Promise SuperTrak EX4650 Battery Backup Unit

User's Guide

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Preface

Congratulations for your purchase of the Additional DAC Battery Backup Unit (called BBU hereafter). The User's Guide describes how to install and use the BBU correctly and safely. Read the guide thoroughly before handling it. In addition, refer to this manual when you want to know how to use it or some malfunction occurs. Always keep the manual at hand so that you can see it as soon as possible if necessary.

For the Disk Array Controller (SAS) to which the BBU is connected, refer to the User's Guide coming with the disk array controller.

Read "Notes on Use" carefully before handling the BBU.

> Keep this User's Guide at hand for quick reference at anytime necessary.
> Be sure to read this section carefully.

⚠ NOTES ON USE - Always read the Notes -

The following includes information necessary for proper and safe operation of the product.

SAFETY INDICATIONS

In the User's Guide, "WARNING" or "CAUTION" is used to indicate a degree of danger. These terms are defined as follows:

⚠ WARNING Indicates the presence of a hazard that may result in death or serious personal injury.

⚠ CAUTION Indicates the presence of a hazard that may cause minor personal injury, including burns, or property damage.

Precautions against hazards are presented with the following symbols. The individual symbols are defined as follows:

⚠	Attention	This symbol indicates the presence of a hazard. An image in the symbol illustrates the hazard type.	(Example) Precaution against electric shock
🚫	Prohibited Action	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example) Prohibition of disassembly
⬤	Mandatory Action	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example) Unplug the power cord!

Symbols Used in This Manual and Warning Labels

Attentions

⚠	Indicates a general notice or warning that cannot be specifically identified.
⚡	Indicates that improper use may cause an electric shock.
♨	Indicates that improper use may cause personal injury.
🔥	Indicates that improper use may cause fumes or fire.

Prohibited Actions

🚫	Indicates a general prohibited action that cannot be specifically identified.
🚫	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.

Mandatory Action

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

Safety Indications

This section provides notes on using your product safely. Read this section carefully to ensure proper and safe use of the product. For symbols, see "SAFETY INDICATIONS" provided earlier.

General

⚠ **WARNING**
Do not use the product in life-critical applications or applications requiring high reliability. The product is not intended for integration with or control of facilities or equipment that may affect human life or that require a high degree of reliability, such as medical equipment, nuclear power facilities or instruments, aerospace instruments, transportation facilities or instruments. The manufacturer does not assume any liability for accidents resulting in injury or death, or for any damages to property that may occur as a result of using the product in such facilities, equipment, or control systems. **Do not use the server if any smoke, odour, or noise is present.** If smoke, odour, or noise is present, immediately turn off the server and disconnect the power plug from the AC outlet, then contact your service representative. Using the server in such conditions may cause a fire. **Keep needles or metal objects away from the server.** Do not insert needles or metal objects into ventilation holes or cartridge slot of the server. Doing so may cause an electric shock.

⚠ **CAUTION**
Keep water or foreign matter away from the server. Do not let any form of liquid (water etc.) or foreign matter (e.g., pins or paper clips) enter the server. Failure to follow this warning may cause an electric shock, a fire, or a failure of the server. When such things accidentally enter the server, immediately turn off the power and disconnect the power plug from the AC outlet. Do not disassemble the server. Contact your service representative.

Power Supply and Power Cord Use

	⚠ CAUTION
	Disconnect the power cord(s) before installing or removing the product in/from the server. Make sure to power off the server and disconnect the power cord(s) from a power outlet before installing/removing the product in/from the server, or connecting with the peripheral devices. All voltage is removed only when the power cords are unplugged.
	Do not use any damaged cable. Make sure the cable condition before connection. Using the damaged connector, bent connector pin, or dirty connector may cause a fire due to short-circuit.
	Do not hold the power plug with a wet hand. Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.
	Do not pull the cable when disconnecting the power cord. When disconnecting the power cord from the server, hold the plug and pull it straight out. Pulling the cord out by the cable portion could damage the cable to result in an electrical shock hazard or a fire.

Installation, Relocation, Storage, and Connection

> ### ⚠ CAUTION
>
> **Do not connect any interface cable with the power cord of the server plugged to a power source.**
>
> Make sure to power off the server and unplug the power cord from a power outlet before connecting/disconnecting any interface cable to/from the server.   If the server is off-powered but its power cord is plugged to a power source, touching a cable or connector may cause an electric shock or a fire resulted from a short circuit.
>
> **Do not use any unauthorized interface cable.**
>
> Use only interface cables authorized by the manufacturer and locate a proper device and connector before connecting a cable. Using an unauthorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire.
> Also, observe the following notes on using and connecting an interface cable.
> - Do not step on the cable.
> - Do not place any object on the cable.
> - Do not use the server with loose cable connections.
> - Do not use any damaged cable connector.
> - Make sure the cable is securely locked with screw.
>
> **Do not use or store the product in the place where corrosive gases exist.**
>
> Make sure not to locate or use the server in the place where corrosive gases (sulphur dioxide, hydrogen sulphide, nitrogen dioxide, chlorine, ammonia, ozone, etc) exist.
> Also, do not install it in the environment where the air (or dust) includes components accelerating corrosion (ex. sulphur, sodium chloride) or conductive metals. There is a risk of a fire due to corrosion and shorts of an internal printed board.
> Consult with your service representative for the location appropriate to the server.
>
> **Avoid installation in extreme temperature conditions.**
>
> Immediately after the server is powered off, its internal components such as hard disk drives are very hot. Leave the server until its internal components fully cool down before installing/removing any component.

Cleaning and Working with the Product

⚠ **WARNING**

	Do not disassemble, repair, or alter the server.
	Never attempt to disassemble, repair, or alter the product on any occasion. Failure to follow this instruction may cause an electric shock or fire as well as malfunctions of the product.
	Disconnect the power plug before accessing inside the server.
	Make sure to power off the server and disconnect the power plug from an AC outlet before accessing inside the server. Touching any internal device of the server with its power cord connected to a power source may cause an electric shock even if the server is off-powered.

⚠ **CAUTION**

	Make sure to complete installation.
	Always connect the DC cable and/or interface cable firmly. An incompletely connected cable may cause a contact failure, resulting in smoking or fire.

During Operation

⚠ **CAUTION**

	Avoid contact with the server during thunderstorms.
	Disconnect the power plug from the outlet when a thunderstorm is approaching. If it starts thundering before you disconnect the power plug, do not touch any part of the server containing the product. Failure to follow this warning may cause an electric shock.
	Keep animals away from the server.
	Keep animals away from the server containing the product. Pet's discharges or fur may enter the server and cause a fire or electric shock.
	Do not use a cellular phone or a pager around the server.
	Turn off the cellular phone or pager near the server containing the product. Radio interference may cause malfunctions of the server.

Warning Labels

The warning label is attached to the product with possible danger or their vicinity to inform the user that a hazardous situation may arise when operating the product. (Do not intentionally remove or damage any of the labels.)

If you find any labels totally/partially removed or illegible due to damage, contact your sales representative.

Notes on Use - for correct operation of BBU
Note the following when you use the BBU. If you ignore the notes, your assets (including important data and/or other devices) may be damaged.

- The BBU is an additional battery to be used exclusively for the SAS Disk Array Controller. The BBU cannot be connected to any other disk array controllers.

- The BBU is an extremely sensitive electronic device. Discharge static electricity from your body before handling the BBU (make contact with the metallic frame of the server).

- Do not drop the BBU. Do not hit the BBU against other objects.

- To recycle or dispose the BBU, see "Recycle and Disposal" in this chapter.

- Turn off your cellular phone or pager near the server containing the product. Radio interference may cause malfunctions of the server.

This Manual

The guide is intended for persons who are familiar with operating systems, including Windows, and fundamental operations of general-purpose I/O devices including using a keyboard and mouse.

Text Conventions

The following conventions are used throughout this User's Guide. For safety symbols, see "SAFETY INDICATIONS" provided earlier.

Notice	Items to be observed or points to be noted when operating the product.
Check	Items to be checked when operating the product
Tips	Information useful or convenient for you

In the Package

The carton contains various accessories, as well as the product itself. See the packing list to make sure that you have everything and that no individual components are damaged. If you find any component missing or damaged, contact your sales agent.

Transportation

To transport the BBU, remove it from the server following "Chapter 1 Overview" and put the BBU and all the accessories in the package used for the delivery.

Third Party Transfer

Make sure to provide this manual along with the product to a third party.

Notice | **About data on the hard disk**
Be sure to take appropriate measures not to leak important data (e.g., customers' information or companies' management information) on the removed hard disk to any third parties.
Data seems to be erased when you empty "Recycle Bin" of Windows or execute the "format" command of the operating system. However, the actual data remains written on the hard disk. Data not erased completely may be restored by special software and used for unexpected purposes.
It is strongly recommended that the software or service (both available at stores) for data erasure should be used in order to avoid the trouble explained above. For details on data erasure, ask your sales representative.
The manufacturer assumes no liability for data leakage if the product is transferred to third party without erasing the data.

To transfer or sell any software application that comes with the product to a third party, the following requirements must be satisfied:

➢ Transfer all the provided software applications, and keep no backup copies.

➢ Uninstall software applications before transferring the product.

BBU Life

The BBU is equipped with a backup battery. The life of the battery is about 2 years, but varies depending on the environment of use and operating conditions.

Replace the battery with a new one after about two years starting from the installation of the BBU (the installation time can be known by the battery label put on the server and the BBU). Contact your service representative for the replacement

Recycling and Disposal

The battery pack of the BBU is equipped with a recyclable lithium ion battery. To enable such valuable resources to be reused, contact your service representative or bring it to the nearest recycle agent.

For the removal of the BBU, see "4. Battery Pack Replacement Procedure" in "Chapter 3 Operation and Maintenance."

Dispose of other devices according to all national laws and regulations. For more information, contact the local government or your service representative.

Take sufficient note on the handling of the battery pack following "Chapter 3 Operation and Maintenance."

Notice | It is the user's responsibility to completely erase or modify all the data stored in storage device such as hard disk, backup data cartridge, floppy disk, or any other media (CD-R/CD-RW) so that the data cannot be restored.

Contents

Chapter 1 Overview

Read this chapter if you use the Additional DAC Battery (called BBU below) for the first time.

This chapter describes the characteristics and configuration of the BBU-Plus2 and outlines the additional battery installation job.

1. Characteristics of BBU

The BBU is an additional battery exclusively used for the Disk Array Controller (SAS).

Connecting the BBU to the disk array controller can prevent data from being lost due to an unforeseen accident, including instantaneous power interruption (in the WriteBack mode).

- Backup (up to 72 hours) of the data in the disk array controller cache memory.
- Improvement of reliability in WriteBack mode.
- Use of rechargeable lithium ion battery

2. Specifications

Item		Specifications	Remarks
Maximum data backup time		72 hours	Full charging
Outer dimension		58 (width) × 52 (depth) x 10 (height) mm	Excluding battery cable
Weight		Approx. 0.10 kg	
Operating voltage		3.7 V or higher	In normal operation
Power consumption		1.92 W	
Operating environment	Temperature	10°C to 35°C	
	Humidity	20% to 80%	Without condensation
Storage environment	Temperature	0°C to 35°C	
	Humidity	20% to 80%	Without condensation
Life (battery back)		About 2 years	Varies depending on operating environment and boundary conditions

3. Installation Flow

The following shows the job flow for installing the BBU. For details, see the respective chapters.

```
                    ┌──────────────┐
                    │    Start     │
                    └──────┬───────┘
                           │
                           ▼
        ┌─────────────────────────────────┐        Chapter 1
        │ Check BBU-Plus2 and             │        Describes how to check the BBU and
        │ accessories.                     │        the included accessories as well as
        │ Check notes on installation.     │        installation notes.
        └─────────────────┬───────────────┘
                           │
                           ▼
        ┌─────────────────────────────────┐        Chapter 2
        │ Install BBU-Plus2.               │        1. Installation Procedure
        │                                  │        Describes how to install the
        └─────────────────┬───────────────┘        BBU-Plus2.
                           │
                           ▼
        ┌─────────────────────────────────┐        Chapter 2
        │ Check connections and            │        2. Check from Utility
        │ set write cache mode.            │        Describes connection checking
        └─────────────────┬───────────────┘        procedure after battery installation and
                           │                        the setting of the write cache mode.
                           ▼
                    ┌──────────────┐
                    │     End      │
                    └──────────────┘
```

4. Checking the Package Contents

The package contains the following items. Check the contents to confirm you have all the necessary items before starting the installation job.

No.	Item	Qty	Remarks
1	Additional DAC battery	1	This unit
2	User's Guide	1	This manual
3	Setup Date Label	1	
4	Certificate	1	
5	Screw	3	

The package contains the following items.
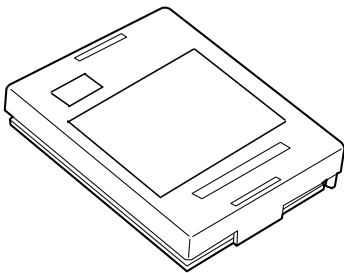
Battery Backup Unit
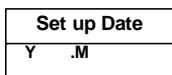
Set up Date
Y   .M

Setup Date Label   Screw

5. Names and Functions of Sections

This section describes the sections of the BBU.

 Front view
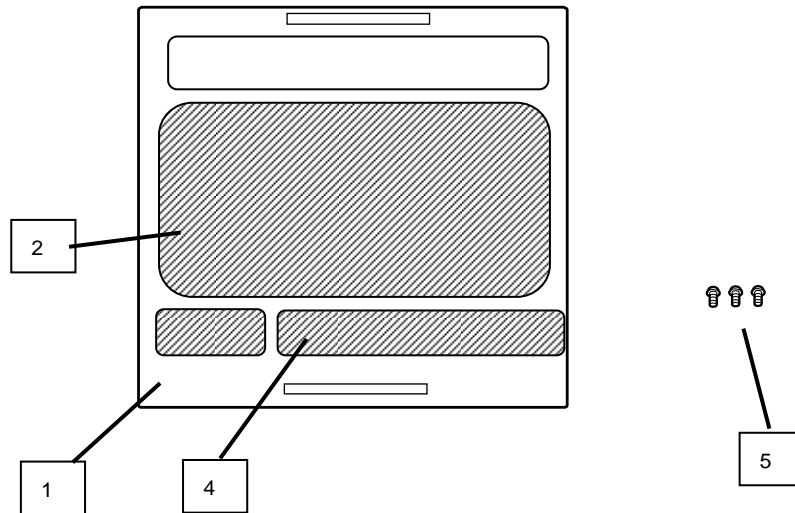
| 1 | Battery Board & Cover
It contains the Litium battery cell. |
| 2 | Recycle & Caution Label
The label is put on the battery pack. It indicates the recycle symbol, battery type, and warning message, and is filled with the management revision of the battery pack. |
| 4 | Rev Label
Indicates the Rev Number, Product Name, Serial Number. |
| 5 | Screw (3 pcs)
To fix this battery (Cover) to the Disk Array Controller |
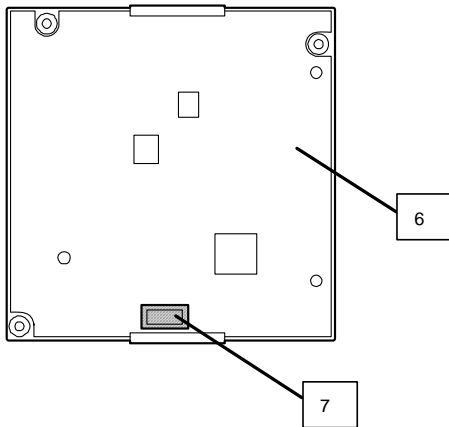
Rear view   **Accessories**
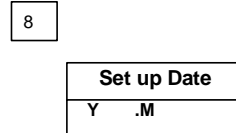
6	Battery Board
	Relays the supply of electric power from the battery pack to the Disk Array Controller

7	Battery Connector
	Connect to the disk array controller.

8	Setup Date label (accessory)
	The label comes with the BBU. Fill the year and month when the BBU is installed in the disk array controller. Then put the label on the server.

6. Notes

Read the following notes thoroughly before using the BBU.

6-1. Notes on Installation

- Do not lay the BBU on a metallic plate, including the chassis of the server.
- Do not hold the BBU if your hands are wet.

Failure to follow these recommendations could cause a short-circuit on the battery.

6-2. Notes on Operation

- The life of the battery pack used for the BBU is around 2 years, which may vary a little depending on the environment of use and the environmental conditions. Replace the battery pack with a new one after about two years starting from the installation. For the replacement, contact your service representative.

- To manage properly the BBU states, install the Disk Array Controller Management Utility "Web-based Promise Array Manager" (called WebPAM PRO hereafter). WebPAM PRO allows you to detect errors and check the states of the BBU (including voltage and temperature).

- The following alert may be logged when you restart the system immediately after charging the BBU, however, you can ignore it. If you continue to charge the BBU, this alert will no longer be logged. "Battery voltage is out of range"

Chapter 2 Installing the BBU

This chapter describes the installation of the BBU in the server.

1. Installation Procedure

Install the BBU in the disk array controller as described in the following procedure.

✔ **Check** Before starting the installation job, refer to the User Guides of the disk array controller and of the server.

1-1. Adding Setup Date Label

Fill in the year and month corresponding to the BBU installation date on the battery label coming with the BBU. Stick the label on the BBU surface.

We suggest to fill in the accessory one and put it to the place that you notice easily such as system case.

Fill the year and month

Example**Y** 2007. **M** 05

Setup Date Label （accessory）

Set up Date	
Y	.M
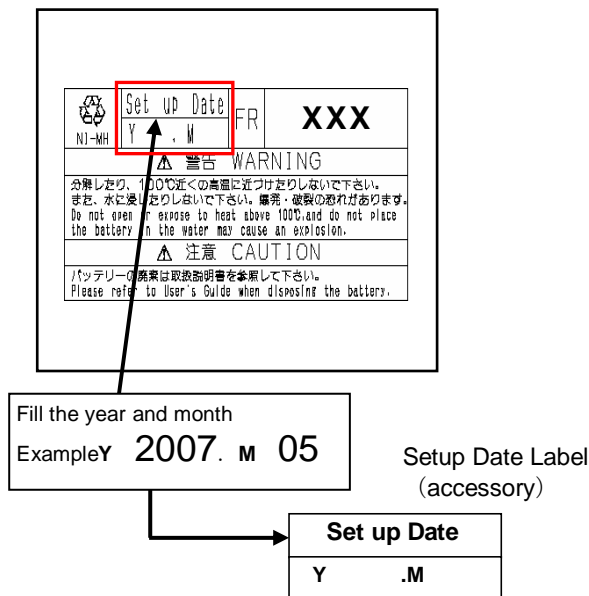
Notice The battery life is about 2 years and varies depending on the environment of use and operating conditions. If the battery pack is used for more than 2 years, we cannot guarantee that the maximum data backup time (72 hours) can still be achieved. Replace the battery pack as described in "Chapter 3 Operation and Maintenance."

1-3. Installing the BBU in Disk Array Controller

See the following instructions and figures.

1. Connect securely the connector of the battery board to the disk array controller board.
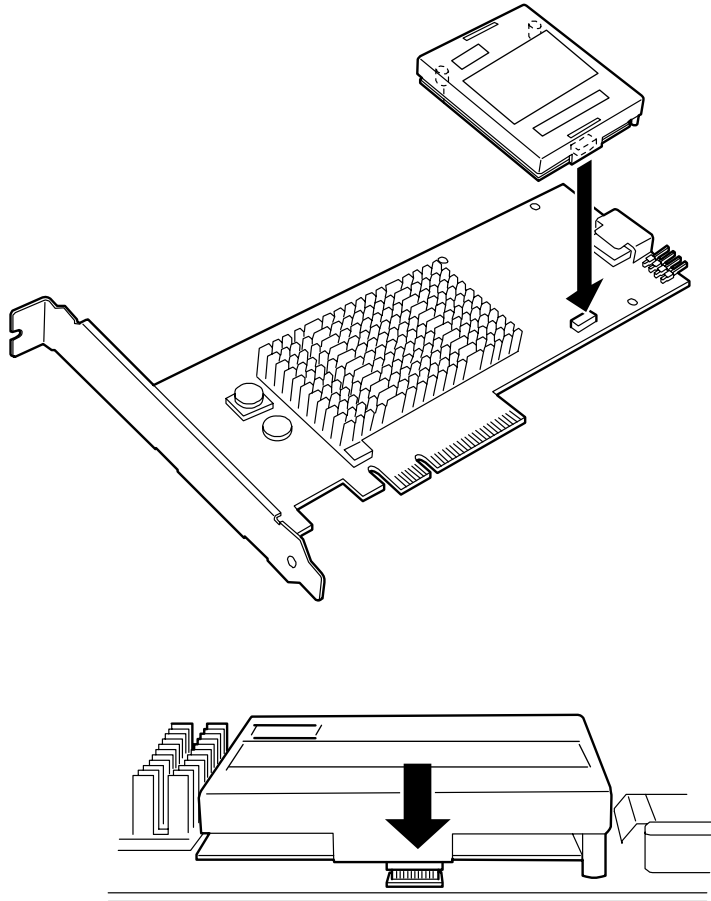
2. Confirm that the screw holes on the standoffs are in line with the screw holes on the rear side of the disk array board.

Carefully insert 3 screws from the back of the board through the holes on the standoffs.
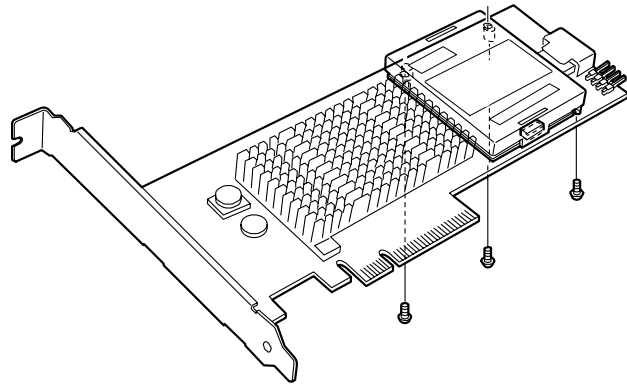
* To remove the additional battery from the disk array board, see the following procedure.

1. Remove the 3 screws from the rear side of the disk array board, and be careful not to lose screws.

2. Pull out the additional battery from the battery connector.
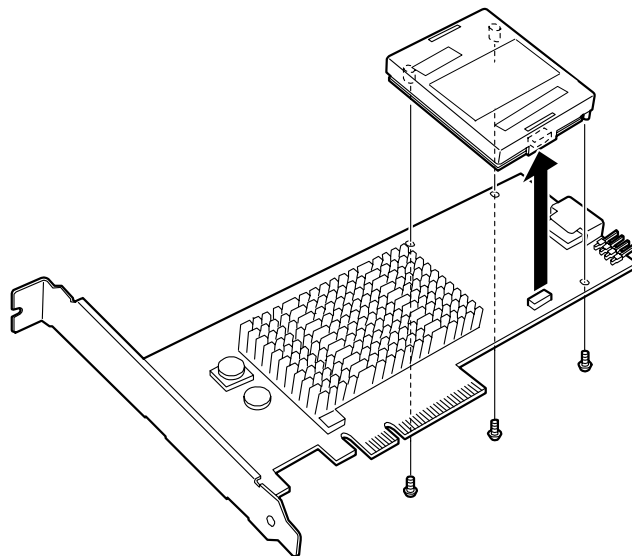
2. Utility Check

After the installation, check the connections and settings of the BBU using the disk array controller management utility "Web-based Promise Array Manager" (called WebPAM PRO hereafter).

1. Select [EX4650EL] -> [Controllers] -> [Controller1] from WebPAM Pro and click [Battery] tab.
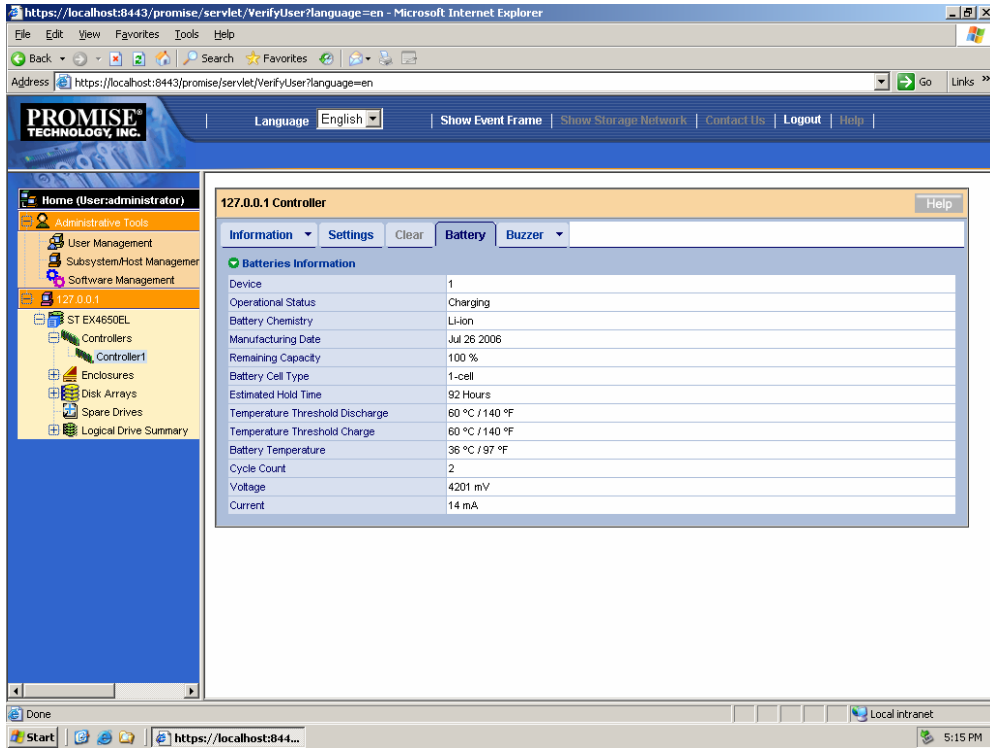
✔ **Check**	If the battery is not attached or it is broken, 'No Battery Detected' is displayed.

2. Select the 'Setting' tab and confirm that 'Adaptive Writeback Cache' is set to'Enable'. If this value is set to 'Disable', change it to 'Enable'.

127.0.0.1 Controller Settings

Information ▼	**Settings**	Clear	**Battery**	**Buzzer** ▼	

🟢 **Controller Settings**

Controller ID	1
Alias	
Enable SMART Log	☑
SMART Polling Interval [1-1440]	10 minutes
Enable Coercion	☐
Coercion Method	GBTruncate
Write Back Cache Flush Interval [1-12]	3 seconds
Enclosure Polling interval [15-255]	15 seconds
Adaptive Writeback Cache	☑

🔑 **Notice**	The Adaptive Writeback Cache is used to detect any battery status error (or if the battery capacity is low) and change WritePolicy to WriteThrough automatically to protect your data. The Default setting of Adaptive Writeback Cache is 'ON'. You can change this value, however we recommend you don't.

3. Select every configured logical drive from the [Logical Drive Summary] in the WebPAM Pro tree and confirm that the WritePolicy is 'WriteBack'.

127.0.0.1 Logical Drive

Information ▼	**Settings**	**Background Activities** ▼	**Check Table**

🟢 **Logical Drive Information**

Alias	
Read Policy	ReadAhead
Write Policy	WriteBack

4. Once the battery is completely charged, click the 'Information' tab and confirm that both the WritePolicy and the Current Write Policy is 'WriteBack'

127.0.0.1 Logical Drive	
Information ▼ **Settings** **Background Activities** ▼ **Check Table**	
● Logical Drive Information	
Logical Drive ID	0
Alias	
RAID Level	RAID5
Operational Status	Critical, Rebuilding
Capacity	101.24GB
Physical Capacity	134.99GB
Number of Axles	1
Number of Used Physical Drives	4
Stripe Size	64KB
Sector Size	512Bytes
Disk Array ID	0
Read Policy	ReadAhead
Write Policy	WriteBack
Current Write Policy	WriteBack
Serial Number	0000000000000000000000000820A4AC4FB6AD244
WWN	229E-0001-5517-B535
Synchronized	Yes
Tolerable Number of Dead Drives	N/A
Parity Pace	N/A
Codec Scheme	N/A

Notice	WebPAM PRO may not able to recognize the battery pack if it is charged only at the minimum level (or uncharged). If this occurs, charge the battery pack for six hours or longer. Reboot the server and try to recognize the battery pack again using WebPAM PRO.
Tips	For details of the Write Policy, refer to the User's Guide of the disk array controller or WebPAM PRO User's Guide (online document in the CD-ROM coming with the disk array controller).

Chapter 3 Operation and Maintenance

1. Maintenance Service

We recommend you ask our Service Representatives for the help of one of our technicians when your BBU requires servicing. They will provide you with genuine parts, and you can rely on their high technical capabilities.

2. Preventive Maintenance

2-1. Preventive Maintenance of BBU

We recommend your regularly check the BBU status (including voltage and temperature) as a preventive maintenance. You can use WebPAM PRO to do so.

2-2. Battery Pack Life

The battery pack used in the BBU can be used for about two years. Replace the battery with a new one after about two years starting from the installation of the BBU (refer to the battery label put on the server and the BBU). Follow the instructions in "3. BBU Replacement Procedure".

Notice	The battery pack is a supply/charged warranty device.

3. Battery Pack Replacement Procedure

Replace the battery pack as described in the following procedure:

1. Exit from all applications and shutdown OS.

2. Turn off the power of the server and remove all the power cords connected to the power unit from the receptacles.

3. Remove the side cover following the User's Guide of the server.

4. Remove all the cables from the disk array controller and the server.

5. Remove the screw fixing the disk array controller. Then remove the disk array controller from the server.

6. On the rear face of the disk array controller, remove the screws (3) fixing the BBU.
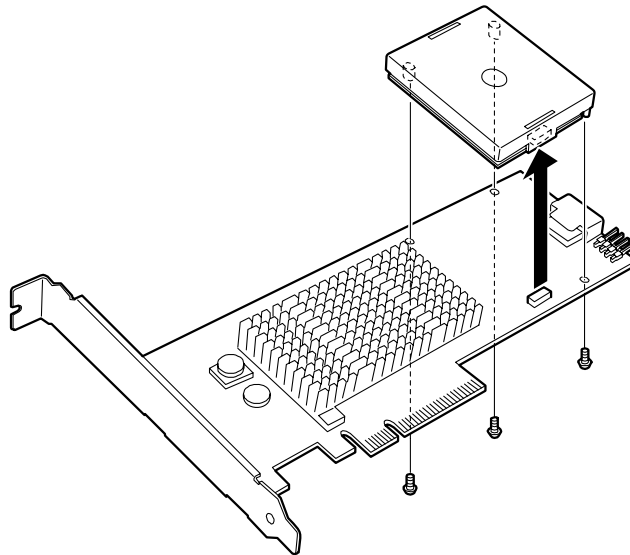
7. Fill the year and month when the BBU is installed in the disk array controller on the battery label coming with the cover.


```
┌─────────────────────────────────────────┐
│  ♻      │Set up Date│FR│  XXX           │
│  NI-MH  │Y  . M     │  │                │
│         ⚠ 警告  WARNING                 │
│  分解したり、100℃近くの高温に近づけたりしないで下さい。│
│  また、水に浸したりしないで下さい。爆発・破裂の恐れがあります。│
│  Do not open or expose to heat above 100℃,and do not place│
│  the battery in the water may cause an explosion.│
│         ⚠ 注意  CAUTION                 │
│  バッテリーの廃棄は取扱説明書を参照して下さい。│
│  Please refer to User's Guide when disposing the battery.│
└─────────────────────────────────────────┘
```
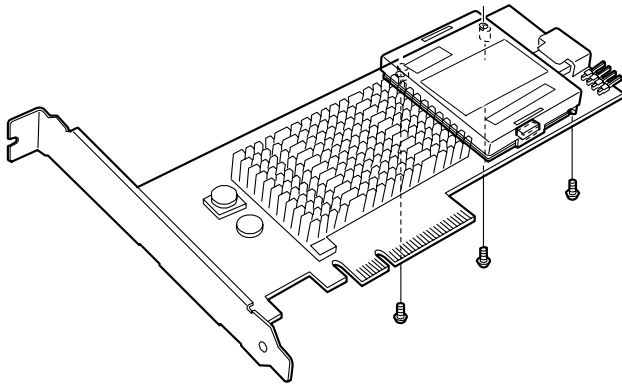
Fill the year and month

Example**Y** 2007. **M** 05

Setup Date Label
（accessory）

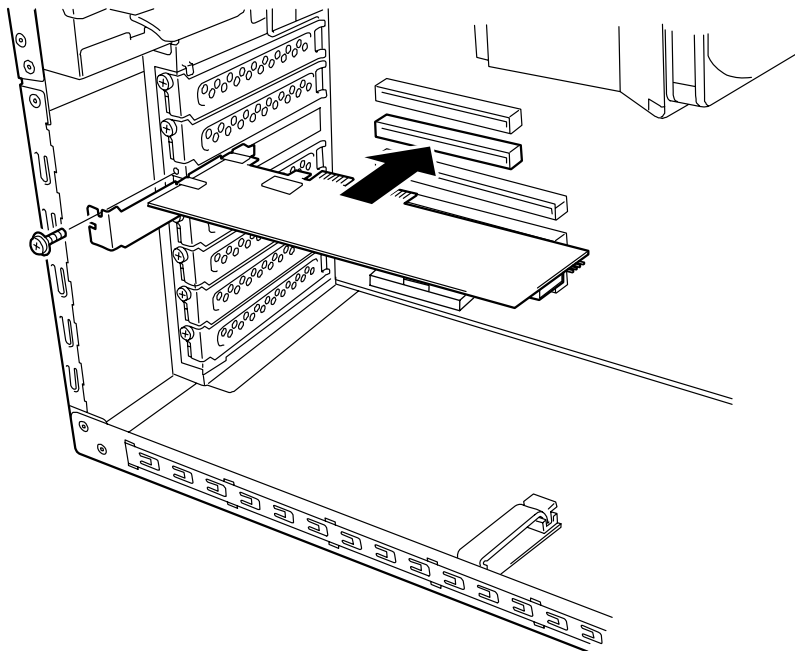| Set up Date	
Y	.M

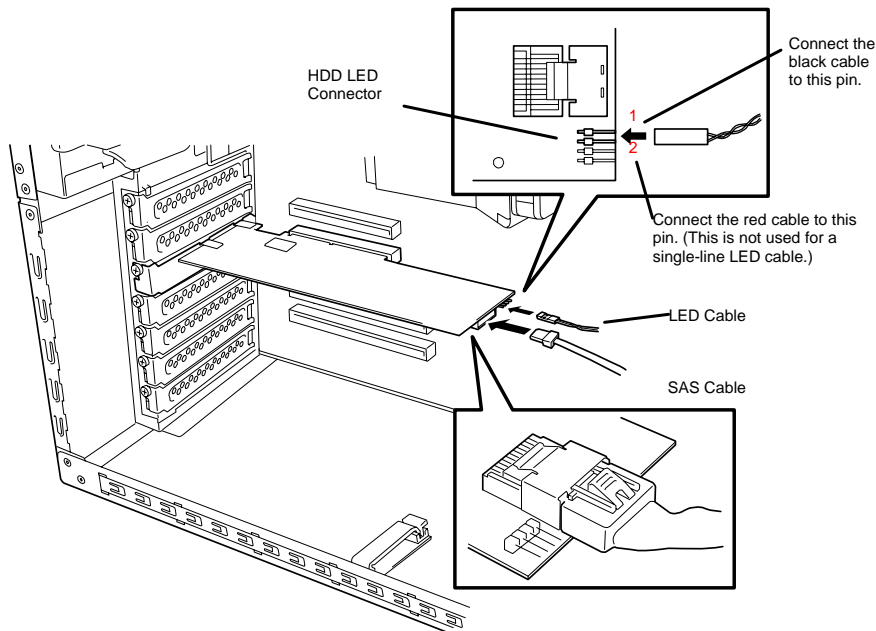**8.** Connect this battery to the connector on the Disk Array Controller.
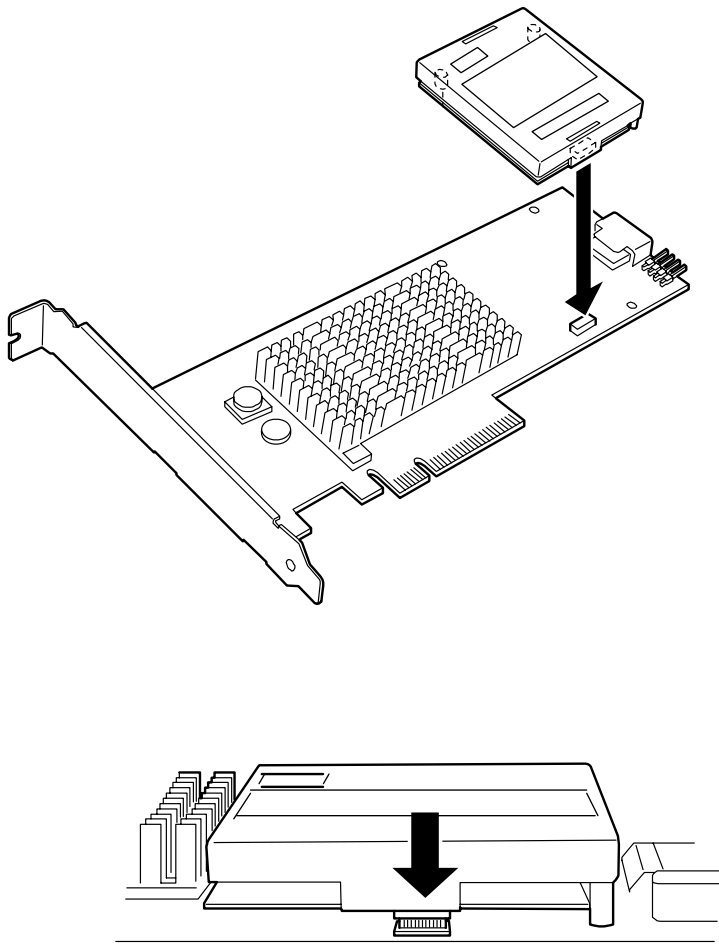
9. Fix the 3 point of the figure below with screws from the rear and set the battery on the Disk Array Controller.

10. Insert the disk array controller into the PCI slot and fix the BBU with the screw removed previously.

11. Connect the cable between the disk array controller and the system to recover the original state

HDD LED Connector

Connect the black cable to this pin.

1
2

Connect the red cable to this pin. (This is not used for a single-line LED cable.)

LED Cable

SAS Cable

12. Put the Setup Date Label to a place that you notice easily, such as the system case.

13. Install the side cover on the server. Connect the power cord to the receptacles to recover the original state and power on the system.

14. Confirm whether the disk array controller is recognized by the system once the OS starts. For more details, refer to [2-2. Checking by Utility].

Notice	WebPAM PRO may not able to recognize the battery pack if it is charged only at the minimum level (or uncharged). If this occurs, charge the battery pack for six hours or longer. Then reboot the server and try to recognize the battery pack again by using WebPAM PRO.

Tips	The battery pack is recyclable.Contact your service representative for more information, or bring it to the nearest recycle agent.

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