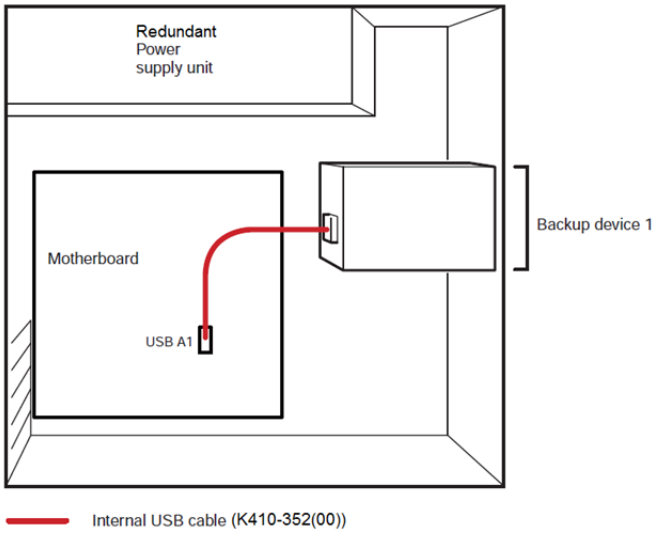
(a) Mounting an internal USB device on non-redundant power supply model

Use the dedicated internal USB cable K410-352(00).



(b) Mounting an internal USB device on redundant power supply model

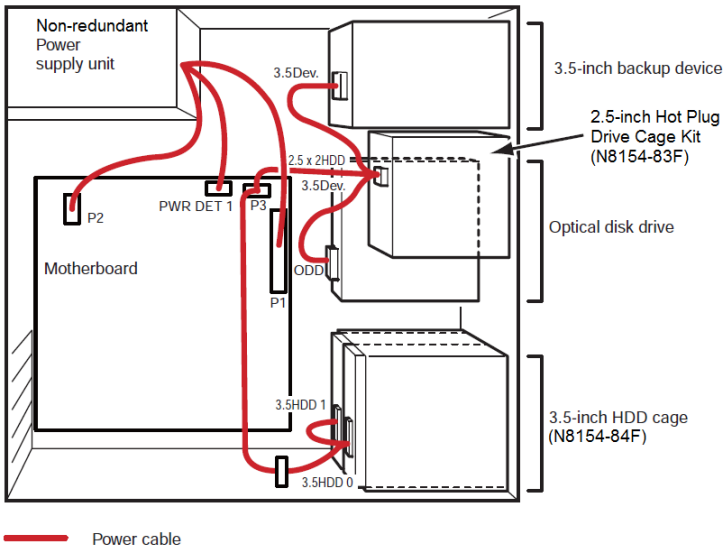
Use the dedicated internal USB cable K410-352(00).



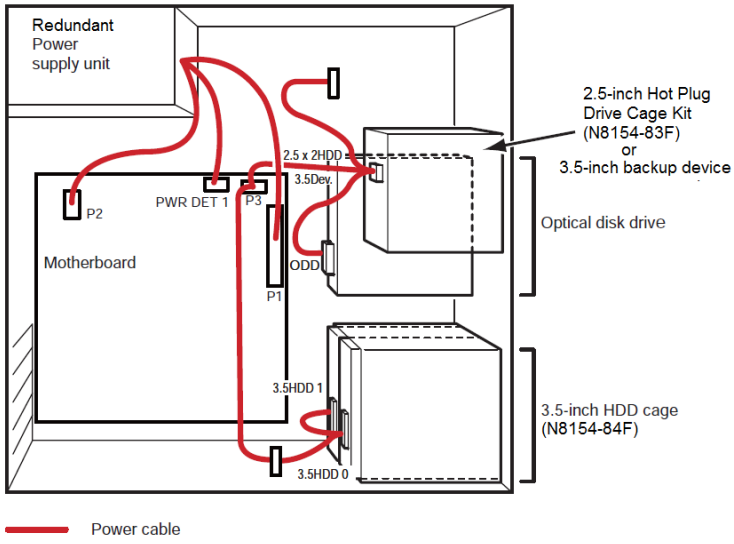
1.14.2 Power cables

The figure below shows an example of connecting the power cables. Power cables other than those shown here are not used by the devices.

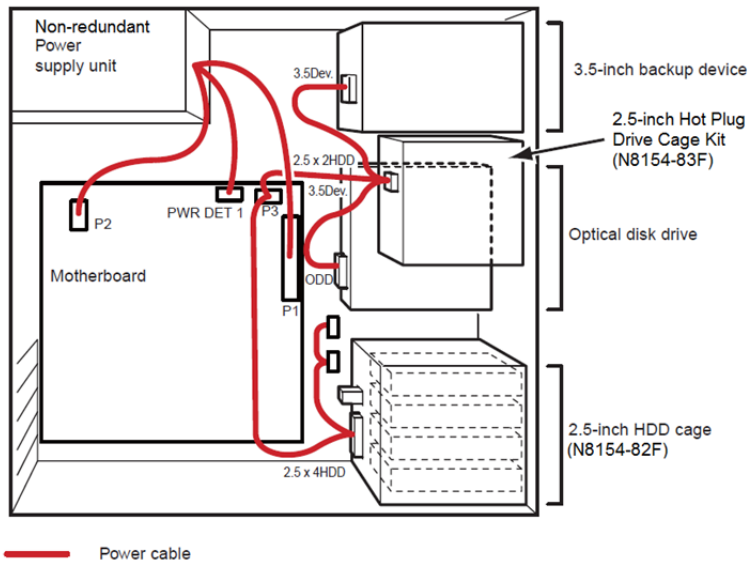
(1) Using 3.5-inch hard disk drives in non-redundant power supply model, an extra 2.5-inch HDD cage and a backup device



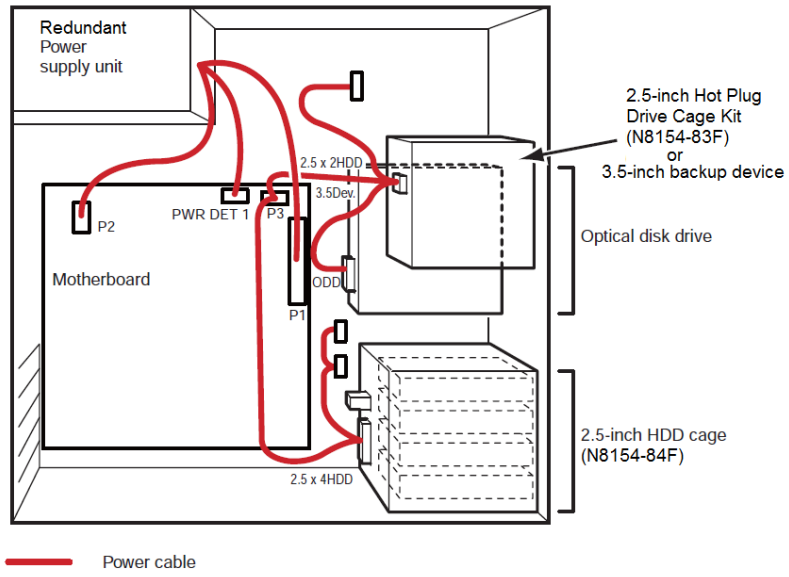
(2) Using 3.5-inch hard disk drives in redundant power supply model, and an extra 2.5-inch HDD cage or a 3.5-inch backup device



(3) Using 2.5-inch hard disk drives in non-redundant power supply model, an extra 2.5-inch HDD cage and a backup device

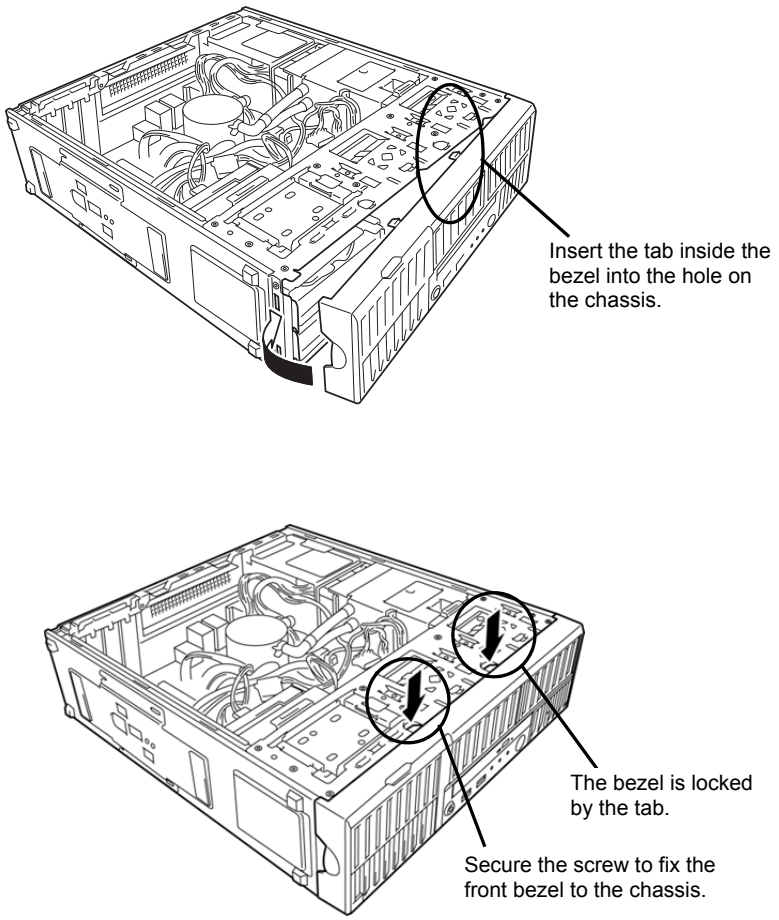


(4) Using 2.5-inch hard disk drives in liquid cooling model, and an extra 2.5-inch HDD cage or 3.5-inch backup device



1.15 Attaching the Front Bezel

You can attach the front bezel by reversing the removal procedure. Insert the tab inside the front bezel into the hole on the front upper side of the server, push the left side of the front bezel toward the server, and then lock the bezel by using the tab on the upper side of the bezel. Secure the screw to fix the bezel onto the chassis.



1.16 Installing the Side Cover

You can attach the side cover by reversing the removal procedure.

Make sure that hooks at both the top and bottom of the side cover are securely inserted in the holes on the server frame. Also make sure that the hooks at the front of the cover are engaged with the server frame when sliding the side cover forward to attach. If they are not engaged with the frame, the cover cannot be secured in place.

2. Installation and Connection

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

2.1 Installation

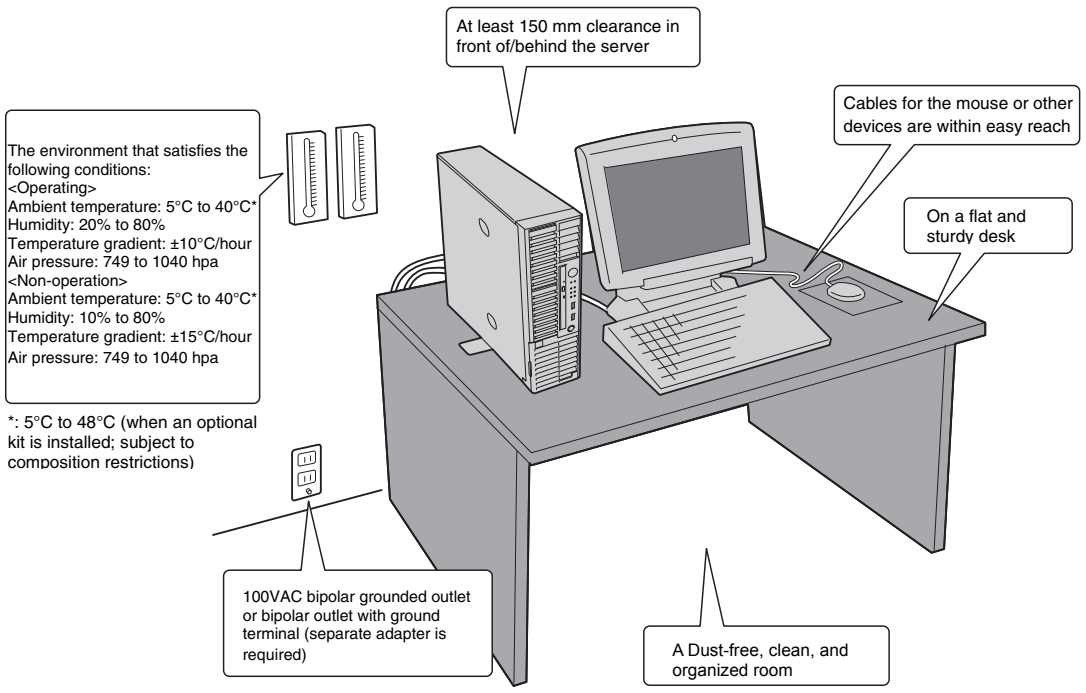
CAUTION

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

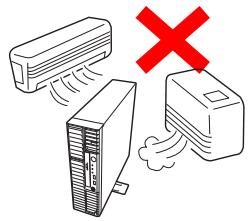
- **Do not attempt to lift the server by gripping the front bezel.**
- **Install and store only in the specified environment.**

The environment suitable for the server is as follows.

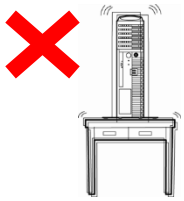
Hold the server firmly, and slowly and gently place it in the position in which it is to be installed.



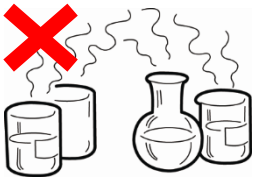
Do not install the server in an environment in which any of the following conditions apply: Installing the server in any of the following conditions will cause the server to malfunction.



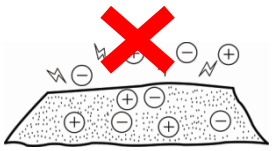
Place of drastic temperature change, near a heater, air conditioner, or refrigerator.



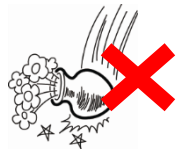
Place where intense vibration may be generated.



Places where corrosive gas is present, such as environments where there is sulfur vapor in the atmosphere, or places where chemicals are nearby or may be accidentally sprayed over.

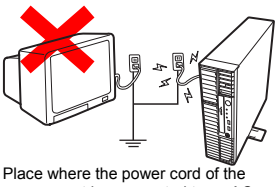


Place where a carpet not subject to anti-static process is laid.

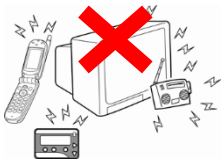


Place where some objects may be fallen.

Places where the power cords or interface cables may be stepped on or tripped over.



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



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

Do not install where there is power supply noise nearby such as contact sparks when turning power on or off during power relays. If you must install the server close to such equipment, separate power cables or install noise filter.

2.1.1 Preparation for installation

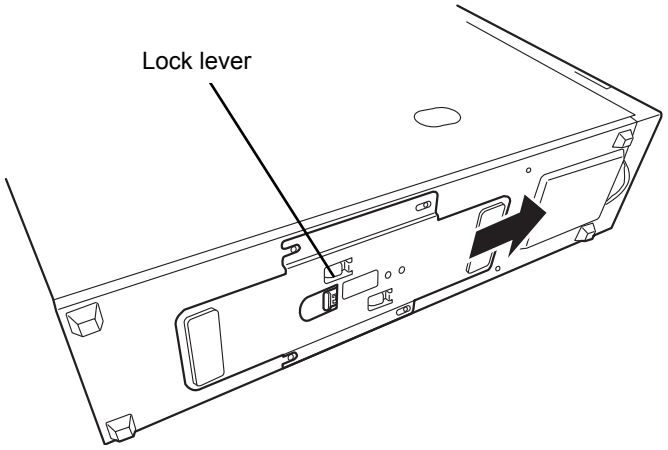
(1) Mounting for vertical

For vertical use of the server, set the stabilizer attached to the bottom of the server as instructed below.

Removing/installing the stabilizer

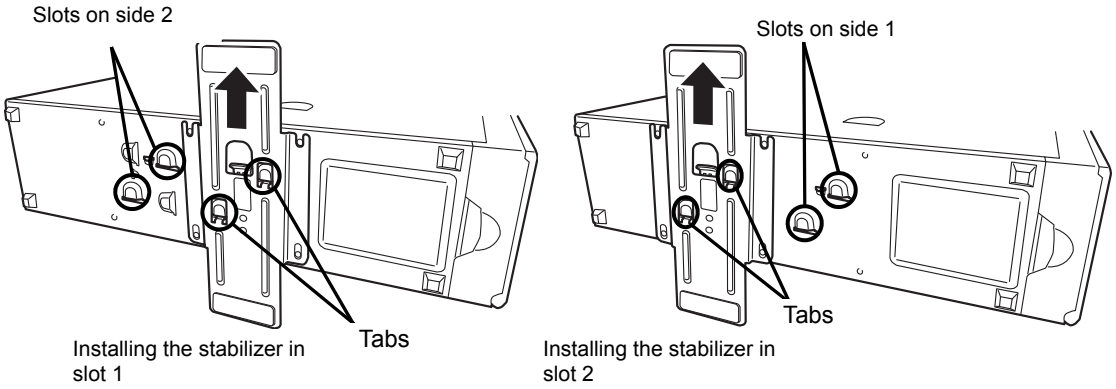
Removing the stabilizer

Release the lock lever and slide it in the direction of the arrow to remove.

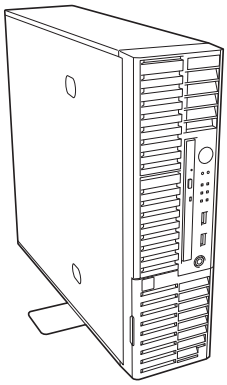


Installing the stabilizer

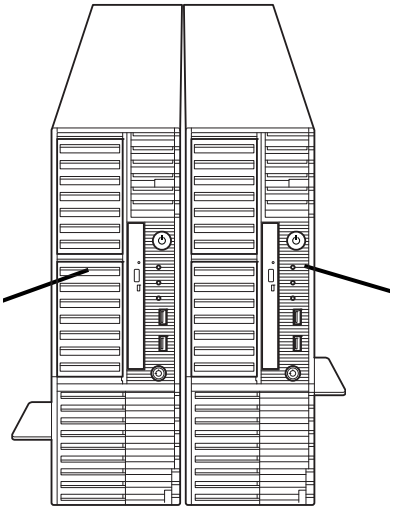
Insert the tab of the stabilizer into the slot of the server as shown in the figure below.



Set up the server as shown in the figure after attaching the stabilizers.

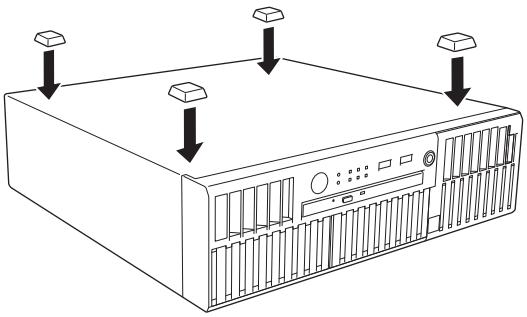


Tips When two or more servers are installed vertically side by side, installing the stabilizers in slots 1 and 2 alternately can remove the gap between servers.



(2) Mounting for horizontal

To mount the server horizontally, attach the provided rubber feet to the positions shown in the figure.



Attach the rubber feet on the right side of the server as shown in the figure.

Important **When the server is horizontally mounted, do not put devices that weigh more than 5 kg on the server.**

2.2 Connection

Connect peripheral devices to the server. Connectors that enable a variety of peripheral devices to be connected are provided at the front and rear of the server. Figures on the following pages show the peripheral devices that can be connected as standard. Connect the peripheral devices before connecting the power cord to the server.

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 and Regulatory Notices.*.

- **Do not hold the power plug with wet hands.**

CAUTION

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

- **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 while the power cord is connected.**
- **Use only the specified interface cable.**

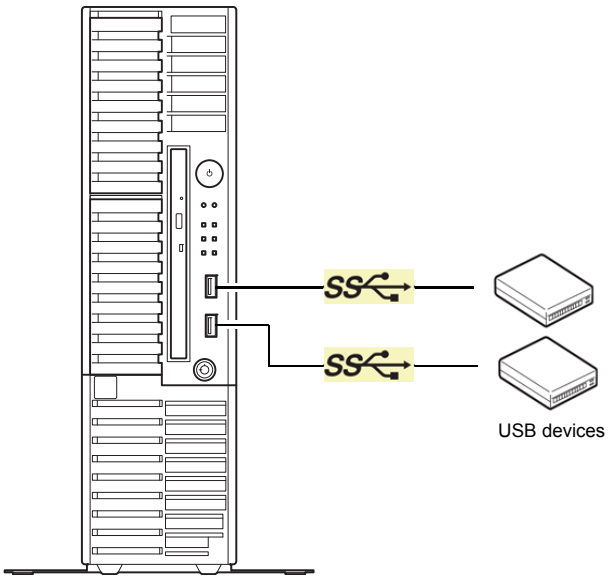
2.2.1 Interface cables

Connect the interface cable before connecting the power cord.

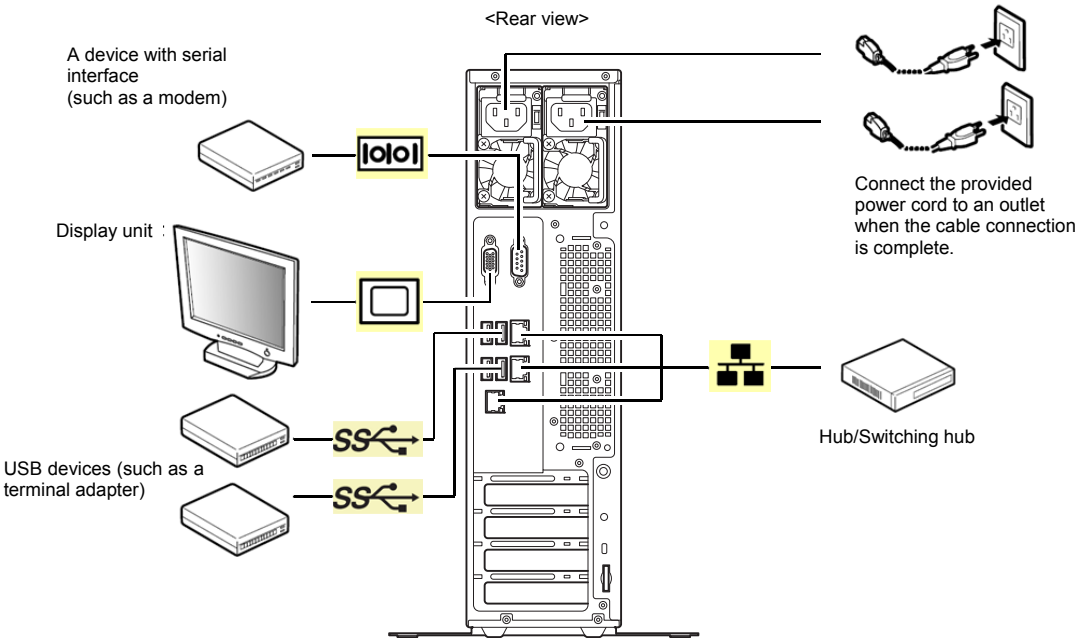
Important

- **Turn off the server and peripheral devices to be connected before connecting.**
- **If you use the third party display or peripheral devices, and connect the interface cable, contact the sales representative to check whether they can be used.**
- **Direct connection from the standard serial port of this sever to the dedicated network line is disabled. To connect to the dedicated line, be sure to connect from the terminal device approved by the Telecommunications Business Act (the dedicated line means the dedicated transmission path installed by the specified users and its accessories. Generally-used public line is also included.)**
- **The connectors that are not explained here are not available. Do not connect anything to the connectors.**

<Front view>

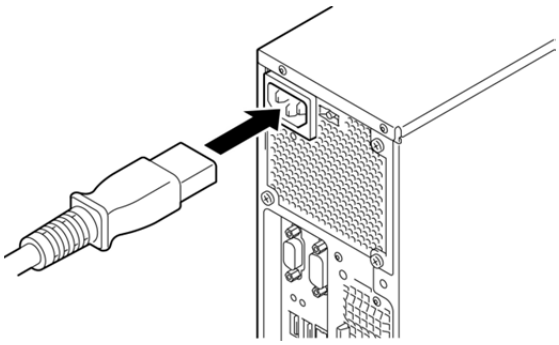


<Rear view>



2.2.2 Power cord

Connect the provided power cord to the server.



When the power cord is connected to an outlet, POWER LED lights amber during initialization of the system.

Tips

- To connect the power cord to a UPS, connect it to the outlet provided at the rear of the UPS. For details, refer to the instruction manual supplied with the UPS
- In order to link the power supply from the UPS with the power-on/off of this server, the BIOS settings change are required depending on the UPS to which the power cord of this server is connected.
  In the BIOS Setup Utility, select **Server**, and then **AC-LINK** to change the parameter to the appropriate value.

NEC Express5800 Series
Express5800/T110h-S

3 Setup

This chapter describes how to set up the server.

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

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

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

4. **EXPRESSBUILDER**
   EXPRESSBUILDER helps you to install Windows and maintain the server. See *Chapter 2 (6. Details of EXPRESSBUILDER)* in *Maintenance Guide*.

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

Turn on the server by using the following procedure.

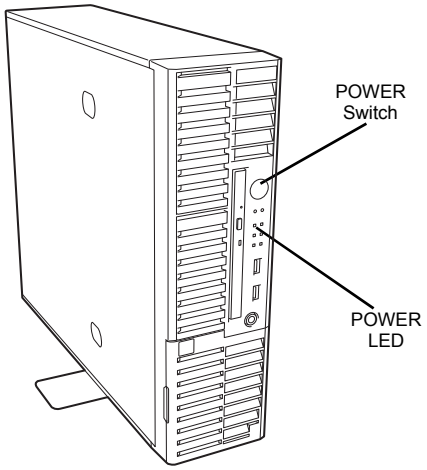
Important **Wait for at least 10 seconds before turning on the server again after the power has been turned off.**

1. Disconnect Flash FDD if applicable.

2. Turn on a display, uninterruptible power supply (UPS), and other peripherals.

3. If STATUS LED 1 turns on green and STATUS LED 2 terns on amber, wait until them are unlit.

4. Press POWER Switch at the front of the server.
   POWER LED is turned on green and after a while, the NEC logo appears on the display.
   While the NEC logo is being displayed, the self-diagnostic program (POST) runs and diagnoses the hardware. For details, see *Chapter 3* (*1.1 POST*).



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

1.1 POST

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

Usually, you do not need to check the message of POST. 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 the power on and OS startup
- When any error message is displayed

1.1.1 POST sequence

Note

- Do not press any keys or perform mouse operations before NEC logo appears.
- Powering on the server, after you installed or removed an optional PCI board or moved it to another slot, may display the message that indicates incorrect board configuration and suspend POST.
  In such a case, press F1 to continue POST. Board configuration can be made using the utility described later.

1. POST runs automatically when the server is turned on.
   NEC logo appears on the screen as factory settings.

Note

- Keyboard becomes operable after the logo appears.
- While an initialization message is displayed, a screen is sometimes switched over to the screen by which nothing is displayed (black screen) several times. It's no problem for operation.
- An initialization message may not be displayed by the occasion with which an option VGA controller was connected or depending on setting of a BIOS setup utility (SETUP).
- An initialization message is not displayed on the console redirection screen of a serial port.

2. If **Password On Boot** is **Enabled** in BIOS settings, the password entry appears.
   If you enter the wrong password three times, POST stops and you cannot proceed. In this case, turn off and on the server.

Important **Do not set a password until you install the OS.**

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

Tips To show the details of POST without pressing <ESC> key, set **Quiet Boot** to **Disabled** in BIOS settings.

4. POST displays the result of memory test, CPU status, and other messages.

Tips The value of memory capacity shown in the message may be smaller than the actual physical memory depending on the hardware configuration. This applies to the information in SETUP and system information of the operating system

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

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

Tips When **Server** → **Power Measurement Policy** is **One time** or **Always**, the power measurement message appears instead of the above message. Wait until the measurement is complete.

You can call the functions below upon completion of POST by pressing the function key.

<F2> key: Run BIOS Setup Utility (SETUP). For details, see *Chapter 3 (2. BIOS Setup)*.
<F3> key: Run EXPRESSBUILDER from Internal Flash Memory. For details, , see *Chapter 3 (4. EXPRESSBUILDER)*.

Note If bootable CD/DVD is inserted into optical disk drive, the system starts from CD/DVD even if <F3> key is pressed.

<F4> key: Run the offline tool. For details, see *Chapter 1 (9. Offline Tools) in "Maintenance Guide*".
<F12> key: Boot from network.

6. When the boot mode is legacy BIOS and a controller which has the dedicated BIOS (such as a SAS controller) is installed, a message that prompts you to start the utility is displayed.

Example: optional RAID controller

```
Press <Ctrl> <H> for Web BIOS
```

The utility starts by pressing <Ctrl> + <H> keys.

Example: on-board RAID controller

```
Press <Ctrl> <M> to Run LSI Software RAID Configuration Utility
```

The utility starts by pressing <Ctrl> + <M> keys.

For details on the utility, refer to the manual supplied with each optional board.

Depending on the hardware configuration, the message "Press Any Key" or "Press <F1> Key" prompts a key entry by optional device . Continue to operate after checking the manual of the optional device.

7. If you set a password in BIOS Setup Utility, the password entry appears upon successful completion of POST.
Three incorrect password entries disable the server to boot. In such a case, turn off the power, wait at least ten seconds, and then turn on the server.

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

8. In BIOS Setup Utility, when **Security** → **Secure Boot** is **Enabled** and **Invalid Signature Detection** is **Halt**, the error message appears and POST stops if the following:
   - The boot image of a bootable device is not signed.
   - The boot image of a bootable device has an incorrect signature.

   In such cases, turn off the server and check that the signature of the boot image in a bootable device is correct. Connect the device for which Secure Boot is enabled to the server and restart.

9. The OS starts after POST is completed.

1.1.2 POST error messages

If POST detects an error, an error message is displayed on the screen or beeps are sounded. Write down the error message for future use. For details, see "*Maintenance Guide*".

Note Take notes on the messages displayed before consulting with your maintenance service company. Error messages are useful information for maintenance.

2. BIOS Setup Utility (SETUP)

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

2.1 Overview

BIOS Setup Utility (SETUP) is a utility to configure basic hardware settings. This utility is installed in the server as standard.

Factory settings of BIOS are set with optimal values. Usually, you do not need to run SETUP. **Modify the settings only at the cases described in *Chapter 3 (2.4 Cases that Require Changes)*.**

2.2 Starting and Exiting SETUP

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. (The on-screen message varies depending on the environment.)

```
Press <F2> SETUP, <F4> ROM Utility, <F12> Network
```

If you press <F2> key, SETUP starts upon completion of POST, and the **Main** menu appears .

Tips

In Legacy boot mode, you can also launch SETUP by pressing the <F2> key while expanding option ROM.

If you have set a password, the following message appears and prompts you to enter the password.

```
Enter Password [                    ]
```

If you enter incorrect password consecutively three times, the operation stops and you cannot proceed. Turn off the power, and try again.

2.2.2 Exiting SETUP

To exit SETUP after saving changes, choose **Save & Exit** → **Save Changes and Exit**.

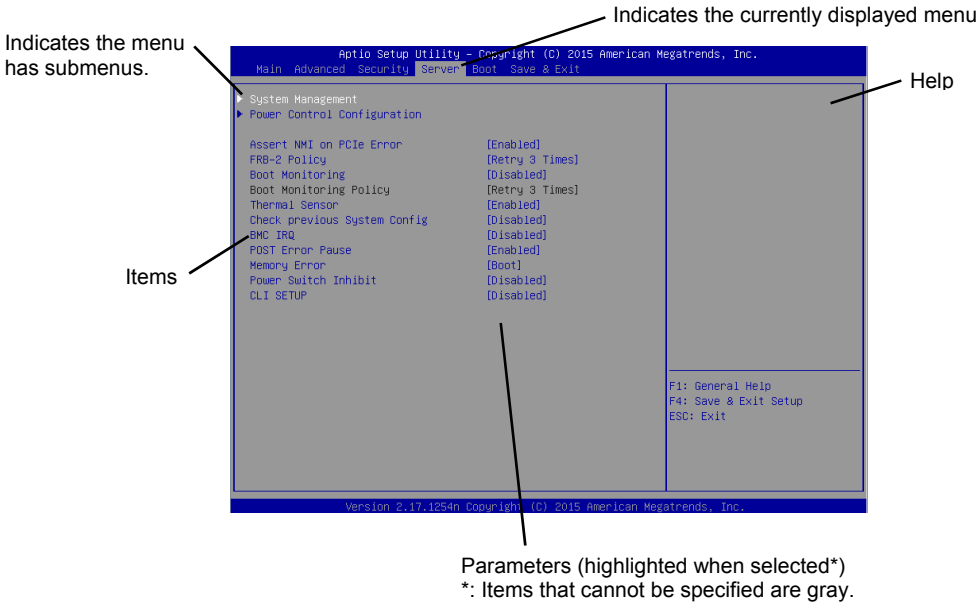
To exit SETUP without saving changes, choose **Save & Exit** → **Discard Changes and Exit**.

Tips

- 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.)
- You cannot restore the default value in the following submenus in **Advanced** menu:
  – **iSCSI Configuration** submenu
  – **UEFI Driver Configuration** submenu

2.3 Usage of SETUP

Use the following keys to operate SETUP. Use the keyboard to work with SETUP.



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

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

☐ <–> key/<+> key
Changes the parameter of the chosen item. You cannot use this key when a menu which has ▶ on the left is selected.

☐ <Enter> key
Determines the chosen parameter.

☐ <Esc> key
Returns the previous screen. If you choose **Yes** in the following message, SETUP closes without saving the changes.

Quit without saving?
[Yes] No

☐ <F1> key
Displays help information. Press <Esc> key to go back to the original screen.

☐ <F2> key
Restores the parameters. If you choose **Yes** in the following message, the previous parameter(s) are restored.

Load Previous Values?
[Yes] No

☐ <F3> key
Loads default settings. If you choose **Yes** in the following message, the default settings of SETUP are restored. **The default settings are different from the factory settings.** See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*" for details.

Load Setup Defaults?
[Yes] No

Note The parameters of **Advanced** → **iSCSI Configuration** and **UEFI Driver Configuration** are not returned to the default value.

☐ <F4> key
Saves parameters. If you choose **Yes** in the following message, the parameters you configured are saved and SETUP closes.

Save configuration and exit?
[Yes] No

2.4 Cases that Require Changes

Use SETUP to change a parameter in the following cases. Other than cases described below, do not change the settings. The 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/Off the function to display the NEC logo during POST	**Boot** → **Quite Boot** → **Disabled**	By pressing <Esc> key, prevent the display of the logo.
Optional board	When an optional board is installed, set to **Disabled** for Option ROM for all PCI devices except for the boot device.	**Advanced** → **PCI Configuration** → **PCI Device Controller and Option ROM Settings** → **PCI Slot n Option ROM** → **Enabled**	*n* is PCI slot number of the RAID controller
		Advanced → **PCI Configuration** → **PCI Device Controller and Option ROM Settings** → **LAN1 Option ROM Scan** → **Disabled**	Option ROM on LAN1 must be disabled.
Memory	Configure the memory after the DIMM is added or exchanged.	**Advanced** → **Memory Configuration** → **Memory Retest** → **Yes**	After rebooting, the **Memory Retest** setting changes to **No** automatically.
Boot	Set to **UEFI** in **Boot mode** depending on the installed OS.	**Boot** → **Boot Mode** → **UEFI** The following OS must be set to UEFI: – Windows Server 2012 – Windows Server 2012 R2	For details, see *Installation Guide*.
	Set to **Legacy** in **Boot mode** depending on the installed OS.	**Boot** → **Boot Mode** → **Legacy** The following OS must be set to Legacy: – Windows Server 2008R2 – VMware ESXi 5	For details, see *Installation Guide*.
	Change the boot order of devices	**Boot** → **Boot Option Priorities** → Change the boot priority	
	Use remote power on feature (from RTC alarm)	**Advanced** → **Advanced Chipset Configuration** → **Wake On RTC Alarm** → **Enabled**	
	Control from HW console terminal	**Advanced** → **Serial Port Configuration** → Change respective setting.	
	Set to **Enabled** in **X2APIC** depending on the installed OS.	**Advanced** → **Processor Configuration** → **X2APIC** → **Enabled** The following OS must be set to Enabled: – Windows Server 2012 – Windows Server 2012 R2	For details, see *Installation Guide*.

Category	Description	To be changed	Remark
Boot	Set to **Disabled** in **X2APIC** depending on the installed OS.	**Advanced** → **Processor Configuration** → **X2APIC** → **Disabled** The following OS must be set to Disabled: ― Windows Server 2008R2 ― VMware ESXi 5	For details, see *installation Guide*.
Security	Set a password to restrict operation of SETUP.	**Security** → **Administrator Password** → **Security** → **User password**	After a password is set, the entry of password is displayed when SETUP is launched.
	Set a password to restrict booting.	**Security** → **Password on Boot** → **Enabled**	You can select this parameter after you set a password.
	Use Trusted Boot (TBOOT) with an optional TPM kit.	**Security** → **Trusted Computing** Set to **Enabled** in the following items: - **TPM Support** - **TPM State** - **TXT Support**	If **TXT Support** is **Enabled** and the OS is started, do not disable TPM by a TPM management tool. If disable TPM, **TPM Support** or **TXT Support** cannot be changed. In such a case, Select **Save & Exit** → **Load Setup Defaults**.
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 the server 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**	

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.

See *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.

Important **This server does not support the Memory Throttling feature.**

3.2 EXPRESSSCOPE ENGINE 3 Network Configuration

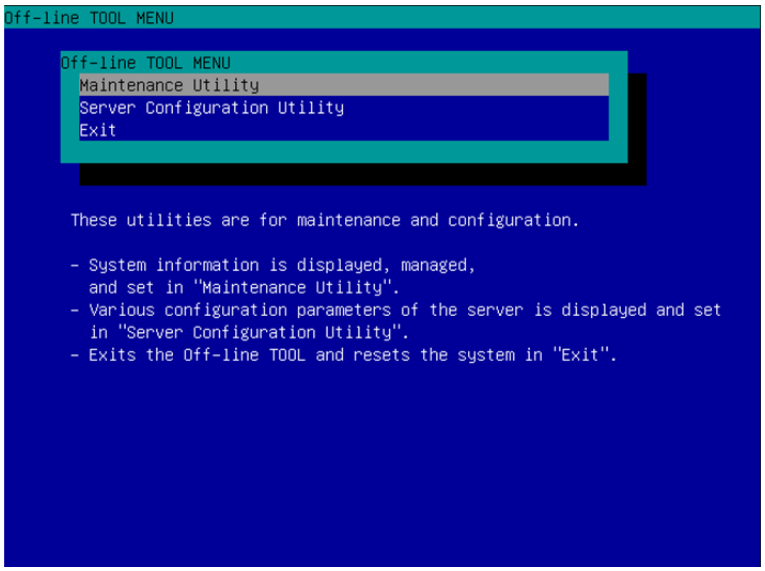
Take the steps below to use EXPRESSSCOPE Engine 3 through the Web browser.

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. Press the <F4> key while the message is being displayed to launch ROM Utility.
3. Select your keyboard type on Keyboard Selection screen.

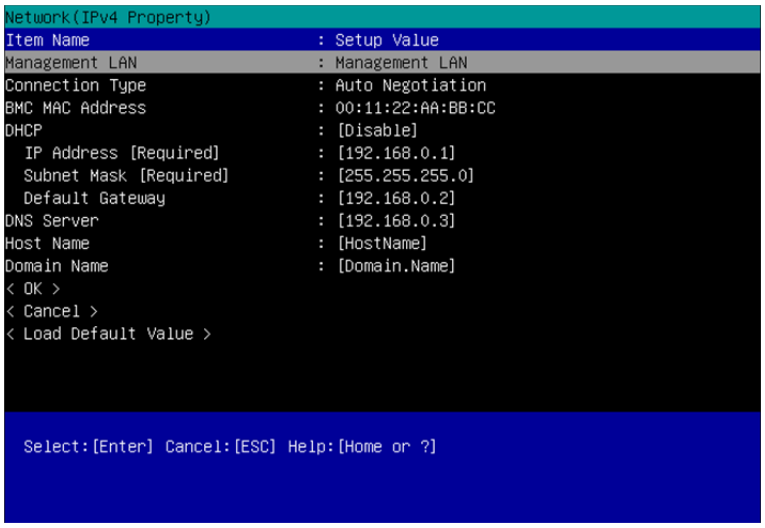
4. On Off-line TOOL MENU, select **Server Configuration Utility** → **EXPRESSSCOPE Engine 3** → **Configuration** → **Network** → **IPv4 Property** or **IPv6 Property**.



5. On the following screen, select **Enable** when you use DHCP, or select **Disable** and specify IP Address (Required), Subnet Mask (Required), Default Gateway, and DNS Server when you do not use DHCP.

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.



When **IPv4 Property** is selected

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 management PC according to the setting.

4. EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows or maintain the server.

4.1 Features of EXPRESSBUILDER

EXPRESSBUILDER provides the following features.

Feature	Description
Setup (Windows reinstallation)	Installs Windows on your server. Easily completes the process from RAID configuration to installation of applications. To use this feature, choose **OS installation** in Boot Selection Menu.
Bundled software	Stores NEC ESMPRO, Universal RAID Utility, and other bundled software.
Maintenance	Diagnoses the server. To use this feature, choose **Tool menu** in Boot Selection Menu.
Manuals	Stores *User's Guide*, *Installation Guide*, *Maintenance Guide*, and other manuals.

4.2 Usage of EXPRESSBUILDER

If you want to configure RAID arrays or run EXPRESSBUILDER by using any of the following.

Internal Flash Memory:

Ensure a CD/DVD is removed from the server, turn on the server, and then press <F3> key during POST.

Windows Application

You can run EXPRESSBUILDER by clicking the shortcut of NEC EXPRESSBUILDER on the desktop, or select NEC EXPRESSBUILDER from Windows Start menu or Start screen after installing Windows and Starter Pack.

EXPRESSBUILDER DVD:

DVD does not come with the product. Purchase the option or download it from the following website

http://www.nec.com/

- Support & Downloads

Set the DVD to an optical disk drive and restart this server, or set the DVD to a computer running Windows.

5. Installing Software Components

Continue to install the operating system and other bundled software.

See the instructions below.

- *Installation Guide (Windows)*

6. Turning off the Server

Turn off the server by using the following procedure. When 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. If the server does not automatically power off, press POWER Switch at the front of the server. Confirm that POWER LED is OFF.
3. Turn off peripheral devices.

NEC Express5800 Series
Express5800/T110h-S

4 Appendix

1. **Specifications**

   Describes specifications of the server.

2. **Interrupt Lines**

   Describes the interrupt lines assigned to this server.

3. **Glossary**

   Describes glossaries of this document.

4. **Revision Record**

   Describes revision history of this document.

1. Specifications

1.1 Non-Redundant Power Supply Model

Product name		Express5800/T110h-S, EXP333		
		N8100-2327F		
CPU	Type	Intel Pentium processor G4400	Intel Xeon processor E3-1220 v5	Intel Xeon processor E3-1230 v5
	Clock/cache	3.3GHz/3MB	3GHz/8MB	3.4GHz/8MB
	Cores(C)/ Threads(T)	2C/2T	4C/4T	4C/8T
	Standard / (maximum)	Not pre-installed / (1)		
Chipset		Intel C236 Chipset		
Memory	Standard	Not pre-installed		
	Maximum	64 GB (16 GB x 4)		
	Expansion unit	DDR4-2133 SDRAM DIMM (unbuffered) x 1		
	Memory module	ECC DDR4-2133 SD-RAM DIMM with 2Way Interleave support		
Graphics		Integrated in BMC (more than 32 MB)		
Auxiliary storage	Hard Disk Drive (standard)	Not pre-installed		
	Hard Disk Drive (maximum)	3.5-inch HDD cage (N8154-84F) installed: 12TB (2 x 6 TB) 2.5-inch HDD cage (N8154-82F/-83F) installed: SATA 12TB (6 x 2TB), SAS 10.8 TB (6 x 1.8TB), SAS SSD 9.6 TB (6 x 1.6TB) 3.5-inch/2.5-inch HDD cage (N8154-84F/-83F) installed: SATA 14TB (2 x 6TB + 2 x 2TB), SATA+SAS 15.6TB (2 x 6TB SATA + 2 x 1.8TB SAS)		
	RAID	SATA 6 Gb/s : RAID 0/1/10(standard), RAID 5/6/50/60 (optional) SAS 12 Gb/s : RAID 0/1/5/6/10/50/60 (optional)		
	Optical disk drive	Selectable: DVD-ROM drive or DVD SuperMULTI drive or blank cover.		
Expansion bay	Disk bay	3.5-inch Hard Disk Drive x 2 + 2.5-inch Hard Disk Drive x 2 (optional) 2.5-inch Hard Disk Drive x 4 + 2.5-inch Hard Disk Drive x 2 (optional)		
	Backup device	1 slot		
Expansion slot (PCI)		1x PCI Express 3.0 (x16 lane, x16 socket) 1x PCI Express 2.0 (x4 lane, x8 socket) 1x PCI Express 2.0 (x2 lane, x8 socket) 1x PCI Express 2.0 (x1 lane, x8 socket)		
External interface	USB3.0	Front: 2 port; rear: 4 ports; internal: 1 port		
	Serial	1 port (D-sub 9-pin)*		
	Network	2x 1000Base-T/100Base-TX/10Base-T (RJ-45) 1x 1000Base-T/100Base-TX/10Base-T (RJ-45):Management LAN exclusive use.		
	Display	MINI D-sub 15-pin (1 port)		
External dimensions		98.0 mm (width) x 386.5 mm (depth) x 341.0 mm (height) (not including stabilizer, protrusions) 200.0 mm (width) x 395.4 mm (depth) x 347.1 mm (height) (stabilizer, protrusions included)		
Mass (maximum)		8 kg (11.5 kg)		
Power supply		1 x 250 W 80 PLUS Platinum (bipolar grounded outlet) (hot-plug not available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz		
Power rating		380 W		
Environmental conditions	When running	Temperature: 5 to 40℃(when High Temperature Resistant Kit is installed: 5 to 48℃(it's subject to composition restrictions.)); Humidity: 20 to 80% (and no condensation)		
	When in storage	Temperature: −10 to 55°C; Humidity: 20 to 80% (and no condensation)		
Bundled OS		None		
Supported OSs		Microsoft Windows Server 2008 R2 Standard Microsoft Windows Server 2008 R2 Enterprise Microsoft Windows Server 2012 Standard Microsoft Windows Server 2012 Datacenter Microsoft Windows Server 2012 R2 Standard Microsoft Windows Server 2012 R2 Datacenter Microsoft Windows Server 2012 R2 Foundation		
Accessories		104 keyboard, Two-button mouse with scroll wheel, Rubber feet, Getting Started, Screws for device, Power cord		

* Can be optionally expanded to two ports.

Product name		Express5800/T110h-S, EXP333		
		N8100-2327F		
CPU	Type	Intel Xeon processor E3-1240L v5	Intel Xeon processor E3-1260L v5	Intel Xeon processor E3-1270 v5
	Clock/cache	2.1GHz/3MB	2.9GHz/8MB	3.6GHz/8MB
	Cores(C)/ Threads(T)	4C/8T	4C/8T	4C/8T
	Standard / (maximum)	Not pre-installed / (1)		
Chipset		Intel C236 Chipset		
Memory	Standard	Not pre-installed		
	Maximum	64 GB (16 GB x 4)		
	Expansion unit	DDR4-2133 SDRAM DIMM (unbuffered) x 1		
	Memory module	ECC DDR4-2133 SD-RAM DIMM with 2Way Interleave support		
Graphics		Integrated in BMC (more than 32 MB)		
Auxiliary storage	Hard Disk Drive (standard)	Not pre-installed		
	Hard Disk Drive (maximum)	3.5-inch HDD cage (N8154-84F) installed: 12TB (2 x 6 TB) 2.5-inch HDD cage (N8154-82F/-83F) installed: SATA 12TB (6 x 2TB), SAS 10.8 TB (6 x 1.8TB), SAS SSD 9.6 TB (6 x 1.6TB) 3.5-inch/2.5-inch HDD cage (N8154-84F/-83F) installed: SATA 14TB (2 x 6TB + 2 x 2TB), SATA+SAS 15.6TB (2 x 6TB SATA + 2 x 1.8TB SAS)		
	RAID	SATA 6 Gb/s : RAID 0/1/10(standard), RAID 5/6/50/60 (optional) SAS 12 Gb/s : RAID 0/1/5/6/10/50/60 (optional)		
	Optical disk drive	Selectable: DVD-ROM drive or DVD SuperMULTI drive or brank cover.		
Expansion bay	Disk bay	3.5-inch Hard Disk Drive x 2 + 2.5-inch Hard Disk Drive x 2 (optional) 2.5-inch Hard Disk Drive x 4 + 2.5-inch Hard Disk Drive x 2 (optional)		
	Backup device	1 slot		
Expansion slot (PCI)		1x PCI Express 3.0 (x16 lane, x16 socket) 1x PCI Express 2.0 (x4 lane, x8 socket) 1x PCI Express 2.0 (x2 lane, x8 socket) 1x PCI Express 2.0 (x1 lane, x8 socket)		
External interface	USB3.0	Front: 2 port; rear: 4 ports; internal: 1 port		
	Serial	1 port (D-sub 9-pin)*		
	Network	2x 1000Base-T/100Base-TX/10Base-T (RJ-45) 1x 1000Base-T/100Base-TX/10Base-T (RJ-45):Management LAN exclusive use.		
	Display	MINI D-sub 15-pin (1 port)		
External dimensions		98.0 mm (width) x 386.5 mm (depth) x 341.0 mm (height) (not including stabilizer, protrusions) 200.0 mm (width) x 395.4 mm (depth) x 347.1 mm (height) (stabilizer, protrusions included)		
Mass (maximum)		8 kg (11.5 kg)		
Power supply		1 x 250 W 80 PLUS Platinum (bipolar grounded outlet) (hot-plug not available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz		
Power rating		380 W		
Environmental conditions	When running	Temperature: 5 to 40℃ (when High Temperature Resistant Kit is installed: 5 to 48℃(it's subject to composition restrictions.)); Humidity: 20 to 80% (and no condensation)		
	When in storage	Temperature: −10 to 55°C; Humidity: 20 to 80% (and no condensation)		
Bundled OS		None		
Supported OSs		Microsoft Windows Server 2008 R2 Standard Microsoft Windows Server 2008 R2 Enterprise Microsoft Windows Server 2012 Standard Microsoft Windows Server 2012 Datacenter Microsoft Windows Server 2012 R2 Standard Microsoft Windows Server 2012 R2 Datacenter Microsoft Windows Server 2012 R2 Foundation		
Accessories		104 keyboard, Two-button mouse with scroll wheel, Rubber feet, Getting Started, Screws for device, Power cord		

* Can be optionally expanded to two ports.

1.2 Redundant Power Supply Model

Product name		Express5800/T110h-S, EXP333A		
		N8100-2328F		
CPU	Type	Intel Pentium processor G4400	Intel Xeon processor E3-1220 v5	Intel Xeon processor E3-1230 v5
	Clock/cache	3.3GHz/3MB	3GHz/8MB	3.4GHz/8MB
	Cores(C)/ Threads(T)	2C/2T	4C/4T	4C/8T
	Standard / (maximum)	Not pre-installed / (1)		
Chipset		Intel C236 Chipset		
Memory	Standard	Not pre-installed		
	Maximum	64 GB (16 GB x 4)		
	Expansion unit	DDR4-2133 SDRAM DIMM (unbuffered) x 1		
	Memory module	ECC DDR4-2133 SD-RAM DIMM with 2Way Interleave support		
Graphics		Integrated in BMC (more than 32 MB)		
Auxiliary storage	Hard Disk Drive (standard)	Not pre-installed		
	Hard Disk Drive (maximum)	3.5-inch HDD cage (N8154-84F) installed: 12TB (2 x 6 TB) 2.5-inch HDD cage (N8154-82F/-83F) installed: SATA 12TB (6 x 2TB), SAS 10.8 TB (6 x 1.8TB), SAS SSD 9.6 TB (6 x 1.6TB) 3.5-inch/2.5-inch HDD cage (N8154-84F/-83F) installed: SATA 14TB (2 x 6TB + 2 x 2TB), SATA+SAS 15.6TB (2 x 6TB SATA + 2 x 1.8TB SAS)		
	RAID	SATA 6 Gb/s : RAID 0/1/10(standard), RAID 5/6/50/60 (optional) SAS 12 Gb/s : RAID 0/1/5/6/10/50/60 (optional)		
	Optical disk drive	Selectable: DVD-ROM drive or DVD SuperMULTI drive or brank cover.		
Expansion bay	Disk bay	3.5-inch Hard Disk Drive x 2 + 2.5-inch Hard Disk Drive x 2 (optional) 2.5-inch Hard Disk Drive x 4 + 2.5-inch Hard Disk Drive x 2 (optional)		
	Backup device	1 slot		
Expansion slot (PCI)		1x PCI Express 3.0 (x16 lane, x16 socket) 1x PCI Express 2.0 (x4 lane, x8 socket) 1x PCI Express 2.0 (x2 lane, x8 socket) 1x PCI Express 2.0 (x1 lane, x8 socket)		
External interface	USB3.0	Front: 2 port; rear: 4 ports; internal: 1 port		
	Serial	1 port (D-sub 9-pin)*		
	Network	2x 1000Base-T/100Base-TX/10Base-T (RJ-45) 1x 1000Base-T/100Base-TX/10Base-T (RJ-45):Management LAN exclusive use.		
	Display	MINI D-sub 15-pin (1 port)		
External dimensions		98.0 mm (width) x 386.5 mm (depth) x 341.0 mm (height) (not including stabilizer, protrusions) 200.0 mm (width) x 419.2 mm (depth) x 347.1 mm (height) (stabilizer, protrusions included)		
Mass (maximum)		8 kg (11.5 kg)		
Power supply		2 x 460 W 80 PLUS Platinum (bipolar grounded outlet) (hot-plug available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz		
Power rating		532 W		
Environmental conditions	When running	Temperature: 5 to 40℃ (when High Temperature Resistant Kit is installed: 5 to 48℃(it's subject to composition restrictions.)); Humidity: 20 to 80% (and no condensation)		
	When in storage	Temperature: –10 to 55°C; Humidity: 20 to 80% (and no condensation)		
Bundled OS		None		
Supported OSs		Microsoft Windows Server 2008 R2 Standard Microsoft Windows Server 2008 R2 Enterprise Microsoft Windows Server 2012 Standard Microsoft Windows Server 2012 Datacenter Microsoft Windows Server 2012 R2 Standard Microsoft Windows Server 2012 R2 Datacenter Microsoft Windows Server 2012 R2 Foundation		
Accessories		104 keyboard, Two-button mouse with scroll wheel, Rubber feet, Getting Started, Screws for device, Power cord		

* Can be optionally expanded to two ports.

Product name		Express5800/T110h-S, EXP333A		
		N8100-2328F		
CPU	Type	Intel Xeon processor E3-1240L v5	Intel Xeon processor E3-1260L v5	Intel Xeon processor E3-1270 v5
	Clock/cache	2.1GHz/3MB	2.9GHz/8MB	3.6GHz/8MB
	Cores(C)/ Threads(T)	4C/8T	4C/8T	4C/8T
	Standard / (maximum)	Not pre-installed / (1)		
Chipset		Intel C236 Chipset		
Memory	Standard	Not pre-installed		
	Maximum	64 GB (16 GB x 4)		
	Expansion unit	DDR4-2133 SDRAM DIMM (unbuffered) x 1		
	Memory module	ECC DDR4-2133 SD-RAM DIMM with 2Way Interleave support		
Graphics		Integrated in BMC (more than 32 MB)		
Auxiliary storage	Hard Disk Drive (standard)	Not pre-installed		
	Hard Disk Drive (maximum)	3.5-inch HDD cage (N8154-84F) installed: 12TB (2 x 6 TB) 2.5-inch HDD cage (N8154-82F/-83F) installed: SATA 12TB (6 x 2TB), SAS 10.8 TB (6 x 1.8TB), SAS SSD 9.6 TB (6 x 1.6TB) 3.5-inch/2.5-inch HDD cage (N8154-84F/-83F) installed: SATA 14TB (2 x 6TB + 2 x 2TB), SATA+SAS 15.6TB (2 x 6TB SATA + 2 x 1.8TB SAS)		
	RAID	SATA 6 Gb/s : RAID 0/1/10(standard), RAID 5/6/50/60 (optional) SAS 12 Gb/s : RAID 0/1/5/6/10/50/60 (optional)		
	Optical disk drive	Selectable: DVD-ROM drive or DVD SuperMULTI drive or brank cover.		
Expansion bay	Disk bay	3.5-inch Hard Disk Drive x 2 + 2.5-inch Hard Disk Drive x 2 (optional) 2.5-inch Hard Disk Drive x 4 + 2.5-inch Hard Disk Drive x 2 (optional)		
	Backup device	1 slot		
Expansion slot (PCI)		1x PCI Express 3.0 (x16 lane, x16 socket) 1x PCI Express 2.0 (x4 lane, x8 socket) 1x PCI Express 2.0 (x2 lane, x8 socket) 1x PCI Express 2.0 (x1 lane, x8 socket)		
External interface	USB3.0	Front: 2 port; rear: 4 ports; internal: 1 port		
	Serial	1 port (D-sub 9-pin)*		
	Network	2x 1000Base-T/100Base-TX/10Base-T (RJ-45) 1x 1000Base-T/100Base-TX/10Base-T (RJ-45):Management LAN exclusive use.		
	Display	MINI D-sub 15-pin (1 port)		
External dimensions		98.0 mm (width) x 386.5 mm (depth) x 341.0 mm (height) (not including stabilizer, protrusions) 200.0 mm (width) x 419.2 mm (depth) x 347.1 mm (height) (stabilizer, protrusions included)		
Mass (maximum)		8 kg (11.5 kg)		
Power supply		2 x 460 W 80 PLUS Platinum (bipolar grounded outlet) (hot-plug available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz		
Power rating		532 W		
Environmental conditions	When running	Temperature: 5 to 40℃ (when High Temperature Resistant Kit is installed: 5 to 48℃(it's subject to composition restrictions.)); Humidity: 20 to 80% (and no condensation)		
	When in storage	Temperature: −10 to 55°C; Humidity: 20 to 80% (and no condensation)		
Bundled OS		None		
Supported OSs		Microsoft Windows Server 2008 R2 Standard Microsoft Windows Server 2008 R2 Enterprise Microsoft Windows Server 2012 Standard Microsoft Windows Server 2012 Datacenter Microsoft Windows Server 2012 R2 Standard Microsoft Windows Server 2012 R2 Datacenter Microsoft Windows Server 2012 R2 Foundation		
Accessories		104 keyboard, Two-button mouse with scroll wheel, Rubber feet, Getting Started, Screws for device, Power cord		

* Can be optionally expanded to two ports.

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	8	Real-time clock
1	–	9	Microsoft ACPI-Compliant System
2	Cascade connection	10	PCI
3	COM 2 serial port	11	PCI
4	COM 1 serial port	12	–
5	PCI	13	Arithmetic operation processor
6	–	14	–
7	–	15	–

3. Glossary

Term	Description
BIOS Setup Utility (SETUP)	Software for setting BIOS. You can run this software by pressing <F2> key during POST.
BMC	Baseboard Management Controller (BMC) is a built-in controller that supports the IPMI version 2.0 protocol. BMC can manage the server hardware.
BMC RESET Switch	A switch for resetting the BMC of the server. This resets the BMC without clearing the BMC settings. Use the switch if the problem on the BMC occurs.
DUMP Switch	A switch that is used for collecting the memory dump if an error occurs. You can specify the destination of the dump by using the Windows function.
EXPRESSBUILDER	Standard software for setting up the server easily. This also includes several useful applications and instruction manuals.
EXPRESSSCOPE ENGINE 3	A name of BMC for NEC Express5800 series.
EXPRESSSCOPE Profile Key	A removable flash memory that stored the settings of BIOS and BMC. If the motherboard of the server is replaced, you can use former settings when moving this flash memory from the former motherboard.
Express Report Service	Software that can report the server failure to the contact center by E-mail or modem. This software is installed with NEC ESMPRO ServerAgentService to the server.
Express Report Service (HTTPS)	Software that can report the server failure to the contact center by HTTPS. This software is installed with NEC ESMPRO ServerAgentService to the server.
Express Report Service (MG)	Software that can report the server failure to the contact center by E-mail, modem or HTTPS without NEC ESMPRO ServerAgentService. This software is installed with NEC ESMPRO Manager to "PC for Management".
ExpressUpdate	A feature for updating BIOS, firmware, driver, or software of the server. This feature is available when NEC ESMPRO Manager cooperates with EXPRESSSCOPE ENGINE 3 and ExpressUpdate Agent.
ExpressUpdate Agent	Software for performing ExpressUpdate. This is installed to the server.
Flash FDD	An optional USB device that can use as a floppy disk drive.
Internal Flash Memory	A built-in flash memory that stored EXPRESSBUILDER as standard. You can start EXPRESSBUILDER from it without DVD when pressing <F3> key during POST.
NEC ESMPRO	Standard software for the server management. This consists of several applications for managing or monitoring.
NEC ESMPRO Agent Extension	Software for performing the scheduled operations. This works with NEC ESMPRO Manager.
NEC ESMPRO Manager	Software for managing multiple servers on network.
NEC ESMPRO ServerAgentService	Software for monitoring the server. This works with NEC ESMPRO Manager. You can choose Service Mode or Non-Service Mode when installing this software. Service Mode resides as the OS service and Non-Service Mode does not use the OS service to reduce memory, CPU power, and other OS resources.
OEM driver	A Windows driver for the mass storage device.
OS standard installer	An installer that stored in Windows installation disc. Use this installer if you want to install the OS manually.
Offline tools	Software that can read or change SEL, SDR, FRU, and other IPMI data. You can start Offline tools when pressing <F4> key during POST.
PC for Management	A computer for managing the server on network. A general Windows/Linux computer can be used as "PC for Management".
Product Info Collection Utility	Software for collecting several hardware/software statuses or event logs. You can easily collect the data for the server maintenance by using this software.

Term	Description
RAID Configuration Utility	Software for configuring RAID arrays. You can run this software during POST.
Server Configuration Utility	Software for setting BIOS or BMC. You can use as Windows application or run this software when pressing <F4> key during POST. This software is the same as BMC Configuration of former models.
Starter Pack	Software package for the server. This software includes the customized drivers for Windows. This must be installed before using Windows on the server.
TPM Kit	An optional product of Trusted Platform Module for the server.
Universal RAID Utility	Software for setting RAID arrays on Windows/Linux. This software is operated on "PC for Management" with NEC ESMPRO Manager.
Windows OS parameter file	A file that saved settings for installing Windows. You can install with the settings in this file when setting Windows with EXPRESSBUILDER.

4. Revision Record

Revision (Document Number)	Date Issued	Description
10.111.01-101.01	January 2016	Newly created
10.111.01-101.02	October 2016	・Windows Server 2008 R2 is now supported for the onboard RAID controller ・Corrected the errors
	August 2018	Clerical Corrections

[MEMO]

NEC Express Server

Express5800/T110h-S
User's Guide

August 2018

NEC Corporation
7-1 Shiba 5-Chome, Minato-Ku
Tokyo 108-8001, Japan