Upgrade

This Upgrade Volume describes the procedure for upgrading from the existing model to the upper model and the procedure for upgrading the HUS150 to the Drive I/O Module (Encryption) (Chapter 8.).

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Chapter 1. Outline

This Upgrade Volume describes the procedure for executing the upgrade operation from CBS to CBL with retaining the customer data of the used Drives.
This describes Hitachi Virtual Storage Platform as “VSP”, Hitachi Universal Storage Platform V as “USP V” and Hitachi Universal Storage Platform VM as “USP VM”.

This Upgrade Volume does not support the procedure for the upgrade operation from CBXSL/CBXSS. Furthermore, this does not include the procedure related to the whole system such as system configuration changes, the procedure for adding/removing optional parts and the procedure for setting priced options.

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Chapter 2. Tools and Arranged Parts Required for Upgrade

The tools required at the time of upgrade and the required arranged part model names are shown here.
The following tools are required for the upgrade procedures.

Table 2.1 Tools Required

Division	Tool name	Specification	Usage
Tool	Phillips screwdriver	No.2	Installation of skirts and fixing the array.
	Allen wrench	No.3	Fixing of cable cramps.
	Allen wrench	No.4	Fixing of rail, connection of power cable.
	Spanner	No.22	Adjustment of leveling bolts.
	M8 socket wrench	No.13	Installing a stabilizer
Tool of other	Wrist strap	–	Band for protecting the array from the static electricity.
	LAN cross cable	Category 5	For connecting a service PC and the array.
	PC for maintenance	–	More than 15 G Bytes of free space on the hard disk

2.1 Arranged Parts Required for Upgrade

The required arranged part model names at the time of upgrade are shown here.
Purchase the options also as needed.

Table 2.1.1 Arranged Parts at the time of Upgrade

Model	Unit Per ASSY	Components	Remarks
DF850-MH	1	Controller Box (1)	Indispensable
DF-F850-16GB	1	Cache Memory (4 G bytes) (4)	Select
DF-F850-32GB	1	Cache Memory (8 G bytes) (4)	Select
DF-F850-HF8G	4	Host I/O Module (8G-FC) (1)	Select
DF-F850-HS10G	4	Host I/O Module (10G-iSCSI) (1)	Select
DF-F850-DBL	1	Drive Box (2.5-inchi) (1)	Select
DF-F850-DBS	1	Drive Box (3.5-inchi) (1)	Select

NOTE : • The parts whose status is “Select” need to be ordered in accordance with the configuration before and after the upgrade of the customer.
• The DVD including the firmware for each model of the most recent version is attached to the ordered parts.

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Chapter 3. Before Starting Upgrade Operation

3.1 Prerequisites

(1) Since the upgrade operation is the offline operation, it is required to stop the access from the host computer. Furthermore, the planned shutdown must be executed for the array before the hardware upgrade operation.
(2) The array before the upgrade must be in the status where no failure has occurred.
(3) The most recent version of Hitachi Storage Navigator Modular 2 must be used.
(4) When the priced option (Excluding Dynamic Provisioning, Dynamic Tiering and Data Retention Utility) is used in the array before the upgrade, it is required to lock the priced option before starting the upgrade operation. The license key of the priced option used before the upgrade cannot be used in the upgraded array.

NOTE :
- Since the priced options of Dynamic Provisioning, Dynamic Tiering and Data Retention Utility can be upgraded in the unlocked status, they do not need to be locked.
- When TrueCopy remote replication/TrueCopy Extended Distance was used, stop the operation and resynchronize the pair. Lock the priced option after checking that you have a record of the priced option setting.
- When using SNMP Agent Support Function continuously after the upgrade, it may need to review the SNMP environment information file.

(5) Since the priced option license key is issued for the chassis, the priced option license key which was used before the upgrade cannot be used in the array after the upgrade. When using the priced option which was used in the chassis before the upgrade in the chassis after the upgrade, it is required to purchase the priced option license key for the chassis after the upgrade.
(6) The array before the upgrade must not be in the following status.
- Priced option is unlocked (Excluding Dynamic Provisioning, Dynamic Tiering and Data Retention Utility)
- Under volume format
- Under RAID Group expansion
- Under firmware replacement
- The DP pool is being formatted
- The DP pool is being optimized
- Relocating

(7) Since the 1 Gbps iSCSI interface is unsupported by the CBL, the upgrade to the CBL cannot be performed with the 1Gbps iSCSI interface installed.
(8) All the Drives installed in the array before the upgrade are moved. Moving only a part of the Drives is not allowed.
(9) In the Controller Box of the CBL after the upgrade, the Drives cannot be installed. Therefore, a new Drive Box is required. Check that the area for 3U is available in the existing rack frame for installing the CBL and the Drive Box.

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(10) It is required to stop and reboot the host because the setting of the host needs to be changed.
(11) When CBSL/CBSS is made as Boot disk, or rootdg of VxVM is installed in CBSL/CBSS, the upgrade cannot be performed because the device file name which the host recognizes is changed in the case of upgrading to CBL.
(12) The downgrade from CBL to CBXSL/CBXSS is not supported.
(13) The upgrade from CBXSL/CBXSS to CBSL/CBSS/CBL is not supported.

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3.2 Before Starting Upgrade Work

(1) Check before the upgrade that the host interface of the array is Fibre Channel or iSCSI, and prepare the same type of the interface board for the array after the upgrade by no later than the upgrade work day.

(2) Check whether the customer uses the priced option used before the upgrade after the upgrade or not, and if it is used, prepare the license key of the priced option for the array after the upgrade by the day of the upgrade operation.
The license key of the priced option is issued for the array. If the customer uses the priced option used in the array before the upgrade in the array after the upgrade, the customer needs to purchase the license key for the array after the upgrade.

(3) When any of Cache Residency Manager, Cache Partition Manager, and Dynamic Provisioning is used and it is continued to be used in the array after the upgrade, depending on the setting and configuration of the array before the upgrade, the cache memory needs to be increased. Refer to "3.3 Notes" (UP 03-0030) for the details.
When the addition is required, prepare the necessary Cache Memory by the day of the upgrade work.

(4) As for the upgrade work, settings of the array must be changed through operation of a maintenance PC connected via a LAN. Besides, the firmware must be installed from a DVD. Make the following preparations before starting upgrade work.
- Prepare a PC in which Hitachi Storage Navigator Modular 2 of the latest version is installed. The PC must fit the LAN environment and have a DVD drive.
- LAN cross cable
- Firmware installation DVD of the most recent version for array after upgrade

(5) Back up the user data by the day of the upgrade work to prepare for emergency. Be sure to perform this work.
If you fail to operate the upgrade work, you may lose the user data on the array.
Back up the user data on the array by the operation on the host computer side.

(6) Check if the array before the upgrade is not connected as the external storage of VSP/USP V/USP VM. As a result of the confirmation, when the array is connected as the external storage, prepare the procedure of the external storage maintenance section of the VSP/USP V/USP VM Maintenance Manual (Refer to EXTERNAL STORAGE MAINTENANCE SECTION "2. Maintenance for External Storage").

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3.3 Notes

(1) When executing updating installation of the firmware, be sure to select [Update].
Never execute the [Initial Setup] because all data will be lost.

(2) When executing updating installation of the firmware, use the firmware whose version.
After this, do not install any firmware other than the version prepared for the upgrade.
When a failure occurs during the upgrade and you try to recover it, if the firmware of two or more versions is installed, you may not recover the array from the failure.

(3) When upgrading the array, do not upgrade two or more array at the same time to avoid the Drive replacement operation error.

(4) When the array before the upgrade is the system configuration of the iSCSI interface, Target iSCSI Name of the array after the upgrade takes over the value before the upgrade. However, when the default iSCSI Name is used in Target of the array before the upgrade, Target iSCSI Name of the array after the upgrade must be changed to a unique value in the network. If the array after the upgrade is used without changing Target iSCSI Name, when configuring the array before the upgrade in the system of the iSCSI interface again after that, iSCSI Name of both array duplicate in the network and the iSCSI protocol has trouble.

(5) The IP address of User management LAN and Maintenance LAN of Controller (Management Module in case of CBL) can be taken over from the value before the upgrading. (In the upgrading procedure, there is a process to use the IP address of the maintenance port as the factory default value (10.0.0.16/17) temporarily.)

(6) When setting the E-mail alert function enabled in the array before the upgrade, the array after the upgrade takes over the information of [Domain Name], [Mail Server Address], [From Address], [Send To Address] and [Reply To Address]. However, since the enabled setting of the mail transmission becomes disabled, it is required to change the setting to use the E-mail alert function continuously. (Refer to System Parameter “9.1.6 Enabling E-mail Alert” (SYSPR 09-0100).)

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(7) When using the Cache Residency Manager, which is an optional feature, there may be a case where the use is not allowed depending on a capacity of the cache memory. Refer to the following Table 3.3.1, if the capacity of the cache memory is found to be insufficient, make addition to the cache memory or use the volume as a non-Cache Residency Manager.
However, when the Cache Residency Manager is enabled after the upgrade in the case where the volume is used as a non-Cache Residency Manager, the array will be placed in a state in which a warning is kept issued.
When Cache Partition Manager of the priced options are used continuously after the upgrade, it is necessary to add the cache memory to be installed.
When upgrading the array which uses the priced option, Dynamic Provisioning in the maximum capacity mode in the configuration with 8 G bytes of cache memory per controller, the cache memory needs to be increased to 16 G bytes per controller.

Table 3.3.1 Cache Memory Capacity before and after the Upgrade when Priced Option is Used (CBSL/CBSS→CBL)

Priced Option to Be Used Continuously after Upgrade			Capacity of Cache Memory before upgrade (G bytes/controller)	Capacity of Cache Memory after upgrade (G bytes/controller)	Remark
•ShadowImage in-system replication •Modular Volume Migration •TrueCopy remote replication			8 G bytes	8 G bytes or more	–
			16 G bytes	16 G bytes	–
•Copy-on-write SnapShot •TrueCopy Extended Distance			8 G bytes	8 G bytes or more	–
			16 G bytes	16 G bytes	–
Cache Partition Manager			8 G bytes	16 G bytes	It is necessary to add the Cache Memory.
			16 G bytes	16 G bytes(*1)	–
Dynamic Provisioning/Dynamic Tiering			8 G bytes	8 G bytes or more	Only in the maximum capacity mode, the cache memory has to be increased to 16 G bytes.
			16 G bytes	16 G bytes	–
Cache Residency Manager	Block size of resident volume (When Dynamic Provisioning and Dynamic Tiering are disabled)	1 to 3,769,920	8 G bytes	8 G bytes or more	–
			16 G bytes	16 G bytes	–
		3,769,921 to 3,890,880	8 G bytes	16 G bytes	It is necessary to add the Cache Memory.
			16 G bytes	16 G bytes	–
		3,890,881 to 10,442,880	16 G bytes	16 G bytes	–
		10,4428,81 to 10,563,840	16 G bytes	–(*2)	–
	Block size of resident volume (When Dynamic Provisioning are enable and Dynamic Tiering are disabled)	1 to 2,116,800	8 G bytes	8 G bytes or more	–
			16 G bytes	16 G bytes	–
		2,116,801 to 3,245,760	8 G bytes	16 G bytes	It is necessary to add the Cache Memory.
			16 G bytes	16 G bytes	–
		3,245,761 to 8,789,760	16 G bytes	16 G bytes	–
		8,789,761 to 9,918,720	16 G bytes	–(*2)	–

*1 : After the upgrade, the cache partition size may not be set to the same size as before the upgrade.
*2 : After the upgrade, the same setting as before the upgrade cannot be performed.

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Priced Option to Be Used Continuously after Upgrade			Capacity of Cache Memory before upgrade (G bytes/controller)	Capacity of Cache Memory after upgrade (G bytes/controller)	Remark
Cache Residency Manager	Block size of resident volume (When Dynamic Provisioning and Dynamic Tiering are enable)	1 to 1,915,200	8 G bytes	8 G bytes or more	–
			16 G bytes	16 G bytes	–
		1,915,201 to 3,044,160	8 G bytes	16 G bytes	It is necessary to add the Cache Memory.
			16 G bytes	16 G bytes	–
		3,044,161 to 8,588,160	16 G bytes	16 G bytes	–
		8,588,161 to 9,717,120	16 G bytes	–(*1)	–

*1 : After the upgrade, the same setting as before the upgrade cannot be performed.

(8) If the serial number of the array is changed by the upgrade operation, WWN is also changed at the same time. Therefore, the operation to recognize the volumes of the array is required again by changing the binding setting of HBA drives, the zoning setting of Fabric switches, setting of application software, and others. Refer to "Chapter 7. Setting Changes in Host Computer and Others" (UP 07-0000) for the setting changes.

(9) When the array before the upgrade is the external storage of VSP/USP V/USP VM, since the serial number and WWN of the host Fibre Channel I/F of the array after the upgrade are changed, the operation to recognize the volumes of the array after the upgrade is required again for VSP/USP V/USP VM. Therefore, when upgrading the array which is the external storage of VSP/USP V/USP VM, follow the procedure of the external storage maintenance section in the maintenance manual of VSP/USP V/USP VM (Refer to EXTERNAL STORAGE MAINTENANCE SECTION "2. Maintenance for External Storage") before the upgrade, and then perform the upgrade operation.

(10) When using the port of the interface newly added to the array after the upgrade, execute the port option setting, LU mapping setting, host group setting and others referring to System Parameter "Chapter 5. Setting Host Group/Targets" (SYSPR 05-0000).

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(11) Check the precautions shown below for the port information taken over between the arrays before and after the upgrade.

Table 3.3.2 Port Information Takeover at the Time of Model Upgrade (CBSL/CBSS→CBL)

No.	The chassis before the upgrade (CBSL/CBSS)		The chassis after the upgrade (CBL)		Additional work
	Port 0A to 0D Port 1A to 1D	Port 0E to 0H Port 1E to 1H	Port 0A to 0D Port 1A to 1D	Port 0E to 0H Port 1E to 1H	
1	Fibre Channel	Unmount	Fibre Channel	Unmount	Since the port information of Port 0A to 0D and 1A to 1D in the array before the upgrade is taken over by Port 0A to 0D and 1A to 1D in the array after the upgrade, the additional settings of the port information on the array side are not required.
2	Fibre Channel	1 Gbps iSCSI	Fibre Channel	Unmount	When the 1 Gbps iSCSI interface board is installed in the array before the upgrade, remove it before the upgrade.
		1 Gbps iSCSI or 10 Gbps iSCSI	Fibre Channel	10 Gbps iSCSI	Since the port information of Port 0A to 0F and 1A to 1F in the array before the upgrade is taken over by Port 0A to 0F and 1A to 1F in the array after the upgrade, the additional settings of the port information on the array side are not required.
3	Fibre Channel	Fibre Channel	Fibre Channel	Fibre Channel	Since the port information of Port 0A to 0H and 1A to 1H in the array before the upgrade is taken over by Port 0A to 0H and 1A to 1H in the array after the upgrade, the additional settings of the port information on the array side are not required.

* : Before and after the model upgrade, when changing to the Host I/O Module whose transfer rate of the supported Fibre Channel is different, even if the port number of the Fibre Channel does not change, the setting value of the transfer rate may be returned to the default value “Auto” after the upgrade. In that case, set it again as needed.

* : Since the 1 Gbps iSCSI interface is unsupported by the CBL, the upgrade to the CBL cannot be performed with the 1Gbps iSCSI interface installed.

* : The serial number and the WWN of all the interfaces change before and after the model upgrade.

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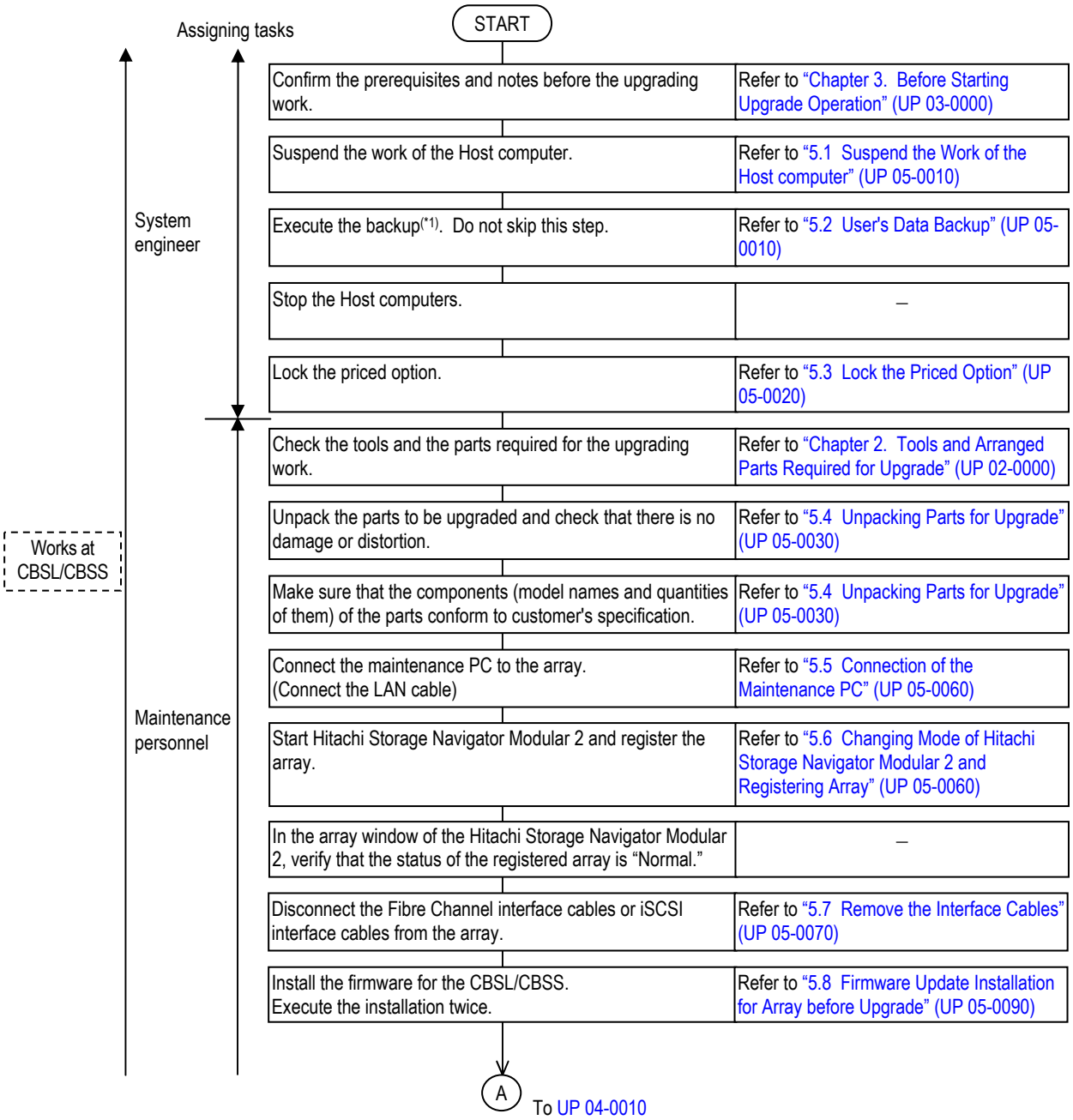
Chapter 4. Flow of Upgrade Operation Procedure

The operation procedure of each upgrade is shown below.

4.1 Flow of the Procedure for Upgrade Work from CBSL/CBSS to CBL

After checking the operation description, execute the upgrade according to the flow of the procedure.



*1 : Maintenance personnel should check if customer has executed user data backups. Without the backups, the upgrade cannot be executed.

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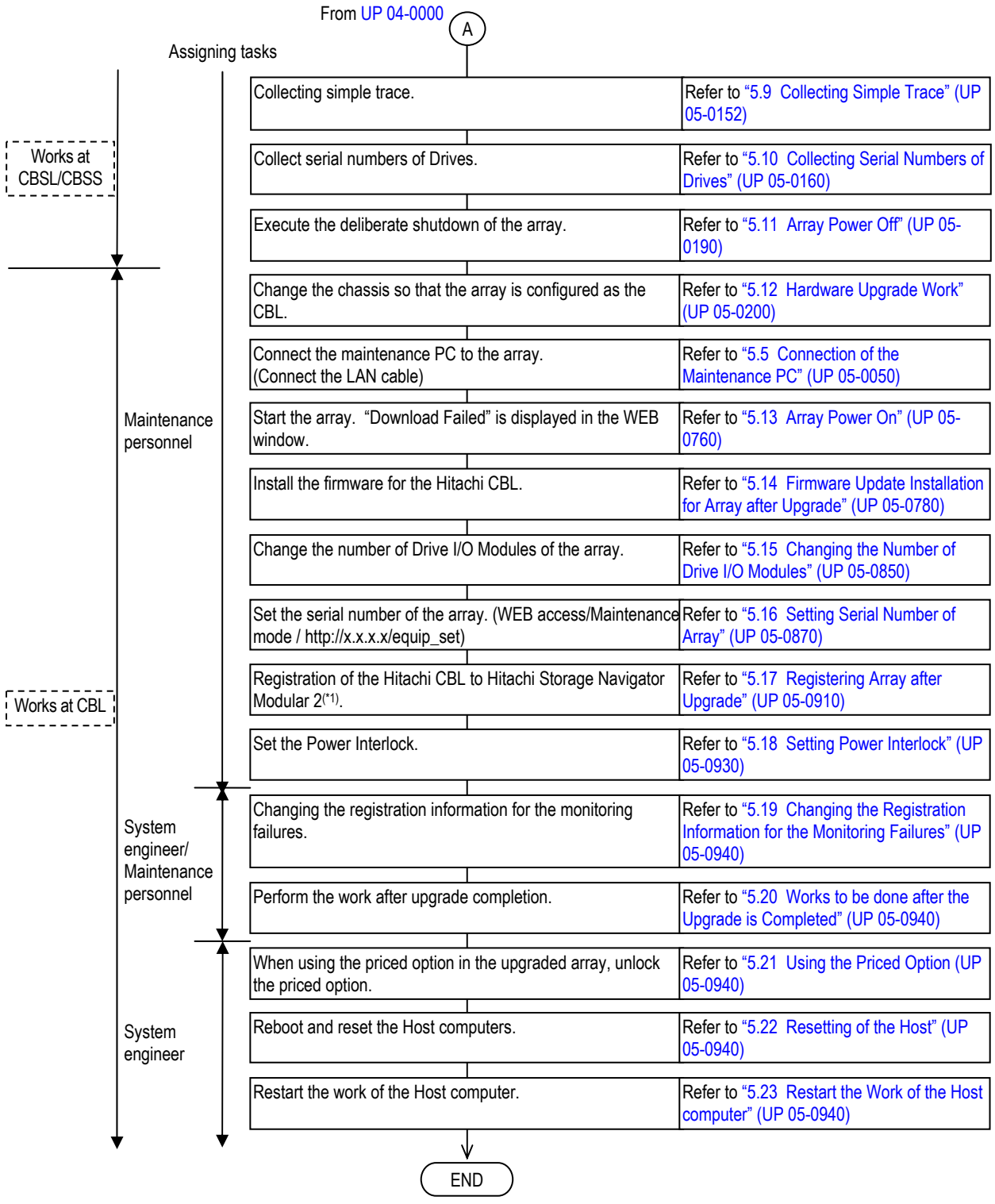

*1 : The registration of the array after the upgrade is required even in Hitachi Storage Navigator Modular 2 used by the customer. Request the SE or the customer to make the same correspondence.

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Chapter 5. Upgrade Work

CAUTION

Touching heat sinks or ICs may cause getting burned. Be sure to handle with care.

NOTICE

- **To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the chassis before starting and do not take it off until you finish.**
- **. Be sure to wear a wrist strap connected to the chassis whenever you unpack parts from a case. Otherwise, the static electrical charge on your body may damage the parts.**

NOTE : Make the upgrade with the power turned off irrespective of whether the system (host computer) is powered on or off.
Offline : The power of the array is OFF.
Online : The power of the array is ON.

Execute the operation at the reference instructed in the relevant flow of the upgrade in "Chapter 4. Flow of Upgrade Operation Procedure" (UP 04-0000) according to the flow order.

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5.1 Suspend the Work of the Host computer

Suspend the work of the Host computer.

5.2 User's Data Backup

There is the possibility of loss of user data if the upgrade procedures fail. To prepare for an emergency, all the Drive data should be backed up.

NOTE : Maintenance personnel must check if customers have executed users' data backups.

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5.3 Lock the Priced Option

5.3.1 Before Locking the Priced Option

When the priced option is used in the array before the upgrade, check that the setting of the priced option is written down before the upgrade, and then lock it according to the "Priced Option User's Guide" which is stored in the Basic Operating System for Modular DVD (P-002D-J500) or the CD-ROMs (P-002x-J5xx) of respective priced options.
You cannot use the license key of the priced option you were using before the upgrade for the upgraded array.

NOTE :
- Since the priced options of Dynamic Provisioning/Dynamic Tiering and Data Retention Utility can be upgraded in the unlocked status, they do not need to be locked.
- When TrueCopy remote replication/TrueCopy Extended Distance was used, stop the operation and resynchronize the pair. Lock the priced option after checking that you have a record of the priced option setting.
- When using SNMP Agent Support Function continuously after the upgrade, it may need to review the SNMP environment information file.

5.3.2 Procedure for Locking the Priced Option

Refer to System Parameter "14.2 Procedure for Locking the License of Priced Option" (SYSPR 14-0020).

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5.4 Unpacking Parts for Upgrade

Unpack the CBL and the Drive Box to be installed in the configuration after the upgrade. The procedure is shown below.

⚠ CAUTION

- **The unpacking should be done by two or more workers to prevent turning over of the array or being caught under the array.**
- **Work carefully because the mass of the single CBSL is about 43 kg, CBSS is about 40 kg, CBL is about 47 kg, DBL is about 27 kg, DBS is about 23 kg, and DBX is about 85 kg.**

(1) Unpacking the CBL, Drive Box.

NOTE : • Unpack it indoor.
Especially, do not unpack it in such places with the outdoor dust, the direct sunlight, and the infiltration of rain water.
• Work on the unpacking in the place where a rapid difference of temperature does not occur.
It may have dew condensation when it is unpacked in the place where a difference of temperature is extreme.

Figure 5.4.1 shows the array within the outer package.

(a) Remove the outer package and packing materials.
(b) Take the array out of the polyethylene bag.
(c) Remove tapes, etc. applied to the array.
(d) Remove desiccating agent from the lower of the array.
(e) Check the exterior of the array visually for distortion or damage owing to the transport.

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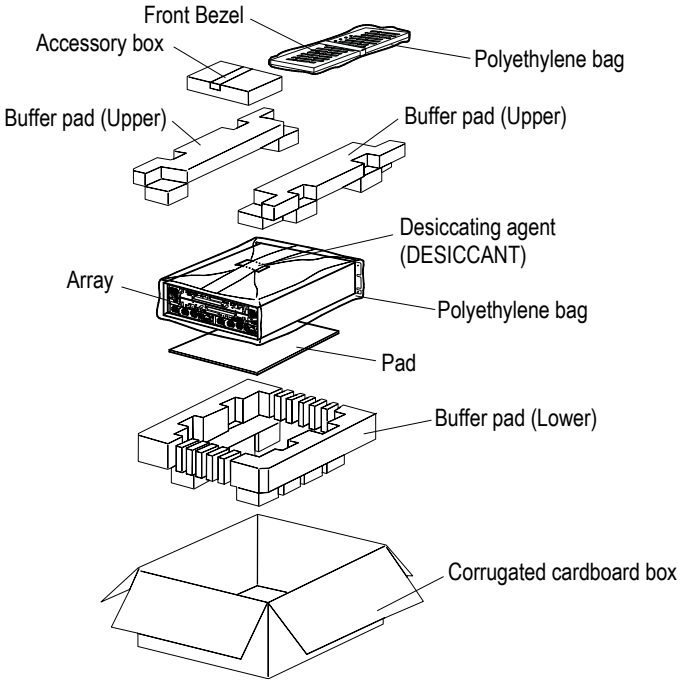

Figure 5.4.1 Packed Array

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(2) Checking contents of package

(a) Check if the contents of the package (their model names, product serial numbers, and quantities) agree with those in the packing list shipped with the array.

(b) The key supplied with the array (CBSL/CBSS/DBL/DBS/DBF for Front Bezel, DBX for front lock) must be kept by service personnel in order to prevent users from maintaining the array.
The key for Front Bezel is used to mount and dismount Front Bezel (CBSL/CBSS/DBL/DBS/DBF).
The key for front lock is used to lock and unlock the front of the DBX.
Keep the key carefully.

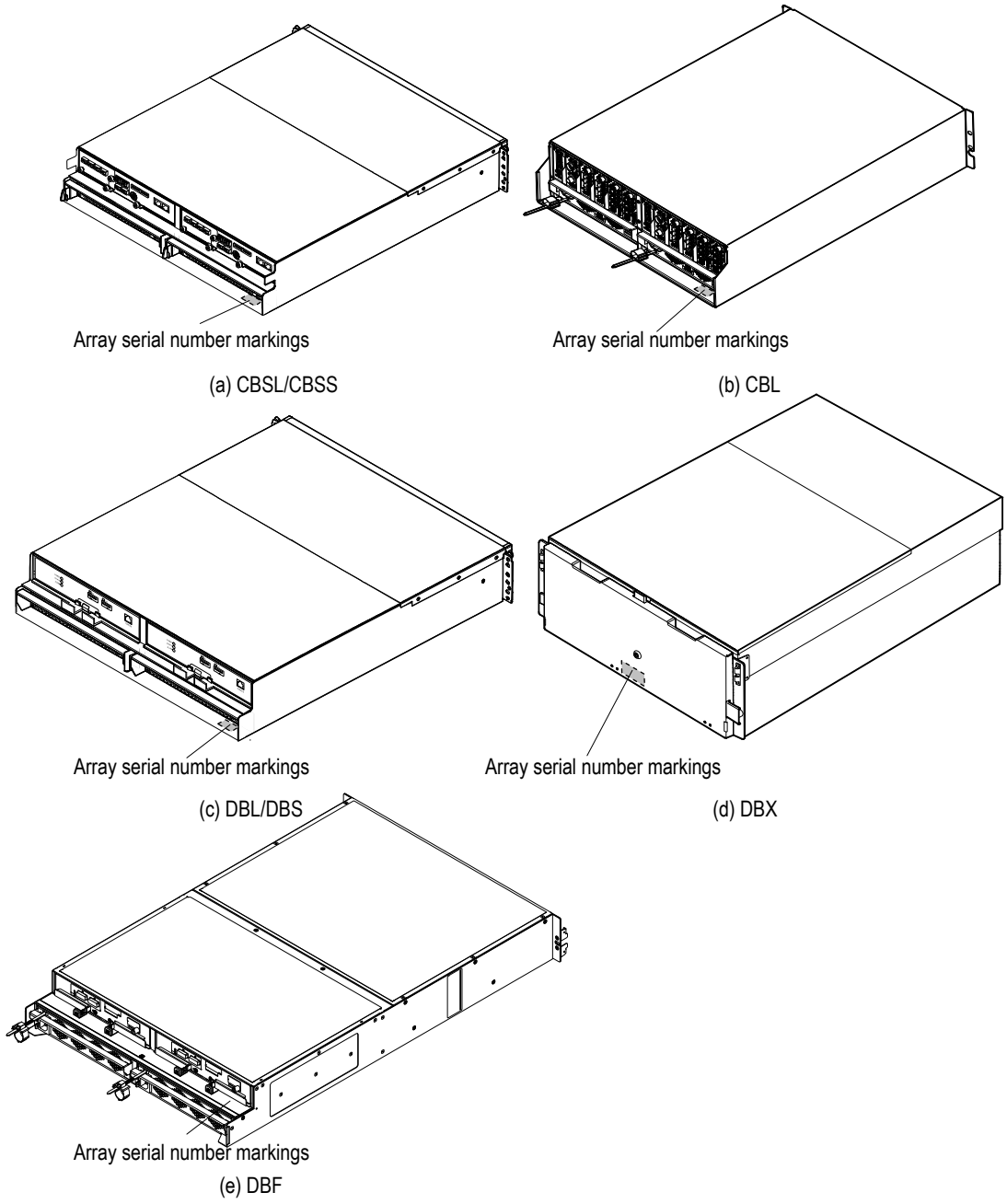

Figure 5.4.2 Position of Array Nameplate (Array Serial Number described Place)

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5.5 Connection of the Maintenance PC

Connect the maintenance PC to the array.

(1) Checking the LAN environment setting
Refer to System Parameter "1.1 (1) Checking the LAN environment setting" (SYSPR 01-0020).

(2) Connecting the LAN cross cable
Refer to System Parameter "1.1 (2) Connecting the LAN cross cable" (SYSPR 01-0040).

5.6 Changing Mode of Hitachi Storage Navigator Modular 2 and Registering Array

Register the array using Hitachi Storage Navigator Modular 2.

Refer to System Parameter "1.1 (4) Registering the newly introduced array in the Hitachi Storage Navigator Modular 2" (SYSPR 01-0070).

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5.7 Remove the Interface Cables

To execute the subsequent operation, Fibre Channel Interface cables and iSCSI cables should be disconnected. If connected, the other connected devices may be affected whenever the array reboots.
Disconnect all the Fibre Channel interface cables and iSCSI interface cables connected to the array (on the side of connecting to the Controller only).

NOTE : When the cable cannot be removed easily, do not pull it by force.
Pull out the parts a little, and then perform the cable removal again.

(1) Remove only the Controller connected side of all Fibre Channel interface cables and all iSCSI interface cables connected to both Controllers in the array before the upgrade. (All the cables connected to the onboard and the installed Host I/O Board).
When removing the Fibre Channel interface cables, pull out the Fibre Channel interface cables completely from the host connectors. If the Fibre Channel interface cables are inserted half in the host connectors, the Controller continues to detect the Fibre Channel failures, and the I/O processing of the Controller may be deteriorated.

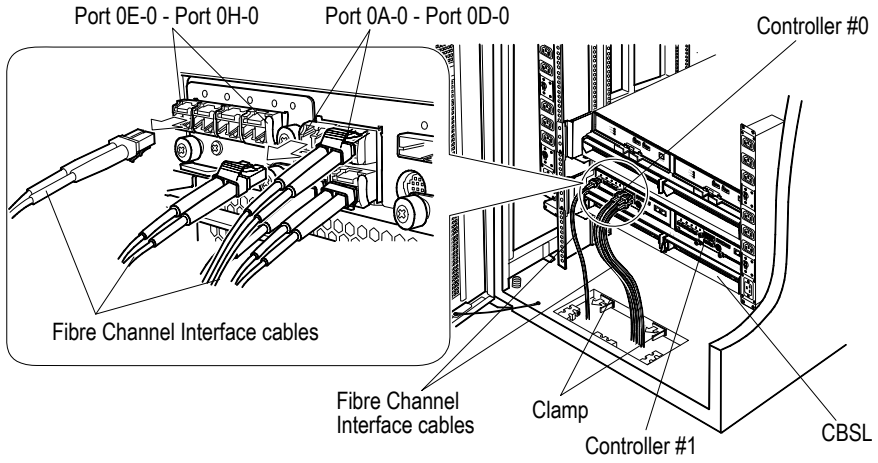

Figure 5.7.1 Disconnecting Interface Cable (Fibre Channel interface cable)

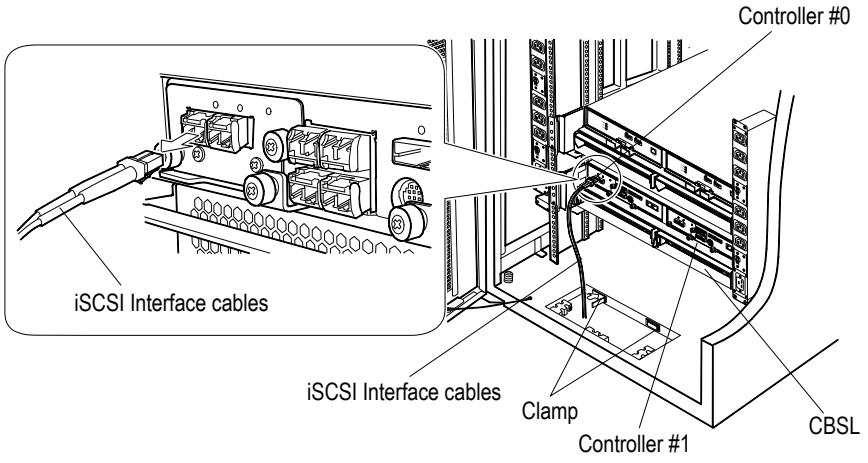

Figure 5.7.2 Disconnecting 10 G iSCSI Interface Cable

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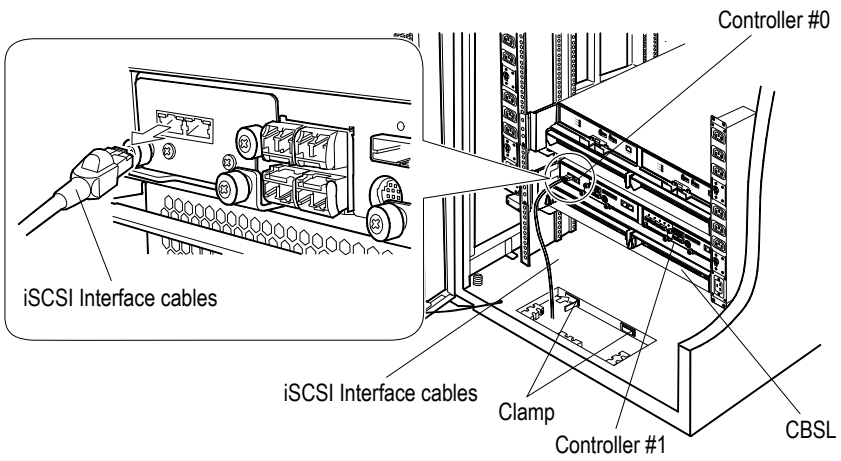

Figure 5.7.3 Disconnecting 1 G iSCSI Interface Cable

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5.8 Firmware Update Installation for Array before Upgrade

Use Hitachi Storage Navigator 2 and perform the update installation of the firmware for the chassis before the upgrade in the same version as the chassis after the upgrade.

NOTE : The firmware for both of the array before the upgrade and the array after the upgrade is stored in the DVD attached to the array after the upgrade.
When performing the firmware update in this upgrade procedure, use the firmware stored in the attached DVD.

The updating installation must be executed twice in order to completely change information of the firmware of two generations.
The procedure is shown below.

(1) Preparation for update installation of firmware

(a) Set up the maintenance PC before starting the update installation.
The setting up is completed when the installer stored in the DVD of the firmware is executed.
Outline of the setting up is shown below.
- Installation of the JRE 6 update 29
- Creating the “C:\diskarray-microprogram\microprogram” folder and setting the security

(b) Prerequisites for setting up of a maintenance PC
Prerequisites concerning the user ID of Windows are as follows.
- The user ID of Windows at the time when the firmware is installed in the maintenance PC must be identical with that at the time when a maintenance work is done.

A prerequisite of a drive for booting the OS of the maintenance PC
- The drive for booting the OS must be the C drive.

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(2) Firmware Update Installation

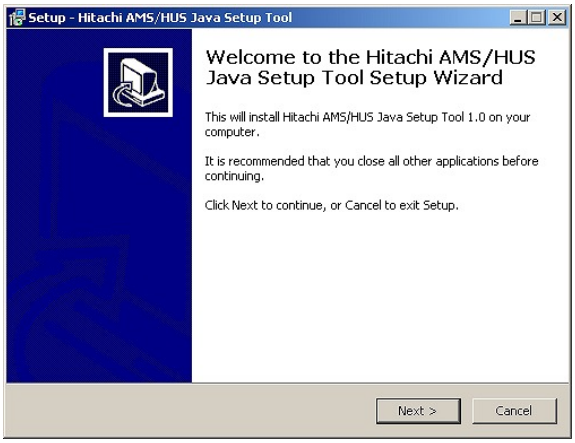
When the version with JRE 6 Update29 is installed in the service PC and when the "C:\diskarray-microprogram\microprogram" folder has already existed, the following step (a) does not needs to be performed. Perform the procedure from the step (b).

(a) Procedure for setting up the Maintenance PC

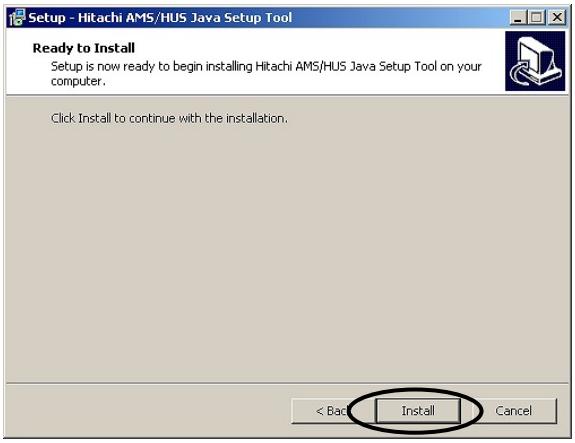
(i) When JRE of other version than JRE 6 Update29 is installed in the service PC, the firmware may not be replaced normally. If JRE of other version than JRE 6 Update29 is installed, be sure to uninstall the JRE, and then install the Java Environmental Construction Tool. Open [Setting] – [Control Panel] from the start menu of Windows, and delete the JRE by "Addition and Deletion of Applications" to uninstall the JRE.

(ii) Install the "program\DFJavaSetup.exe" for firmware installation DVD.

(iii) The initial window of the setting up appears.
The confirmation window is displayed. Click the [Next] button.



(iv) The confirmation window is displayed. Click the [Install] button.



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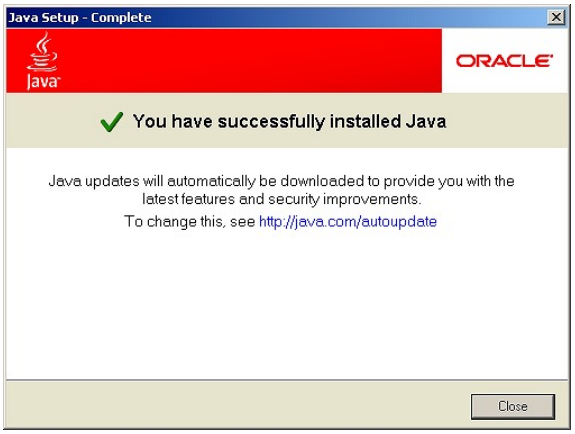
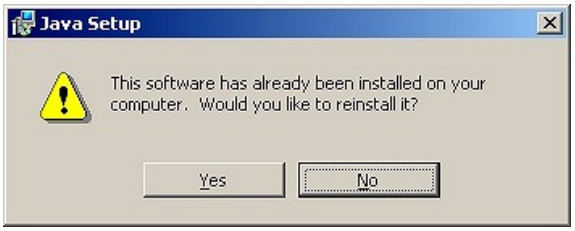
(v) Install JRE 6.
The confirmation window is displayed. Check the license agreement and click the [Accept] button.

(vi) Click the [Finish] button.



(vii) When JRE 6 or JRE 6 Update29 is already installed, the next window is displayed. Click the “No” button, and go to the next step.



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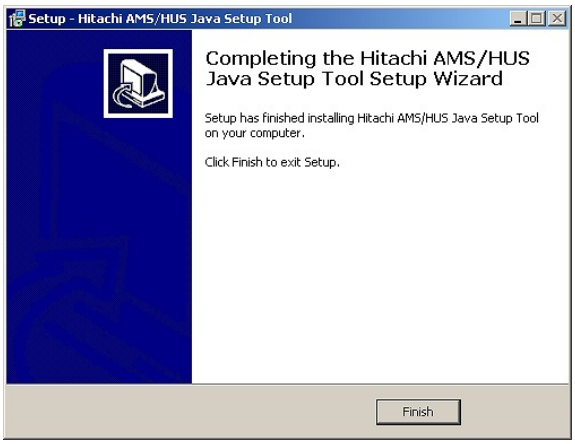
(viii) The setting up is completed. Press the [Finish] button.



(b) Copy of the firmware file

The firmware is stored as the compression format (zip file) in the DVD for firmware installation. The firmware (zip file) is stored under "Firmware\program\microprogram" of the DVD for the firmware installation. Be sure to copy it to under the directory "C:\diskarray-microprogram\microprogram" in the maintenance PC.

If the firmware (zip file) is not copied to the above-mentioned directory, it cannot be installed correctly.

Table 5.8.1 DVD Directory Hierarchy

First stratum	Second stratum	Third stratum
manual	HostInst	Manual file
	UG	
program	Microprogram	Firmware zip file
	DFJavaSetup.exe (Java setup file)	–

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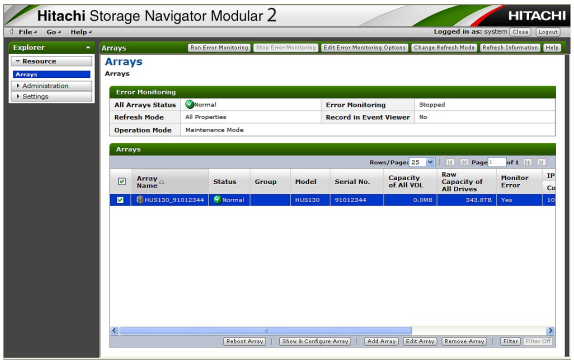
(3) Perform the update installation of the firmware for the chassis before the upgrade in the same version as the chassis after the upgrade.

(a) Connect the LAN cross cable to the array LAN connector for maintenance and connect the array to the WEB. (Refer to System Parameter "1.1 (2) Connecting the LAN cross cable" (SYSPR 01-0040).

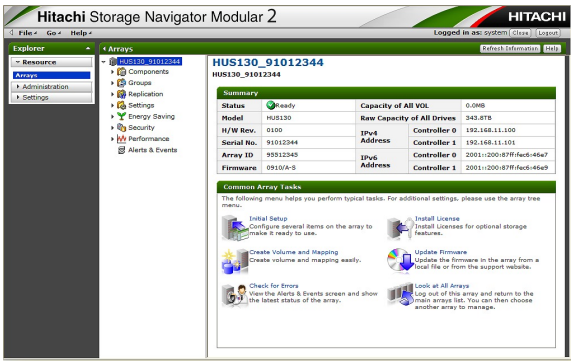
(b) Start Hitachi Storage Navigator Modular 2, put a checkmark to the array to set, press the [Ctrl] key, [Shift] key and [E] key at the same time, and change the operation mode to "Maintenance Mode".(‡1)

Check that "Maintenance Mode" is displayed in [Operation Mode] on the top of the main window.



(c) Click the array name, and open the unit window.

NOTE : There is a case that the LAN Port Number is changed. When the main screen is not displayed even though the icon of the array is clicked, use the changed LAN Port Number, and execute it again. (Refer to System Parameter "1.2 LAN Port Number Change by Hitachi Storage Navigator Modular 2" (SYSPR 01-0120).)



‡1 : When the array to operate is not registered, click the blank area (other than buttons and characters) in the "Arrays" window, and press the [Ctrl] key, [Shift] key and [E] key at the same time.

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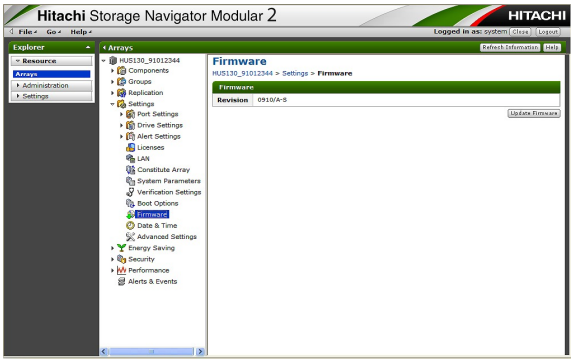
(d) Select [Settings] – [Firmware] in the unit window.



(e) Record the version of the firmware before the update displayed in [Revision], and click the [Update Firmware] button.

(f) Check the [Transfer and Update] radio button of the [Basic] tab, enter [Update File] (specify the ZIP format file), enter [1] second into [Interval Time] of the [Advanced] tab, and then click the [OK] button.

When using Windows®:

c:/diskarray-microprogram/microprogram/micro/09xxx.zip

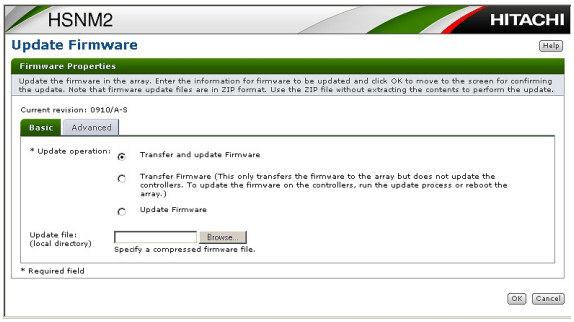
When using Solaris™ or Red Hat Linux®:

diskarray-microprogram/microprogram/micro/09xxx.zip

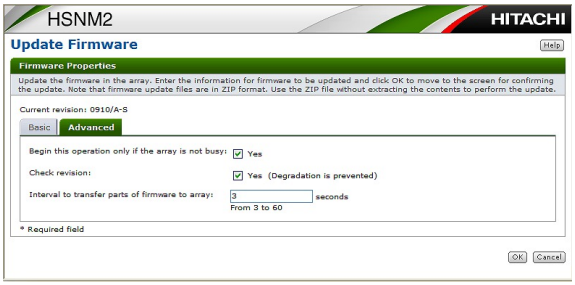
Specified firmware file (ZIP form file)

The file name “xxx” differs depending on the firmware version.

Basic tab



Advanced tab



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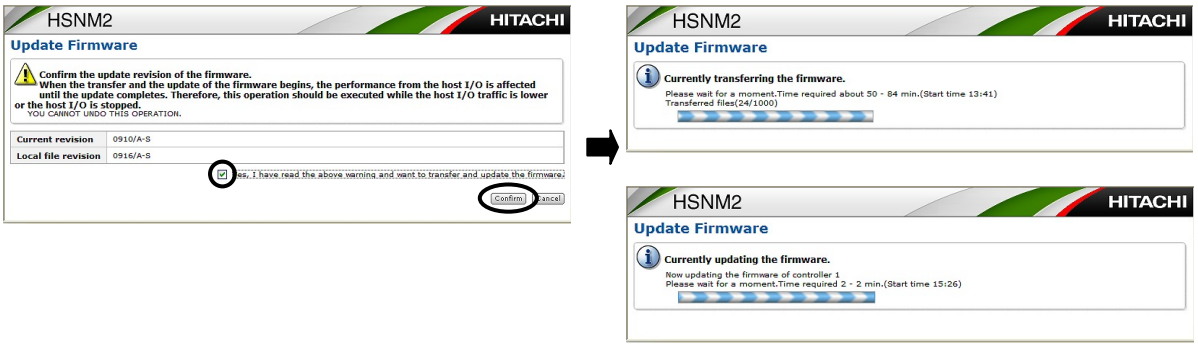
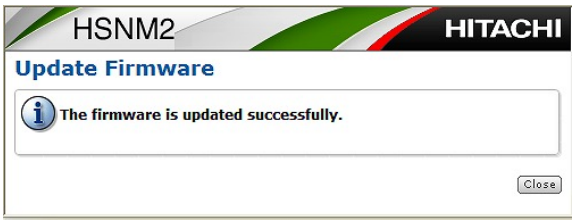
(g) The confirmation window of the firmware to update is displayed. Put a checkmark, and click the [Confirm] button.

Check that the last one letter (model type) of the firmware revision displayed in “Local File Revision” and “Current Revision” is the same (e.g.: part of “S” of 09xx/x-S of the number).

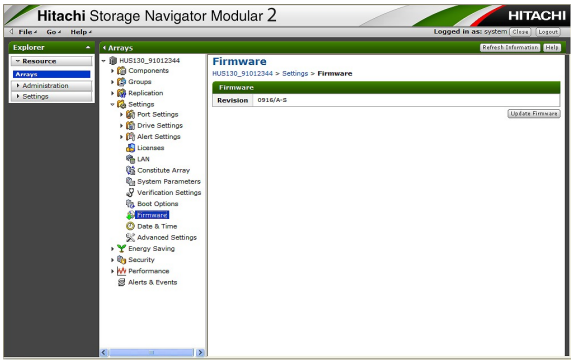


NOTE : When a LAN failure, etc. occurred and the processing of the Hitachi Storage Navigator Modular 2 terminated abnormally, execute the download of the firmware again from the beginning.

(h) Since a message is displayed when the reading in of the firmware is completed, click the [Close] button.



(i) Select [Advanced Settings] – [Firmware] on the unit window.



(j) Check that the version of the firmware replaced to “Revision” is displayed.

(k) Because the firmware is managed by two generations, return to the procedure (d) reference place, and perform the update installation of the firmware again.

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(l) If the version confirmation is completed, the firmware update to the array is completed.

NOTE : When the firmware was replaced online after performing the processing to change the system configuration (Create VOL, Format, Change LU Ownership, etc.), the “I14000 System copy started (Unit-x, HDU-y)” message may be displayed two or more times in Information Message on WEB, but it is not a problem.

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5.9 Collecting Simple Trace

In order to find out the cause in case the upgrade fails, collect the simple trace in advance and store the trace information.

Use WEB and collect the simple trace. (Refer to Troubleshooting “5.3 Collecting Simple Trace” (TRBL 05-0040).)

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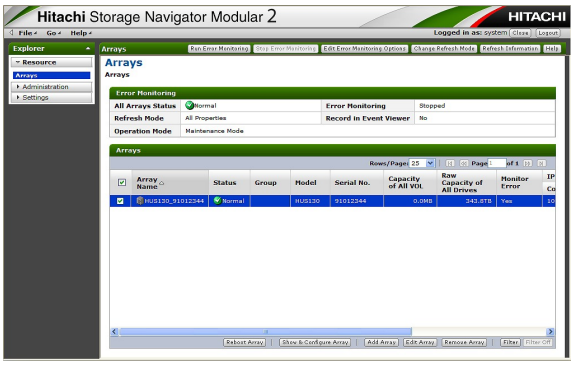
5.10 Collecting Serial Numbers of Drives

The procedure for the upgrade includes the work to remove the Drives from the array, move the array in the rack and insert the Drives to the same installation positions as before the removal.
In such case, it is required to collect the position information of the Drive installed in the array before the upgrade to deal with the case that the installation position of the Drive is unknown or the installation position is incorrect.
Collect the serial numbers of the Drives using Hitachi Storage Navigator Modular 2.
The procedure is shown below.

(1) Connect the maintenance PC to the array. (Refer to System Parameter "1.1 (2) Connecting the LAN cross cable" (SYSPR 01-0040).)

(2) Start Hitachi Storage Navigator Modular 2, put a checkmark to the array to set, press the [Ctrl] key, [Shift] key and [E] key at the same time, and change the operation mode to "Maintenance Mode".(‡1)
Check that [Maintenance Mode] is displayed in "Operation Mode" on the top of the main window.



‡1 : When the array to operate is not registered, click the blank area (other than buttons and characters) in the "Arrays" window, and press the [Ctrl] key, [Shift] key and [E] key at the same time.

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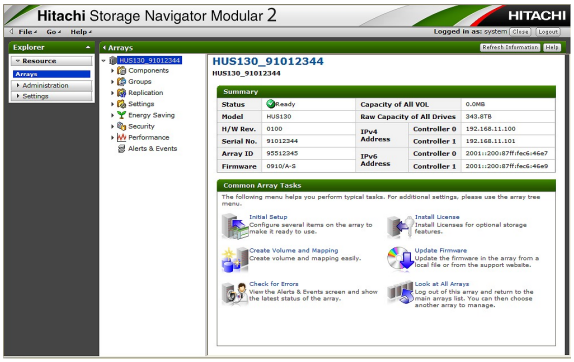
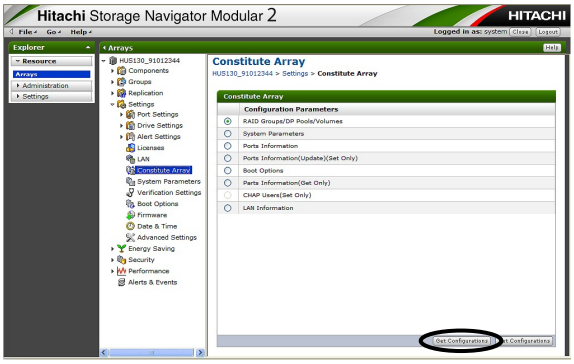
(3) Click the array name, and open the unit window.



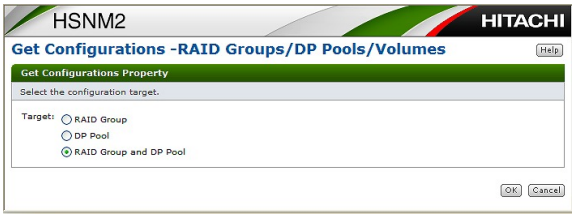
NOTE : There is a case that the LAN Port Number is changed. When the main screen is not displayed even though the icon of the array is clicked, use the changed LAN Port Number, and execute it again. (Refer to System Parameter "1.2 LAN Port Number Change by Hitachi Storage Navigator Modular 2" (SYSPR 01-0120).)
If it is changed, use the confirmed LAN port number, and execute it again.

(4) Select [Settings] – [Constitute Array].

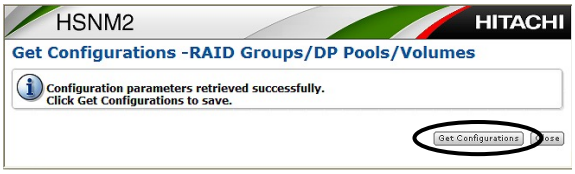


(5) Select the [Raid Groups/DP Pools/Volumes] radio button, and click the [Get Configurations] button.

(6) Select the [RAID Group and DP Pool] radio button, and click the [OK] button.



(7) Click the [Get Configurations] button. Specify a location to save the file.



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(8) Open the configuration information file that has been got in procedure (7) and make sure that the following information is output.

```
Array unit configuration information list.
File Format : 22.00

DF Name : HUS130_92100009
Date : 2011/11/21 22:08:54
Firmware Revision : 0910/B-S
Array Unit Type : HUS130
Serial Number : 92100009
Hardware Revision : 0100
#HSNM2 Version : 21.10

---- RAID Configuration Information ----
  ---- RAID Configuration ----
  RAID  RAID    Start Location    Number of HDU   Number of     Free Capacity  Type
  Group  Level  [Unit No.  HDU No.]  in parity group  parity group       [block]
     0  5            1        0             5           1     4473044992  SAS

  -- End

  ---- Drive Location of RAID Group ----
  RAID Group   Drive Location(Unit No.-HDU No.)
        0   1-0    1-1    1-2    1-3    1-4

  -- End
-- End

#---- DP Pool Configuration Information ----
# Not Available

---- LU Configuration Information ----
  ---- LU Configuration ----
  LU       Capacity  Status           RAID  DP   RAID  Number of      Stripe Size   Capacity  Type          Accelerated Wide  Full        Number
  No.      [block]                  Group  Pool  Level  Cache Partition      [KB]  [MB/GB/TB]              Striping Mode    Capacity Mode  of Paths
   0     20971520  Normal               0  N/A  5                0       256    10.0 GB  SAS           N/A            N/A              0

  -- End
-- End

---- Drive Configuration Information ----
Location      Status     Type       Vendor ID  Product ID       Revision  Serial Number   Capacity   Drive Type       Rotational Speed
Unit0 ,HDU0   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM67206          2TB   SAS7K                 7200rpm
Unit0 ,HDU1   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM6714G          2TB   SAS7K                 7200rpm
Unit0 ,HDU2   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM6715L          2TB   SAS7K                 7200rpm
Unit0 ,HDU3   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM671C7          2TB   SAS7K                 7200rpm
Unit0 ,HDU4   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM670ZF          2TB   SAS7K                 7200rpm
Unit0 ,HDU5   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM672AG          2TB   SAS7K                 7200rpm
Unit0 ,HDU6   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM6723Q          2TB   SAS7K                 7200rpm
Unit0 ,HDU7   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM672NB          2TB   SAS7K                 7200rpm
Unit0 ,HDU8   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM6BZ51          2TB   SAS7K                 7200rpm
Unit0 ,HDU9   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM61WYB          2TB   SAS7K                 7200rpm
Unit0 ,HDU10  Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM6735P          2TB   SAS7K                 7200rpm
Unit0 ,HDU11  Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM67122          2TB   SAS7K                 7200rpm
Unit1 ,HDU0   Normal     Data       SEAGATE    DKS5C-J600SS     5C01      6WN0CDYL         600GB  SAS                  10000rpm
Unit1 ,HDU1   Normal     Data       SEAGATE    DKS5C-J600SS     5C01      6WN0CVB7         600GB  SAS                  10000rpm
Unit1 ,HDU2   Normal     Data       SEAGATE    DKS5C-J600SS     5C01      6WN0GL1S         600GB  SAS                  10000rpm
Unit1 ,HDU3   Normal     Data       SEAGATE    DKS5C-J600SS     5C01      6WN0JAN7         600GB  SAS                  10000rpm
Unit1 ,HDU4   Normal     Data       SEAGATE    DKS5C-J600SS     5C01      6WN0CLEJ         600GB  SAS                  10000rpm

-- End
```

[Drive Configuration]

[Location] : Shows a location where a Drive is installed.

[Unit] : Unit ID number

[HDU] : Drive number

[Serial Number] : Serial number (Drive)

The RAID Group/DP Pool/Volume information is stored in the specified file name in the form of the text file.

NOTE : Store the file carefully because it will be required when the upgrade work is done.

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5.11 Array Power Off

Check that the current of the Power Interlock mode is the Standard Mode. If it is not the Standard Mode, set it to the standard mode. (Refer to System Parameter "Chapter 16. Setting Power Interlock" (SYSPR 16-0000).)

Execute the deliberate shutdown of the array. (Refer to Installation "1.5.2 Array Power Off (Sequential Shutdown)" (INST 01-0260).)

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5.12 Hardware Upgrade Work

Request the customer to replace the parts for the CBL configuration and keep the unused parts for the CBS configuration at hand.

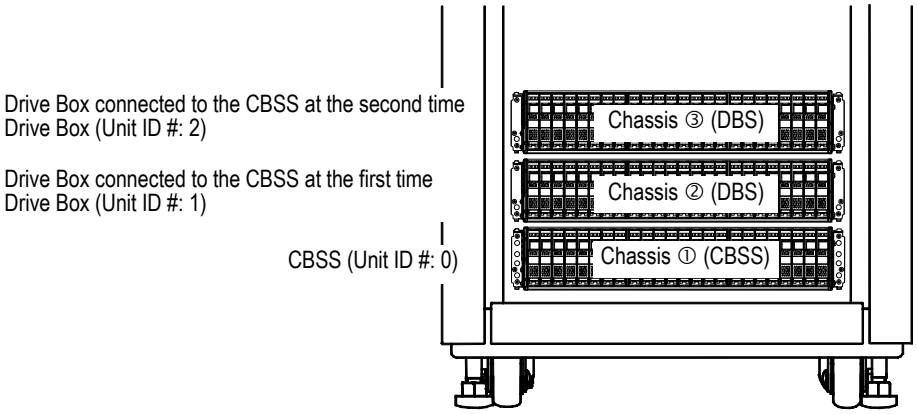
The Drives cannot be installed in the Controller Box of CLB. Therefore, a Drive Box which becomes the migration destination of the Drives installed in the Controller Box before the upgrade is newly required.

When the Controller Box before the upgrade is CBSS, a newly required Drive Box becomes DBS. When the Controller Box before the upgrade is CBL, a newly required Drive box becomes DBL.

Move the Drive Box already installed in the rack frame subsequently, and keep a free area of 3 U (unit) in the Controller Box (CBSL/CBSS).

The procedure is shown below.

The Controller Box (CBSL/CBSS) is indicated as “Chassis ① (CBSL/CBSS)”, the Drive Box connected to the CBSL/CBSS at the first time as “Chassis ② ”, and the Drive Box connected to the CBSL/CBSS at the second time as “Chassis ③”.
Also, the procedure for the Fibre Channel configuration is shown in this section, but if the procedure differs in the iSCSI configuration, the supplement is added.



*1: This figure shows an example for the array configured with CBSS + DBS.

Figure 5.12.1 System Configuration Example

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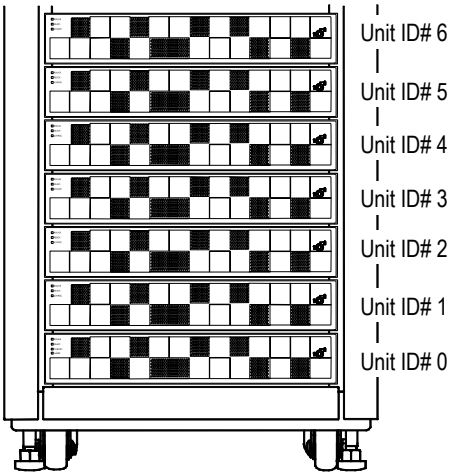
NOTE : This section is explained as an example of the case where unit ID# are arranged in ascending order from the bottom of the rack frame in the configuration before the upgrade.
Start the work after checking this in order of the SAS(ENC) cable connection. If it is not so, the work such as moving the installed array to the installation destination occurs when moving the arrays within the rack frame.



NOTE : When the maximum number of array in the rack frame is installed in the configuration before the upgrade, add the rack frame newly. For the further information on the rack frame installation procedure, refer to Installation "2.2.1 RK40 Rack Frame (Unpacking/Installing and Installation Areas/Maintenance Areas)" (INST 02-0030).)

Moreover, for the system connected with the DBX, the following cautions are provided.

- Since the DBX has 4 U (units) and the height is different from the normal Drive Box (DBL/DBS), be careful of the installation positions of the rack rails.
- Since it is required to install the DBX in the position of 1,300 mm (26 U (units)) or lower of the rack frame, if the DBX exceeds the restriction of 1,300 mm (26 U (units)) or lower when migrating it for 3 U (units) in the upgrade operation, the correspondence such as migrating the DBX to another rack frame is required.
- On the SAS(ENC) cables connected to the DBX, the cable labels indicating the connection destinations are attached.
  Since the connection destinations of the SAS(ENC) cables vary depending on the upgrade operation, it is required to change the labels using the attached cable labels.
- Refer to Instillation "Chapter 2. Installing Array" (INST 02-0000) for the details of the installation and removal of the rack rails for the DBX, installation of the DBX, and the connection of the SAS(ENC) cables (including the change of the cable labels).

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5.12.1 Note on Hardware Upgrade Works

(1) Notes on turning off the power

The user data may be lost unless the power is turned off in the correct procedure.
Since the power feeding to the array is duplicated, when turning off the power, remove the power cables from two Power Units per array.

⚠ CAUTION

Hazard exists that can cause an electric shock.
Start the work after making sure that the breaker in the power distribution box has been turned off.

(2) Notes on Unpacking, Installing or Removing the Parts

For installing or removing the parts, do not apply any shock as the precise parts are installed.

NOTICE

- **To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the chassis before starting and do not take it off until you finish.**
- **Be sure to wear a wrist strap connected to the chassis whenever you unpack parts from a case. Otherwise, the static electrical charge on your body may damage the parts.**
- **When you install a Drive, support its metal part with your hand that has the wrist strap. You can discharge static electricity by touching the metal plate.**
- **When you install the Controller or a Cache Memory in the Controller, do the installation holding it by its sheet steel part with your hand(s) wearing the ESD grounding wrist strap. The electrostatic charge can be discharged through your touch to the sheet steel part.**

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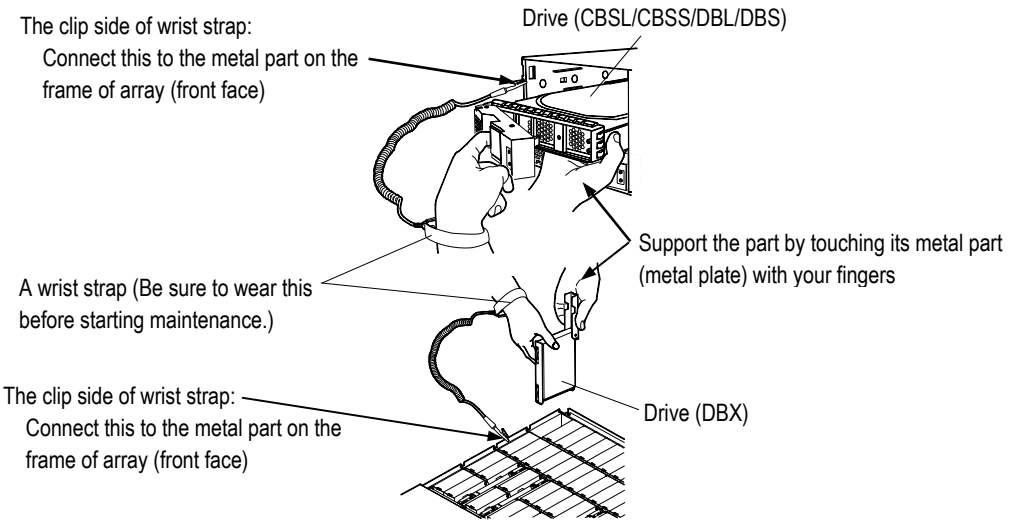
Be sure to put a wrist strap on your wrist and the array before starting installation or maintenance work, and do not put it off till the work is finished.
When installing the Drive, the Controller, the Cache Memory, execute the operation so that the fingertip wearing the wrist strap touches the metal part on the side surface.



(3) Notes on cable routing

(a) Handling of cables placed on the installation floor

- Protect the cables, which cannot be accommodated by the array and thus laid on the floor or cross a passage, with the cable protection duct.
- For cables that relay between the arrays, lay them on the floor and do not leave them from the floor.

(b) Handling of under floor cables when the array is installed on the free access floor.

- Give extra lengths to cables routed under the floor and do not make them float in the air.

(c) Routing method

- Give a room for routing as earthquake and the like are considered.
- Give a room for routing not to disturb the part replacement for maintenance.
- Make the AC cables apart from each other and when they should be adjacent, do not make them in parallel but make them cross at right angle.
- When using a cable protection duct, be careful not to damage or cut cables by catching them.

(d) Hold the connector to insert or pull out a cable. If the cable part is pulled, it may cause a failure.

(e) For connecting the Fibre Channel interface cable, the SAS(ENC) cable, or iSCSI interface cable, bend it with a long radius (not less than 30mm) and do not give the load to the cable and the connector.

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(4) Note on completing the work
Close all the external covers when the work is completed.
(The cover is to maintain the performance of the array (radio wave noise suppression and others), so that be sure to keep all the external covers closed to operate the array normally.)

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5.12.2 Open/Close Door or Attach/Remove Front Bezel/Rear Door

(1) Procedure for opening rear door
Refer to Installation "1.4.2 How to Open/Close the Rear Door of RK40 Rack Frame" (INST 01-0210).

(2) How to remove Front Bezel
Remove the Front Bezel attached to "Chassis ③" (a Drive Box with the last unit ID#).
Refer to Installation "1.4.1 How to Attach/Remove Front Bezel" (INST 01-0140).

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5.12.3 Removing the Cables of the Drive Box

- Disconnecting the power cables ····· UP 05-0260
- Disconnecting the SAS(ENC) cables ····· UP 05-0280

(1) Disconnecting the power cables

⚠ CAUTION

Make sure that there is no scratch or flaw on a power cable. It can cause an electric shock or even a fire.

NOTE : When the cable cannot be removed easily, do not pull it by force.
Pull out the parts slightly, and then remove the cable again.

(a) Disconnect all the power cable connected to the “Chassis ③” (a Drive Box with the last unit ID#).

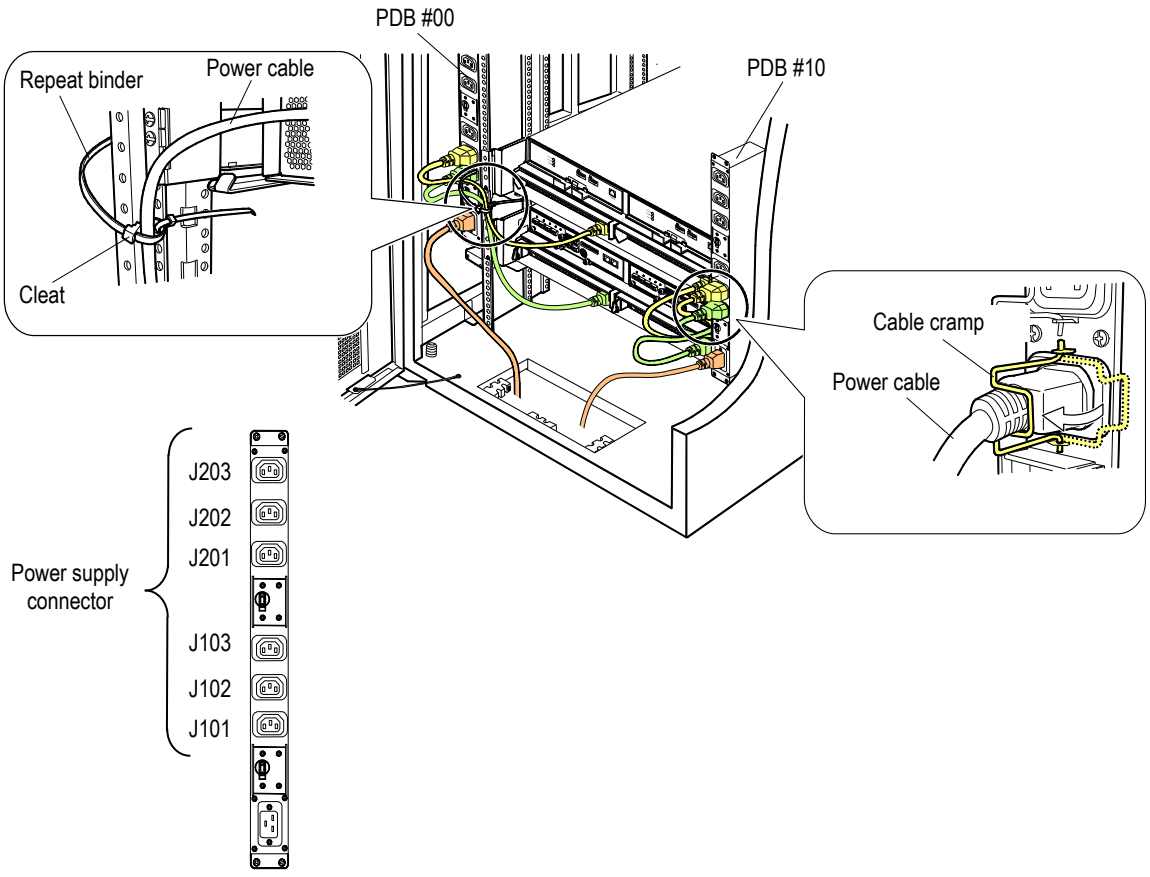

Figure 5.12.2 Disconnecting Power Cables

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(b) In case of DBX, remove the stopper on the rear of the array and the cable tray, open the cable routing cover and remove the power cable.

(i) Make the right and left screws turn 90 degrees and pull them out to the direction of the arrow ①.

(ii) Remove the stopper.

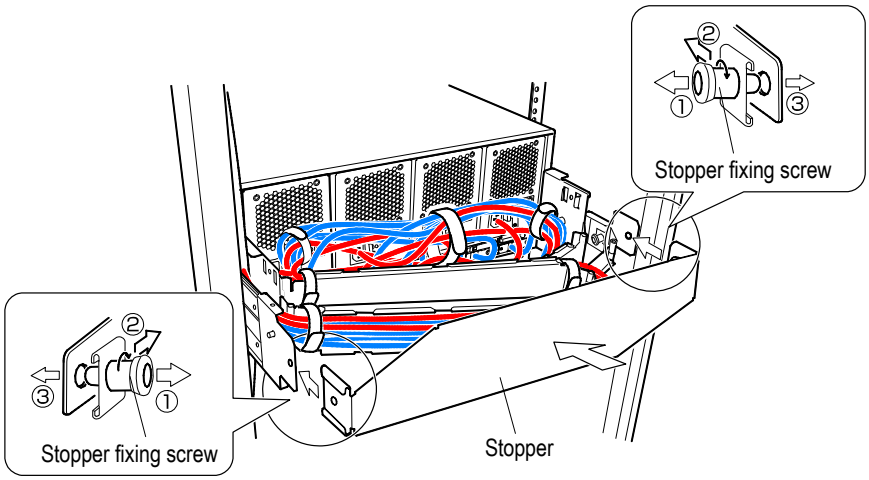
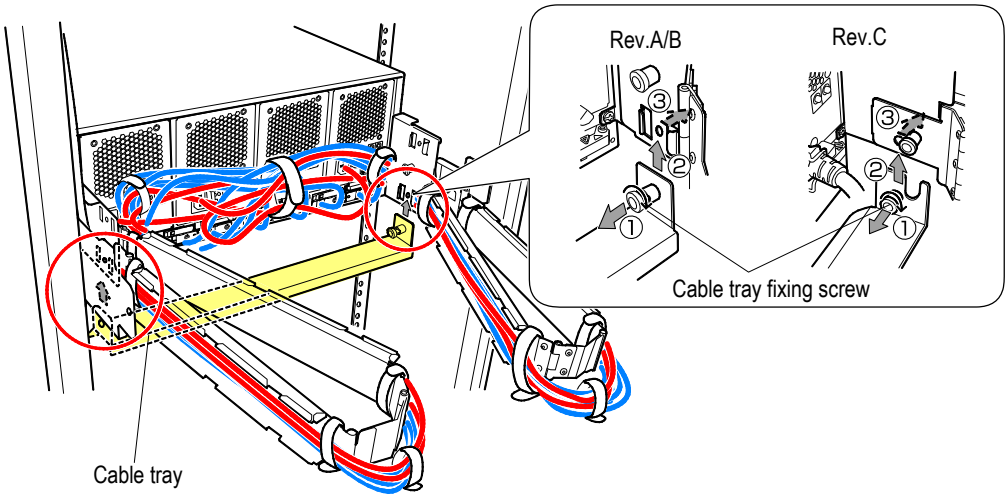


Figure 5.12.3 Attaching the Stopper

(iii) Release the cable tray fixing screw.



*1 : The figure shows the rear left side of the DBX.

Figure 5.12.4 Attaching the Cable Tray

(iv) Remove the power cable.

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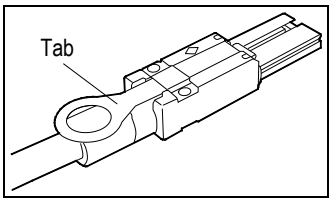
(2) Disconnecting the SAS(ENC) cables

In case of DBX, the removal procedure differs. Therefore, work from (b).

(a) Disconnect the SAS(ENC) cable while pulling the tab of the SAS(ENC) cables connecting the "Chassis ③" (a Drive Box with the last unit ID#).



(b) For DBX

(i) Open the cable routing bar and remove the cable holder to which the SAS(ENC) cable is connected.

(ii) Loosen the screws (blue) fixing the holder cover of the cable holder and remove the holder cover.

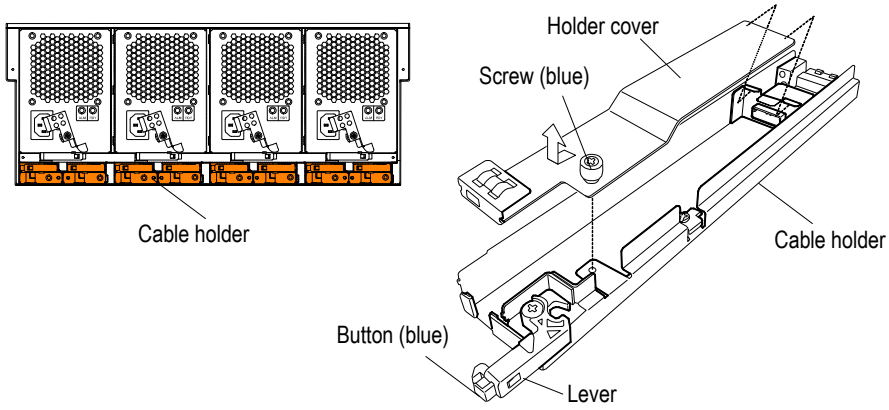


Figure 5.12.5 Removing the Holder Cover

(iii) Pull the tab of the SAS(ENC) cable to remove it.

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(iv) Pull the screws of the stopper to the direction of the arrow ① and remove the cable routing from the rails.

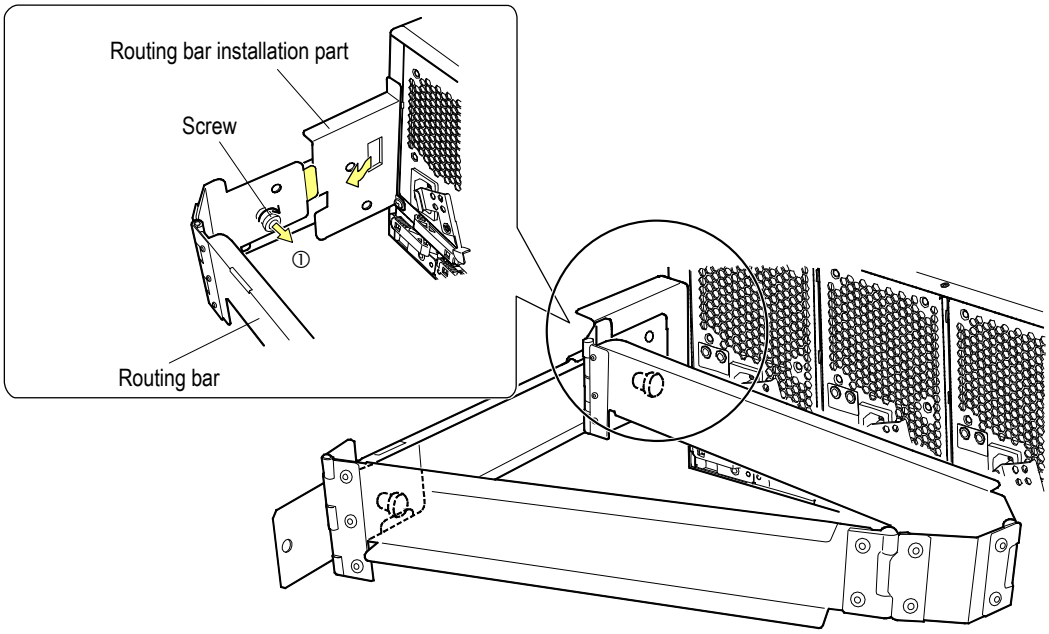
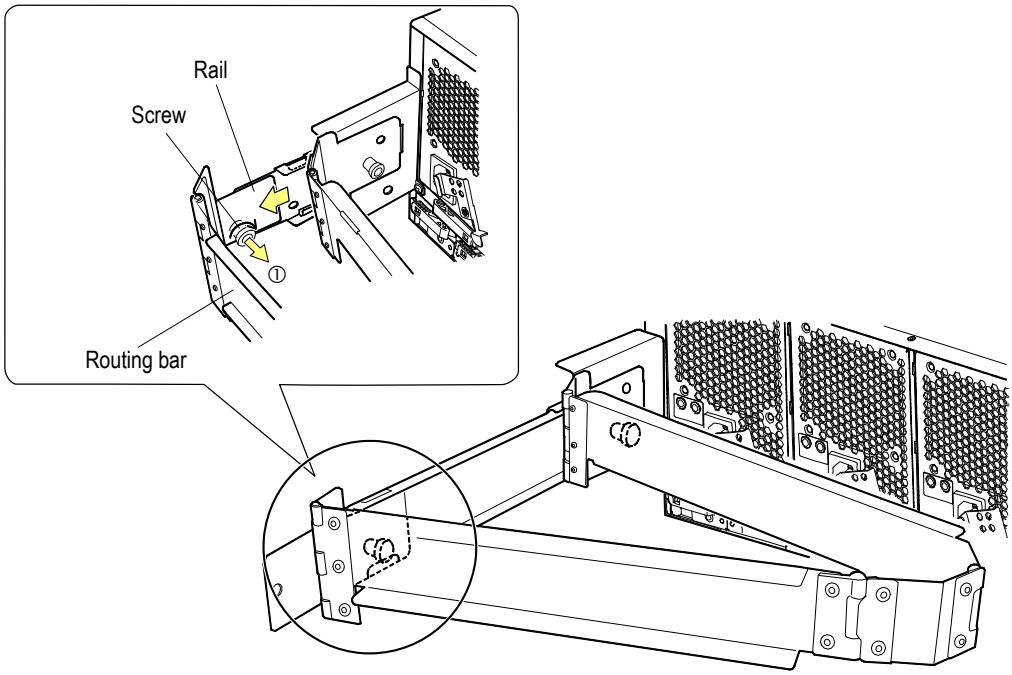


Figure 5.12.6 Removing the Routing Bar

(v) Remove the cable routing.
Pull the screws to the direction of the arrow ① and remove the cable routing from the routine installation part.



*1 : The figure shows the rear left side of the DBX.

Figure 5.12.7 Releasing the Routing Bar

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5.12.4 Removing a Drive

(1) Remove the Drives installed in the "Chassis ③" (a Drive Box with the last unit ID#).

NOTE : Drives are precision components. Be careful not to expose Drives to hard shock.

(a) Affix labels with the HDD numbers to all the Drives that were installed in the "Chassis ③" (a Drive Box with the last unit ID#).

(b) Removing Drive

NOTICE

- **To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the chassis before starting and do not take it off until you finish.**
- **Be sure to wear a wrist strap connected to the chassis whenever you unpack parts from a case. Otherwise, the static electrical charge on your body may damage the parts.**
- **Drives are precision components.**
  Be careful not to expose drives to hard shock.
- **When you install a Controller, support its metal part with your hand that has the wrist strap. You can discharge static electricity by touching the metal plate.**

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(b-1) In the case of DBL

(i) Remove the Drive or a dummy (Drive).
Pull the stopper of the handle toward you to have the lock off (①), tilt the handle toward you, and then remove the Drive by pulling it out taking care not to apply a shock to it.
Pressing the latch on the left side of the dummy (Drive) to the direction of the arrow, hold the right side of the dummy and pull it out, and then remove it.

NOTE : When handling the Drive, hold the RAIL side because the SHIELD SPRING is subject to breakage.

(ii) Keep the Drive that has been removed temporarily in the component safekeeping box at the location shown on the address label with its handle returned to its original state (locked by the stopper).

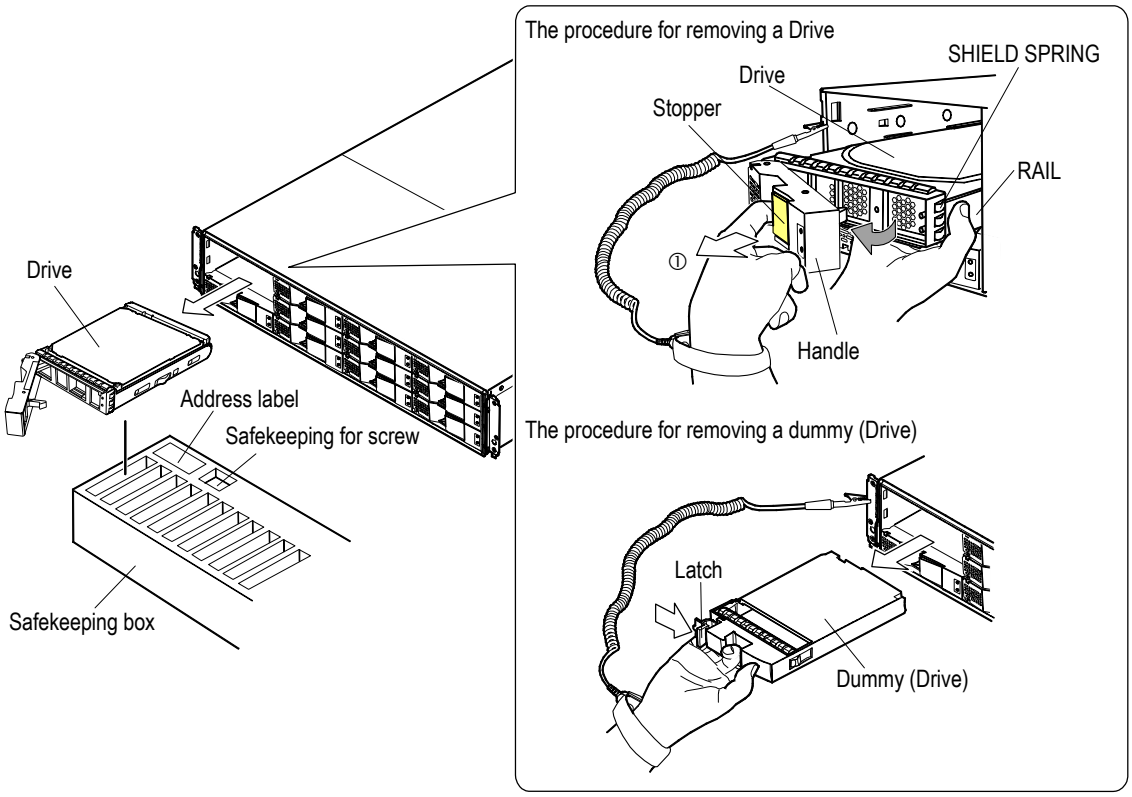

Figure 5.12.8 Removing Drive (DBL)

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(b-2) In the case of DBS

(i) Remove the Drive or a dummy (Drive).
Pull the stopper of the handle toward you to have the lock off (①), tilt the handle toward you, and then remove the Drive by pulling it out taking care not to apply a shock to it.
Pressing the latch at the lower part of the dummy (Drive) to the direction of the arrow, hold the upper part and pull it out, and then remove it.

(ii) Keep the Drive of dummy (Drive) that has been removed temporarily in the component safekeeping box at the location shown on the address label with its handle returned to its original state (locked by the stopper).

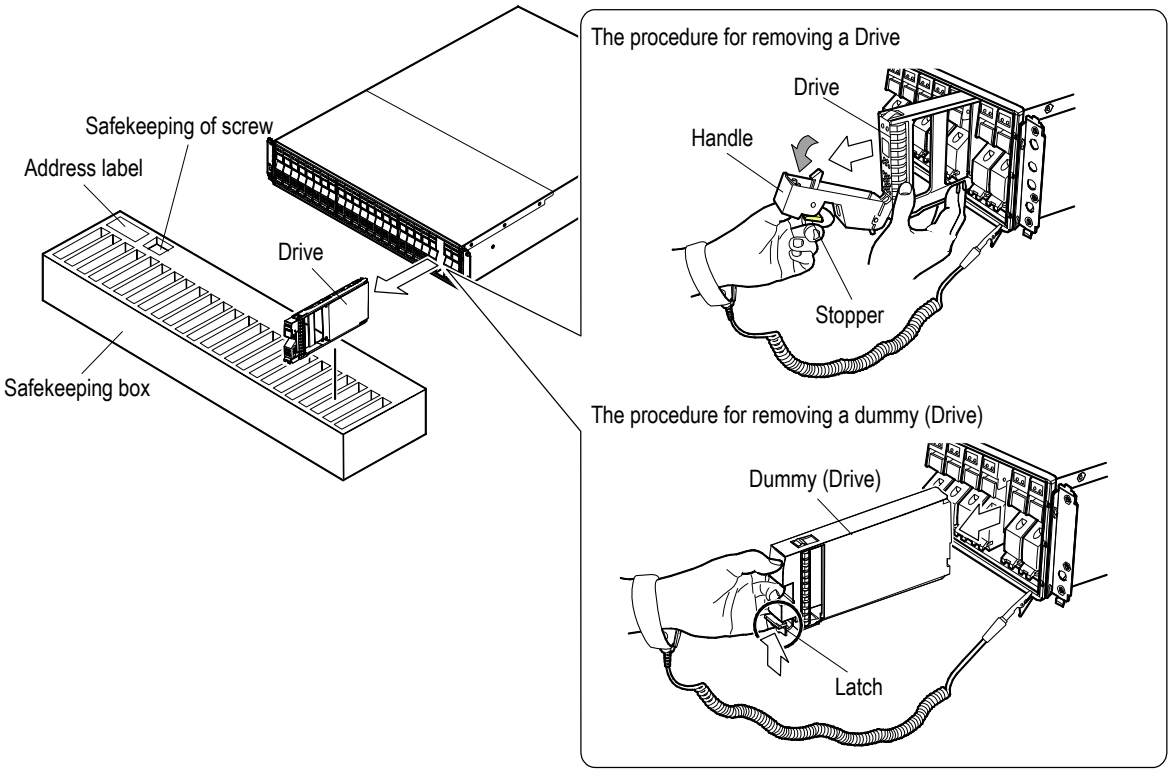

Figure 5.12.9 Removing Drive (DBS)

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(b-3) In the case of DBX

(i) Remove the top cover of the DBX. (Refer to Installation "1.4.1 How to Attach/Remove Front Bezel (3)" (INST01-0190).)

(ii) Remove the Drive or a dummy (Drive).
Slide the latch (blue) on the Drive and open the handle, and then pull out and remove the Drive or dummy (Drive) taking care not to apply a shock to it.

(iii) Keep the Drive of dummy (Drive) that has been removed temporarily in the component safekeeping box at the location shown on the address label with its handle returned to its original state.

(iv) Attach the top cover of the DBX. (Refer to Installation "1.4.1 How to Attach/Remove Front Bezel (3)" (INST01-0190).)

NOTE : Do not drop a screw and such in the DBX.
If you dropped it, immediately remove it.
If you leave it unattended, the parts will short out, and it will cause a fire or a failure.

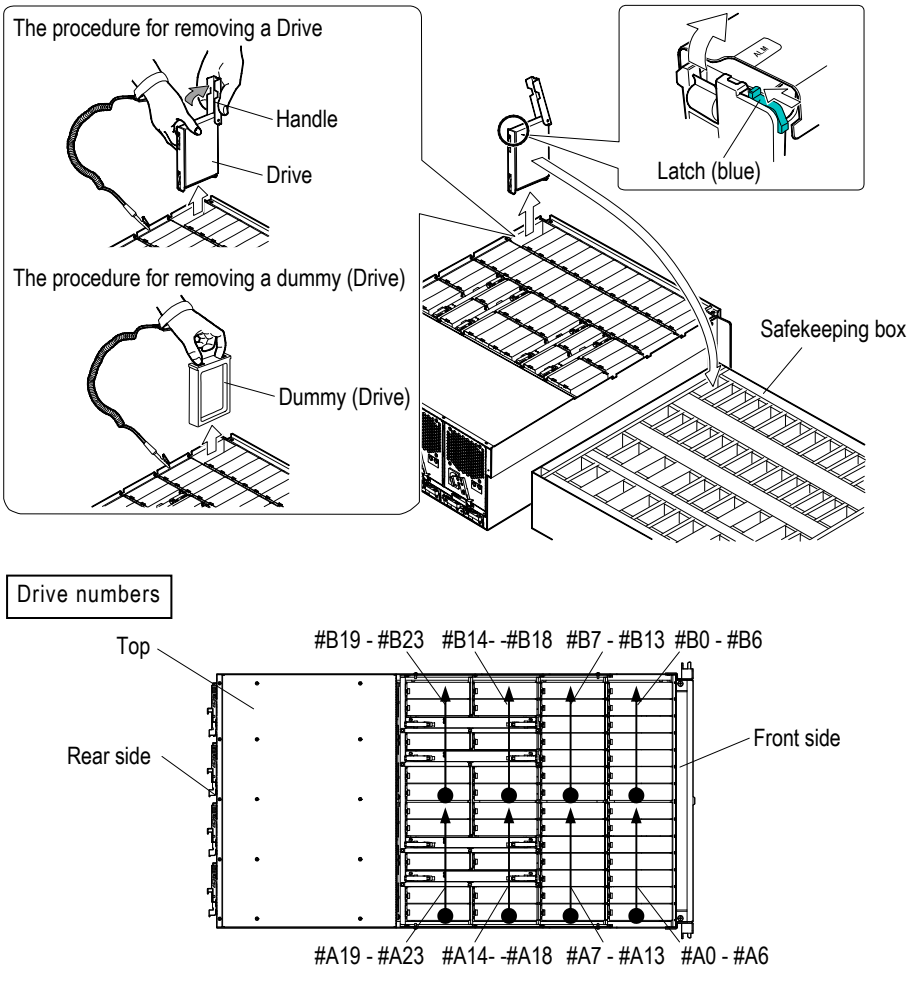

Figure 5.12.10 Removing Drive (DBX)

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5.12.5 Removing a Drive Box

(1) Take down "Chassis ③" (a Drive box with the last unit ID#).

Prepare a special lifter.
When the height is one meter or less or when taking it down by the exclusive lifter, take down the rack frame in the status where respective parts are installed.
In other cases, remove respective parts and then remove it from the rack frame.

⚠ CAUTION

- **Rack mounting and lifter operation should only be conducted by a person who has been trained and qualified since the array could turn over or a worker could be caught under the array.**
- **Be sure to perform the operation with two or more workers.**

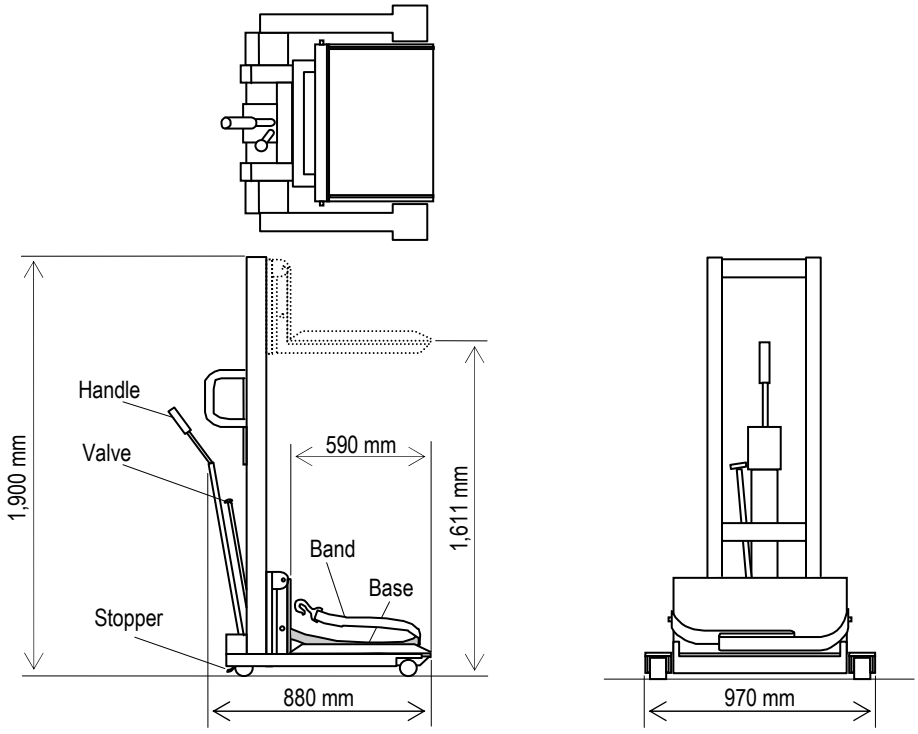

Figure 5.12.11 Appearance of Special Lifter

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(a) Remove the front side of the "Chassis ③" (a Drive Box with the last unit ID#).

(a-1) In the case of DBL/DBS

(i) Remove the binding screws M5×10 (four placed) fixing "Chassis ③" (a Drive Box with the last unit ID#).

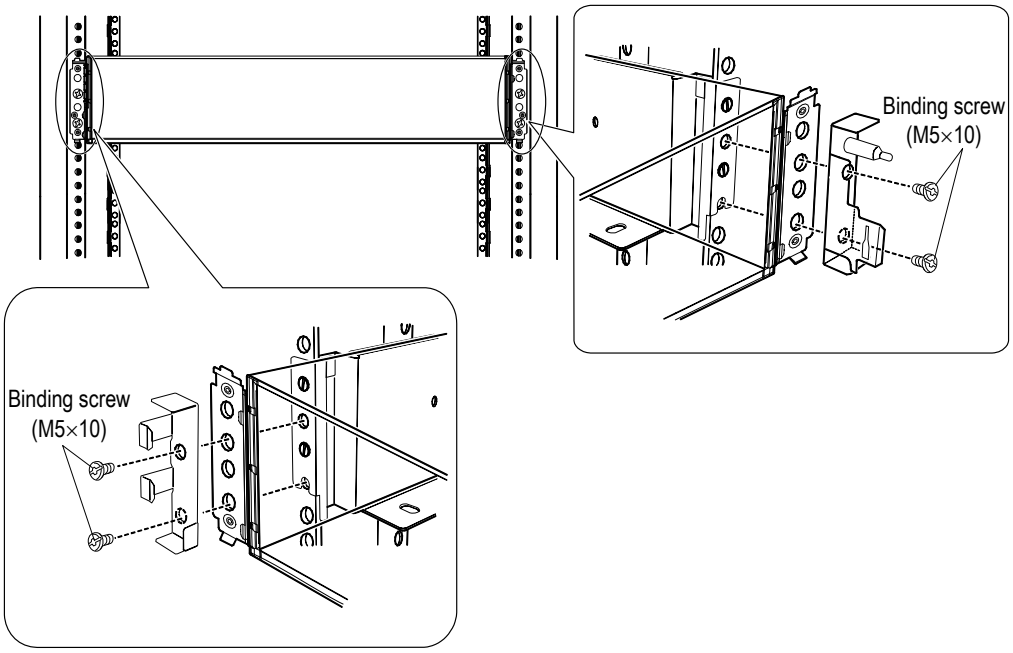

Figure 5.12.12 Fastening Front Side of the "Chassis ③" (A Drive Box with the Last Unit ID#)

(a-2) In the case of DBX

(i) Insert the key into the keyhole on the front of "Chassis ③" (a Drive Box with the last unit ID#) and unlock.

(ii) Remove the fixing screws (one each on the right and left) of the front.

(iii) Press the latches of the rails to unlock and then pull out the front of DBX slowly toward you.

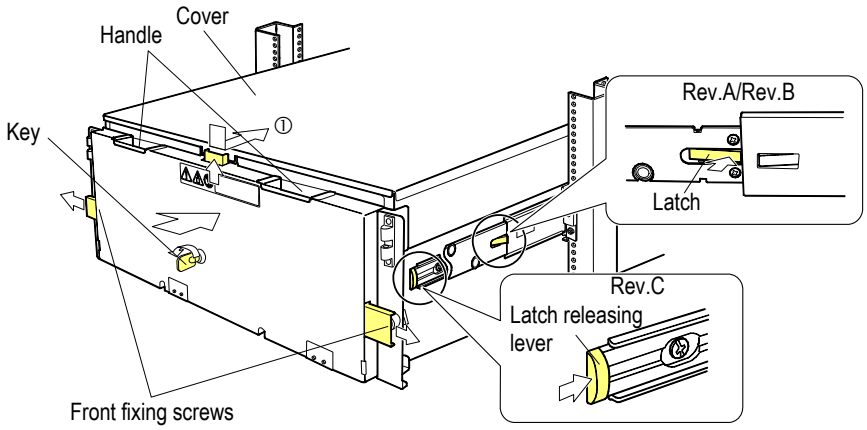

Figure 5.12.13 Removing Front Side of the "Chassis ③" (A Drive Box with the Last Unit ID#)

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(b) Demount the "Chassis ③" (a Drive Box with the last unit ID#) from the RK40 rack frame.

(i) Adjust the position of the rack frame, and apply the brake to the lifter.

(ii) Move the pumping handle of the external lifter to the right and left repeatedly to lift the "Chassis ③" (a Drive Box with the last unit ID#) up to the height suitable for the unloading.

⚠ WARNING

Perform the positioning, fastening, or other handlings very carefully.
If the array falls when the elevator of the lifter is at a high position, a personal injury will be caused.
Perform the positioning, fastening, or other handlings very carefully.

⚠ CAUTION

- **Operate the valve slowly when opening it. If it is opened quickly, the elevator of the lifter descends rapidly and may cause personal injury.**
- **Work carefully because the mass of the single DBL is about 27 kg, DBS is about 23 kg, and DBX is about 85 kg.**

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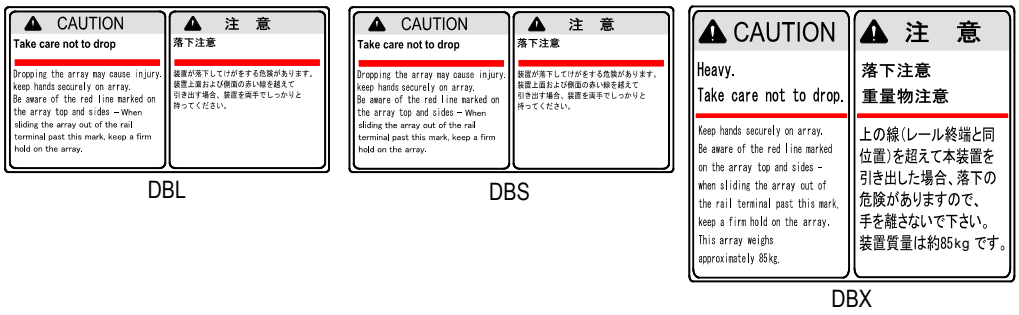
(iii) Shift the "Chassis ③" (a Drive Box with the last unit ID#) onto the elevating base of the special lifter. Shift the "Chassis ③" (a Drive Box with the last unit ID#) gently until it hits the backboard of the elevating base.

⚠ CAUTION

Do not move the lifter away from the rack frame nor lower the elevator until the red line on the label affixed on the array enters the rack frame across the end of it. Otherwise, falling of the array may be caused.



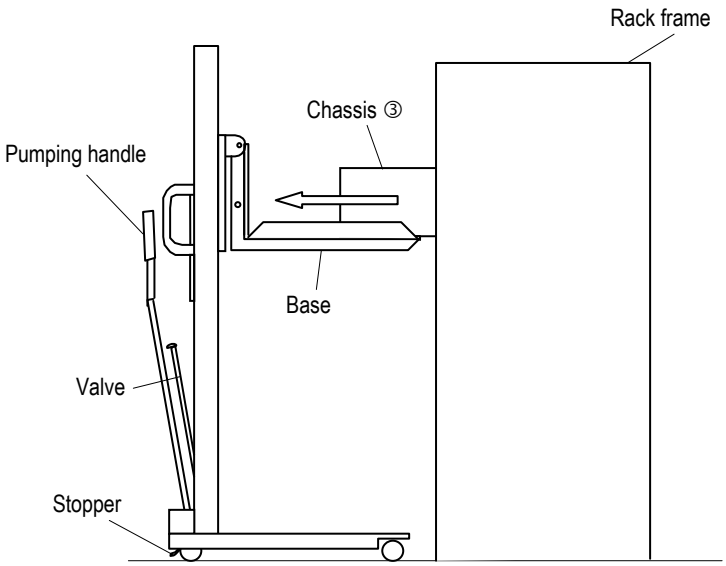


Figure 5.12.14 Mounting "Chassis ③" (A Drive Box with the Last Unit ID#) on Eternal Lifter

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(iv) Secure the "Chassis ③" (a Drive Box with the last unit ID#) to the lifter with a band of the lifter.
Bind the "Chassis ③" (a Drive Box with the last unit ID#) with the band tightly by fitting the length of the belt to the "Chassis ③" (a Drive Box with the last unit ID#).

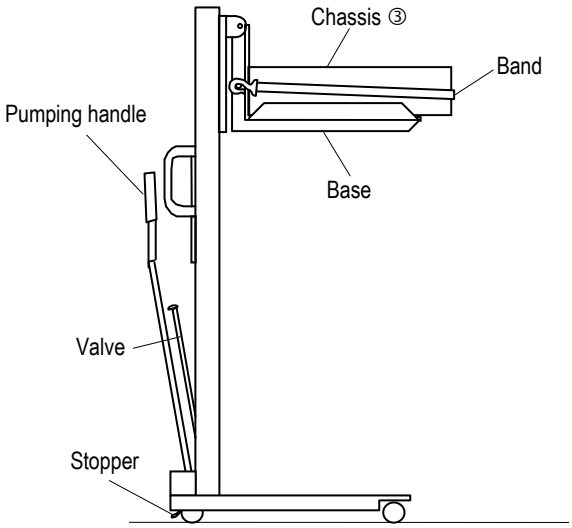

Figure 5.12.15 Secure the "Chassis ③" (A Drive Box with the Last Unit ID#)

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5.12.6 Removing the Rack Rails

Remove the rack rails in which "Chassis ③" (a Drive Box with the last unit ID#) is installed.

(1) In the case of DBL/DBS

(a) Removing the rails with circular holes

(i) Remove the screws M5×10 (two places) fixing the movable rail (R).

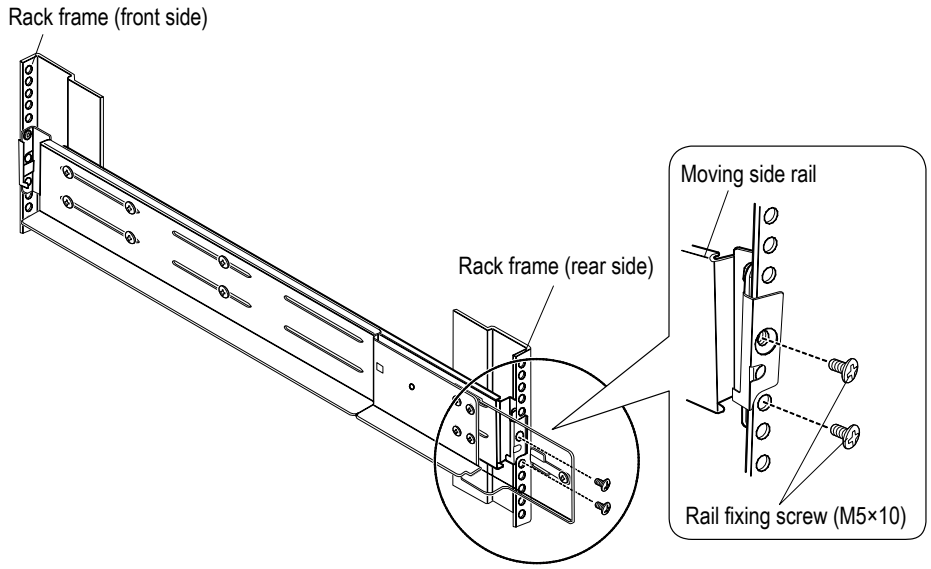

Figure 5.12.16 Removing Drive Box (2U) Installation Rails (for Circular Hole) - 1

(ii) Raise the clips of the fixed rail (R) and the movable rail (R) to the rail sides and remove the fixed rail (R) and the movable rail (R) from the rack.

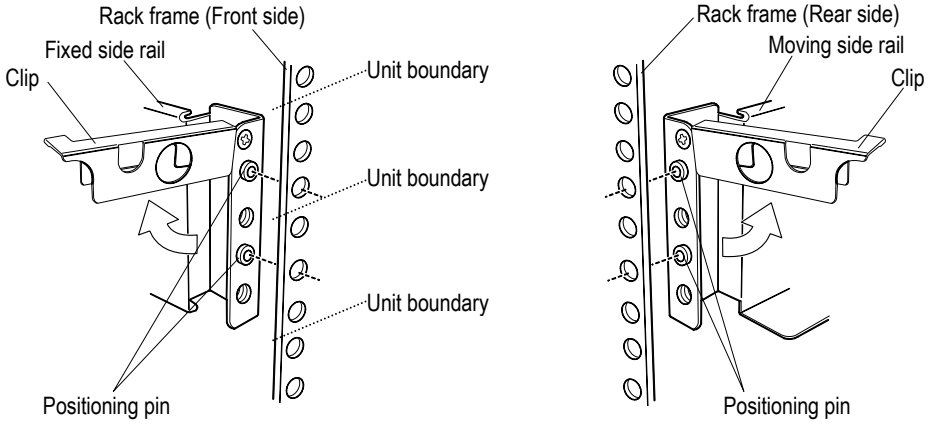

Figure 5.12.17 Removing Drive Box (2U) Installation Rails (for Circular Hole) - 2

(iii) In the same procedure as (i) to (ii), remove the fixed rail (L) and the movable rail (L) from the rack frame.

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(b) Removing the rails with square holes

(i) Remove the screws M5×10 (two places) fixing the blocks (two) of the movable rail (R) and the plate for fixing screws (one).

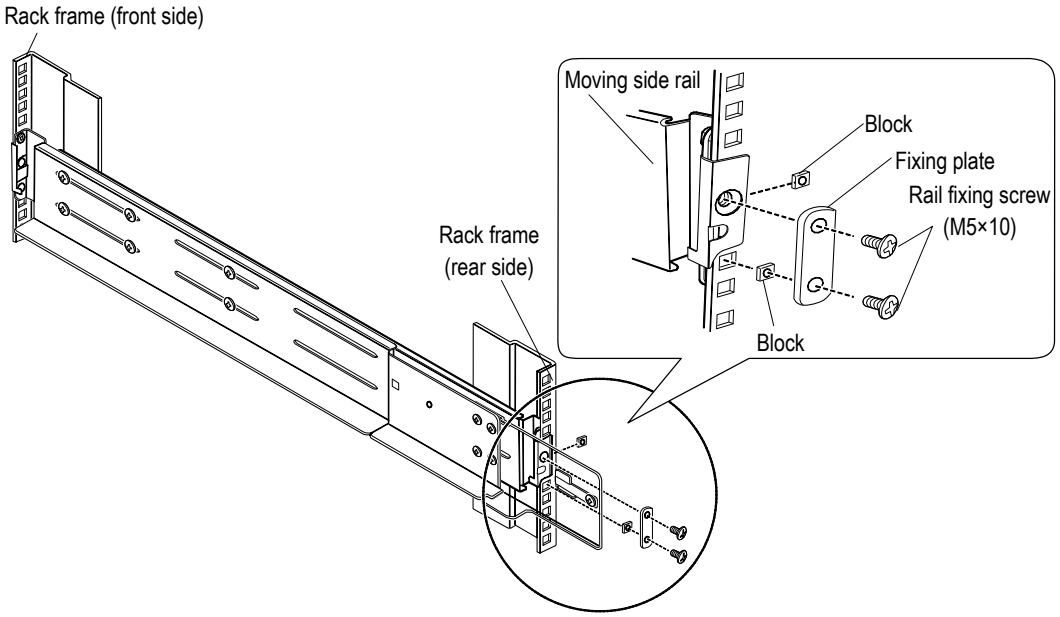

Figure 5.12.18 Removing Drive Box (2U) Installation Rails (for Square Hole) - 1

(ii) Raise the clips of the fixed rail (R) and the movable rail (R) to the rail sides and remove the fixed rail (R) and the movable rail (R) from the rack.

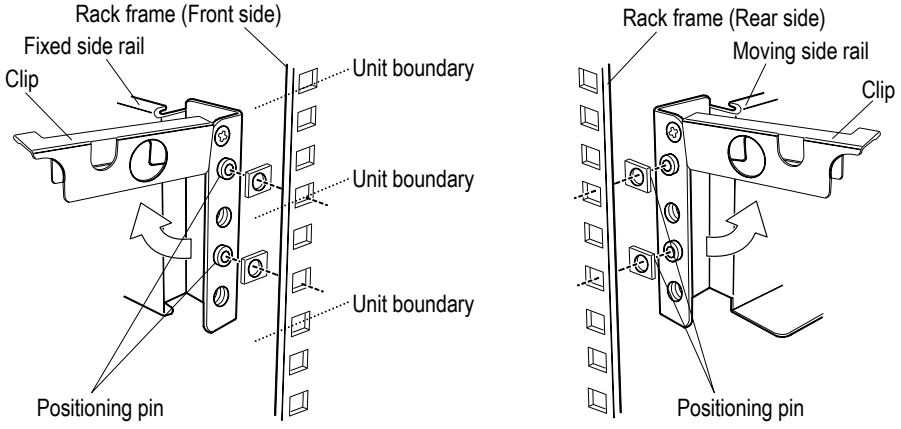

Figure 5.12.19 Removing Drive Box (2U) Installation Rails (for Square Hole) - 2

(iii) In the same procedure as (i) to (ii), remove the fixed rail (L) and the movable rail (L) from the rack frame.

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5.12.7 Installing the Rack Rails

Move “Chassis ③” and “Chassis ②” up for 3U (unit) for replacing the Drives in the Controller Box before upgrade to the new Drive Box.
Install the rack rails in which “Chassis ③” for 3U (unit) was installed in the upper place.
EIA units and intervals of mounting holes of 19-inch rack frame conforming to EIA standard

- A unit (U) space conforming to EIA standard is 19 inches wide and 44.5mm high as shown in the figure below.
- The boundary of the unit (U) falls on the middle of the interval of 12.7mm.
- For the RK40 rack frame

  Universal intervals: Repeat of 44.45 mm (15.875 mm + 15.875 mm + 12.7 mm)
  Maximum number of mountable unit (U) spaces: 40

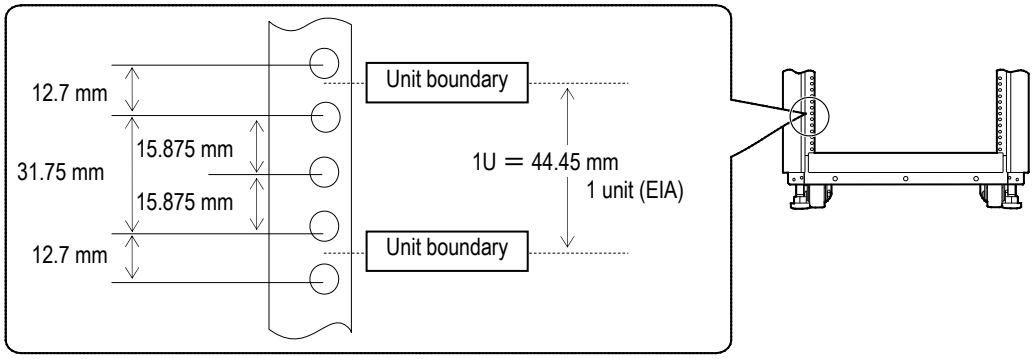

Figure 5.12.20 Attachment Hole Size of Rack

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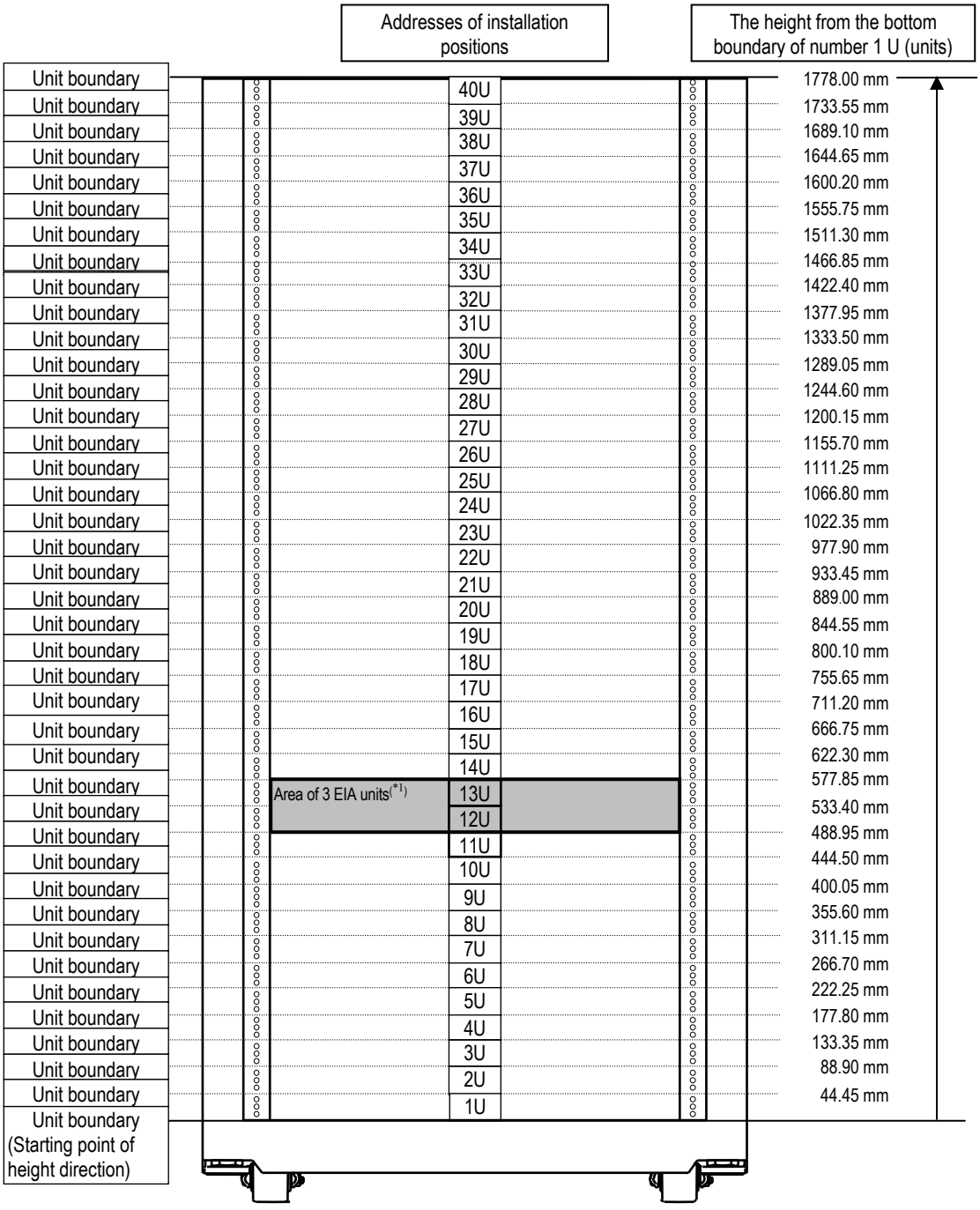
Addresses within the rack frame are called (EIA) unit numbers.
The addresses are given as 1, 2, 3, and so on counted from the bottom of the rack frame.
The following figure illustrates the whole layout of addresses of installation positions in the RK40 rack frame.
There are 40 dresses, that is, the 1 U (units) to 40 U (units) counted in the vertical direction starting from the lower boundary of the 1 U (the lowest unit).



*1 : The grayed are shows a layout of an area for installing the Drive Box at the 11 U (units)

Figure 5.12.21 Whole Layout of Installation Position Addresses

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Install the rack rail in the position adjacent to the existing Controller Box or the Drive Box. When the system of the maximum installation is upgraded, install it in the added RK40 rack frame.

(1) In the case of DBL/DBS

(a) Installing the rails with circular holes

(i) Fit the positioning pins for the fixed side rail (R) and moving side rail (R) in the holes in the position to be installed on the right side of rack frame (at 4 places in front and rear).

(ii) Close the clips of the fixed side rail (R) and moving side rail (R) toward the rail, and then install them in the rack.

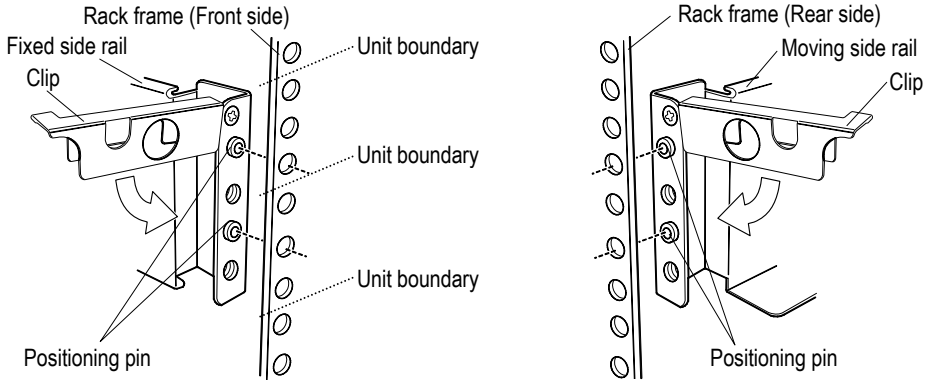

Figure 5.12.22 Installing Drive Box (2U) Installation Rails (for Circular Hole) - 1

(iii) Fix the fixed side rail (L) and the moving side rail (L) in the rack frame in the same way following the steps (i) to (v).

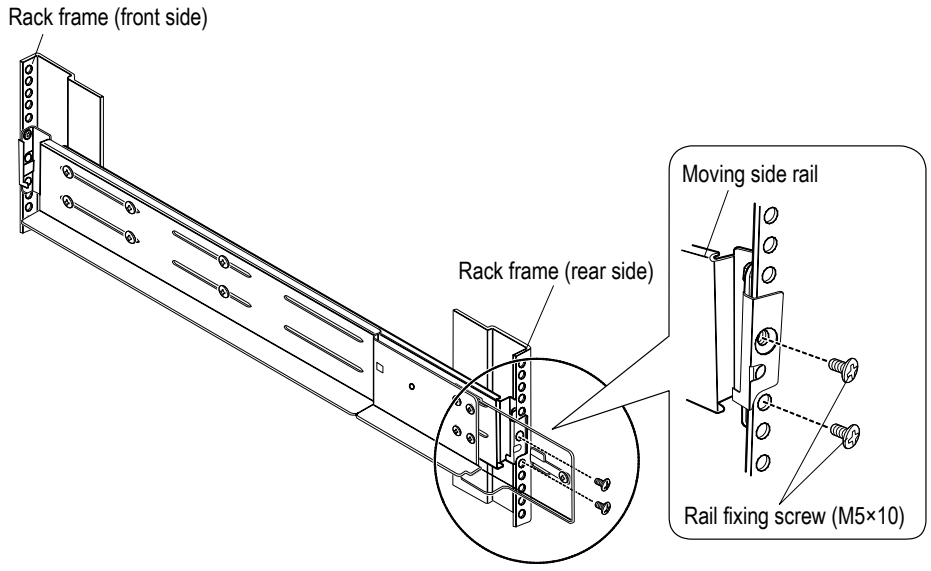

Figure 5.12.23 Installing Drive Box (2U) Installation Rails (for Circular Hole) - 1

(vi) In the same way, fix the fixed rail (L) and the movable rail (L) to the rack frame in the procedures from (i) to (iii).

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(b) Installing the rails with square holes

(i) Fit the positioning pins for the fixed side rail (R) and moving side rail (R) in the holes in the position to be installed on the right side of rack frame (at 4 places in front and rear).

(ii) Close the clips of the fixed side rail (R) and moving side rail (R) toward the rail, and then install them in the rack.

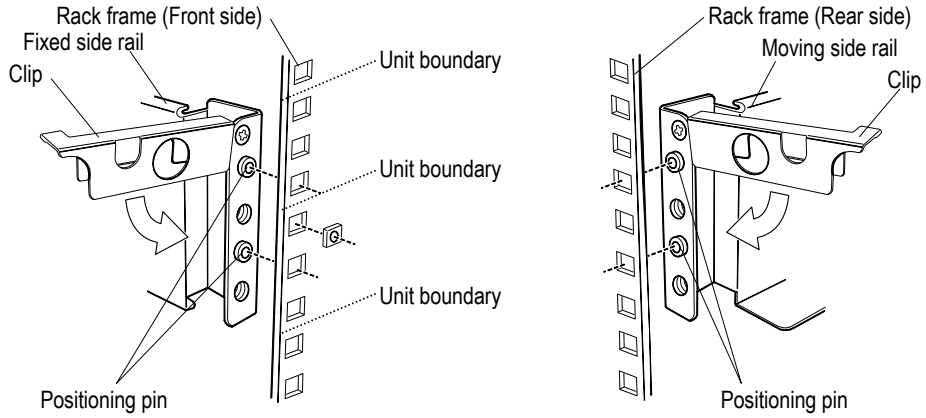

Figure 5.12.24 Installing Drive Box (2U) Installation Rails (for Square Hole) - 1

(iii) Fix the moving side rail (R) with two screws (M5×10).

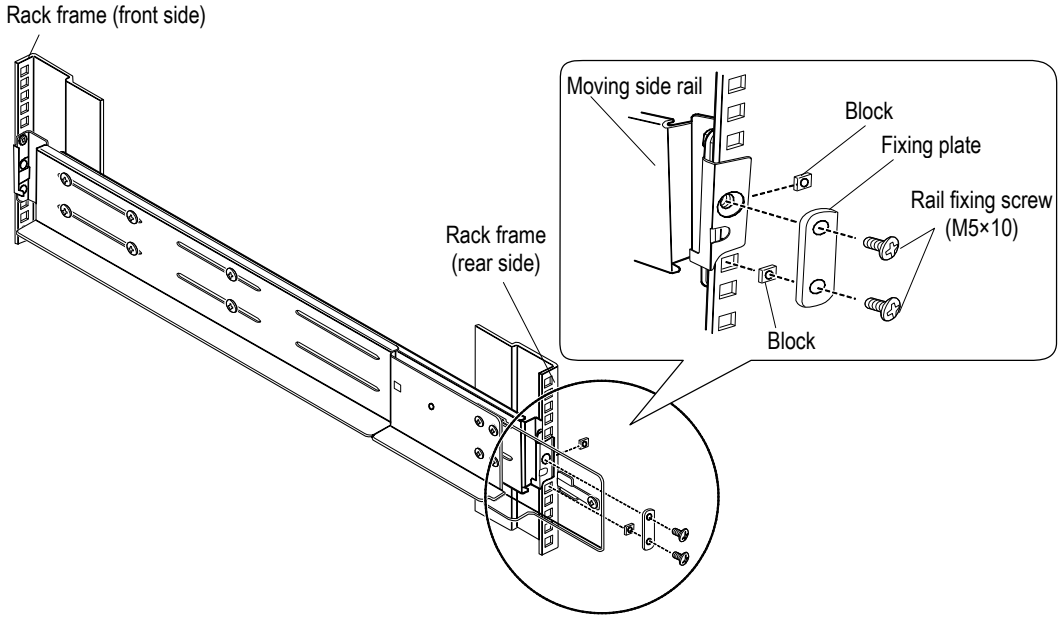

Figure 5.12.25 Installing Drive Box (2U) Installation Rails (for Square Hole) - 2

(vi) In the same way, fix the fixed rail (L) and the movable rail (L) to the rack frame in the procedures from (i) to (iii).

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(2) In the case of DBX

(a) Loosen the adjustable screws for the rail (four places).
Loosen the adjustable screw on the front side of the rail from the adjustable hole by sliding the Inter in the direction of the back side to the adjustable position.

(b) On the right side of the installation location in the rack frame, align the circular holes of the rail with those of the rack frame and insert the fasteners (at four places in total in front and rear.).

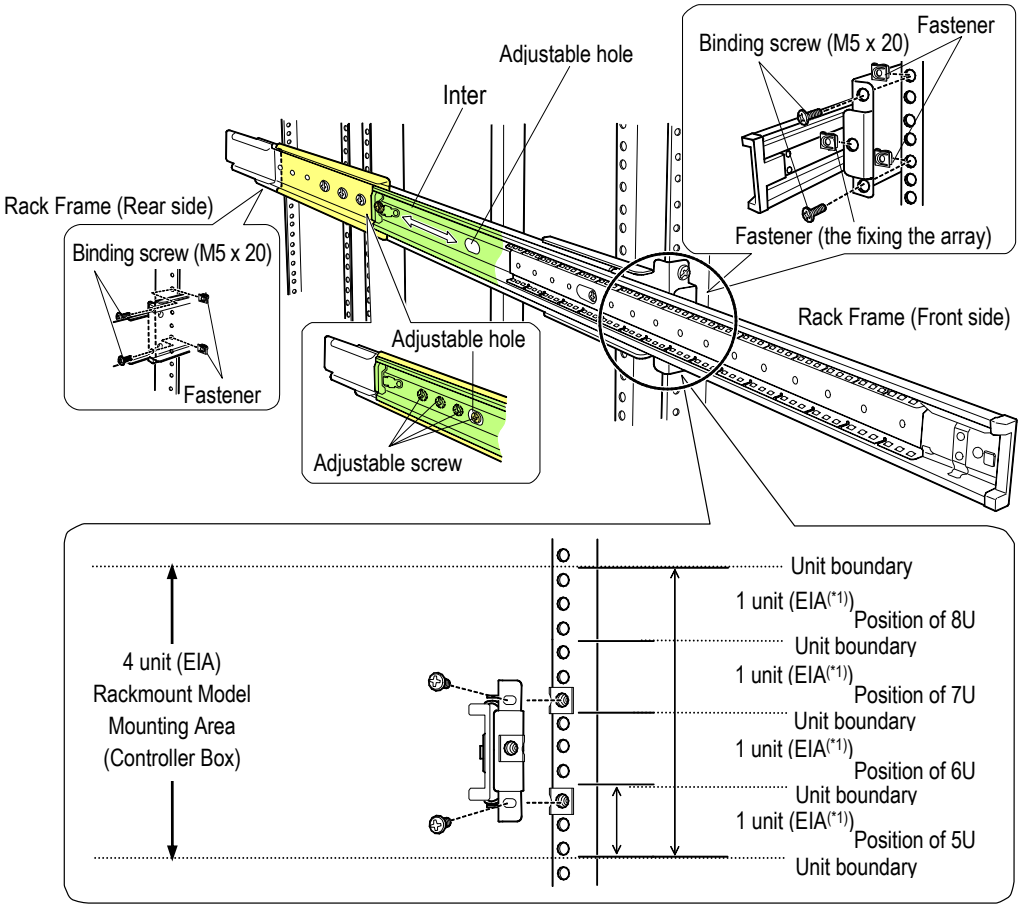
(c) Fix the rail with the binding screws (M5 (at four places in total in front and rear.)).
Adjust the length of the rail by sliding the arrow part (⇔).

NOTE : Fix the rail pressing it outward.

(d) Fix the rail with the adjustable screw.
Tighten the adjustable screw on the front side of the rail from the adjustable hole by sliding the Inter in the direction of the back side to the adjustable position.

(e) Attach the fastener for fixing the array to the front side of the rail (R) (at one place).

(f) In the same way, fix the rail to the left side of the rack frame.



*1 : One EIA unit is approximately 44.45 mm.
*2 : This figure shows the rail is installed in the right side of the rack frame.

Figure 5.12.26 Fixing the Rails to the Rack Frame

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5.12.8 Installing a Chassis

(1) Mounting the “Chassis ③” (a Drive Box with the last unit ID#)

(a) Move the pump handle of the special lifter from side to side, and lift it to the height (for three units (U)) of the position where the rack rail was installed in the “5.12.6 Removing the Rack Rails” (UP 05-0390).

Be careful not to lift the elevating base too high. If you lift it too high, lower it by opening the up/down valve gently.

(b) Remove the band and adjust the position of the “Chassis ③” (a Drive Box with the last unit ID#) so that the “Chassis ③” (a Drive Box with the last unit ID#) comes in the center in front of the rack frame.

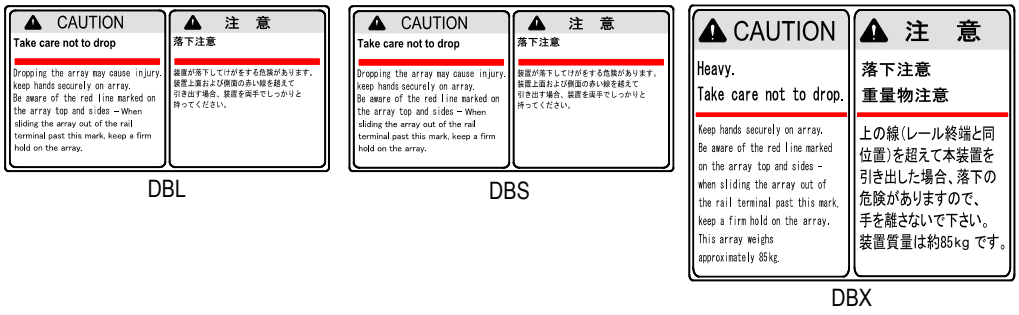
If the array is positioned off-centered, a screw contacts the front bezel preventing the bezel from being opened or closed.

(c) Shift the “Chassis ③” (a Drive Box with the last unit ID#) onto the rails in the rack frame.

When shifting the “Chassis ③” (a Drive Box with the last unit ID#), push it in to the end gently.

⚠ CAUTION

Do not move the lifter away from the rack frame nor lower the elevator until the red line on the label affixed on the array enters the rack frame across the end of it. Otherwise, falling of the array may be caused.



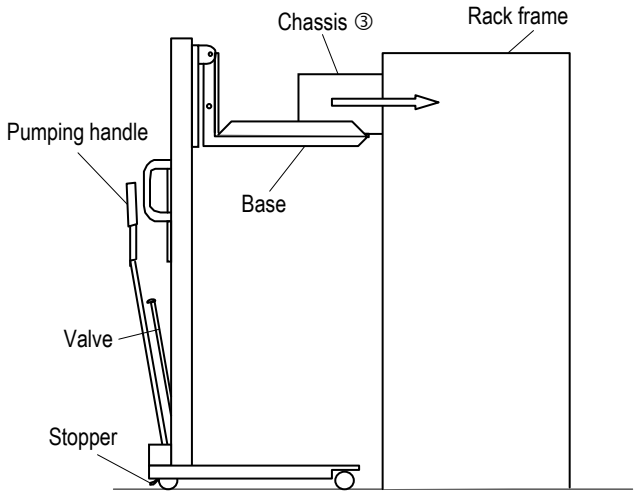


Figure 5.12.27 Mounting Array on Rack Frame

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(d) Fasten the "Chassis ③" (a Drive Box with the last unit ID#) in the rack frame.

(d-1) In the case of DBL/DBS

(i) Fix the DBL/DBS.
Install the array with the bracket.
Fasten the array to the rack frame with the M5×10 binding screws temporarily (two places each at right and left).

(ii) Tighten the bind screws pressing the bracket in the direction of ① and ② to fix the bracket.

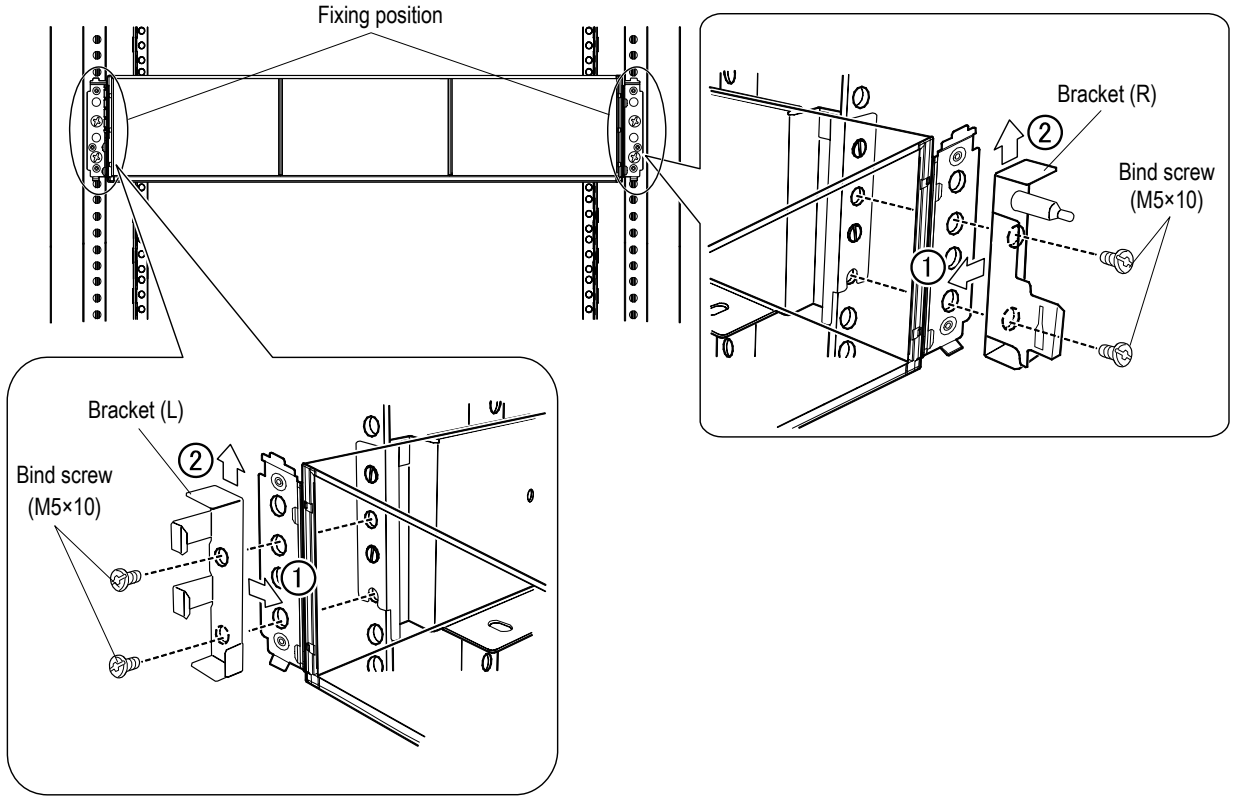

Figure 5.12.28 Fixing the Front Side of the Array (DBL/DBS)

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(d-2) In the case of DBX

(i) Release the locks by sliding the latch releasing lever in the front end of the right and left rack rail, and then push the front side of DBX gently in to the end by pushing its front side gently.

NOTE : • Push the DBX gently without giving momentum.
• Be careful not to hit the center rail during the work.

(ii) Tighten the front side fixing screw (one each for right and left) by hand to fix it.

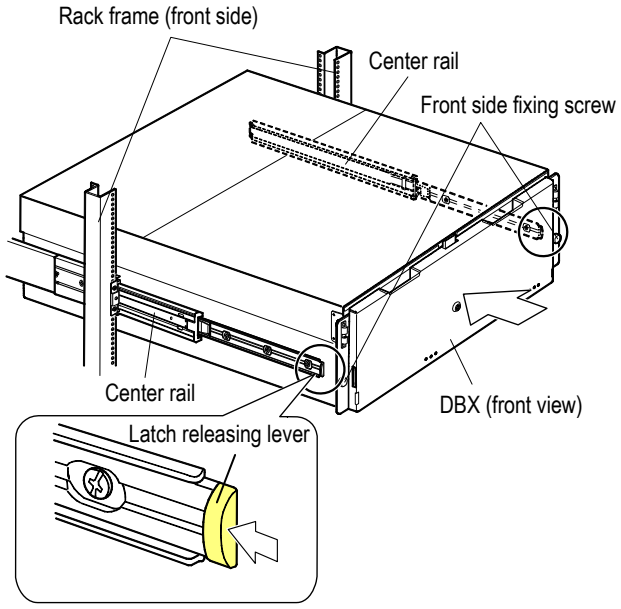

Figure 5.12.29 Fixing the Front Side of the Array (DBX)

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5.12.9 Installing a Drive

(1) Install the Drive which was removed in the "5.12.4 Removing a Drive" (UP 05-0300) in "Chassis ③" (a Drive Box with the last unit ID#).

NOTICE

- **To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the chassis before starting and do not take it off until you finish.**
- **Drives are precision components.**
  Be careful not to expose drives to hard shock.
- **When you install a Drive, support its metal part with your hand that has the wrist strap. You can discharge static electricity by touching the metal plate.**

(a) Pull the parts out of the Drives safekeeping box.
Install the removed Drives in the same positions in "Chassis ③" (a Drive Box with the last unit ID#).

(b) Drive Mounting
Hold the handle and insert the Drives in the same addresses in "Chassis ③" (a Drive Box with the last unit ID#).
The Drive size and removal operation vary depending on the array to be installed.
Check the array and the Drive before starting the work.

(b-1) In the case of DBL

NOTE : When handling the Drive, hold the RAIL side because the SHIELD SPRING is subject to breakage.

(i) Open the handle fully and fit the Drive in the guide rail and slide it in the direction shown by the arrow.
(ii) Push it in until it reaches the position where a hook of the handle can be entered into the square hole on a frame.
(iii) Pull the stopper lightly and close the handle, and then have the lock on by pressing the stopper.

NOTE : If the handle is raised in the state in which its hook cannot be entered into the square hole, the Drive cannot be installed correctly because it runs into the frame of the disk array unit.

(iv) Pull the handle lightly to make sure that the Drive cannot be pulled out.
(v) Attach the dummy (Drive) to the each Drive slot in which no Drive is installed.
Insert it into the slot slowly so that the latch part of the dummy (Drive) comes to the left side.

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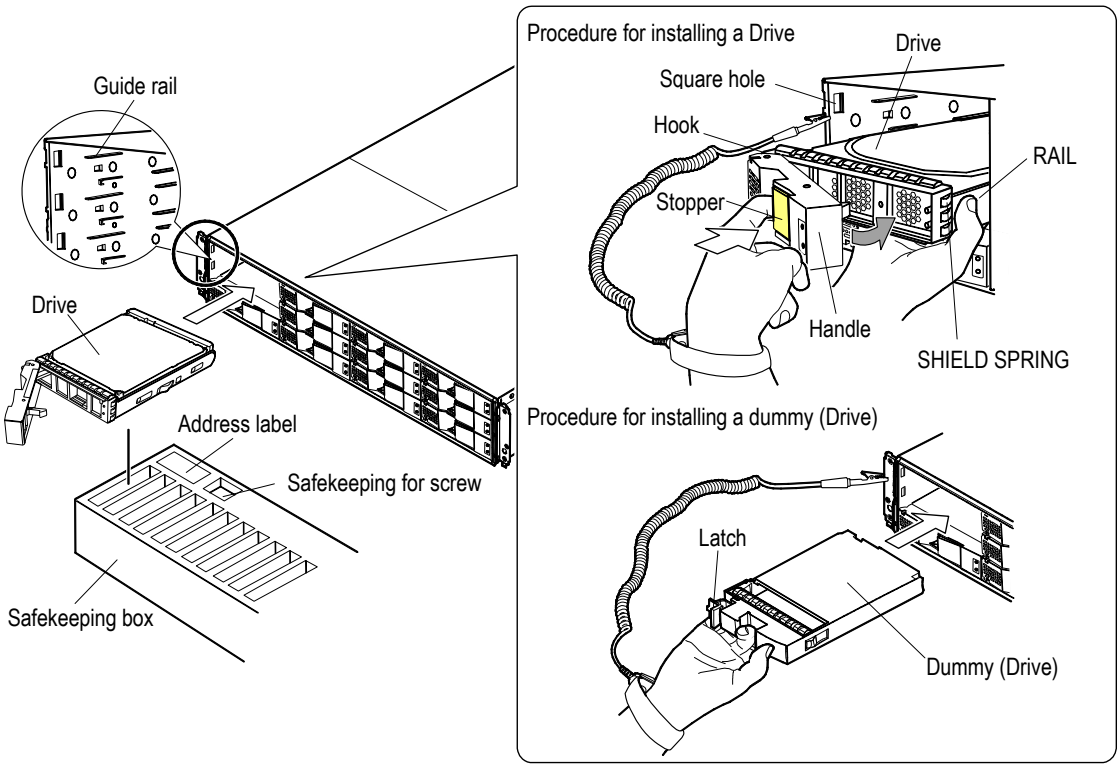

Figure 5.12.30 Installing the Drive/Dummy (Drive) (CBXSL/CBSL/DBL)

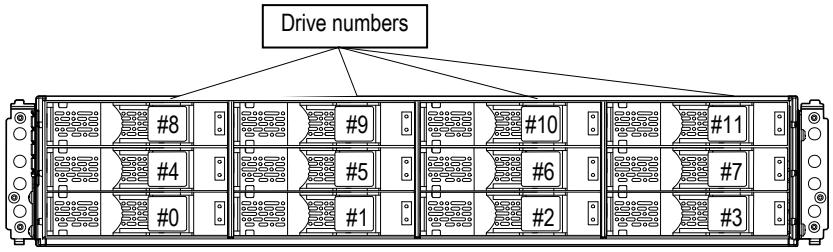

Figure 5.12.31 Drive Mounting Location

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(b-2) In the case of DBS

(i) Fit the Drive in the guide rail and slide it in the direction shown by the arrow.

(ii) Push it in until it reaches the position where a hook of the handle can be entered into the rectangular hole at the lower part of a frame on the front side of the DBS.

(iii) Raise the stopper, which has been tilted toward you, and then have the lock on by pressing the stopper.

NOTE : If the handle is raised in the state in which its hook cannot be entered into the rectangular hole, the Drive cannot be installed correctly because it runs into the frame of the disk array unit.

(iv) Pull the handle lightly to make sure that the Drive cannot be pulled out.

(v) Attach the dummy (Drive) to the each Drive slot in which no Drive is installed. Insert it into the slot slowly so that the latch part of the dummy (Drive) comes to the lower side.

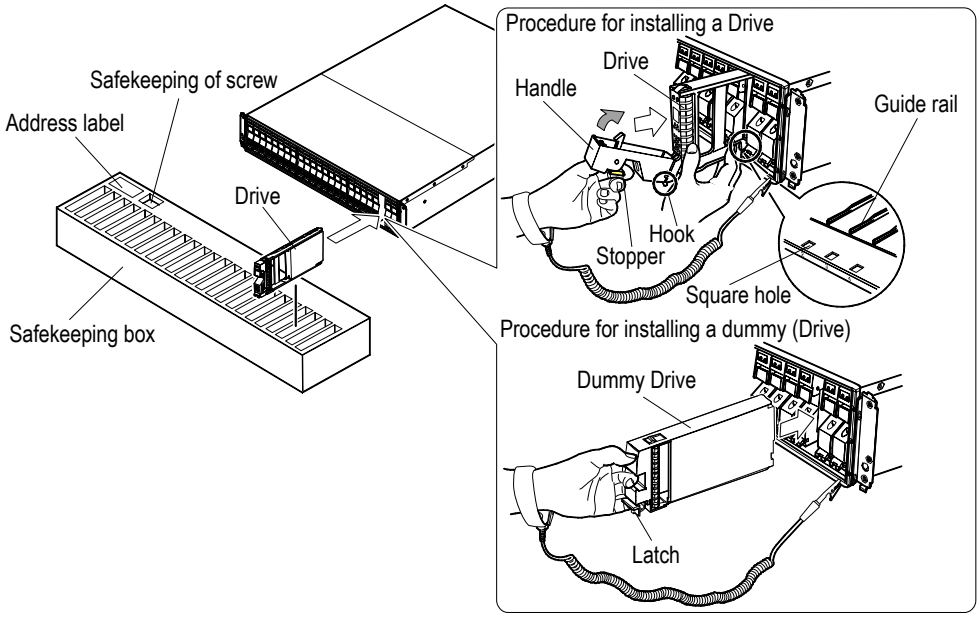

Figure 5.12.32 Installing the Drive/Dummy (Drive) (DBS)

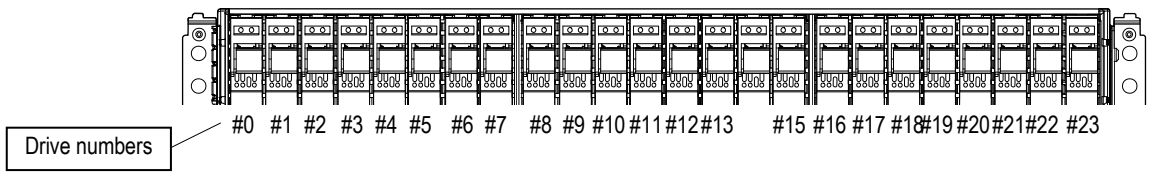

Figure 5.12.33 Drive Mounting Location (CBXSS/CBSS/DBS)

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(b-3) In the case of DBX

(i) Pull the DBX out of the rack, and remove the top cover. (Refer to Installation "1.4.1 How to Attach/Remove Front Bezel (3)" (INST01-0190).)

(ii) Remove the Drive from the Drive safekeeping box.
Be sure to install the removed Drive to the original positions.

(iii) Open the handle, and insert the Drive into the same address as the one on the DBX holding it with both hands.

(iv) Close the handle.

(v) Install the Dummy (Drive) into the slot where the Drive is not installed.

(vi) Return the DBX into the rack after attaching its cover. (Refer to Installation "1.4.1 How to Attach/Remove Front Bezel (3)" (INST01-0190).)

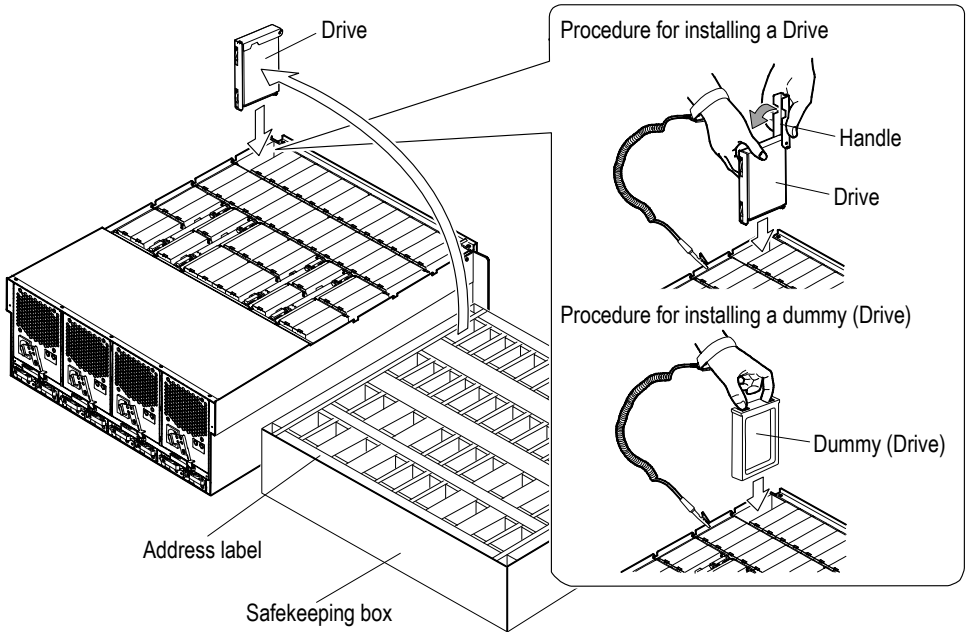

Figure 5.12.34 Installing the Drive/Dummy (Drive) (DBX)

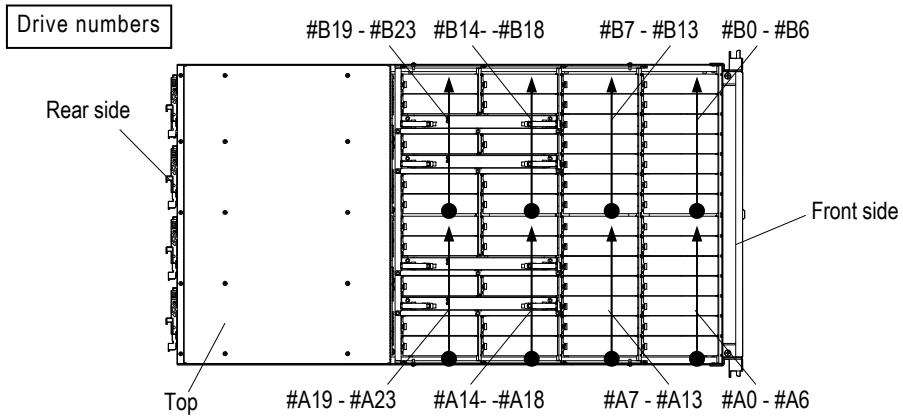

Figure 5.12.35 Location of Installing the Drive (DBX)

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5.12.10 Attaching a Front Bezel

Attach the Front Bezel attached to “Chassis ③” (a Drive Box with the last unit ID#).

- In case of the DBS, refer to Installation “1.4.1 How to Attach/Remove Front Bezel (1)” (INST01-0150).
- In case of the DBX, refer to Installation “1.4.1 How to Attach/Remove Front Bezel (3)” (INST01-0190).

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5.12.11 Installing a Drive BOX

(1) When two or more Drive Box are installed, repeat the "5.12.2 Open/Close Door or Attach/Remove Front Bezel/ Rear Door" (UP 05-0250) to "5.12.10 Attaching a Front Bezel" (UP 05-0530) in ascending order of the unit ID#, and migrate all the rack installation positions upward by 3 U (units).

NOTE : Be sure to execute the movement of the Drive Box one by one.

When all Drive Box are migrated, the area for 3 U (units) is made in the Controller Box. After confirming the free area, proceed to the procedure (13).

(2) Remove the Front Bezel
Remove the Front Bezel attached to "Chassis ① (CBSL/CBSS)" (the Controller Box). (Refer to Installation "1.4.1 How to Attach/Remove Front Bezel (1)" (INST01-0150).)

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5.12.12 Removing the Cables of the Controller Box

(1) When the UPS is connected, remove the UPS cable on the side connected to the Controller.
(2) When the LAN cables are connected, remove the LAN cable on the side connected to the Controller.

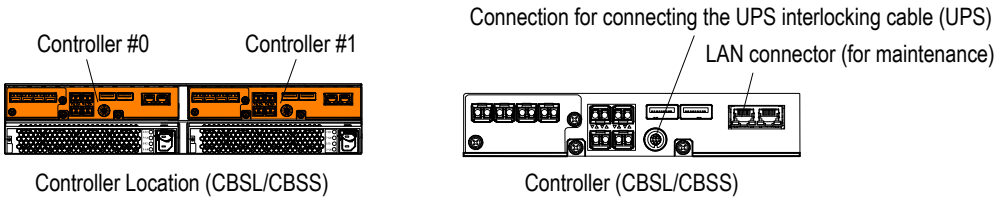

Figure 5.12.36 Disconnecting UPS Cables/LAN cable

(3) Disconnect only the connector, which is connected to the Power Unit, of the all power cable connected to the "Chassis ① (CBSL/CBSS)" (the Controller Box).

⚠ CAUTION

Make sure that there is no scratch or flaw on a power cable. It can cause an electric shock or even a fire.

NOTE : When the cable cannot be removed easily, do not pull it by force.
Pull out the parts a little, and then perform the cable removal again.

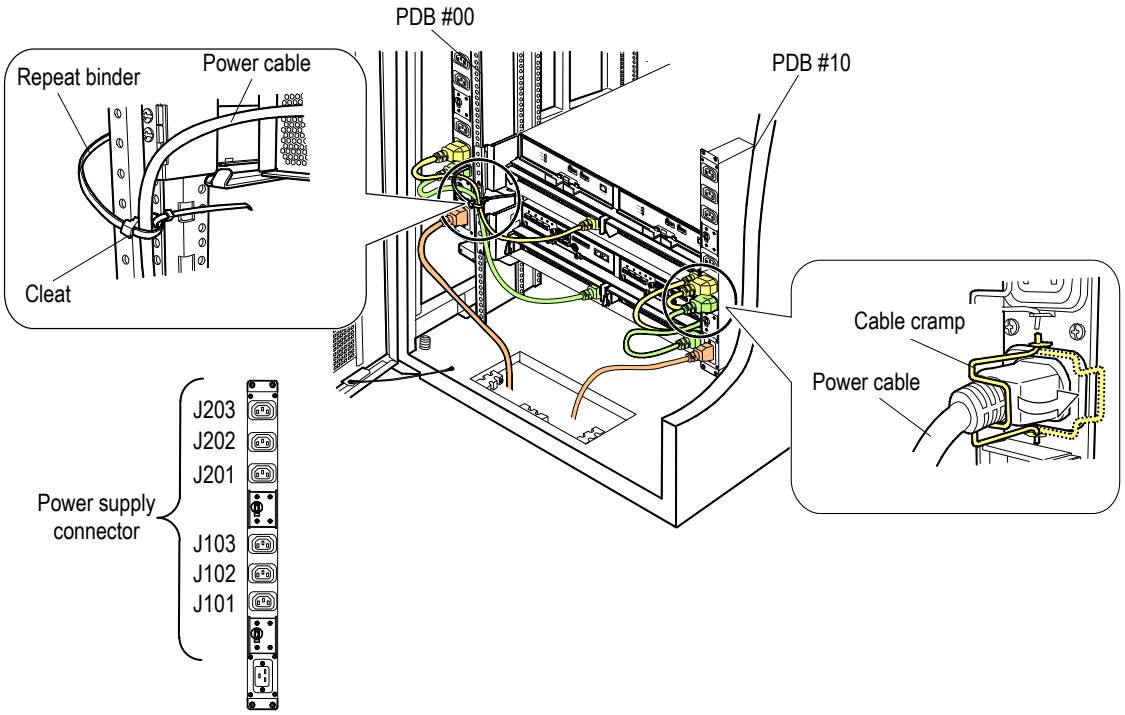

Figure 5.12.37 Disconnecting Power Cables

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5.12.13 Removing a Drive

(1) Remove the Drives installed in the "Chassis ① (CBSL/CBSS)" (the Controller Box).

NOTICE

- **To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the chassis before starting and do not take it off until you finish.**
- **Drives are precision components.**
  Be careful not to expose drives to hard shock.

(a) Affix labels with the HDD numbers to all the Drives that were installed in the "Chassis ① (CBSL/CBSS)" (the Controller Box).

(b) Drive removal

(b-1) In the case of CBSL

(i) Remove the Front Bezel. (Refer to Installation "1.4.1 How to Attach/Remove Front Bezel (1)" (INST 01-0150).)

(ii) Remove the Drive or a dummy (Drive).
Pull the stopper of the handle toward you to have the lock off (①), tilt the handle toward you, and then remove the Drive by pulling it out taking care not to apply a shock to it.
Pressing the latch on the left side of the dummy (Drive) to the direction of the arrow, hold the right side of the dummy and pull it out, and then remove it.

NOTE : When handling the Drive, hold the RAIL side because the SHIELD SPRING is subject to breakage.

(iii) Keep the Drive of dummy (Drive) that has been removed temporarily in the component safekeeping box at the location shown on the address label with its handle returned to its original state (locked by the stopper).

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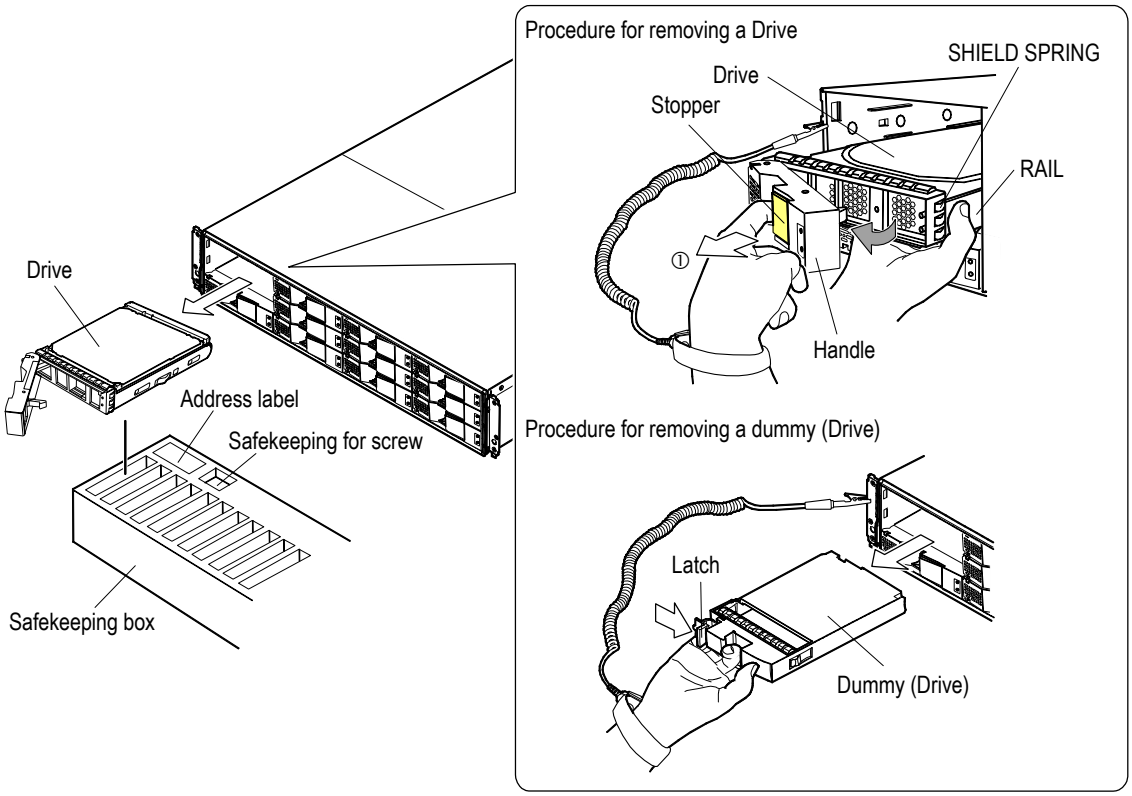

Figure 5.12.38 Removing Drive (CBSL)

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(b-2) In the case of CBSS

(i) Remove the Front Bezel. (Refer to "1.4.1 How to Attach/Remove Front Bezel (1)" (INST 01-0150).)

(ii) Remove the Drive or a dummy (Drive).
Pull the stopper of the handle toward you to have the lock off (①), tilt the handle toward you, and then remove the Drive by pulling it out taking care not to apply a shock to it.
Pressing the latch at the lower part of the dummy (Drive) to the direction of the arrow, hold the upper part and pull it out, and then remove it.

(iii) Keep the Drive of dummy (Drive) that has been removed temporarily in the component safekeeping box at the location shown on the address label with its handle returned to its original state (locked by the stopper).

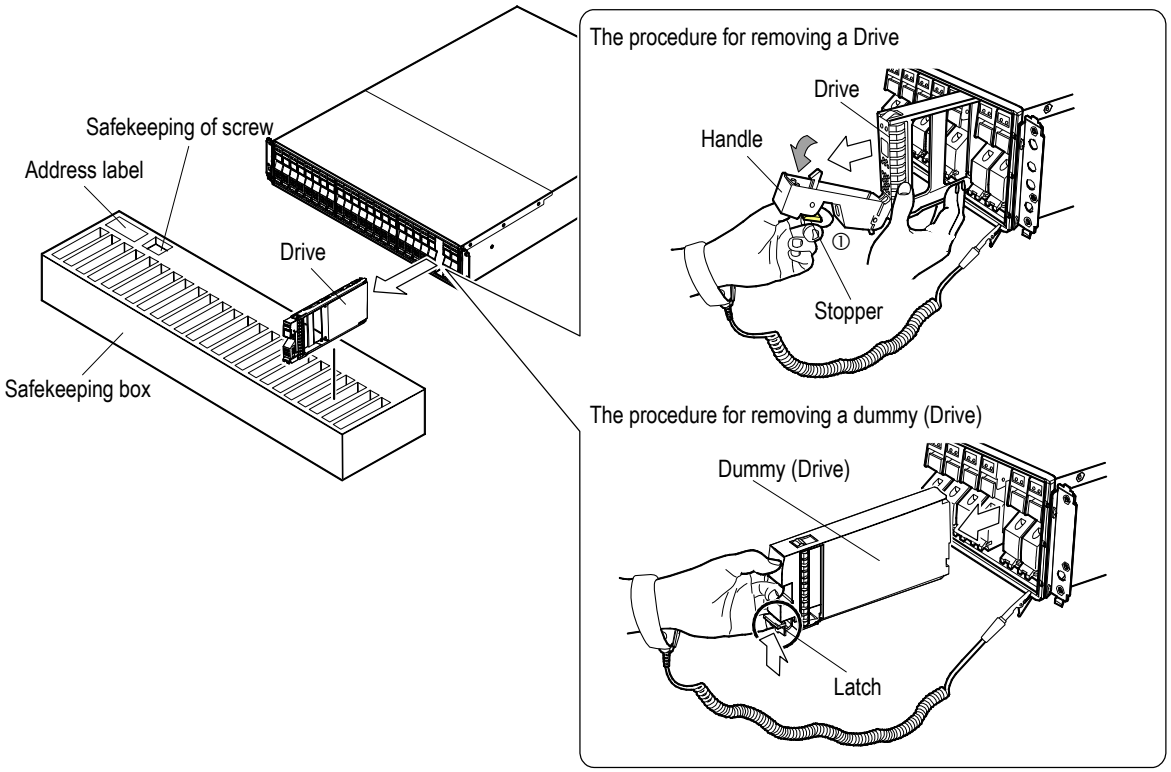

Figure 5.12.39 Removing Drive (CBSS)

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(2) Replace the "Chassis ① (CBSL/CBSS)" (Controller Box) with the CBL.
Prepare a special lifter.

⚠ CAUTION

- **Rack mounting and lifter operation should only be conducted by a person who has been trained and qualified since the array could turn over or a worker could be caught under the array.**
- **Be sure to perform the operation with two or more workers.**

(a) Remove the front side of the "Chassis ① (CBSL/CBSS)" (the Controller Box)

(i) Remove the four M5×10 binding screws which fix the "Chassis ① (CBSL/CBSS)" (the Controller Box).

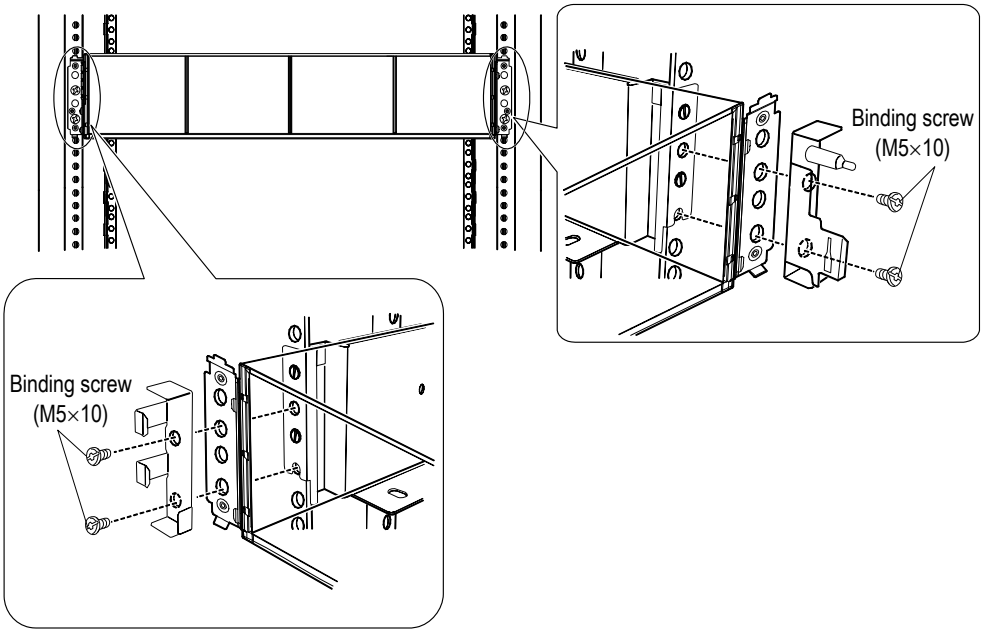

Figure 5.12.40 Removing the Front Side of the "Chassis ① (CBSL/CBSS)" (Controller Box)

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(b) Demount the "Chassis ① (CBSL/CBSS)" (Controller Box) from the RK40 rack frame.

⚠ WARNING

If the array falls when the elevator of the lifter is at a high position, a personal injury will be caused.
Perform the positioning, fastening, or other handlings very carefully.

⚠ CAUTION

- **Rack mounting and lifter operation should only be conducted by a person who has been trained and qualified since the array could turn over or a worker could be caught under the array.**
- **Operate the valve slowly when opening it. If it is opened quickly, the elevator of the lifter descends rapidly and may cause personal injury.**
- **Be sure to perform the operation with two or more workers.**
- **Work carefully because the mass of the single CBSL is about 43 kg, and CBSS is about 40 kg.**

(i) Adjust the position of the array so that it is seated in the center of the rack frame.
(ii) Move the pumping handle of the pumping lifter from side to side and lift it up to the level where "Chassis ① (CBSL/CBSS)" (Controller Box) is installed.
Be careful not to lift the elevating base too high. If you lift it too high, lower it by opening the up/down valve gently.

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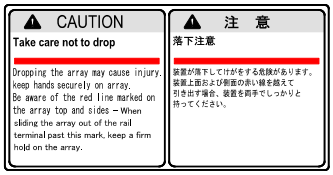
(iii) Shift the "Chassis ① (CBSL/CBSS)" (Controller Box) onto the elevating base of the external lifter. Shift the "Chassis ① (CBSL/CBSS)" (Controller Box) gently until it hits the backboard of the elevating base.

⚠ CAUTION

Do not move the lifter away from the rack frame nor lower the elevator until the red line on the label affixed on the array enters the rack frame across the end of it. Otherwise, falling of the array may be caused.



CBSL/CBSS

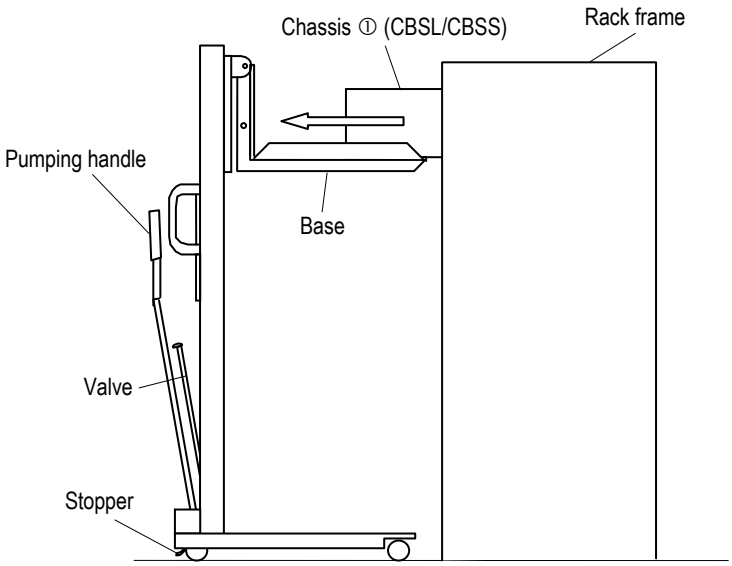


Figure 5.12.41 Mounting "Chassis ① (CBSL/CBSS)" (Controller Box) on Special Lifter

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(iv) Secure the “Chassis ① (CBSL/CBSS)” (Controller Box) to the lifter with a band of the lifter. Bind the “Chassis ① (CBSL/CBSS)” (Controller Box) with the band tightly by fitting the length of the belt to the “Chassis ① (CBSL/CBSS)” (Controller Box).

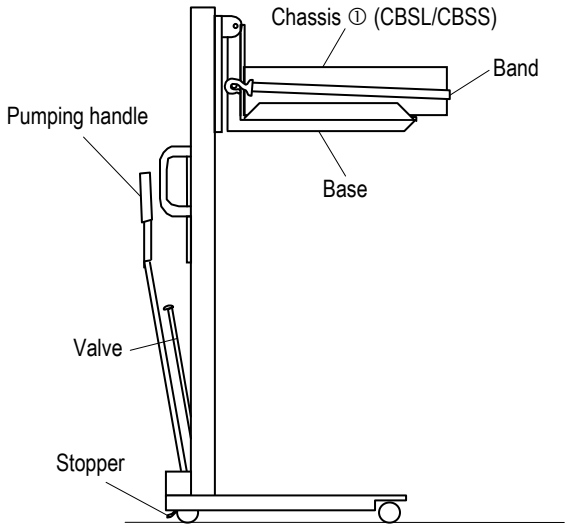

Figure 5.12.42 Secure the “Chassis ① (CBSL/CBSS)” (the Controller Box)

(v) After securing the “Chassis ① (CBSL/CBSS)” (Controller Box) to the elevating base, open the up/down valve of the external lifter gently and lower the elevating base to the lowermost position.

(vi) Take off the brake of the external lifter, move the lifter away from the rack frame, and take down the “Chassis ① (CBSL/CBSS)” (Controller Box) after loosening the belt.

(vii) Move the external lifter to the place where the lifter does not disturb the following works.

(viii) Packing the “Chassis ① (CBSL/CBSS)” (Controller Box). (Refer to “Export Packing Specifications”.)

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5.12.14 Removing/Installing the Rack Rails

(1) Remove the rack rail of the "Chassis ① (CBSL/CBSS)".

(a) Removing the rails with circular holes

(i) Remove the two M5x10 screws which fix the moving side rail (R).

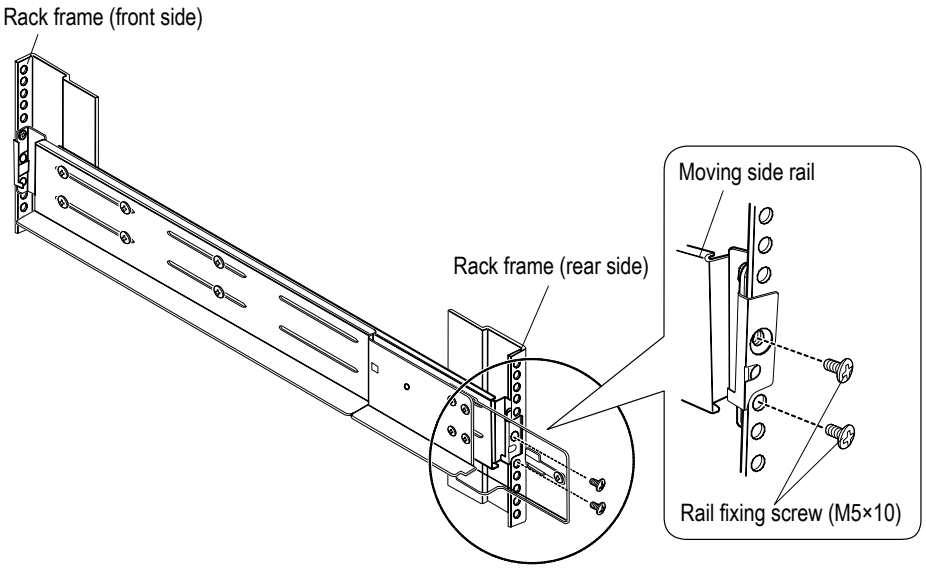

Figure 5.12.43 Removing Drive Box (2U) Installation Rails (for Circular Hole) - 1

(ii) Raise the clips of the fixed rail (R) and the movable rail (R) to the rail sides and remove the fixed rail (R) and the movable rail (R) from the rack.

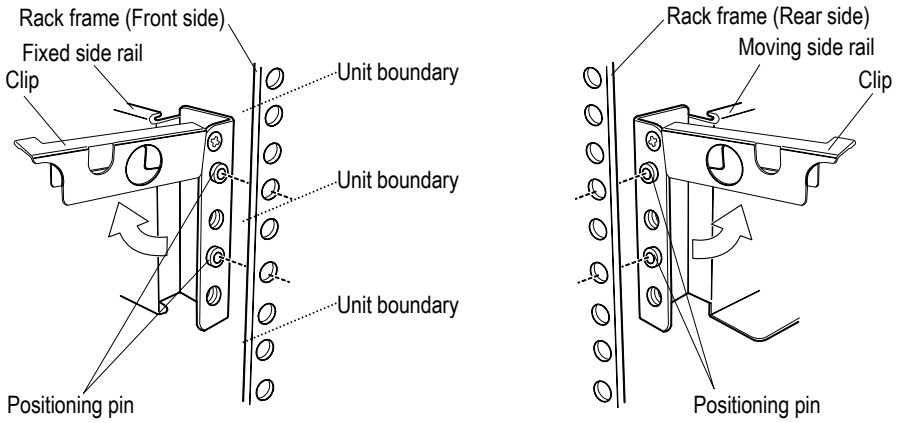

Figure 5.12.44 Removing Drive Box (2U) Installation Rails (for Circular Hole) - 2

(iii) In the same procedure as (i) to (ii), remove the fixed rail (L) and the movable rail (L) from the rack frame.

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(b) Removing the rails with square holes

(i) Remove the two M5x10 screws which fix the two blocks for the moving side rail (R) and the one screw fixing plate.

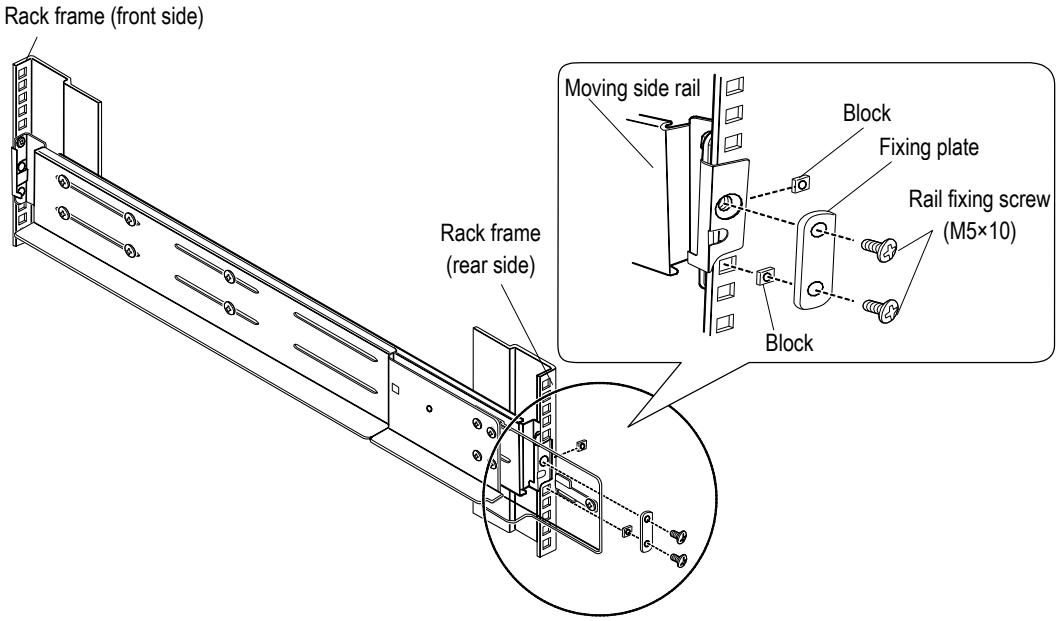

Figure 5.12.45 Removing Drive Box (2U) Installation Rails (for Square Hole) – 1

(ii) Raise the clips of the fixed rail (R) and the movable rail (R) to the rail sides and remove the fixed rail (R) and the movable rail (R) from the rack.

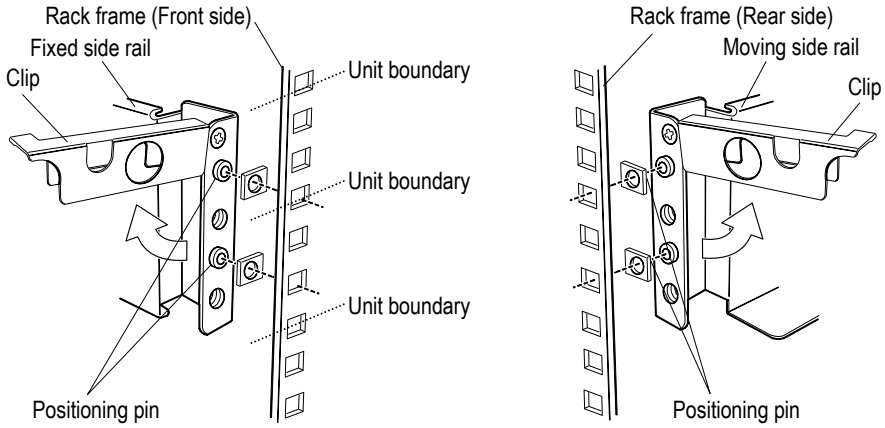

Figure 5.12.46 Removing Drive Box (2U) Installation Rails (for Circular Hole) - 2

(iii) In the same procedure as (i) to (ii), remove the fixed rail (L) and the movable rail (L) from the rack frame.

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(c) The rack rails for CBL and the rack rails for the Drive Box to be unit #00 are installed.

(i) Install the rack rails for CBL. (Refer to Installation "2.2.2 (2) Installing rack rails for Controller Box (3U)" (INST 02-0240).)

(ii) Install the rack rails for the Drive Box to be unit #00. (Refer to Installation "2.2.2 (3) Installing rack rails for Drive Box (2U)" (INST 02-0290).)

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5.12.15 Installing DBL/DBS on Rack Frame

(1) The EMI gaskets are attached on DBL/DBS.
Stick the EMI gasket supplied with the rack rail on the top of the DBL/DBS frame.
(a) Peel off the anti-adhesion sheet from the bottom surface of the EMI gasket.
(b) Stick the EMI gasket by aligning it with the front end of the top of the frame.

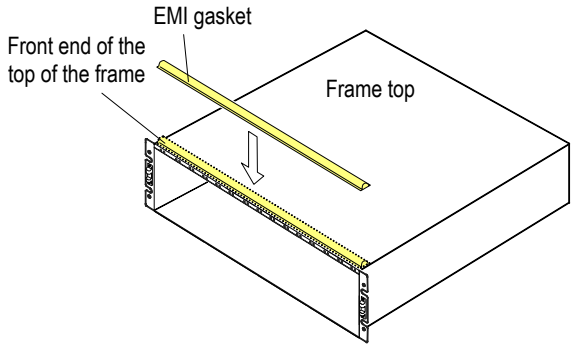

Figure5.12.47 Position for Sticking EMI Gasket (DBL/DBS)

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(2) Mounting the DBL/DBS on the rack frame.
When the Controller Box before upgrade is CBSS, install DBS in the rack rails.
When the Controller Box before upgrade is CBSL, install DBL in the rack rails.

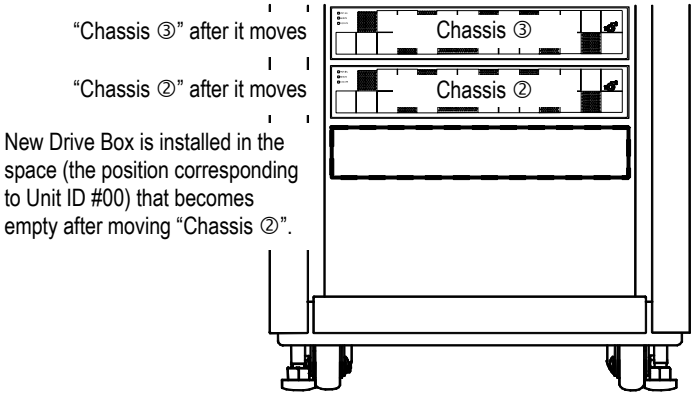

Figure 5.12.48 System Configuration

WARNING

If the array falls when the elevator of the lifter is at a high position, a personal injury will be caused.
Perform the positioning, fastening, or other handlings very carefully.

CAUTION

- **Rack mounting and lifter operation should only be conducted by a person who has been trained and qualified since the array could turn over or a worker could be caught under the array.**
- **Operate the valve slowly when opening it. If it is opened quickly, the elevator of the lifter descends rapidly and may cause personal injury.**
- **Be sure to perform the operation with two or more workers.**
- **Work carefully because the mass of the single CBSL is about 43 kg, and CBSS is about 40 kg.**

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(a) Bring the lifter close to the DBL/DBS to be mounted and apply the brake to the lifter.

NOTE : When putting the DBL/DBS on the lifter, be sure to remove the front bezel beforehand.

(b) Put the DBL/DBS on the lifter.

(c) Secure the DBL/DBS to the lifter with a band of the lifter.
Bind the DBL/DBS with the band tightly by fitting the length of the belt to the DBL/DBS.

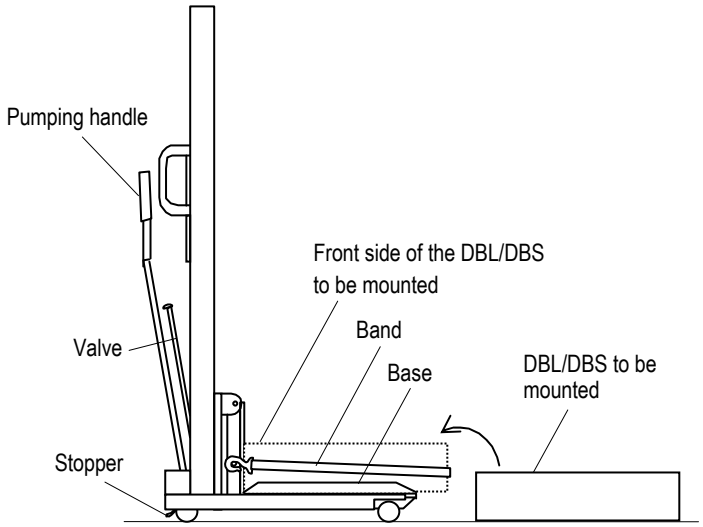

Figure 5.12.49 Putting the DBL/DBS on Lifter

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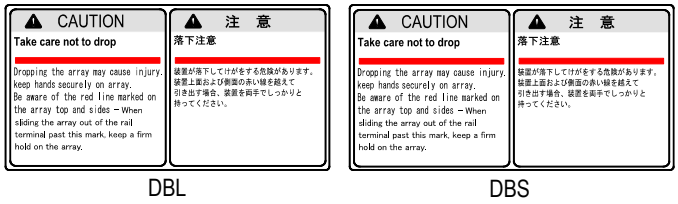
(d) Take off the brake of the lifter on which the DBL/DBS has been put, and move the lifter close to the rack frame.

(e) Adjust the position of the DBL/DBS so that it is seated in the center of the rack frame.

(f) Move the pumping handle of the special lifter to the right and left repeatedly to lift the DBL/DBS up to the height suitable for the mounting.
Be careful not to lift the elevating base too high. If you lift it too high, lower it by opening the up/down valve gently.

⚠ CAUTION

Do not move the lifter away from the rack frame nor lower the elevator until the red line on the label affixed on the array enters the rack frame across the end of it. Otherwise, falling of the array may be caused.



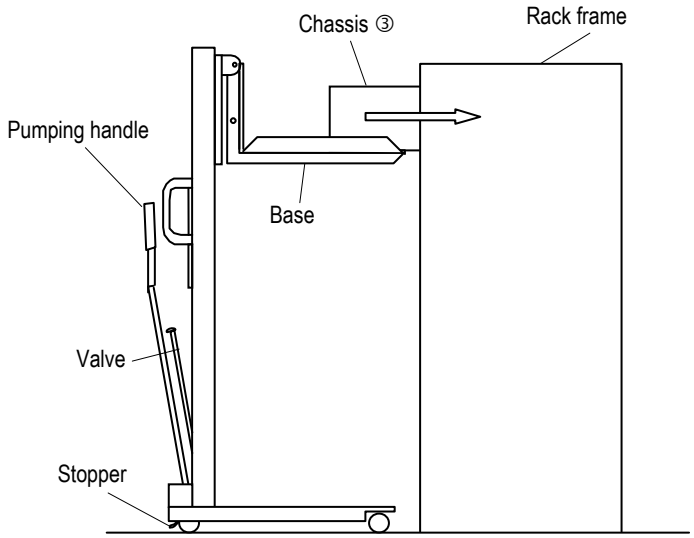


Figure 5.12.50 Mounting Array on Rack Frame

(g) Remove the band and adjust the position of the DBL/DBS so that the DBL/DBS comes in the center in front of the rack frame. If the DBL/DBS is positioned off-centered, a screw contacts the front bezel preventing the bezel from being opened or closed.

(h) Shift the DBL/DBS onto the rails in the rack frame. When shifting the DBL/DBS, push it in to the end gently.

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(i) Fix the front of DBL/DBS to the rack frame.

(i) Install the array with the bracket.
Fasten the array to the rack frame with the M5×10 binding screws temporarily (two places each at right and left).

(ii) Tighten the bind screws pressing the bracket in the direction of ① and ② to fix the bracket.

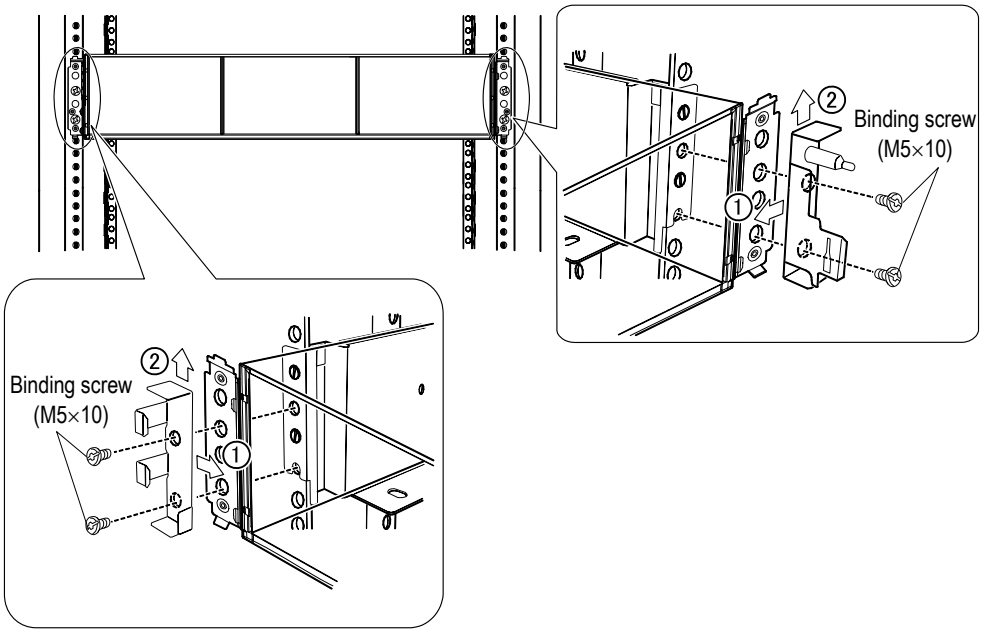

Figure 5.12.51 Fastening Front Side

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5.12.16 Installing a Drive

(1) Install the Drives, which were removed from the "Chassis ① (CBSL/CBSS)" (Controller Box), in the DBL/DBS.

Notes on the replacement of the Drives:
Since the Drives cannot be installed in CBL, it is required to replace the Drives installed in "Chassis ① (CBSL/CBSS)" (Controller Box) to the newly installed DBL/DBS.
Make the Drive number unchanged with the position where it was installed in the array before moving the Drives.

NOTICE

- **To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the chassis before starting and do not take it off until you finish.**
- **Be sure to wear a wrist strap connected to the chassis whenever you unpack parts from a case. Otherwise, the static electrical charge on your body may damage the parts.**
- **Drives are precision components.**
  Be careful not to expose drives to hard shock.
- **When you install a Drive, support its metal part with your hand that has the wrist strap. You can discharge static electricity by touching the metal plate.**

(a) Take the parts out of the Drives safekeeping box.
Install the Drives removed from "Chassis ① (CBSL/CBSS)" (Controller Box) in the same positions in DBL/DBS.

NOTE : Install the Drives checking that the Drive installation locations are the same as the ones in the CBSL/CBSS configuration by referring to the record made in the section "5.10 Collecting Serial Numbers of Drives" (UP 05-0160).

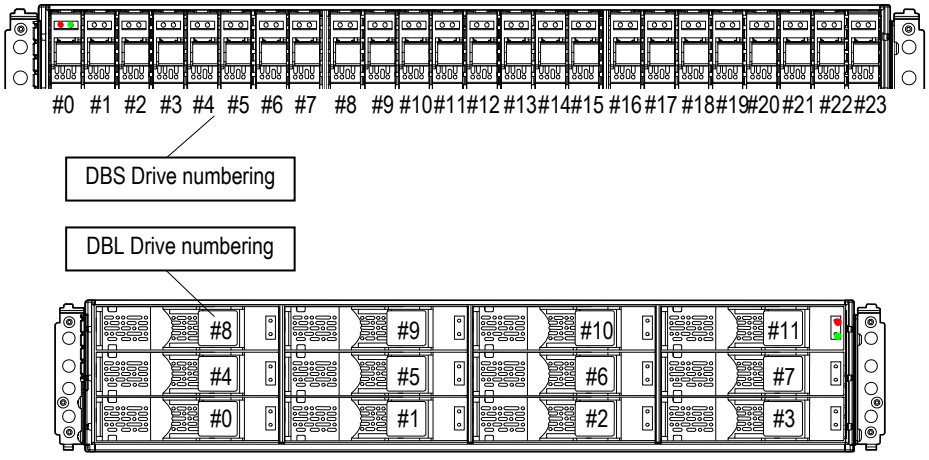

Figure 5.12.52 Drive Installing Location

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(b) Installing Drives

The Drive size and the procedure for installing a Drive differ depending on the array to be installed. Start to work after checking the array and the Drives.

(b-1) In the case of DBL

(i) Pull the parts out of the Drives safekeeping box.
Be sure to install the removed Drive to the original positions.

(ii) Insert the Drive into the position (address) where it was by holding it with the handle.

NOTE : When handling the Drive, hold the RAIL side because the SHIELD SPRING is subject to breakage.

(iii) Open the handle fully and fit the Drive in the guide rail and slide it in the direction shown by the arrow (①).

(iv) Push it in until it reaches the position where a hook of the handle can be entered into the square hole (②) on the frame.

(v) Pull the stopper lightly and close the handle, and then have the lock on by pressing the stopper (③).

NOTE : If the handle is closed in the state in which its hook cannot be entered into the rectangular hole, the Drive cannot be installed correctly because it runs into the frame of the array unit.

(vi) Pull the handle lightly to make sure that the Drive cannot be pulled out.

(vii) Attach the dummy (Drive) to the each Drive slot in which no Drive is installed.
Insert it into the slot slowly so that the latch (circular dent) part of the dummy (Drive) comes to the lower side.

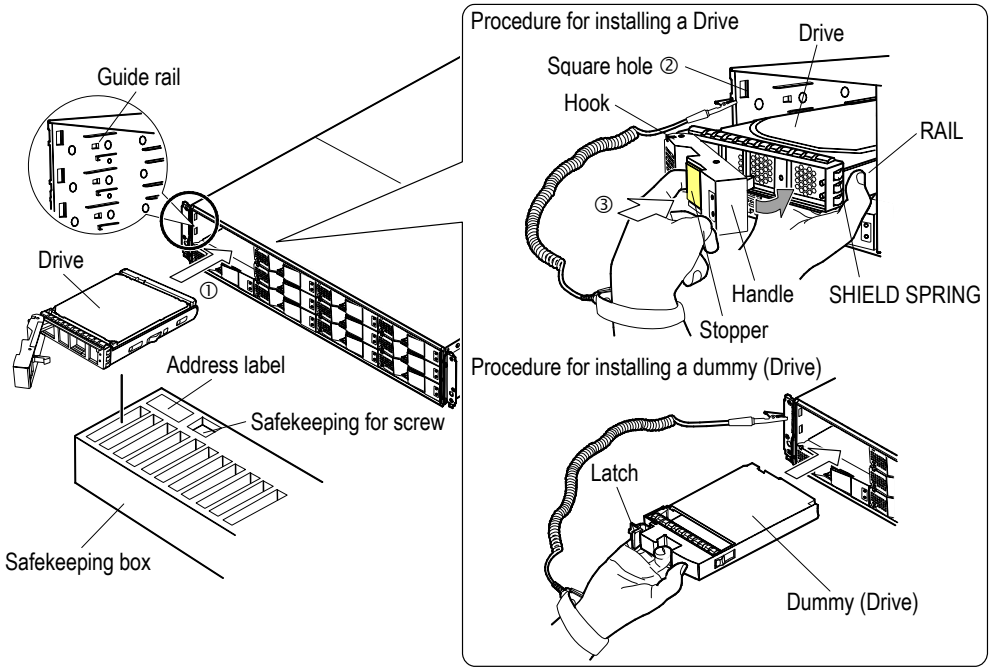

Figure 5.12.53 Installing the Drive/Dummy (Drive) (CBXSL/CBSL/DBL)

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(b-2) In the case of DBS

(i) Pull the parts out of the Drives safekeeping box.
Be sure to install the removed Drive to the original positions.

(ii) Insert the Drive into the position (address) where it was by holding it with the handle.

(iii) Fit the Drive in the guide rail and slide it in the direction shown by the arrow (①).

(iv) Push it in until it reaches the position where a hook of the handle can be entered into the square hole at the lower part of a frame on the front side of the array (②).

(v) Raise the stopper, which has been tilted toward you, and then have the lock on by pressing the stopper (③).

NOTE : If the handle is raised in the state in which its hook cannot be entered into the square hole, the Drive cannot be installed correctly because it runs into the frame of the disk array unit.

(vi) Pull the handle lightly to make sure that the Drive cannot be pulled out.

(vii) Attach the dummy (Drive) to the each Drive slot in which no Drive is installed.
Insert it into the slot slowly so that the latch part of the dummy (Drive) comes to the lower side.

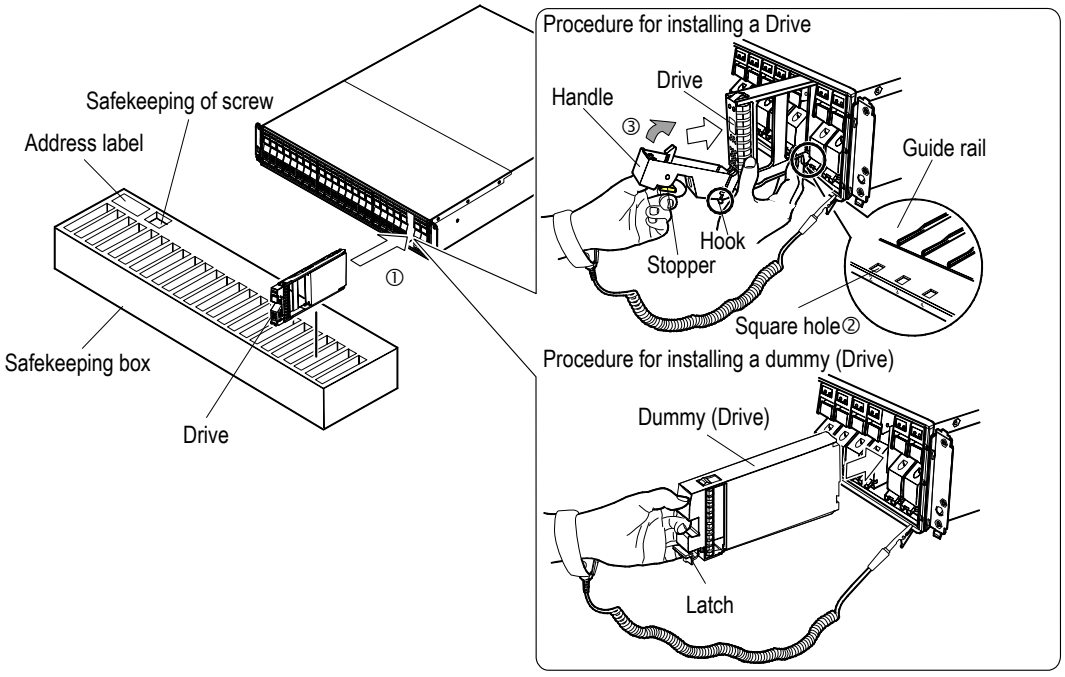

Figure 5.12.45 Installing the Drive/Dummy (Drive)

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5.12.17 Installing CBL on Rack Frame

(1) The EMI gaskets are attached on CBL.
Stick the EMI gasket supplied with the rack rail on the top of the CBL frame.
(a) Peel off the anti-adhesion sheet from the bottom surface of the EMI gasket.
(b) Stick the EMI gasket by aligning it with the front end of the top of the frame.

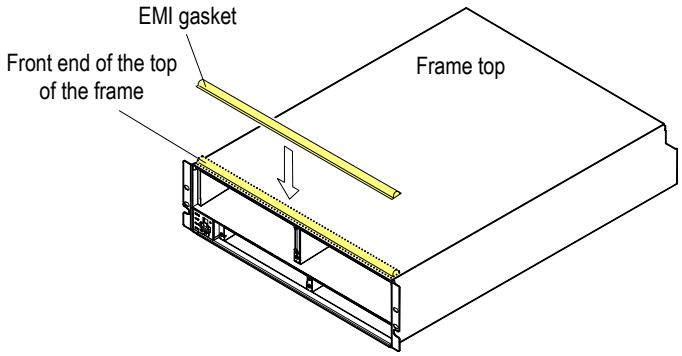

Figure5.12.55 Position for Sticking EMI Gasket (CBL)

(2) Installing the CBL on the rack frame.
Refer to Installation "2.4.5 Mounting Array on Rack Frame" (INST 02-0560), and Installation "2.4.6 Fastening the Array" (INST 02-0580).

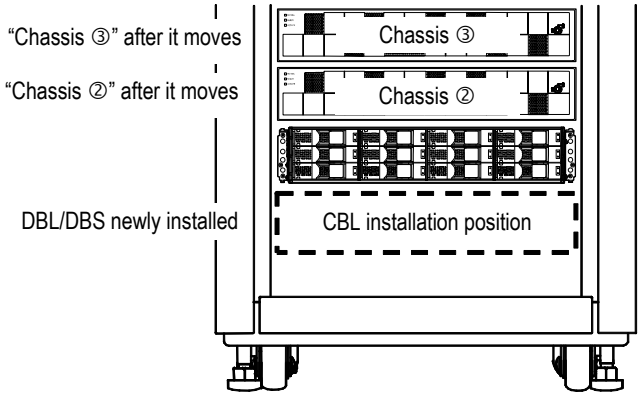

Figure 5.12.56 System Configuration

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5.12.18 Connecting Cables

NOTICE

Take full care to connect cables correctly.

(1) Connecting SAS(ENC) cables.
Refer to Installation “2.4.11 Connecting the SAS(ENC) Cables” (INST 02-0990).

(2) Connecting the power cables of Power Unit
Refer to Installation “2.4.12 Connecting the Power Cables” (INST 02-1270).

(3) Connecting interface cables
Refer to Installation “2.4.10 Connecting the Interface Cables” (INST 02-0940).

(4) Connect the maintenance PC to the array. (Refer to “5.5 Connection of the Maintenance PC” (UP 05-0060).)

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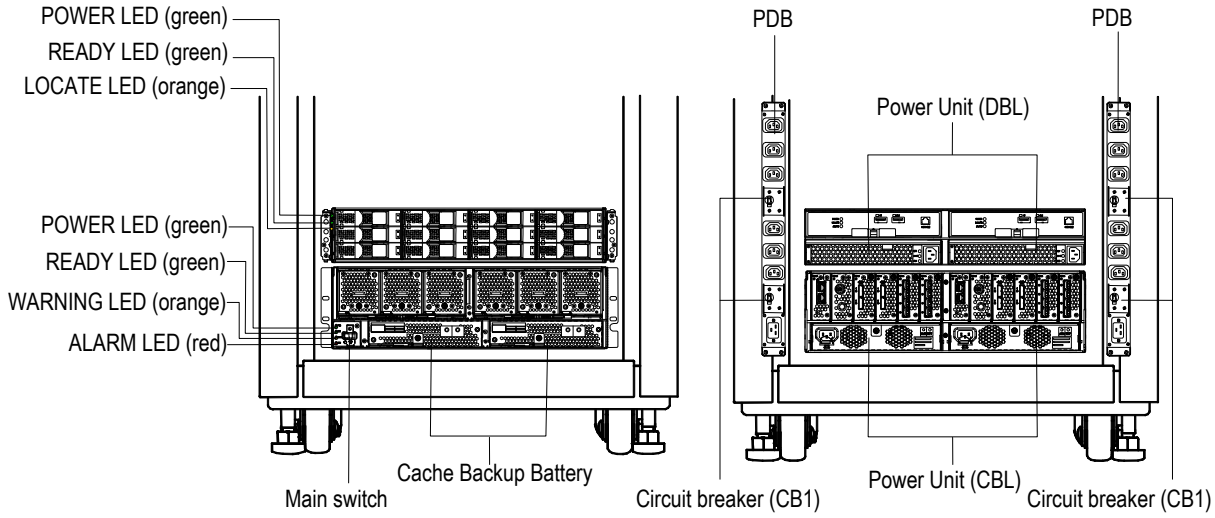
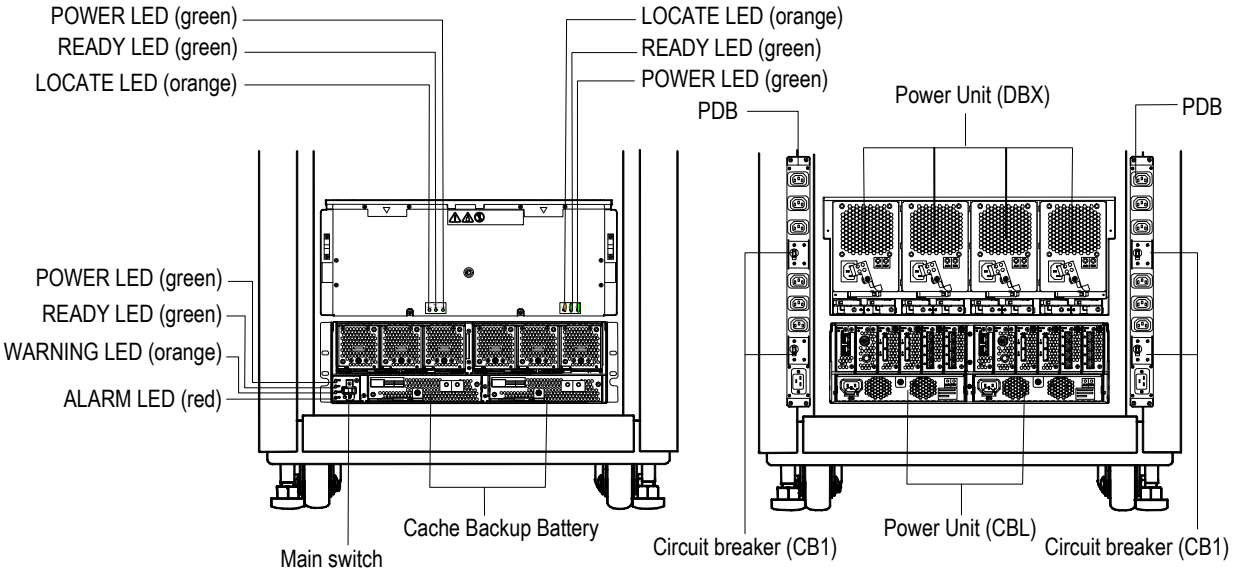
5.13 Array Power On

(1) Check that the main switches are turned off.
(2) Turn on the circuit breaker of the PDB.
(3) Turn on the main switch.
(4) Make sure that the ALARM LED (red) lights up and the WARNING LED (orange) blinks on the upgraded array. (If you check the WEB window connecting the service PC to each LAN port on the Management Module #0 and the Management Module #1, the WARNING LED (orange) may go out.)



*1 : The figure shows the CBL+DBL.

Figure 5.13.1 Switches and LED Locations on the CBL/DBL/DBS



*1 : The figure shows the CBL+DBX.

Figure 5.13.2 Switches and LED Locations on the CBL/DBX

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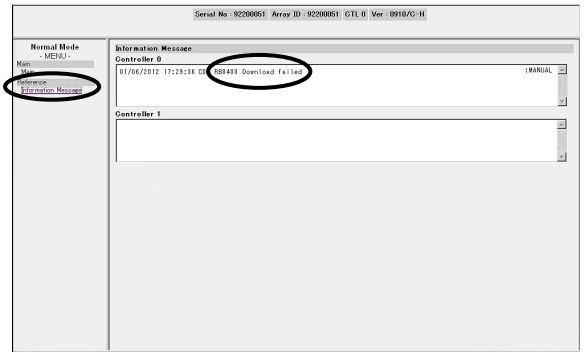
(5) Connect to the WEB. (Refer to "5.5 Connection of the Maintenance PC" (UP 05-0060).)

NOTE : In the upgrade procedure, the IP address of the maintenance port of the array keeps the factory default value (10.0.0.16/17) until the array after the upgrade once becomes READY (until the array becomes READY in "5.14 Firmware Update Installation for Array after Upgrade" (UP 05-0780) in the following procedure) (the IP address of the maintenance port is taken over by the value before the upgrade immediately before the array becomes READY at the time of initial start).
Therefore, if the IP address of the maintenance port was changed from the factory default value "10.0.0.16/17" in the array before the upgrade, connect the IP address of the array to be connected as the factory default value (10.0.0.16/17).

(6) Select the "Information Message".

(7) Check that "RB8400 Download failed" message is displayed in "Information Message", and move on to the next operation.



NOTE : When the checked contents in the operation (4) and (7) are not shown as above, the operation so far may have errors. Refer to "Chapter 6. Troubleshooting at the Time of Upgrade" (UP 06-0000) to solve the problem.

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5.14 Firmware Update Installation for Array after Upgrade

Using WEB, install the firmware of the same version as the array before the upgrade in which the update installation was performed in "5.9 Firmware Update Installation for Array before Upgrade" (UP 05-0090).
The procedure is shown below.

After this, until the upgrade operation is completed, do not install the firmware other than the one tried to perform the update installation and the one installed in the array before the upgrade even if the update installation of the firmware fails or the start of the array after the upgrade fails.(‡1).

(1) The point to be checked before installation
Make sure of the following before starting installation
- Make sure that the main switch of the array is turned on. If it is turned off, turn it on to start the array. (Refer to "5.13 Array Power On" (UP 05-0760).)

(2) Set the operation mode in the Maintenance Mode.
(a) Press the RST SW of the Controller #0. (While pressing RST SW, the RST LED (orange) is on.) Use a tool with a thin tip (a precise screwdriver, etc.) because the hole of RST SW is small (3 mm in diameter).
(b) Wait for a while (about ten seconds) and check that the ALM LED (red) of the Controller lights up. Within ten seconds after the ALM LED (red) lights up, press the RST SW of the other Controller.
Make sure that the ALARM LED (red) on the front of the array goes out.
If it did not go out, return to the step (a), and retry it.
When the READY LED (green) on the front bezel goes out, it is migrated to the maintenance mode.

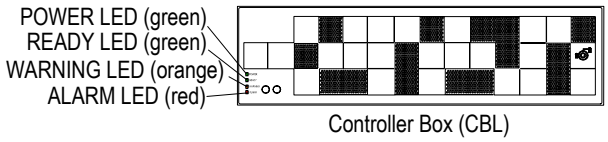

Figure 5.14.1 Locations and Name of LED (Front Bezel)

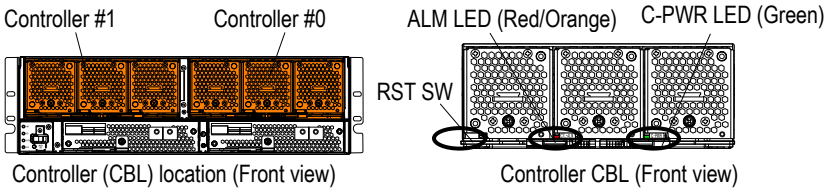

Figure 5.14.2 Controller Location and LED

‡1 : When a failure occurs during the upgrade and you try to recover it, if the firmware of two or more versions is installed, you may not recover the array from the failure.

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NOTE : • Set the TCP/IP to “Disable DNS” because the connection takes a long time when the TCP/IP of the network is set to the condition in which the DNS is used. For the setting procedure, refer to the instruction manual of the PC to be used.

• Make sure that the browser is set to the condition in which the proxy server is not used because the connection cannot be done if the proxy server is set to be used. To make sure the setting, refer to the instruction manual of the browser to be used.

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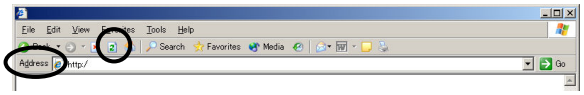
(3) Install procedure

(a) Connect the LAN cross cable to the array LAN connector for maintenance and connect the array to the Web.

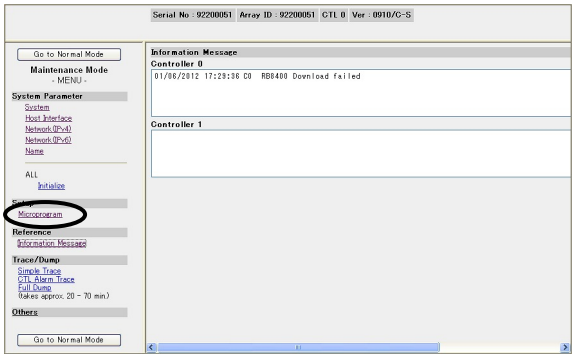
(b) Please input the IP Address of the Controller where it was connected with the network to the browser. Please input the page by the update button of the browser if it has already been connected with WEB.



NOTE : The contents that were set up with “System Parameter” and the firmware that was installed with “Setup” come into effect after the rebooting of the Controller.

A “User Name” and a “Password” may be requested at the time of Web connection or Web operation. In that case, input “maintenance” for the “User Name” and “hosyu9500” for the “Password”.

(c) Click [Microprogram].



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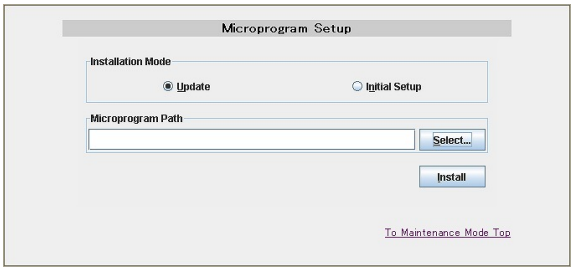
(d) When the [Microprogram] is clicked, the following window is displayed.



NOTE : If the window is not displayed, the JRE 1.6.0 may have not been installed or the installation of it may have failed.
Perform the installation of the JRE 1.6.0 (Refer to the "5.9 (2) (a) Procedure for setting up the Maintenance PC" (UP 05-0100).) again.

(e) Select the [Update] installation in the "Installation Mode".

NOTICE

For update installation of the firmware, select [Update].
If [Initial Setup] is selected, the data is all lost.
When executing [Initial Setup], contact the Technical Support Center in advance.

Be sure to uncompress (unzip) the firmware (zip file) under "C:\diskarray-microprogram\microprogram" into the same directory. If it is not uncompressed (unzipped) into the same directory, it cannot be installed correctly.
In the "Microprogram Path" field, specify the Unified version directory in which the firmware to be installed is stored.

Table 5.15.1 ZIP File Directory Hierarchy

First stratum	Second stratum	Third stratum	Fourth stratum
Unified version (Example: 09xx/x)	DF850MH	disk 01 - disk X	Firmware file
		fmins	
	DF850MHD	disk 01 - disk X	
		fmins	
	DF850S	disk 01 - disk X	
		fmins	
	DF850XS	disk 01 - disk X	
		fmins	
	drvfirm	DKR2F-VIPERAP	Drive firmware file
		:	
	ENC850	ENC Firmware file	–

NOTE : Do not change a name of the unified version directory or directory in a stratum under the unified version directory. The firmware becomes unable to be installed if the directory name is changed.

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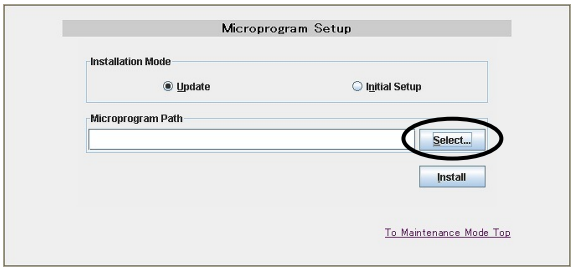
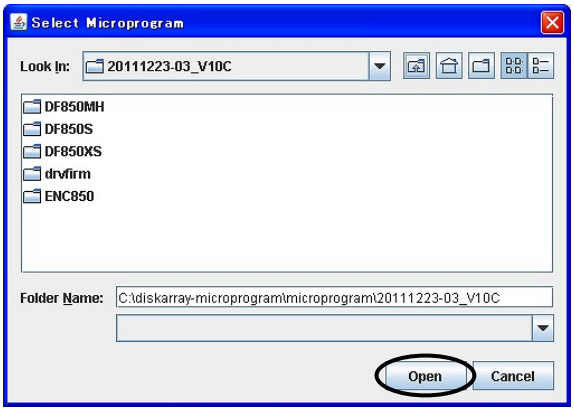
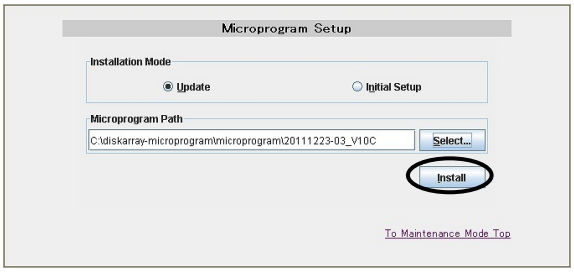
When the [Select] button is clicked, the “Select Microprogram” window is displayed. Select the Unified version directory in which the firmware is stored and click the [Open] button.





(f) Press the [Install] button.



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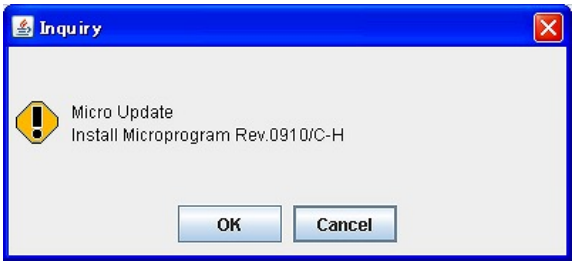
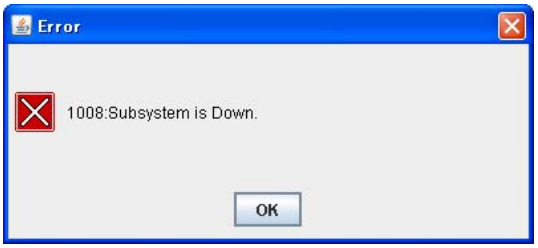
(g) A dialog box for confirming whether to execute the installation is displayed.
Press the [OK] button when you want to install or [Cancel] when you want to abort.

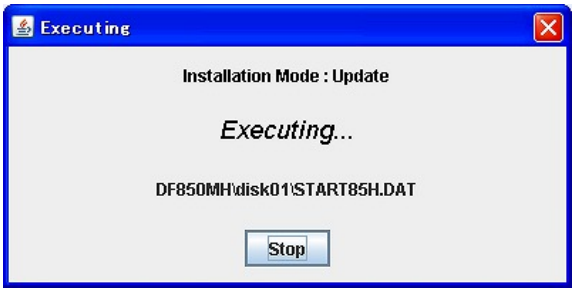


If either of the following windows displays, the migration to the maintenance mode fails. Retry the procedure "5.14 (2) Set the operation mode in the Maintenance Mode" (UP 05-0780).



(h) When the installation is started, the following dialog box showing that the installation is in progress is displayed. The installation type and a name of a file being processed is displayed in the dialog box. When you abort the installation, press the [Stop] button.

NOTE : When a LAN failure, etc. occurred and the processing of WEB terminated abnormally before the window in the procedure (i) was displayed, execute the new installation procedure again from the beginning.



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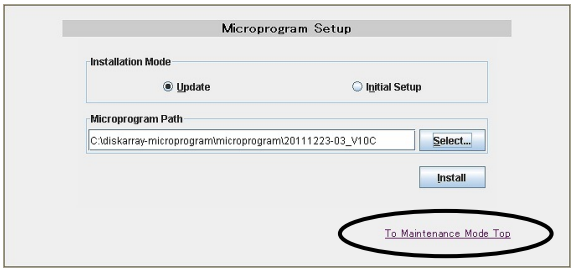
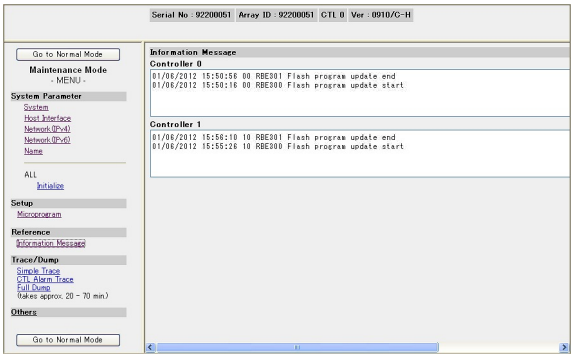
(i) When the installation is completed, the completion window is displayed. Click the [OK] button.

(j) Clicking [To Maintenance Mode Top] in the “Microprogram Setup” window.



(k) Displayed the “Maintenance Mode”.



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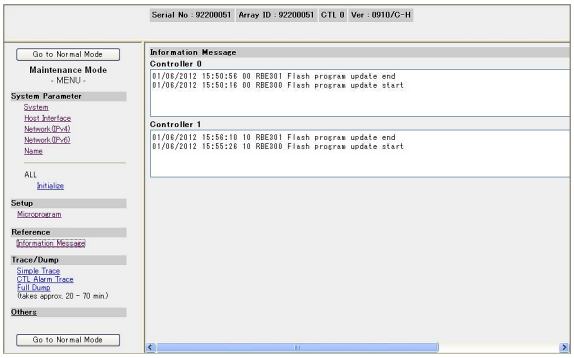
5.15 Changing the Number of Drive I/O Modules

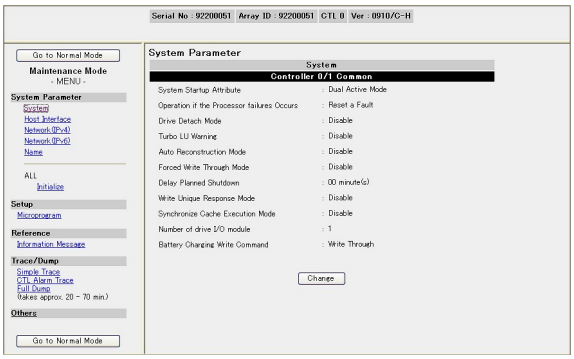
Change the installation number of the Drive I/O Modules in the system parameter window on WEB.

The procedure is shown below.

(1) Please click [System].

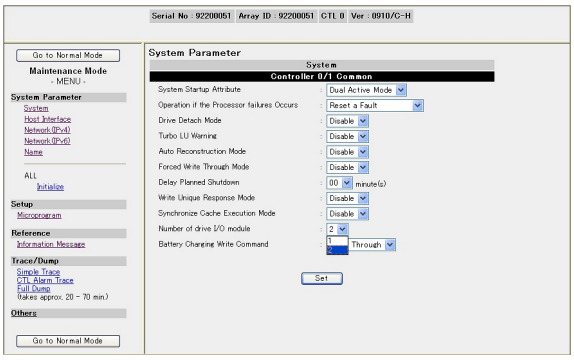


(2) The “System Parameter” window is displayed.
Click the [Change] button.



(3) Change the pull-down of “Number of drive I/O module” from “1” to “2” and click the [Set] button.

NOTE : For the procedure from “6.4 When Returning Configuration of the Array after the Upgrade to that of the Chassis before the Upgrade” (UP 06-0040), change the pull-down of “Number of drive I/O module” from “2” to “1”.



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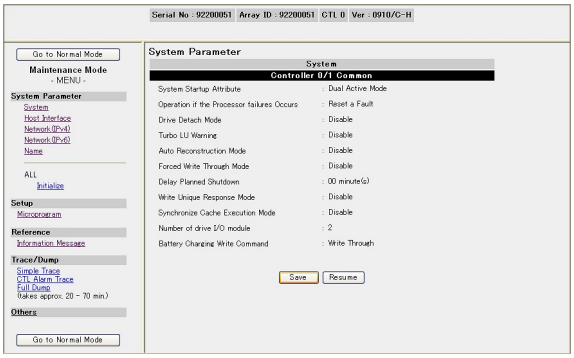
(4) The window to confirm the following set contents is displayed.
Click the [Save] button.



(5) Click the [OK] button.

(6) Click the [OK] button.

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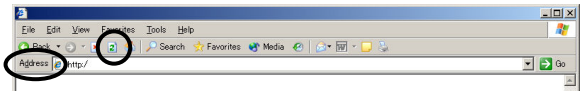
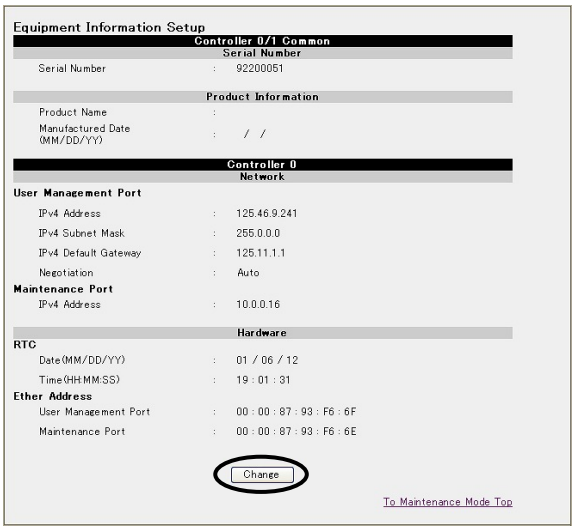
5.16 Setting Serial Number of Array

Change the serial number of the array through the hidden WEB window using the serial number setting up function.
The procedure is shown below.

(1) Enter “http://(IP address of the array)/equip_set” in the “Address”.
A “User Name” and a “Password” may be requested at the time of WEB connection or WEB operation. In that case, input “maintenance” for the “User Name” and “hosyu9500” for the “Password”.



(2) Displayed the “Equipment Information Setup”.
Click the [Change] button.



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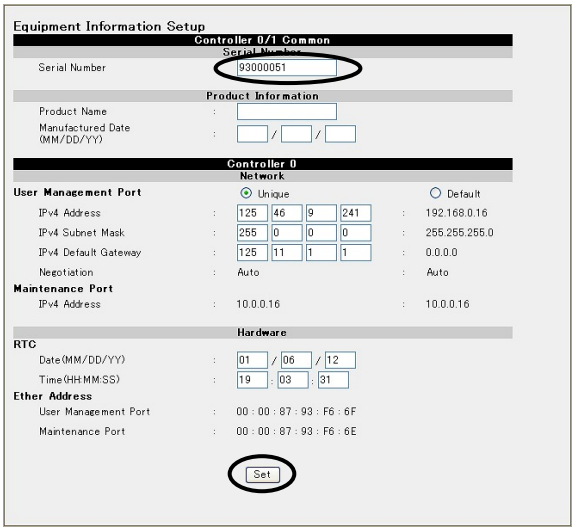
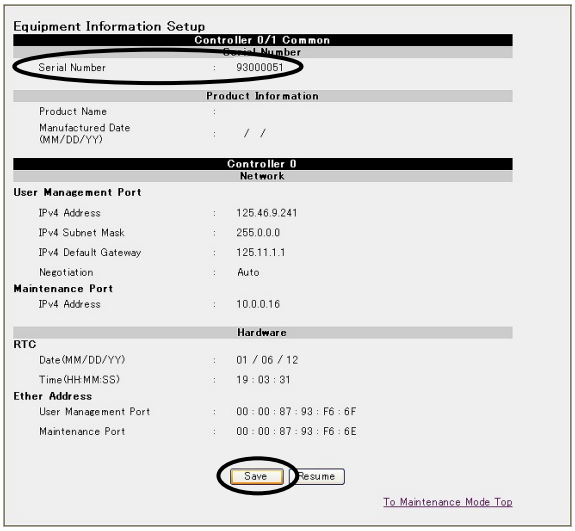
(3) Enter a serial number in the “Serial Number” box and click the [Set] button.
The serial number is the 8-digit number described in the place shown in Figure 5.4.3 of “5.4 Unpacking Parts for Upgrade (2)” (UP 05-0050).

NOTE : • Do not enter nothing into the [Product Name] column.
• For the procedure from “6.4 When Returning Configuration of the Array after the Upgrade to that of the Chassis before the Upgrade” (UP 06-0040), set the CBSL/CBSS serial number.



(4) After making sure that the change to be made is correct, click the [Save] button.
The serial number is changed.



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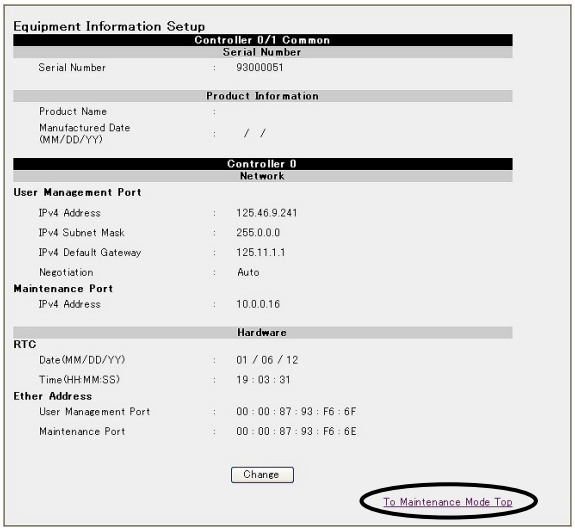
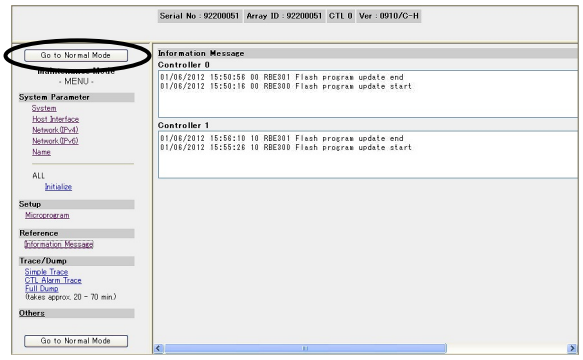
(5) Click the [OK] button.

(6) Click the [OK] button.

(7) Clicking [To Maintenance Mode Top] in the “Equipment Information Setup” window.



(8) Displayed the “Maintenance Mode”.
Change the mode from Maintenance to Normal by clicking the [Go to Normal Mode] button.



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(9) When the [Go to Normal Mode] button is clicked, the following window is displayed.

NOTE : If the WEB processing terminates abnormally because a LAN failure and others occur before the following screen display disappears, click [View] – [Refresh] of the menu bar or the [Refresh] button of the tool bar, and update the WEB page. Then, click the [Go To Normal Mode] button after the main window is displayed.

(10) Click the [OK] button.

(11) The array becomes ready in about 4 to 15 minutes.
Make sure that the READY LED (green) of the array after the upgrade is on.
The READY LED (green) may blink at high speed (for the maximum of 30 to 50 minutes, or 40 to 60 minutes in case of the CBL (80 to 180 minutes when the DBW is connected to the CBL)) or the WARNING LED (orange) may blink at high speed (for the maximum of 30 to 85 minutes) before the READY LED (green) on the front of the Controller Box lights up.
If the READY LED does not come on, the installation may have failed. Perform the installation over again.

NOTE :
- Since the value of the IP address before the upgrade is taken over after the array becomes READY, when performing the WEB connection from the maintenance port after this procedure, use the IP address before the upgrade for the connection.
- When "Abnormal End Empty System Retry Full Install" is displayed, refer to the recovery procedure, "6.2 When "RB8300 Empty System retry full install" Occurs" (UP 06-0010).
- After the update installation, at the time when the array becomes READY status, it cannot be returned to the configuration before the upgrade.

(12) Quit the WEB.

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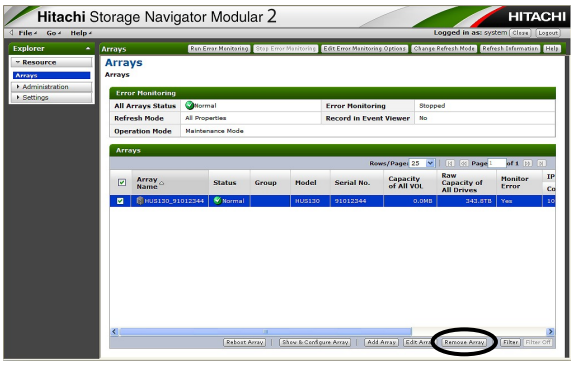
5.17 Registering Array after Upgrade

Register the array after upgrade in Hitachi Storage Navigator Modular 2.
Cancel the array before the upgrade registered in Hitachi Storage Navigator Modular 2, and then register the array after the upgrade.

The procedure is shown below.

(1) Connect the maintenance PC to the array and start Hitachi Storage Navigator Modular 2. (Refer to System Parameter "1.1 (2) Connecting the LAN cross cable" (SYSPR 01-0040).)

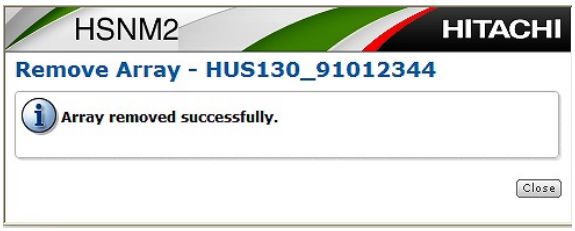
(2) Start Hitachi Storage Navigator Modular 2, put a checkmark to the array to set, press the [Ctrl] key, [Shift] key and [E] key at the same time, and change the operation mode to "Maintenance Mode".(‡1)
Check that "Maintenance Mode" is displayed in [Operation Mode] on the top of the main window.



(3) Cancel the registered array before the upgrade.
Check that the array before the upgrade is displayed on the array list.

(4) Click the [Remove Array] button.

(5) Click the [Close] button.



‡1 : When the array to operate is not registered, click the blank area (other than buttons and characters) in the "Arrays" window, and press the [Ctrl] key, [Shift] key and [E] key at the same time.

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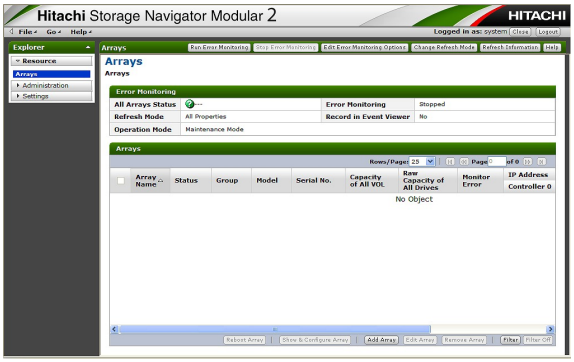
(6) Check that the array before the upgrade is deleted from the array list.



(7) The array after upgrade is registered. (Refer to System Parameter “1.1 (4) (b) Array registration” (SYSPR 01-0090).)

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5.18 Setting Power Interlock

When performing the power interlock by using the UPS, set the appropriate power interlock mode for the configuration. (Refer to System Parameter "Chapter 16. Setting Power Interlock" (SYSPR 16-0000).)

If other than the standard mode is set, the array may not start. By issuing the start instruction from the UPS, the array starts.

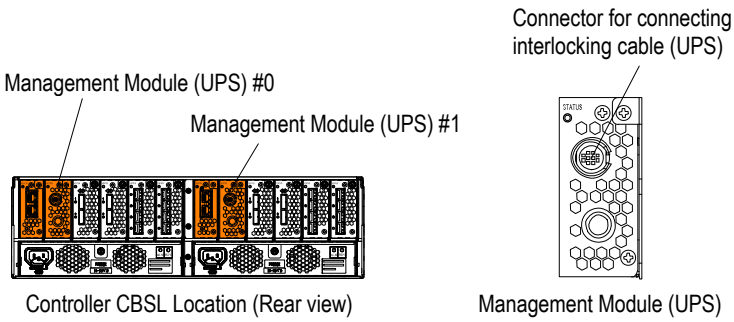

Figure 5.18.1 Connection for UPS Cables

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5.19 Changing the Registration Information for the Monitoring Failures

Change the device model name of E-mail Alert Function and SNMP Agent Support Function to the chassis after the upgrade.

5.20 Works to be done after the Upgrade is Completed

When all the upgrade works are completed, do the works such as removal of the maintenance PC.
The procedure is shown below.

(1) Disconnect the maintenance PC from the array referring to the instruction given in "5.5 Connection of the Maintenance PC" (UP 05-0060).
(2) Attach the Front Bezels to the all array.
Refer to Installation "1.4.1 How to Attach/Remove Front Bezel" (INST 01-0140).
(3) Close the rear door of RK40 Rack Frame.
Make sure that the rear door is latched and cannot be opened.
Refer to Installation "1.4.2 How to Open/Close the Rear Door of RK40 Rack Frame" (INST 01-0210).

5.21 Using the Priced Option

When the license key of the priced option for the array after the upgrade is acquired, request the customer/SE to use the priced option by unlocking it according to the Priced Option User's Guide after completing the upgrade operation.
Furthermore, when unlocking the priced option in the chassis after the upgrade, request the customer/SE to use the license key exclusive for the array after the upgrade.
The license key of the priced option used before cannot be used in the array after the upgrade.

The serial number of the array is changed by upgrading the array.
Therefore, be careful of the serial number to input in the remote array ID of the remote path setting.

5.22 Resetting of the Host

Reboot the connecting Host and execute the setting.
For notes, refer to "Chapter 7. For Setting Changes in Host Computer and Others" (UP 07-0000).

5.23 Restart the Work of the Host Computer

Restart the work of the Host computer.

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Chapter 6. Troubleshooting at the Time of Upgrade

6.1 Error Messages

6.1.1 Flash Detected Messages

Refer to Message "Chapter 5. Flash Detected Messages" (MSG 05-0000).

6.1.2 Failure Messages

Refer to Message "Chapter 3. Failure Messages" (MSG 03-0000).

6.1.3 Progress Messages

Refer to Message "Chapter 4. Progress Messages" (MSG 04-0000).

6.1.4 WEB Error Messages

Refer to Message "Chapter 7. Web Error Messages" (MSG 07-0000).

6.1.5 Other Messages

When a message ("6.1.1 Flash Detected Messages" to "6.1.4 WEB Error Messages") other than the above is displayed, be sure to check the configuration first.
Check whether the Drive locations are correct, whether the cable connections are correct, and so on following the procedure.
To check the Drive locations, refer to "6.3 When a Drive was inserted in a Wrong Location" (UP 06-0020).

When one of the following messages is displayed, there may be a mistake in the Drive location, the connecting of SAS(ENC) cable, or some other matter. Check if the configuration is correct.

Example)

- RA7900 System HDU spin up failed:
  Spin-up of the system drive failed.
- HH7700 Backend down [Cable error] (Unit-x, ENC-y):
  Connection errors of the ENC cables were detected when the array started.

When a problem is found in the configuration related to the upgrade, correct the configuration.
When no problem is found in the configuration and the operation, take some recovery action referring to the Troubleshooting "Chapter 11. Details of Recovery Methods" (TRBL 11-0000).

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6.2 When "RB8300 Empty System retry full install" Occurs

The model upgrade was performed by the unsupported upgrade path. Or when the firmware update was performed twice in the array before the upgrade, the update may have failed.

When the upgrade was performed by the unsupported upgrade path, refer to "Operation in the chassis after the upgrade" in the flow of "6.4 When Returning Configuration of the Chassis after the Upgrade to that of the Chassis before the Upgrade" (UP 06-0040) and return to the configuration before the upgrade.

If not so, the update may have failed when the firmware update was performed twice in the array before the upgrade, refer to "6.4 When Returning Configuration of the Chassis after the Upgrade to that of the Chassis before the Upgrade" (UP 06-0040) and return to the configuration before the upgrade. Then, perform the upgrade again.

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6.3 When a Drive was inserted in a Wrong Location

The recovery procedure to be used when a Drive was inserted in a wrong location is shown below.

(1) Check the following information referring to the configuration information collected according to “5.10 Collecting Serial Numbers of Drives” (UP 05-0160).

```
Array unit configuration information list.
File Format : 22.00

DF Name : HUS130_92100009
Date : 2011/11/21 22:08:54
Firmware Revision : 0910/B-S
Array Unit Type : HUS130
Serial Number : 92100009
Hardware Revision : 0100
#HSNM2 Version : 21.10

---- RAID Configuration Information ----
  ---- RAID Configuration ----
  RAID  RAID   Start Location     Number of HDU   Number of     Free Capacity  Type
  Group  Level  [Unit No.  HDU No.]  in parity group  parity group     [block]
    0  5        1       0            5         1     4473044992  SAS

  -- End

  ---- Drive Location of RAID Group ----
  RAID Group   Drive Location(Unit No.-HDU No.)
       0  1-0   1-1   1-2   1-3   1-4

  -- End
-- End

#---- DP Pool Configuration Information ----
# Not Available

---- LU Configuration Information ----
  ---- LU Configuration ----
  LU     Capacity  Status          RAID  DP   RAID  Number of     Stripe Size   Capacity  Type         Accelerated Wide  Full        Number
  No.     [block]                 Group  Pool  Level  Cache Partition     [KB]  [MB/GB/TB]            Striping Mode    Capacity Mode  of Paths
   0     20971520  Normal               0   N/A  5              0       256    10.0 GB  SAS          N/A          N/A              0

  -- End
-- End

---- Drive Configuration Information ----
Location       Status     Type       Vendor ID  Product ID       Revision  Serial Number  Capacity  Drive Type       Rotational Speed
Unit0 ,HDU0    Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM67206        2TB   SAS7K              7200rpm
Unit0 ,HDU1    Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM6714G        2TB   SAS7K              7200rpm
Unit0 ,HDU2    Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM6715L        2TB   SAS7K              7200rpm
Unit0 ,HDU3    Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM671C7        2TB   SAS7K              7200rpm
Unit0 ,HDU4    Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM670ZF        2TB   SAS7K              7200rpm
Unit0 ,HDU5    Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM672AG        2TB   SAS7K              7200rpm
Unit0 ,HDU6    Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM6723Q        2TB   SAS7K              7200rpm
Unit0 ,HDU7    Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM672NB        2TB   SAS7K              7200rpm
Unit0 ,HDU8    Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM6BZ51        2TB   SAS7K              7200rpm
Unit0 ,HDU9    Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM61WYB        2TB   SAS7K              7200rpm
Unit0 ,HDU10   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM6735P        2TB   SAS7K              7200rpm
Unit0 ,HDU11   Undefined  Undefined  SEAGATE    DKS2C-H2R0SS     5C05      9WM67122        2TB   SAS7K              7200rpm
Unit1 ,HDU0    Normal     Data       SEAGATE    DKS5C-J600SS     5C01      6WN0CDYL      600GB   SAS                10000rpm
Unit1 ,HDU1    Normal     Data       SEAGATE    DKS5C-J600SS     5C01      6WN0CVB7      600GB   SAS                10000rpm
Unit1 ,HDU2    Normal     Data       SEAGATE    DKS5C-J600SS     5C01      6WN0GL1S      600GB   SAS                10000rpm
Unit1 ,HDU3    Normal     Data       SEAGATE    DKS5C-J600SS     5C01      6WN0JAN7      600GB   SAS                10000rpm
Unit1 ,HDU4    Normal     Data       SEAGATE    DKS5C-J600SS     5C01      6WN0CLEJ      600GB   SAS                10000rpm

-- End
```

[Drive Configuration]

[Location] : Shows a location where a Drive is installed.

[Unit] : Unit ID number

[HDU] : Drive number

[Serial Number] : Serial number (Drive)

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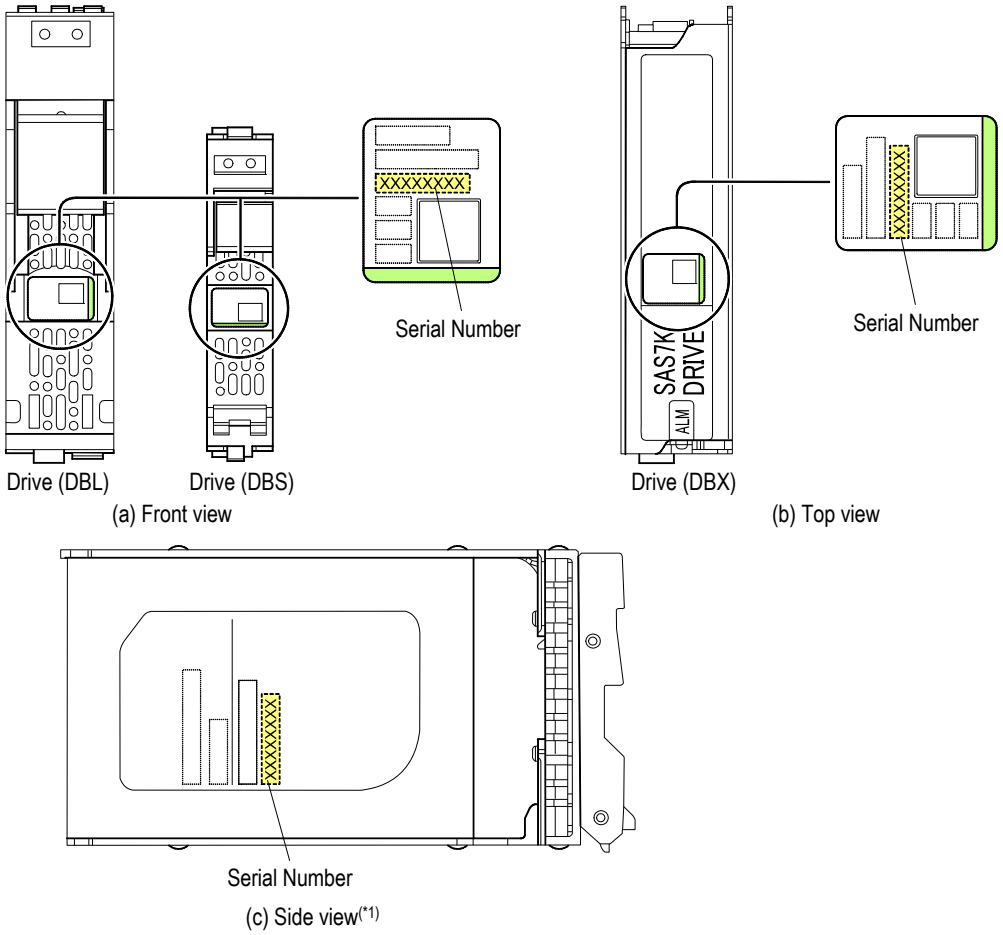
(2) Power off the array.
  (a) Turn off the main switch on front side of Controller Box.
  (b) The power of the Drive Box is not turned off only by turning off the main switch on the front of the Controller Box. Therefore, remove the power cables on the rear of the Drive Box.
  (c) Turn off the circuit breaker of the PDB.

(3) Check the serial numbers described on the Drives installed in the array.
  The described position of the serial number is as shown below. It is the 8-digit (XXXXXXXX) value surrounded with a frame.

  NOTE : The 8-digit value described on the Drive is displayed in the "Serial Number" column of the collected configuration information file.



*1 : This figure shows the Drive for the DBL.

Figure 6.3.1 Serial Number Description Position on the Drive

(4) Refer to the configuration information file for the "Unit" and "HDU" of the Drive having the same serial number and reinsert the Drive in the slot having the unit ID number and Drive number shown.
(5) Start the array. (Refer to "5.13 Array Power On" (UP 05-0760).)

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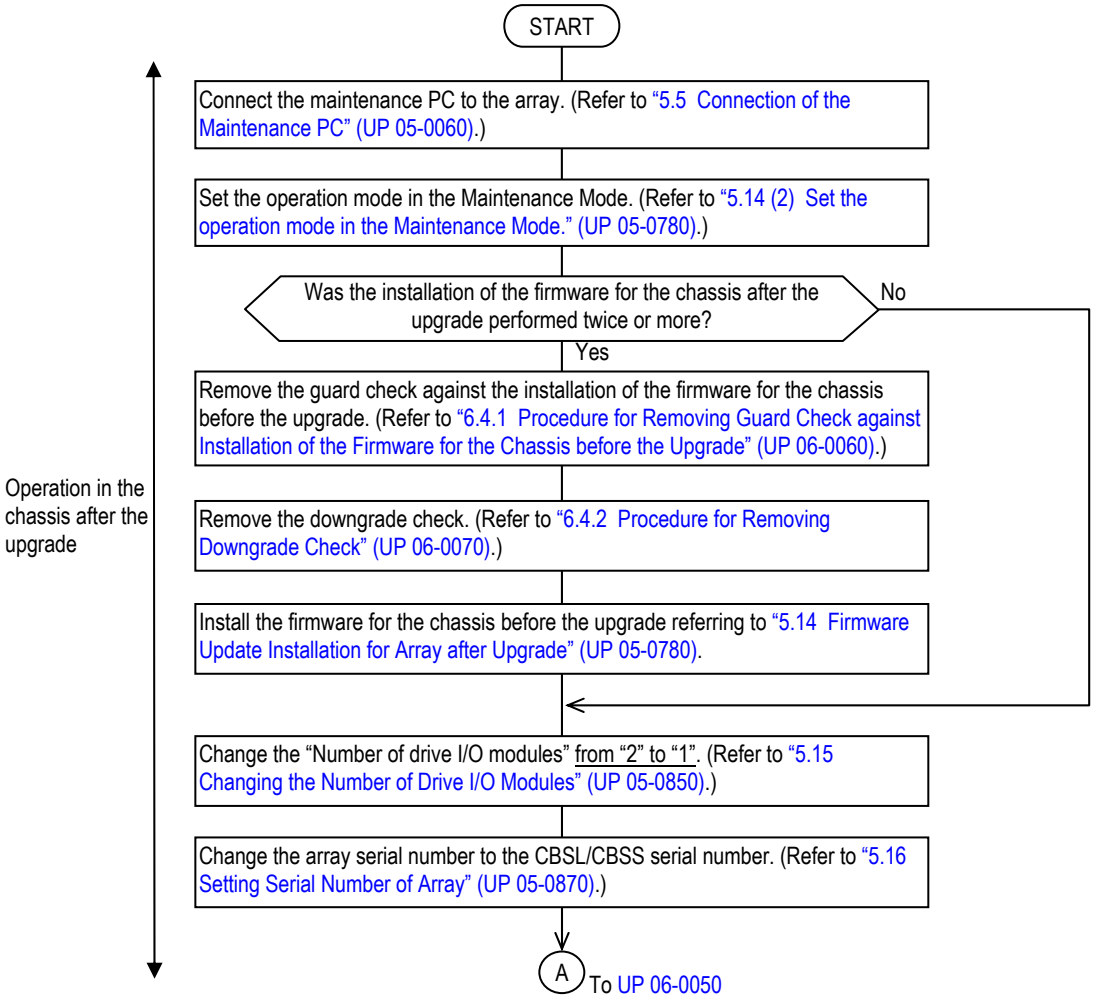
6.4 When Returning Configuration of the Chassis after the Upgrade to that of the Chassis before the Upgrade

The procedure to be used in case the upgrade fails is explained below. In the procedure, the upgrade is made again after the configuration of the array is returned to that of the chassis before the upgrade once.

Even if the update installation of the firmware fails or the start of the array after the upgrade fails, do not install the firmware other than the one tried to perform the update installation and the one installed in the array before the upgrade.
When a failure occurs during the upgrade and you try to recover it, if the firmware of two or more versions is installed, you may not recover the array from the failure.

NOTE : In the procedure of "5.14 Firmware Update Installation for Array after Upgrade" (UP 05-0780), after the array becomes READY status by performing the firmware update installation for the array after the upgrade, it cannot be returned to the configuration before the upgrade.



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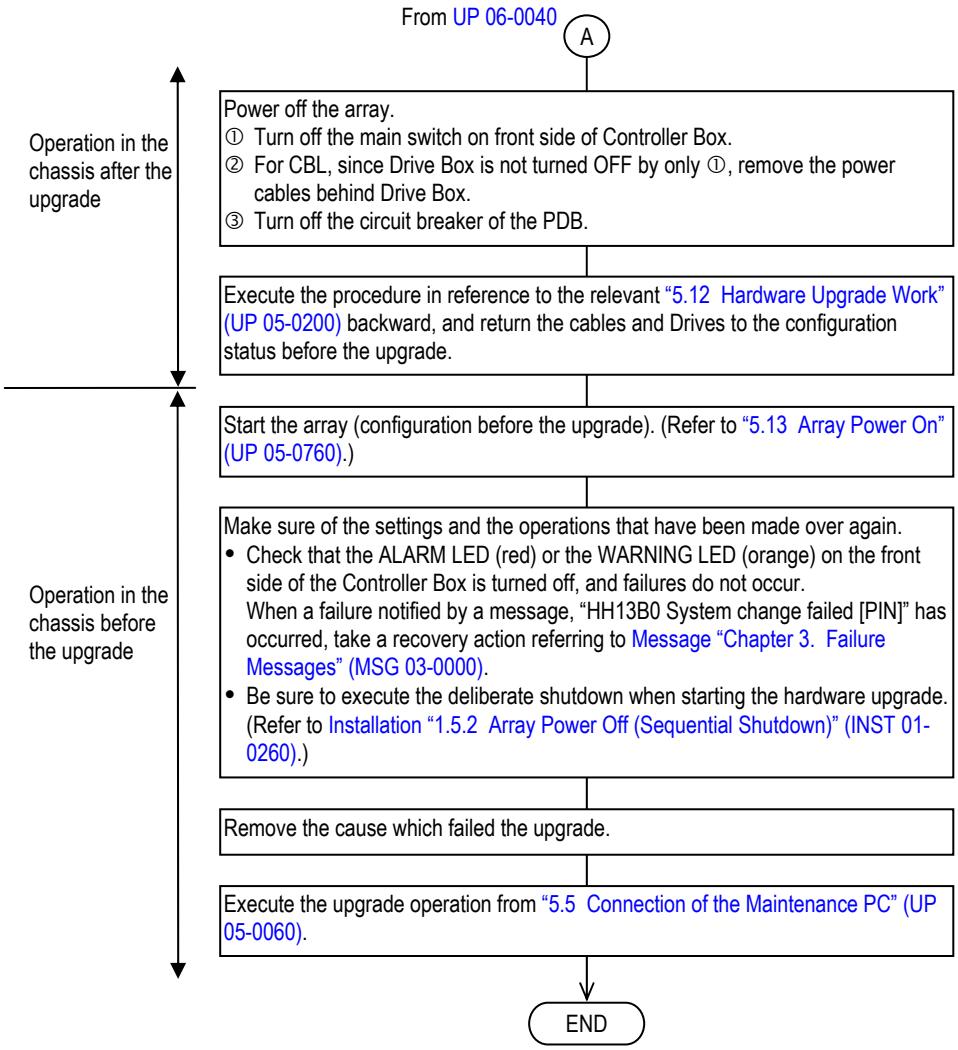

NOTE : Be sure to review all the settings and procedures that have been made before making the upgrade again.

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6.4.1 Procedure for Removing Guard Check against Installation of the Firmware for the Array before the Upgrade

The procedure for removing the firmware installation guard check is shown below.

(1) Enter “http://(IP address of the array)/instlgrd” in the “Address”.
A “User Name” and a “Password” may be requested at the time of WEB connection or WEB operation. In that case, input “maintenance” for the “User Name” and “hosyu9500” for the “Password”.

(2) Select the [Disable] radio button of “Install Guard” in the “Install Guard” window.
Click the [Change] button.

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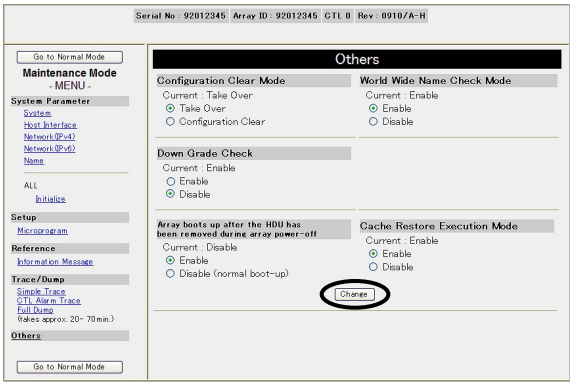
6.4.2 Procedure for Removing Downgrade Check

The procedure for removing the downgrade check is shown below.

(1) Please input the IP Address of the Control Unit where it was connected with the network to the browser.
A “User Name” and a “Password” may be requested at the time of WEB connection or WEB operation. In that case, input “maintenance” for the “User Name” and “hosyu9500” for the “Password”.

(2) Click [Others] in the menu tree.

(3) Select the [Disable] radio button of the “Down Grade Check”.
Click the [Change] button.



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6.4.3 System Power Off

Because a message, “Download Failed” is displayed and the array is in the Alarm status, the Drive Box cannot be powered off although the main switch on the front side of the Controller Boxes is turned off. The power of the Drive Box must be turned off by the other means. The procedure is shown below.

(1) Turn off the main switch.
When the main switch is turned off and it is enabled, the C-PWR LED (green) of the Controller goes on after blinking for three seconds, and then it goes out.

(2) Make sure that the POWER LED on the front of the array changes from green to orange. (‡1) (‡2)
It takes about 10 minutes at the maximum before the POWER LED turns orange.

(3) Remove all power cables connected to the Controller Box and Drive Box.

(4) All turn off the circuit breaker of the PDB.

‡1 : The READY LED (green) of the DBL/DBS/DBX does not go off when the main switch is turned off in the Maintenance mode, however, this is not a problem.

‡2 : The ACT LED(green) for Drive may still blink after the POWER LED(orange) lights up, however, this is not a problem.

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Chapter 7. Setting Changes in Host Computer and Others

When upgrading to CBL, the following items are changed in the array.

No.	Name of Items	CBCL/CBSS	CBL	Existence of Limits
1	Array Product Serial Number	921xxxxx (CBSL)/ 922xxxxx (CBSS)	930xxxxx	The following contents may be changed depending on the array product serial number changes. As occasion demands, the changing operation for upper host device information or various application setting may be needed. • World Wide Name • Product Serial Number of Inquiry
2	World Wide Name	–	–	If the serial number is registered in the chassis after the upgrade from the array maintenance mode and the array is rebooted, after the upgraded chassis becomes READY, WWN of the front-end Fibre channel automatically becomes the different value from the one before the upgrade. Therefore, Front End Fibre Channel can be used, and the volume recognition from the upper Host enables.
3	Target iSCSI Name	–	Same value with the lower model	When the array to be upgraded is the system configuration of the iSCSI interface, Target iSCSI Name of the chassis after the upgrade takes over the value before the upgrade. However, when the default iSCSI Name was used in Target of the array before the upgrade, Target iSCSI Name after the upgrade must be changed to a unique value in the network. If the array after the upgrade is used without changing Target iSCSI Name, when executing the configuration of the array before the upgrade by the iSCSI interface system again after using the chassis after the upgrade, iSCSI Name of both chassis duplicate in the network, and the iSCSI protocol has trouble.
4	Inquiry	921xxxxx (CBSL)/ 922xxxxx (CBSS)	930xxxxx	Product Serial Number After upgrading from CBSL/CBSS to CBL, CBL responds to “921xxxxx”.

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(1) When the Array is the system configuration of the iSCSI interface
You will login to the target of the chassis after the upgrade with new target iSCSI name which you set in the upgrade. (When setting the CHAP enabled, insert the secret again.)
Note that, you will follow proper setting procedures to set the information of CHAP authentication, Two-way authentication and digest with new target iSCSI name on the host computer if needed.
The host computer may continue to execute login process to the target of old iSCSI name if the target iSCSI name or the IP address for the iSCSI interface of the chassis after the upgrade are changed.
If it happens, you will logout from the target of old iSCSI name.

(2) When the array is the system configuration of the Fibre Channel interface
The device file name changes due to World Wide Name change. Following the change, OS reconstruction is needed.

The setting review is also needed in the application software using the device file name.
If you use the WWN binding in the Driver setting file, it is necessary to change the setting. And the Host needs rebooting after the setting change.
When Fabric Switch is used and WWN executes zoning, it is necessary to execute the zoning setting review since WWN is changed.

Once upgraded, it becomes an added image of the new device for the OS. However, as different from the ordinary new device addition, the user's data is maintained when installed. Therefore, great care is needed for setting the Host computer and peripherals.
For each platform, the points of which special care is needed are shown below.

- When HP-UX is used.
  It is necessary to export the Volume Group before upgrading and import the Volume Group after upgrading.
  When MC/service guard is used, it is necessary to suspend the MC/service guard before upgrading and reboot the MC/service guard after upgrading.

- When AIX + HDLM is used.
  It is necessary to export the Volume Group before upgrading and note the disk property such as queue depth for the physical disk and the HDLM device. It is also necessary to import the Volume Group after remaking the HDLM device when the upgrade is completed.

  Examples of the HDLM device file remake

① deletion of the HDLM device file	# rmdev
② reset of the device configuration information	# chdev
③ remake of the HDLM device file	# dlmcfgmgr

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- When Solaris + VxVM is used.
  It is necessary to boot the Host with option "r" after upgrading and boot VxVM.

  NOTE : • When HBA: Sun genuine, rebooting is necessary since the driver setting is changed at the time of the device recognition ("#vxdctl enable" commande).
  • When SunCluster is used, it is necessary to exclude the wide area device from the definition (excluding "quorum device" in the wide area device from the definition).
  The correspondence between the Disk ID instance number in the wide area device and the disk device (cXtYdZ) is also changed due to the volume serial number change after upgrading. Therefore, check the correspondence between the Disk ID instance number and the local and remote path. If the correspondence is illegal, it is necessary to redefine.
  Then, redefine the wide area device as SunCluster (redefine quorum device from the optional wide area device).

- When IRIX is used.
  It is necessary to execute the device recognition and mapping file making again after upgrading and reboot the Host.

- When Windows -related system is used.
  Rebooting is necessary after upgrading.

- When Linux + VxVM is used.
  It is necessary to deport the Disk Group before upgrading and import the Disk Group after upgrading.

- When Tru64 is used.
  For UFS: It is necessary to mount with the new device.
  For AdvFS: It is necessary to link again with the new device as the registered device.

① device recognition check	# scu show edt
② device file check	# hwmgr –view devices
③ transfer to domain directory	# cd /etc/fdmns/[domain name]
④ domain directory contents check	# ls
⑤ allocation to domain directory	# ln –fs /dev/disk/dskzzzc dskxxxc

Registered device
New device file name

For LSM, the data must be restored at the time of the LSM configuration since the disk group cannot be imported.

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Chapter 8. Upgrading to the Drive I/O Module (Encryption)

The upgrade procedure to introduce the Drive I/O Module (Encryption) to the HUS150 is described.

8.1 Tools Required for Upgrade

The following tools are required for the upgrade procedures.

Table 8.1.1 Tools Required

Tool name	Specification	Usage
Wrist strap	–	Band for protecting the array from the static electricity.
LAN cross cable	Category 5	For connecting a service PC and the array.
PC for maintenance	–	More than 15 G Bytes of free space on the hard disk

8.2 Arranged Parts Required for Upgrade

The required arranged part model names at the time of upgrade are shown here.

Table 8.2.1 Arranged Parts at the time of Upgrade

Model	Unit Per ASSY	Components	Remarks
DW-F700-BS6GE	1	Drive I/O Module (Encryption) (4)	Indispensable

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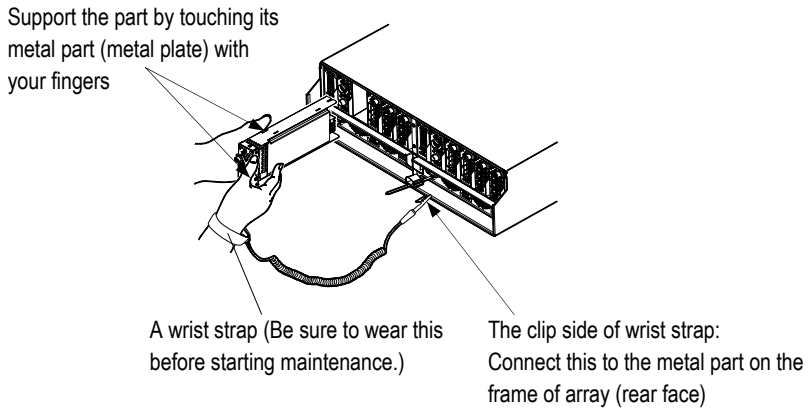
8.3 Upgrade procedure

NOTICE

- **To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the chassis before starting and do not take it off until you finish.**
- **Be sure to wear a wrist strap connected to the chassis whenever you unpack parts from a case. Otherwise, the static electrical charge on your body may damage the parts.**
- **When you install a Drive I/O Module, support its metal part with your hand that has the wrist strap. By so doing, you can discharge the static electricity from your body may change the parts.**

A failure may be caused by the electric shock since the Drive I/O Module is a precision instrument. Be sure to put on the wrist strap before starting work in order to protect Drive I/O Module from electrostatic discharge.

NOTE : Before unpacking and replacing maintenance components, be sure to wear a wrist strap and connect to ground the grounding clip in the opposite end of the wrist strap to the chassis frame (metal part).
When you insert a Drive I/O Module into the array, support the Drive I/O Module as touching its metal part with fingers of your hand that wears a wrist strap.



How to upgrade has the following two types.

- Status where the power unit is turned off :
  See Item "8.3.1 Upgrade Procedure in the Status where the Power Unit is Turned Off" (UP 08-0020).
- Status where the power unit is turned on :
  See Item "8.3.2 Upgrade Procedure in the Status where the Power Unit is Turned On" (UP 08-0050).

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8.3.1 Upgrade Procedure in the Status where the Power Unit is Turned Off

(1) Check the firmware version.
The firmware version is described in the summary firmware column when you start Hitachi Storage Navigator Modular 2 and click the array name to be checked and open the unit window.
(2) When the firmware version is less than 0950/A, perform the update installation to be 0950/A or more. (Refer to Firmware "Chapter 1 Installation of Firmware" (Firm 01-0000).)
(3) Turn off the main switch.
Press the main switch to the off side on the front of the Controller Box.
Make sure that the POWER LED on the Front Bezel changes from green to orange. It takes about 10 minutes at the maximum before the POWER LED turns orange. If you cannot turn off the power, troubleshoot the failure by connecting to the Web.

NOTE : If the C-PWR LED (green) on the Controller blinks, it may be that some of the Cache Memory data has not been written into the Drive. Wait until the C-PWR LED (green) goes off.
If the Controller is removed from the array when the C-PWR LED (green) blinks, user data may be lost.

(4) Remove two power cables from the Power Unit of the Controller Box.
(5) Remove all SAS(ENC) cables from the Drive I/O Module to be replaced.

NOTE : When the cable cannot be removed easily, do not pull it by force.
Besides, the cable can be damaged if it is bent upward or downward forcibly.

(6) Remove all Drive I/O Module.
(a) Loosen one screw (blue) which fixes the Drive I/O Module, and then pull the lever open.
When the lever is completely opened, the Drive I/O Module comes out forward.
(b) Pull out and remove the Drive I/O Module.

NOTE : Place the removed Drive I/O Module temporarily in the place where anti-static measures are taken.

(7) Install four all Drive I/O Modules (Encryption).
(a) Push the Drive I/O Module (Encryption) into the slot with its lever completely opened.
(b) Close the lever and tighten one screw (blue) to fix the Drive I/O Module (Encryption).
(8) Connect all removed SAS(ENC) cables to the Drive I/O Module (Encryption).
(9) Connect two power cables to the Controller Box.
(10) Turn on the main switch.

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(11) Check that the READY LED (green) on the front of the Controller Box lights up and the ALARM LED (red) and the WARNING LED (orange) go out [‡1].
Before the READY LED (green) on the front of the Controller Box lights up, the READY LED (green) may blink at high speed (for the maximum of 30 to 50 minutes) or the WARNING LED (orange) may blink at high speed (for the maximum of 30 to 85 minutes).

(12) Check that the start message and the end message of the drive firmware automatic download are displayed. When the drive firmware version of the Drive is new, the start message and completion message of the drive firmware automatic download are not displayed.
When the message indicating the abnormal termination is displayed, perform the maintenance according the recovery method in the message code. (Refer to Firmware "1.6 (4) Checking the start message and end message of the automatic download" (FIRM 01-1620).)

(13) Click [Component] – [I/F Module] in the unit window of Hitachi Storage Navigator Modular 2, and check that the status of the I/F modules 0C, 0D, 1C and 1D is Normal and the I/O Module (Drive (Encryption)) is displayed in the types column.

‡1 : When it is blinking at low speed, perform the maintenance according to the recovery method of the message referring to the Information Message on WEB. If the array is in the Warning status when the Information Message on WEB was referred to, the WARNING LED (orange) on the front of the Controller Box lights up, and if the array is not in the Warning status, the WARNING LED (orange) goes out.

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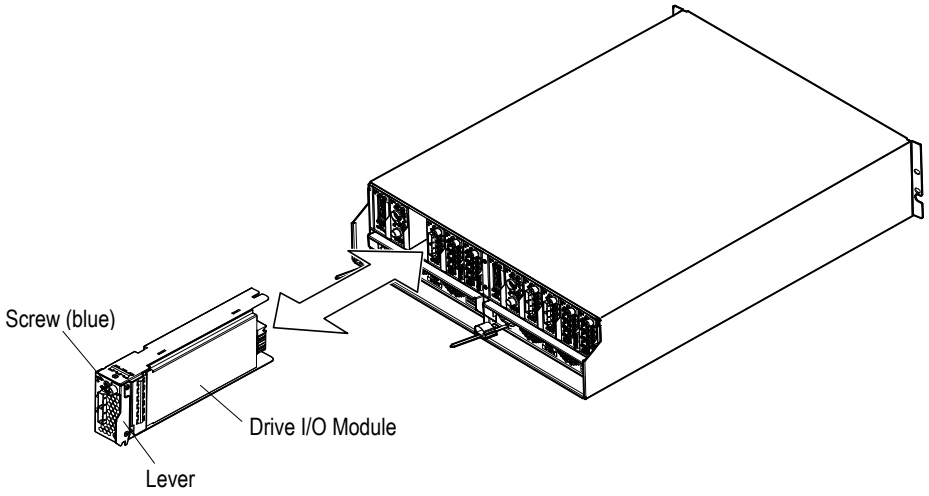

Figure 8.3.1 Upgrading Drive I/O Module

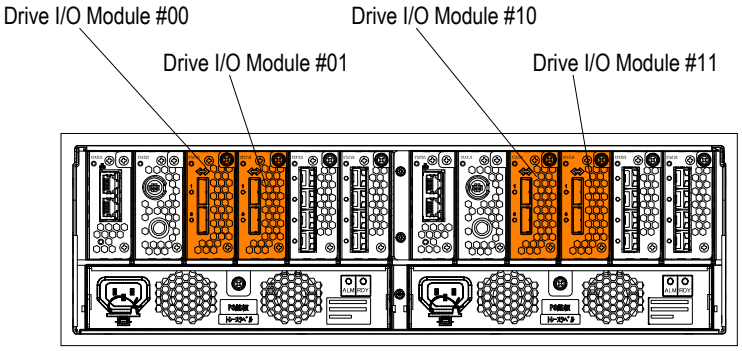

Figure 8.3.2 Position and Number of Drive I/O Module

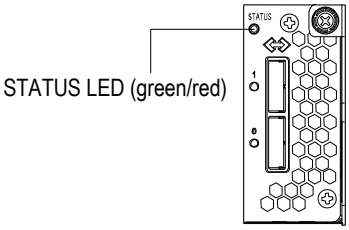

Figure 8.3.3 Position of the STATUS LED on the Drive I/O Module

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8.3.2 Upgrade Procedure in the Status where the Power Unit is Turned On

(1) Check the firmware version.
The firmware version is described in the summary firmware column when you start Hitachi Storage Navigator Modular 2 and click the array name to be checked and open the unit window.

(2) When the firmware version is less than 0950/A, perform the update installation to be 0950/A or more. (Refer to Firmware "Chapter 1 Installation of Firmware" (Firm 01-0000).)

(3) Detach the Drive I/O Module.
Select the [Components] – [I/F Modules] on the unit window of Hitachi Storage Navigator Modular 2, and click the [Detach I/F Module] button after selecting the module to be changed.
A confirmation message is displayed. If it is OK, click the [Confirm] button.
Although the ALM LED (red) on the Controller lights up for about three seconds, there is no problem.
Check that the STATUS LED (red) on the Drive I/O Module lights up.

(4) Remove the SAS (ENC) cables connected to the Drive I/O Module whose STATUS LED (red) lights up.

NOTE : When the cable cannot be removed easily, do not pull it by force.
Besides, the cable can be damaged if it is bent upward or downward forcibly.

(5) Remove the Drive I/O Module whose STATUS LED (red) lights up.
(a) Loosen one screw (blue) which fixes the Drive I/O Module, and then pull the lever open.
When the lever is completely opened, the Drive I/O Module comes out forward.
(b) Pull out and remove the Drive I/O Module.

NOTE : Place the removed Drive I/O Module temporarily in the place where anti-static measures are taken.

(6) Check that 20 seconds or more has been passed since the Drive I/O Module was removed.

(7) Install four all Drive I/O Modules (Encryption).
(a) Insert the new Drive I/O Module (Encryption) into the slot with its lever completely opened.
At this time, do not push it in all the way.
(b) Connect the removed SAS(ENC) cables to the Drive I/O Module (Encryption).
(c) Close the lever and then push the Drive I/O Module (Encryption) in all the way.
(d) Tighten one screw (blue) to fix the Drive I/O Module (Encryption).

(8) Make sure that the STATUS LED (red) on the Drive I/O Module (Encryption) is off.

(9) Make sure that the WARNING LED (orange) on the front side of the Controller Box is off(‡1).
(The Controller usually recovers in about three minutes, but if the I/O load from the host computer is high, it may take about 30 minutes to recover.)

(10) Check that the READY LED (green) on the front of the Controller Box lights up. The READY LED (green) on the front of the Controller Box may blink at high speed (40 to 60 minutes (80 to 180 minutes when the DBW is connected to the CBL)) before it lights up.

‡1 : When it is blinking at low speed, perform the maintenance according to the recovery method of the message referring to the Information Message on WEB. If the array is in the Warning status when the Information Message on WEB was referred to, the WARNING LED (orange) on the front of the Controller Box lights up, and if the array is not in the Warning status, the WARNING LED (orange) goes out.

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(11) Refer to “Information Message” on WEB, and check to see that “IAA0j0 Drive I/O module recovered (CTL-x, Slot-l)” is indicated. (Refer to WEB “2.5 Information Message” (WEB 02-0150).)

(12) Perform the procedures (3) to (11) for all the Drive I/O Modules (#00, #01, #10 and #11), respectively.

(13) Click [Component] – [I/F Module] in the unit window of Hitachi Storage Navigator Modular 2, and check that the status of the I/F Modules 0C, 0D, 1C and 1D is Normal and the I/O Module (Drive (Encryption)) is displayed in the types column.

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