

Disk Array management program (for GUI) User's Guide Vol. 1

Considerations

Before using this Disk Array management program, read safety instructions described in this manual carefully. Be sure to observe precautions in individual chapters. Keep this manual at hand for reference at any time.

HITACHI

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Preface

This manual describes the operation to execute the configuration setting and display, information display, and error monitoring of the Hitachi disk array units (DF350, DF350F, DF400, and DF500, collectively called the array unit below) using the Disk Array management program (called the manager below).

For the specifications of the array unit, see the manual attached to the array unit.

Notes on use:

- This manual is intended for system administrators responsible for operation of systems including array units, system engineers for construction of systems including array units, and customer support engineer for maintenance of array units.
- When using the manager, be sure to read this manual and understand the operating procedures and instructions described herein thoroughly before starting your operation. Understand, in particular, the descriptions in the Chapter **Safety Precautions** thoroughly and follow the instructions in this manual.
- The user is presupposed to have thorough knowledge of the basic operation of Windows, Solaris, and IRIX.
- “Windows 95”, “Windows 98”, “Windows 2000”, and “Windows NT Version 4.0” are abbreviated to “Windows” in the manual.
- This manual quotes screens that appears when the Disk Array management program runs with Windows NT 4.0, and when an array unit is configured from a dual system and is connected to a LAN. When the program runs with Windows 95, Windows 98, Windows 2000, Solaris, and IRIX, displays on some screens differ from those on corresponding screens shown in this manual.

Safety Precaution

When using this manager, read the following notes carefully, and follow the instructions to operate the manager.

Precautions before starting your operation

- Do not operate an array unit except system administrators responsible for operation of systems including array units, system engineers for construction of systems including array units, and qualified service personnel for maintenance of array units.
- Read and understand this manual thoroughly before starting your operation.
- The following attention mark heading appears in this manual to indicate a safety precaution.



Indicates a potentially serious situation which, if continuing operation with negligence of the instructions where this alert appears, can cause loss of the user data stored in the Hitachi disk array subsystem. Be sure to read the instructions described in a precaution item carefully and follow them to start your operation.

Cautions while starting your operation

- While operating the manager, the contents of an error, which occurs in an array unit, may be displayed as an error message. In this case, read the user's manual or maintenance manual to look up action on the error message and handle the error according to the action.
- When performing operations in this manual with a caution attention mark indicated, be sure to read precautions before starting the operation, and follow them to operate.

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Chapter 1 Outline

1.1 Outline

The manager is used to perform such operations on an array unit as referencing the status of an array unit and setting up the configuration of an array unit.

1.2 Notes on Using the Manager

When using this manager, take the following considerations.



- When using the manager on “RS232C connection”, the “ERROR INF” (a function to specify an error information transfer mode to the RS232C) must be set to “OFF” (suspension of an error information transfer) by means of the system parameter setting function of the array unit.
(The “ERROR INF” is set to “OFF” when shipped from the factory.) Otherwise, it may be caused that the manager fails to be connected to the array unit or that functions of the manager end abnormally.
- Regarding the functions to be executed by the manager, some are available and others are not available during an on-line. For details, see chapter 2.
For a case of high I/O load, functions that are available in the on-line might cause a command time-out in the host or a recovering fault in the manager. A use during off-line is recommended.
- A logical unit, at least, must be in the array unit, to make available all of manager functions. If no logical unit are in the array unit, some functions selected can not be operated.
- The manager can operate up to 1,024 array units. When setting configuration (setting of RAID groups, logical units, etc.), set the controllers one by one, after quitting the device status failure monitoring.
- When the PC enters the suspension status during operation while the manager, the manager may not operate correctly after the PC is released from the suspension status.
When you operate the manager, set the power management of the PC so that the PC should not enter the suspension status.

- When the manager is in operation, it may hang up in the following cases. If the manager hangs up, terminate it forcibly and check the array unit status and the connection status of RS232C or LAN. Then, boot up the manager once again. And start the manager again after you finish other application.
 - In case that the communication with the connected array unit fails due to controller blockage, array unit failure, or disconnected LAN connection, etc., or in case that the array unit receives a Reset/LIP from the host.
 - Other application works at the same time, and a CPU use rate is high.

- If any array unit failure is detected, contact with maintenance personnel.

1.3 Operating Environments

The manager is operated by connecting between the array unit and a LAN or RS232C. When an array unit is connected to a LAN, a machine (personal computer, SUN server/workstation, SGI server/workstation), in which the manager is installed, must be connected with the LAN and operate normally.

When an array unit is connected to an RS232C interface, an RS232C port of the machine must operate normally.

- PC
 - Windows 95, Windows 98, Windows 2000, or Windows NT 4.0
 - CPU : Pentium (Pentium-II 233 MHz or more is recommended.)
 - Memory : 40 M byte (96 M byte or more is recommended.)
 - Disk capacity : 2 M byte max. (A free capacity of 100 M byte or more is required.)
 - Network adapter
 - Monitor (Resolution 800 × 600, 1,024 × 768 or more is recommended.)

- SUN server/workstation
 - Solaris 2.6, 2.7, 2.8
 - CPU : UltraSPARC or more is recommended.
 - Memory : 40 M byte (96 M byte or more is recommended.)
 - Disk capacity : 3 M byte max. (A free capacity of 100 M byte or more is required.)
 - Network adapter
 - Monitor (Resolution 800 × 600, 1,024 × 768 or more is recommended.)

- SGI server/workstation
 - IRIX 6.5
 - CPU : R10000 or more is recommended.
 - Memory : 40 M byte (100 M byte or more is recommended.)
 - Disk capacity : 3 M byte max. (A free capacity of 100 M byte or more is required.)
 - Network adapter
 - Monitor (Resolution 800 × 600, 1,024 × 768 or more is recommended.)

- JRE
 - Windows : JRE1.1.8_006
 - IRIX : JRE1.1.8
 - Solaris : JRE1.1.8_10 (OS patch is mandatory in case of Solaris 2.6 or Solaris 2.7)

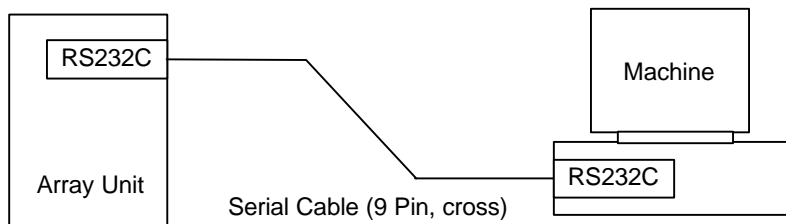
- RS232C connection
 - Serial port
 - baud rate : 9600
 - data bit : 8
 - parity : non
 - stop bit : 1
 - flow control : non
 - Serial cable (9 pin, cross) for RS232C connection : 1 cable/controller

- LAN connection
 - When an array unit is connected to a machine directly, a 10BaseT/100BaseT (in the case of DF500) cable (cross) or a twisted pair cable (cross) is used.
When an array unit is connected to a machine via a hub, a 10BaseT/100BaseT (in the case of DF500) cable or a twisted pair cable is used.

1.4 Connection

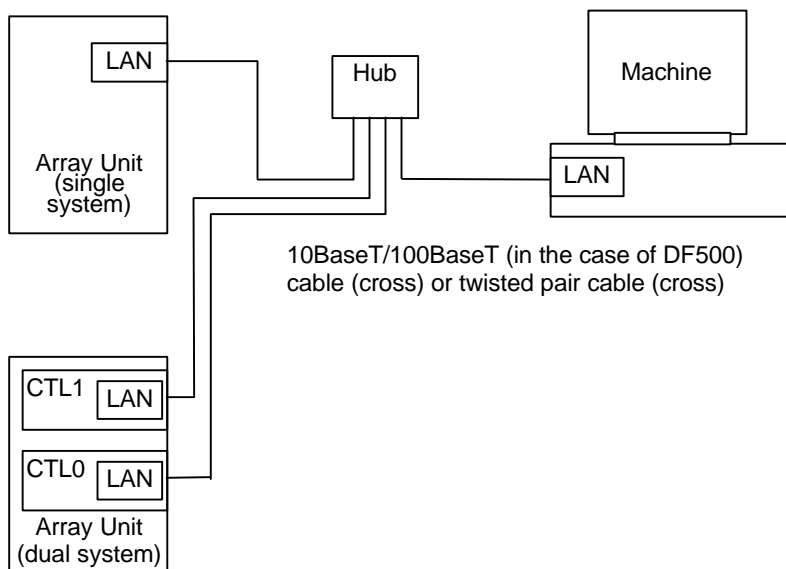
Shown below is an example of connections between a machine in which the manager has been installed and an array unit.

■ RS232C connection



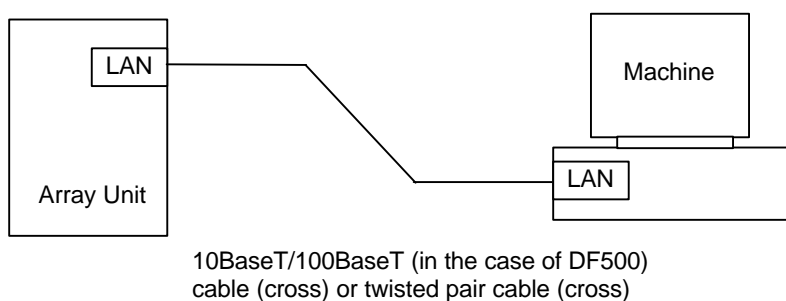
Note: If an array unit is configured from a dual system and a machine is equipped with two RS232C ports, both controller 0 and controller 1 are connected through an RS232C interface.

■ LAN (with a Hub)



Note: If an array unit is already connected with a LAN, a machine is connected to the same network as the one to which the array unit connects.

■ LAN (without Hub)



1.5 Installing the manager

The procedures for installing and uninstalling the manager are described below. For using the manager, JRE1.1.8 is installed on a machine and is in normal operation. Before installing JRE1.1.8, check if it is in normal operation. If JRE1.1.8 is not installed, install JRE1.1.8_006 or JRE1.1.8_10.

1.5.1 Installing the manager

Installs the manager by the following procedure.

1.5.1.1 Windows

1. Start the PC, then boot up Windows.
2. If JRE1.1.8_006 is not yet installed, installs JRE1.1.8_006 contained in the provided CD-R.
3. Executes the setup.exe in the GUI directory of the provided CD-R.
4. When executing the startmgr.bat (a batch file used to start the manager), the manager starts.

Note: When starting the manager from other than a directory in which the manager has been installed, edits the CMDF_PATH environment variable of the startmgr.bat in the developed file. Sets up the install directory of the manager in the CMDF_PATH environment variable.

Example : If the manager has been installed in C:\manage,
set CMDF_PATH=C:\manage
jrew -cp .\Confmng.jar jp.co.hitachi.str.diskarray.DiskArrayManager >> exclog

1.5.1.2 Solaris

1. Starts a SUN server/workstation, and starts up a session in the common desk-top environment.
2. If JRE1.1.8_10 is not yet installed, installs JRE1.1.8_10 contained in the provided CD-R. When installing JRE1.1.8_10, OS patches need to be applied, and hence applies the patch in the provided CD-R.
Solaris 2.6 : 1.1.8_10_patches_sparc_5.6.tar
Solaris 2.7 : 1.1.8_10_patches_sparc_5.7.tar
Solaris 2.8 : unnecessary
3. Creates a new directory for installing the manager, and copies the ArrayManage-S350-GUI.tar file in the provided CD-R into the created directory in the hard disk drive.
4. The ArrayManage-S350-GUI.tar is the Tar format of a file. Develops the file by referring to the example below.

Example : tar xvf ArrayManage-S350-GUI.tar

5. Changes scripts in the startmgr (a shell script used to start the manager) in the developed file as follows.
“DEFAULT_JAVAHOME=/usr/java” has been described in the startmgr as specification of a path to JRE.
Sets up a path to JRE in the DEFAULT_JAVAHOME variable so as to suit the environment in which JRE has been installed. The path to JRE is a path to a place in which JRE has been installed, and a path to a place in which the directories of bin, lib, etc., are placed. Usually, it is named JRE1.1.8, etc.
Example : If JRE has been installed in /usr/local/JRE1.1.8,
DEFAULT_JAVAHOME=/usr/local/JRE1.1.8
6. Logs in again.
7. After logging in again, when executing the startmgr (a shell script used to start the manager), the manager starts.

Note: When starting the manager from other than a directory in which the manager has been installed, edits the CMDF_PATH environment variable of the startmgr in the developed file before logging in again at Step 6. Sets up the install directory of the manager in the CMDF_PATH environment variable.

Example : If the manager has been installed in /usr/manage,
CMDF_PATH environment variable
CMDF_PATH=/usr/manage
export CMDF_PATH

1.5.1.3 IRIX

1. Starts a SGI server/workstation.
2. Creates a new directory for installing the manager, and copies the ArrayManage-I350-GUI.tar file in the provided CD-R into the created directory in the hard disk drive.
3. The ArrayManage-I350-GUI.tar is the Tar format of a file. Develops the file by referring to the example below.

Example : tar xvf ArrayManage-I350-GUI.tar

4. Changes scripts in the startmgr (a shell script used to start the manager) in the developed file as follows.
“DEFAULT_JAVAHOME=/usr/java” has been described in the startmgr as specification of a path to JRE.

Sets up a path to JRE in the DEFAULT_JAVAHOME variable so as to suit the environment in which JRE has been installed. The path to JRE is a path to a place in which JRE has been installed, and a path to a place in which the directories of bin, lib, etc., are placed. Usually, it is named JRE1.1.8, etc.

Example : If JRE has been installed in /usr/local/JRE1.1.8,
DEFAULT_JAVAHOME=/usr/local/JRE1.1.8

5. Logs in again.
6. After logging in again, when executing the startmgr (a shell script used to start the manager), the manager starts.

Note: When starting the manager from other than a directory in which the manager has been installed, edits the CMDF_PATH environment variable of the startmgr in the developed file before logging in again at Step 6. Sets up the install directory of the manager in the CMDF_PATH environment variable.

Example : If the manager has been installed in /usr/manage,
CMDF_PATH environment variable
CMDF_PATH=/usr/manage
export CMDF_PATH

Correct character fonts may not be displayed on screens, depending on the environment setting of an SGI server/workstation that is installed. The font size is set to 9 as standard. If characters are displayed in a large size, set the font size to 5 or 6. To add the font size, insert a space after the \$JAVABIN \$EXECJAVA in the last line of the startmgr, and add "-font5" or "font6" following the space.

1.5.2 Updating

Updates the manager by the following procedure. If you update, be sure to terminate the manager before starting operations.

1.5.2.1 Windows

1. Executes the setup.exe in the GUI directory of the provided CD-R.

The updated manager can be run without restarting Windows.

1.5.2.2 Solaris

1. Copies the ArrayManage-S350-GUI.tar file in the provided CD-R to the hard disk.
2. The ArrayManage-S350-GUI.tar is the Tar format of a file. Develops the file by referring to the example below.

Example : tar xvf ArrayManage-S350-GUI.tar

The updated manager can be run without restarting Solaris.

1.5.2.3 IRIX

1. Copies the ArrayManage-I350-GUI.tar file in the provided CD-R to the hard disk.
2. The ArrayManage-I350-GUI.tar is the Tar format of a file. Develops the file by referring to the example below.

Example : tar xvf ArrayManage-I350-GUI.tar

The updated manager can be run without restarting IRIX.

1.5.3 Uninstalling

Uninstalls the manager by the following procedure.

1.5.3.1 Windows

1. Deletes the manager using the Add and Delete Application icon on the Control Panel.
2. Deletes the directory, for installing the manager, on the hard disk drive.

1.5.3.2 Solaris and IRIX

1. Deletes the directory, for installing the manager, on the hard disk drive.

Chapter 2 Functions

2.1 Manager Functions

Table 2.1 lists functions of the manager. Available or Not Available on-line depends on the respective functions. Functions that can be used vary depending on the action mode (monitor mode or management mode). Therefore, change the mode according to the function you want to use.

Don't operate during on-line except for item 12 : **Error monitoring**, in the case of RS232C connection.

Table 2.1 Manager Functions

No.	Category	Name of function	Outline of function	Remarks	Usability during operation	Mode	
						Standard	Administrator
1	Configuration display	Component status display (GUI)	Displays the status of a component such as drive and fan by using an icon.	—	○	○	○
		Component status display (list)	Displays the status of a component such as drive and fan by using a list.	—	○	○	○
		Configuration display	Displays the IP configuration information.	—	○	○	○
2	User ID management	Setting user ID	Registers a user ID used to operate an array unit.	—	○	×	○
		Changing user ID	Changes a user ID already registered in an array unit.	—	○	×	○
		Deleting user ID	Deletes a user ID already registered in an array unit.	—	○	×	○
		Changing password	Changes the password of a user ID already registered in an array unit.	—	○	×	○
		Logging in	Logs into an array unit with a user ID registered in the array unit.	—	○	×	○
		Logging in forcibly	Logs forcibly, with a user ID registered, into an array unit to which another user has already logged in.	—	○	×	○
		Logging out	Logs out from an array unit to which a user has already logged in.	—	○	×	○

Table 2.1 Manager Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Usability during operation	Mode	
						Standard	Administrator
3	RAID group definition	RAID group institution	Used to adds a RAID group. You can set a new RAID group by specifying its disk number, RAID level, and group range for the RAID group to be created.	—	○	×	○
		RAID group extension	Used to extend an previously defined RAID group. A previously defined RAID group can be extended by specifying its group number, level, and group range.	Only a drive adjoining a previously defined RAID group can be extended.	○	×	○
		RAID group deletion	Delete a defined RAID group or a specified RAID group.	Note that this function invalidates user data of the deleted RAID group. No specified RAID group can be deleted, when a logical unit is defined.	×	×	○

Table 2.1 Manager Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Usability during operation	Mode	
						Standard	Administrator
4	LU definition	LU institution	Used to add a logical unit (LU). A new logical unit is added by specifying its capacity.	Logical unit can be added only in an order of lower to higher number.	○	×	○
		LU extension	Used to extend the capacity of a previously defined logical unit (LU). Capacity is increased by specifying a capacity for the logical unit.	Only the LU with the greatest LU number can be extended.	○	×	○
		LU deletion	Deletes all defined local units (LU) or the last logical unit.	Note that this function invalidates user data on the deleted logical unit.	×	×	○
		LU formatting	Used to make a defined logical unit (LU) accessible by the host. This function writes null data to the specified logical unit.	This operation is always required to make a logical unit accessible to the host. Note that this function invalidates all user data on disks when the data is already stored on them.	×/○ See Note 1.	×	○
		Change of default controller in charge of an LU	Used to change the default controller in charge of an LU as follows : CTL0 → CTL1 and CTL1 → CTL0	Restart the array unit to make the setting valid. See Note 4.	○	×	○
		Setting TURBO LU Assignment	Can set the LU to be resident in the cache.		○	×	○

Table 2.1 Manager Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Usability during operation	Mode	
						Standard	Administrator
5	System parameter setting	Setting wizard	Sets a system parameter in the wizard format. There are two types of wizard formats : standard setup and full setup. The RTC is set individually.	To make the setting valid, restart the array unit. See Note 4. I/Os directed from the host cannot be executed after the setting is made until the array unit is restarted. Besides, the function of the manager cannot be used except the setting wizard, SNMP environmental information setting or error monitoring. The RTC is validated when it is set.	×	×	○

Table 2.1 Manager Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Usability during operation	Mode	
						Standard	Administrator
6	Configuration setup	Target ID setting	Sets a combination of the target ID and the LUN.	To make the setting valid, restart the array unit. See Note 4.	○	×	○
		LAN configuration information setting	Sets the IP Address, Sub Net Mask, Default Gateway Address, and the DHCP mode.	To make the setting valid, restart the array unit. See Note 4.	○	×	○
		SCSI transfer rate setting	Sets the SCSI I/F transfer rate of the port.	To make the setting valid, restart the array unit. See Note 4.	○	×	○
		Setting up spare disk drive	Sets up spare disk drives.	—	○	×	○
		Setting the drive restoration option	Sets a drive restoration mode, automatic or non-automatic start of copy-back, and automatic or non-automatic start of correction copy, time interval, restoring processing unit size, and Dynamic sparing mode.	Optimum time interval and restoring processing unit are set before shipment. Do not change these values unless required for fear of giving bad effect to the performance.	×	×	○
		On-line verify setting	Whether or not to execute the on-line verify function and an interval for it.	Note that an incautious change in the setting may give a bad effect on the performance.	×	×	○
		Setting and display of the Fibre Channel information	Sets and displays port addresses and security information, etc.	To make the setting valid, restart the array unit. See Note 4.	×	×	○

Table 2.1 Manager Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Usability during operation	Mode	
						Standard	Administrator
7	Configuration information file output and its setup by use of a file	Outputting system parameters and RAID/LU configuration information to a file, and setting them by use of a file	Outputs system parameters and RAID/LU configuration information to a file individually. Sets system parameters and RAID/LU configuration information using a file	If system parameters are set using a file, restart the array unit in order to validate the settings. When RAID/LU configuration information is set, if setting it with user data stored in the disk drive, the user data is set invalid.	○	○	○
8	Microprogram replacement	Microprogram download and updating	Downloads and updates the microprogram of the array unit.	To validate the downloaded microprogram, restart the array unit. When DF350 has been executed, I/O cannot be executed from the host.	×/○ See Note 2.	×	○
9	Setting SNMP environment information and outputting its file	Setting SNMP environment information and outputting its file	Sets the SNMP environmental information file and outputs the set contents in it.	To make the setting valid, restart the array unit. See Note 4. I/Os directed from the host cannot be executed after the setting is made until the array unit is restarted. Besides, the function of the manager cannot be used except the setting wizard, SNMP environmental information file setting and error monitoring.	×/○ See Note 3.	×	○

Table 2.1 Manager Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Usability during operation	Mode	
						Standard	Administrator
10	Statistical information display	Controller use information display	Displays previous statistical information by selecting a related item.	—	○	○	○
11	Performance		Outputs the command operation status during a certain period or a specified period to the file in the text format.	—	○	○	○
12	Error monitoring	Report when a failure occurs and controller status display	Displays the status of an array unit, and displays the result of monitoring it by polling. When an error is detected while monitoring, outputs the error into a log file, sends it to a specified address by E-Mail, and starts a specified application.	If a failure occurs, contact with maintenance personnel.	○	○	○
13	Fee-basis option	Setup and display of the fee-basis option	Opens/closes the fee-basis option key and sets and displays the enable/disable condition.	—	○	×	○

Note 1: When formatting is executed, **Format (single)** is available in the on-line status.

Note 2: If the DF400 and the DF500 are connected, commands can be used during on-line.

Note 3: When the manager is connected to the DF350, this function can be used while the array unit is on-line.

Note 4: When redriving from the manager, the unit window is closed. Select an array unit to operate from the main window to open the unit window again. An instruction to restart may be issued to a DF400 (with a dual system configuration, with a controller not being in blockade) that supports restarting.

2.2 Applying Support Functions of Microprograms

Functions of the manager may be disabled depending on the revision number of the microprogram of the array unit connected. Table 2.2 shows the revision numbers of the microprogram which support the manager functions and the manager operations when the microprogram does not support the manager functions.

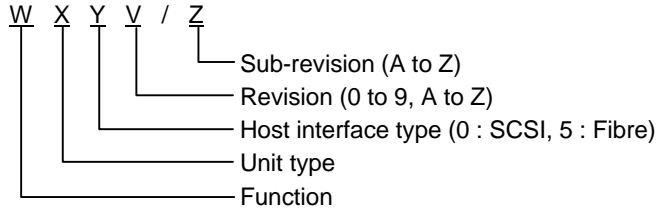
Table 2.2 Microprogram Revision Numbers and Their Supports for Manager Functions

No.	Function	Revision Nos. of microprogram which support the manager			Remarks
		DF350/DF350F	DF400	DF500	
1	Current IP address display	Not supported	0404, 4404, 0454, 4454, and later respectively	All	
2	Expanding RAID group	All	All	0552, and later respectively	
3	Expanding LU				
	LU formatting : (Single)	0304, 1304, 4304, 0354, 4354, and later respectively		All	
	LU formatting : (Multi)	Not supported	0406, 4406, 0456, 4456, and later respectively		
	Setting of TURBO LU Assignment		0404, 4404, 0454, 4454, and later respectively	0552, and later respectively	
4	Setting and display of the Fibre Channel information		0450, 4450, and later respectively	All	
5	Referencing /setting system parameters		0406, 4406, 0456, 4456, and later respectively		
6	Referencing /setting target information	0304, 1304, 4304, and later respectively	All		Not supported for DF350F.
7	Setting up spare disk drive	Not supported	Not supported		

Table 2.2 Microprogram Revision Numbers and Their Supports for Manager Functions
(Continued)

No.	Function	Revision Nos. of microprogram which support the manager			Remarks
		DF350/DF350F	DF400	DF500	
8	Setting LAN information	0307/P, 4307/P, and later respectively	0401/A, 4401/A, 0451/A, 4451/A, and later respectively	All	Not supported for DF350F.
	DHCP mode setting		0404, 4404, 0454, 4454, and later respectively		
9	SCSI transfer rate setting	0304, 1304, 4304, 0354, 4354, and later respectively	All	0503, and later respectively	
10	Setting drive restoration control information interleave (Priority mode)		0406, 4406, 0456, 4456, and later respectively	All	
11	Dynamic sparing setting		All		
12	Microprogram replacement	All	0404, 4404, 0454, 4454, and later respectively		Not supported for DF350F.
13	Setting SNMP information and outputting it to a file	4307/P and later respectively	4406, 4456, and later respectively		Not supported for DF350F.
14	Array unit management by user ID	Not supported	040A, 440A, 045A, 445A, and later respectively	0552, and later respectively	
15	Instruction to reboot		(Flash program revision : B15 or later)		
16	Fee-basis option setup		Not supported	All	

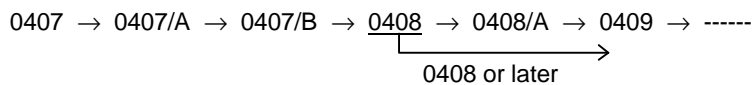
Note: Revision numbers of the microprogram are classified as shown below according to the function of the array unit.



- Host interface : SCSI
 - 030V (030V/Z) : Version for the DF350 single/dual system used in the open system
 - 130V (130V/Z) : Version for the DF350 single/dual system used in the open system and connected to the AS/400
 - 430V (430V/Z) : Version for the DF350 single/dual system used in the open system and supports the SNMP
 - 040V (040V/Z) : Version for the DF400 single/dual system used in the open system
 - 440V (440V/Z) : Version for the DF400 single/dual system used in the open system and supports the SNMP

- Host interface : Fibre Channel
 - 035V (035V/Z) : Version for the DF350F single/dual system used in the open system
 - 435V (435V/Z) : Version for the DF350F single/dual system used in the open system and supports the SNMP
 - 045V (045V/Z) : Version for the DF400 single/dual system used in the open system
 - 445V (445V/Z) : Version for the DF400 single/dual system used in the open system and supports the SNMP
 - 055V (055V/Z) : Version for the DF500 single/dual system used in the open system

Update of revision is made for each of nine revisions listed above. An example is shown below.



Sub-revision is updated in alphabetic order, however, some sub-revisions may be skipped.

Chapter 3 Operations

Functions of displaying the status of array units, setting up the configuration of array units, monitoring array units for errors, etc are achieved by using the GUI (Graphical User Interface) on Windows, Solaris, and IRIX.

Operations of these functions conform to those of Windows, Solaris, and IRIX.

3.1 Basic Operations

3.1.1 Starting

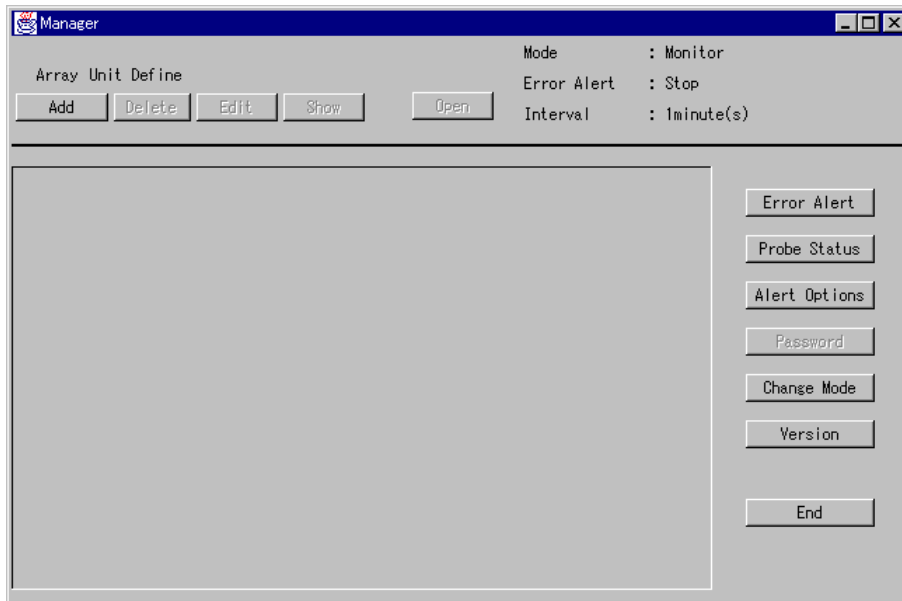
1. Execute the batch file or shell script for starting the manager.

- For Windows, start the batch file : startmgr.bat.

- For Solaris, start the shell script : startmgr.

Note: When starting the batch file and the shell script, execute them by using the same directory as that of the manager program.

2. The manager is started in the monitor mode and the main window appears.



In the case of Windows, the prompt window is also displayed.

Close the prompt window because it has no connection with manager operations. When you specify "Minimize icon" or "Exit program", in the batch file property, "Minimize icon" or "Exit program" can be automatically executed.

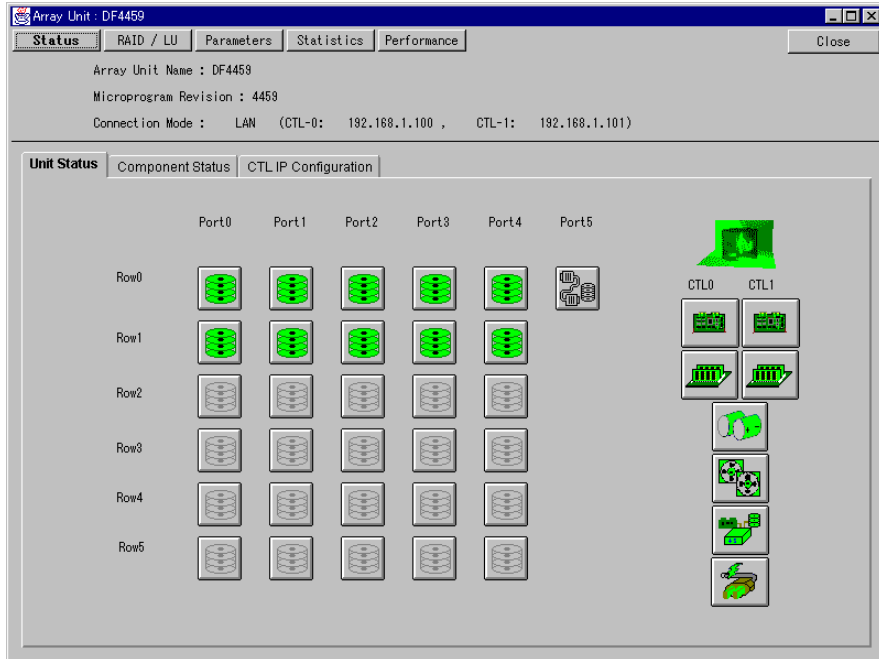
In the main window, the manager action mode and the error monitoring status are displayed and the following functions are performed. The operation for each function, see the page pertaining to the explanation of each function.

- Registering the array unit (Register, Delete, Change, Refer)
- Executing error monitoring and setting error monitoring option
- Changing the action mode
- Setting and changing the password for logging-in to the management mode
- Displaying the version

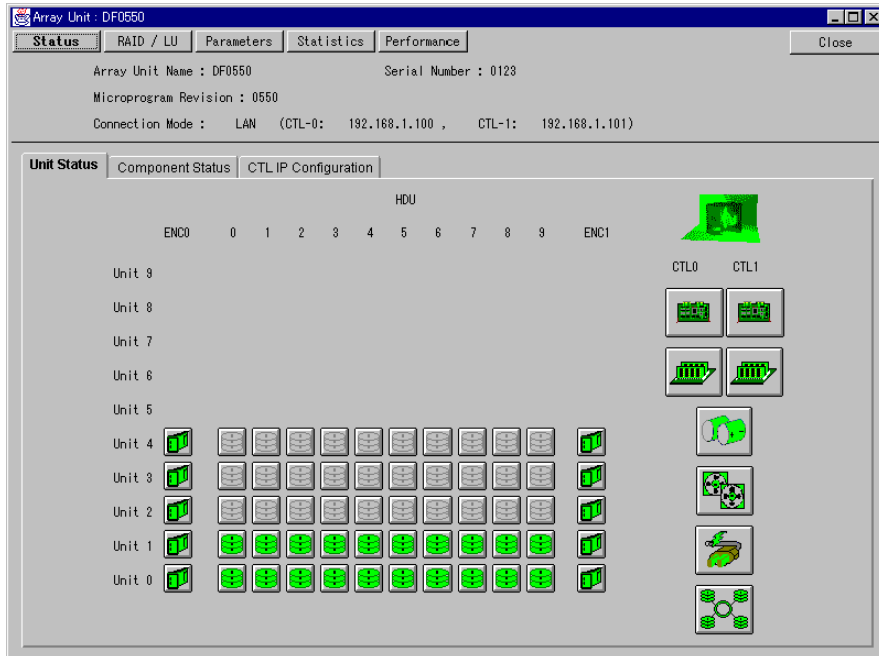
To change the action mode, execute **Change Mode**.

Note: When the manager is first started, the **Change Mode** button is displayed in half-tone. Click **Password** to register the password, and the **Change Mode** button will be enabled.

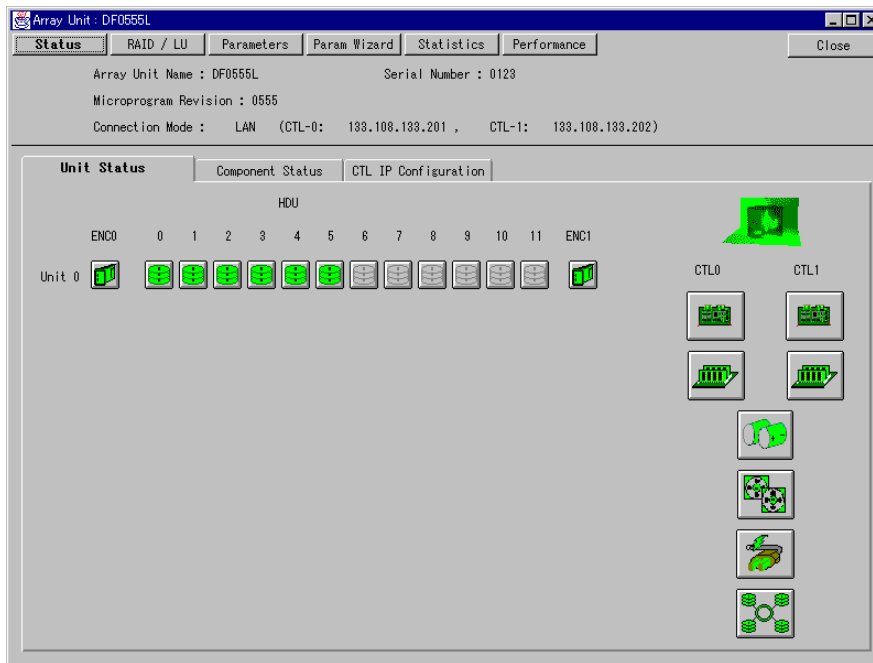
3. Click the icon of the array unit in the main window and click **Open**, and the unit window of the array unit you clicked will appear.
 - a) For DF350, DF350F, and DF400



- b) For DF500 (CK, and RK model)



c) For DF500 (MK, and RKL model)



In the unit window, the registered array unit name, serial number, microprogram revision, and connection information are displayed and the following function are performed. For the operation for each function, see the page pertaining to the explanation of each function.

- Displaying the array unit status
- Displaying and defining RAID/LU
- Displaying and setting the configuration information
- Setting the system parameters
- Displaying statistic information
- Acquiring the performance information

Note: The serial number item indicates the lower four digits of the manufacturing serial number of an array unit.

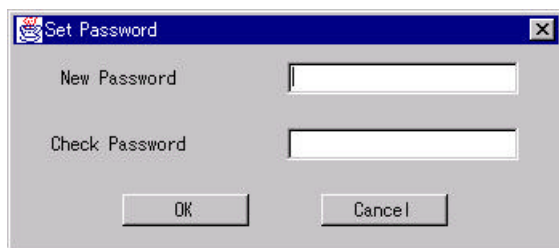
3.1.2 Password setting

When using the manager in the management mode, set a password.

3.1.2.1 Registration of a password

Register a password.

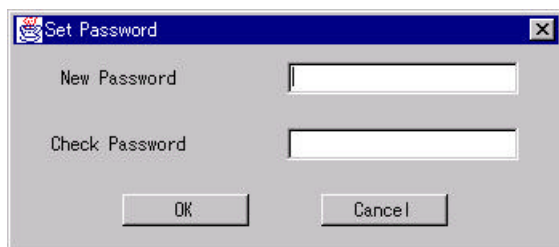
1. Click **Password** in the main window.
2. Input **New Password** and **Check Password** and click **OK**.
Specify a password of up to 12 alphanumeric characters.



3.1.2.2 Changing the password

Change the set password. The password can be changed only in the management mode.

1. Click **Password** in the main window.
2. Input **New Password** and **Check Password** and click **OK**.
Specify a password of up to 12 alphanumeric characters.



3.1.2.3 Deleting the password

To delete the password, the manager must be uninstalled and reinstalled.

1. Delete the directory where the manager is installed.

Note: To save the information of the registered array unit, back up the “utlprm.inf” file in the directory where the manager is installed.

2. Create a directory with the same path and the same name as those of the directory deleted in 1.

3. Install the manager.

Note: When the “utlprm.inf” file has been backed up in 1, copy this file to the directory created in 2.

3.1.3 Changing the action mode

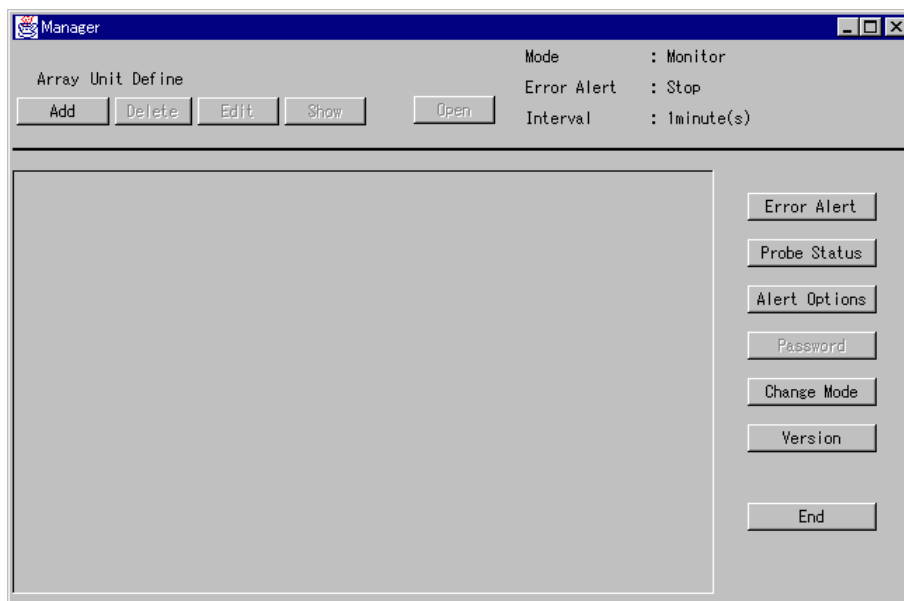
The manager is provided with two action modes, namely, monitor mode and management mode. In the monitor mode, both array unit configuration and status are displayed. In the management mode, the array unit configuration can be set in addition to the monitor mode functions.

Change the action mode in accordance with the operation of the array unit.

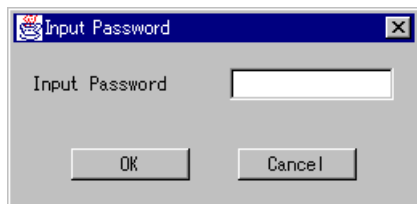
3.1.3.1 Changing from the monitor mode to the management mode

Change the action mode from the monitor mode to the management mode. When logging-in is performed in the monitor mode, **Monitor** is displayed in **Mode:** in the upper right part of the main window.

1. Click **Change Mode** in the main window.



2. When the password input screen appears, input a password and click **OK**.

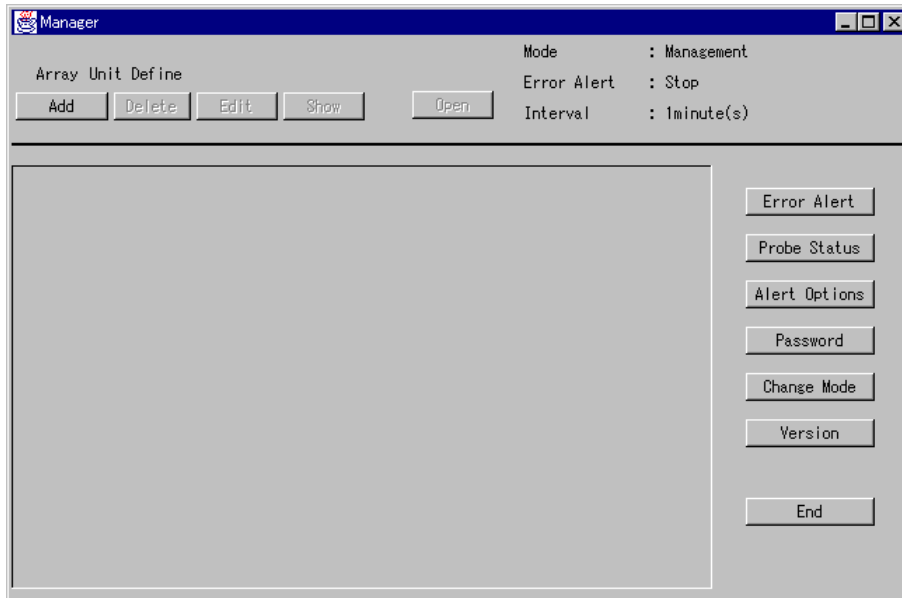


3. **Management** is displayed in **Mode:** in the upper right part of the main window and the manager will operate in the management mode.

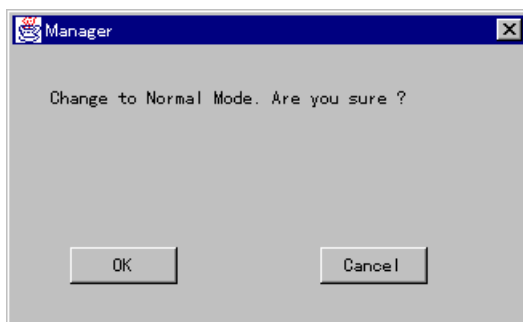
3.1.3.2 Change from the management mode to the monitor mode

Change the action mode from the management mode to the monitor mode. When logging-in is performed in the management mode, **Management** is displayed in **Mode:** in the upper right part of the main window.

1. Click **Change Mode** in the main window.



2. When a confirmation message appears, click **OK**.



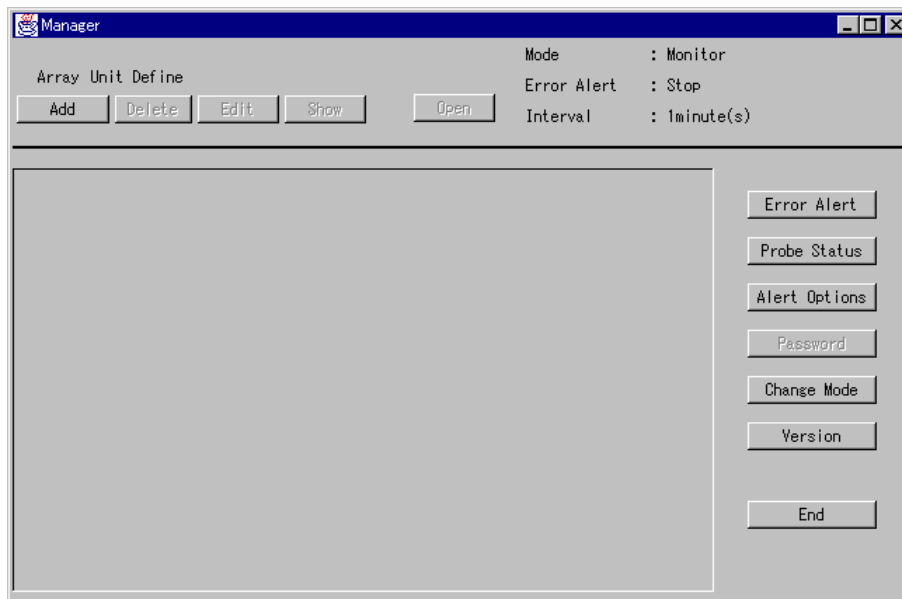
3. **Monitor** is displayed in **Mode:** in the upper right part of the main window and the manager will operate in the monitor mode.

3.1.4 Registering an array unit

To operate the array unit from the manager, register the array unit to be operated. For a non-existing array unit, it is impossible to temporarily register it.

3.1.4.1 New registration

1. Click **Add** in the main window.



2. Input the registration information and click **OK**.

The screenshot shows a dialog box titled "Array Unit Regist". It has a standard Windows-style title bar with a close button. The dialog is organized into two columns. The left column contains: "Array Unit Name" (text input), "Array Unit Type" (dropdown menu showing "DF400 Dual"), "Controller 0" (text input), and "Controller 0" (text input). The right column contains: "Group Name" (text input), "Connection Mode" (dropdown menu showing "LAN"), "Controller 1" (text input), and "Controller 1" (text input). Below these columns are two checkboxes: "Error Alert" (checked) and "ON". At the bottom of the dialog are two buttons: "OK" and "Cancel".

Input the name native to the array unit to be registered in **Array Unit Name** and **Group Name**.

Group Name is input to control array units as a group. It is not necessary to input any name when they are not controlled as a group.

Select an array unit type to be connected in **Array Unit Type**.

Specify **Connection Mode** to select a connection mode with the array unit and a connection port fit for the connection mode for each controller.

Check off the **Error Alert** check box when the array unit is to be monitored.

- **Array Unit Name:** Registered name of array unit. Specify it in up to 16 alphanumeric characters or characters (-, _) except numbers.
- **Group Name:** Group name when array units are controlled as a group. Specify it in up to 16 alphanumeric characters or characters except numbers (-, _). When array units are controlled as a group, input its name. If not, it is not necessary to input the name. The maximum registered number of groups is 200.
- **Array Unit Type:** Select a type of array unit.
- **Connection Mode:** Select a connection mode with the array unit.
- **Controller 0 IP Address Host Name Device Name:** Specify the connection information of controller 0. When you select **LAN** in **Connection Mode**, specify **IP Address** or **Host Name**. When you select **RS232C**, specify **Device Name**. Specify the RS232C port name or device file name as **Device Name**. (Example : Windows-COM1, Solaris-ttya)
- **Controller 1 IP Address Host Name Device Name:** Specify the connection information of controller 1. When you select **LAN** in **Connection Mode**, specify **IP Address** or **Host Name**. When you select **RS232C**, specify **Device Name**. Specify the RS232C port name or device file name as **Device Name**. (Example : Windows-COM2, Solaris-ttyb)

- **Error Alert:** Specify whether or not to perform error monitoring. When you click the check box, the ON/OFF display will change at right.

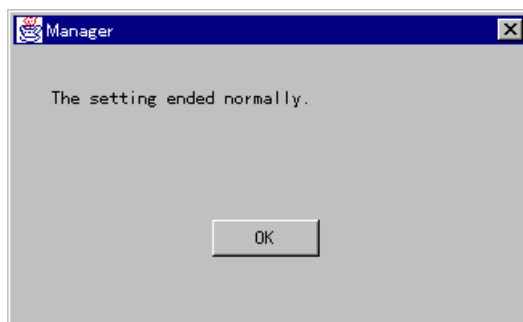
Check (ON display): Error monitoring

No check (OFF display): No error monitoring

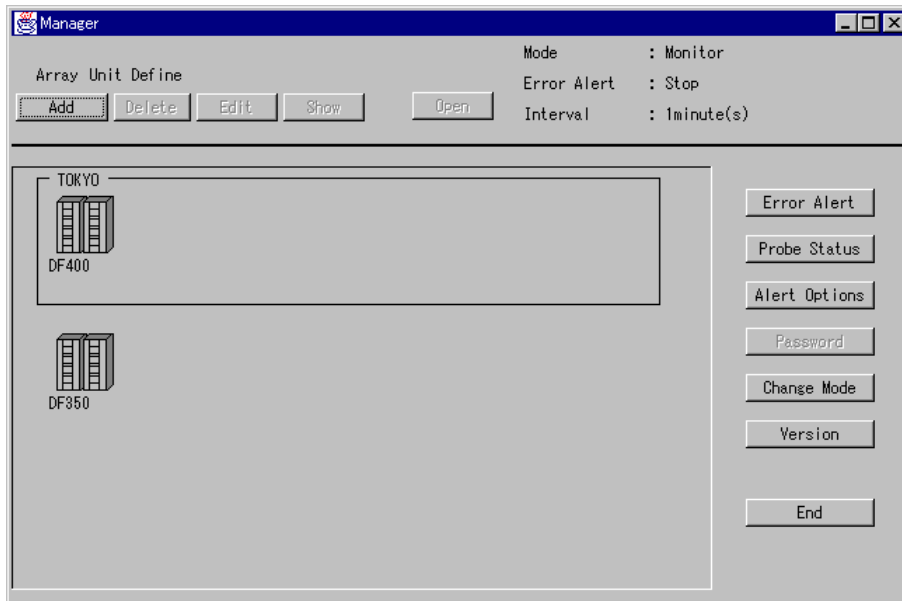
Note: In the array unit in the dual system, only one controller can be used in the LAN connection mode. **Array Unit Type** is used to select an array unit type to be connected. Specify **Controller 0 IP Address/Host Name/Device Name** and **Controller 1 IP Address/ Host Name/Device Name** for the connected controller side only.

When registering the array unit in the dual system, confirm the controller to be connected to before specifying **Controller 0 IP Address/Host Name/Device Name** and **Controller 1 IP Address/Host Name/Device Name**. If you specified the wrong controller, depending on the specified contents the controller configuration may be set as the opposite controller side.

3. When a registration completion message appears, click **OK**. If the registration information is not valid, the prompt is displayed in the incorrect item.



4. The main window is updated and then displayed.



When you input in **Group Name**, an array unit icon is displayed in the frame enclosed with the input group. Array unit icons are classified into one for dual system and the other for single system as shown in the following figure.

For dual system



For single system

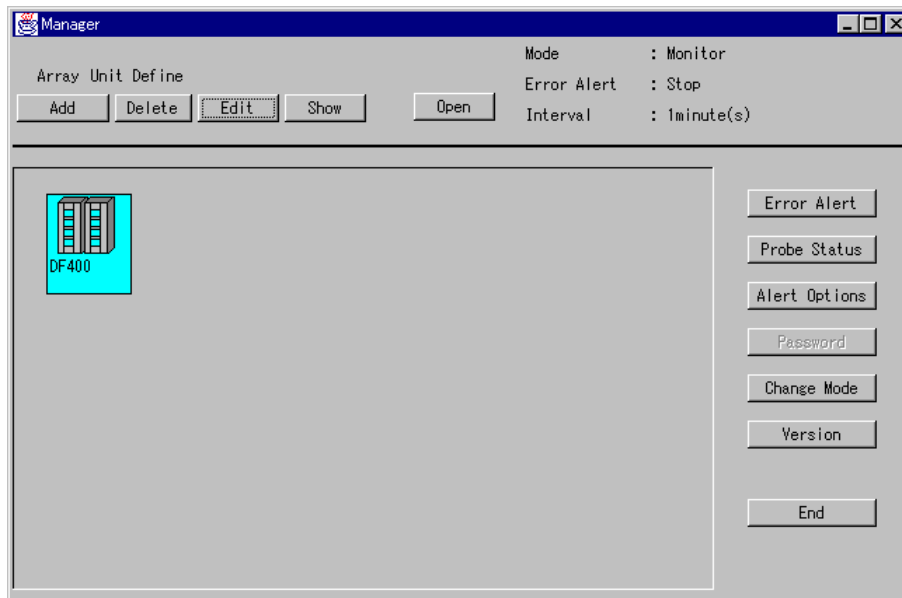


Array unit icons are displayed in the order of registration.

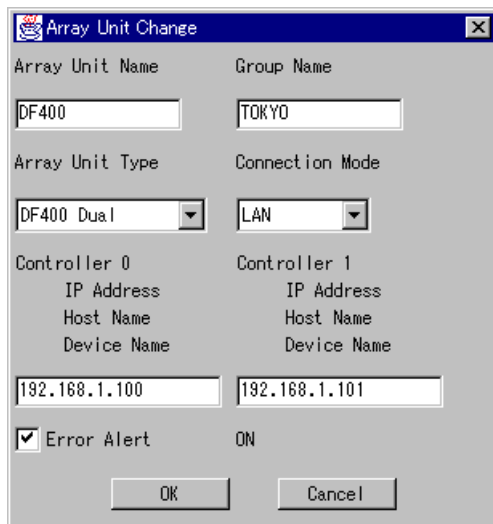
3.1.4.2 Changing the registration contents

Change the registration contents of the array unit which are registered in the manager.

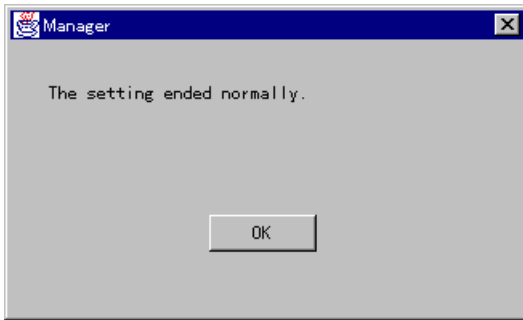
1. Click the icon of the array unit to be change in the main window and click **Edit**.
The icon of the array unit selected by clicking is displayed in a light blue frame.



2. The registration contents are displayed. Change the registration contents and click **OK**.



3. When a registration change completion message appears, click **OK**.



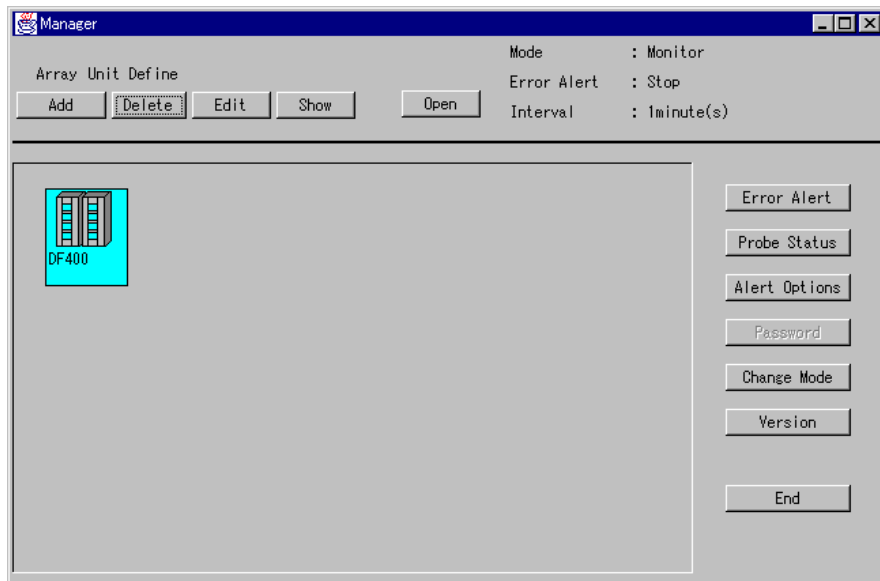
4. The main window is updated and then displayed.



3.1.4.3 Deleting the registration

Delete the registration of an array unit which is registered in the manager.

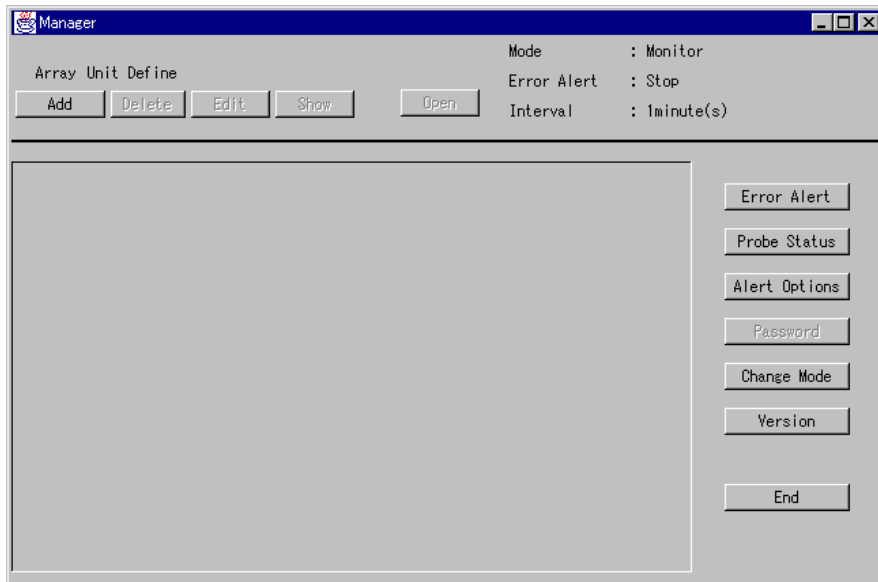
1. Click the icon of the array unit to be deleted in the main window and click **Delete**.
The icon of the array unit selected by clicking is displayed in a light blue frame.



2. When a message confirming whether the registration should be deleted or not is displayed, click **OK**.



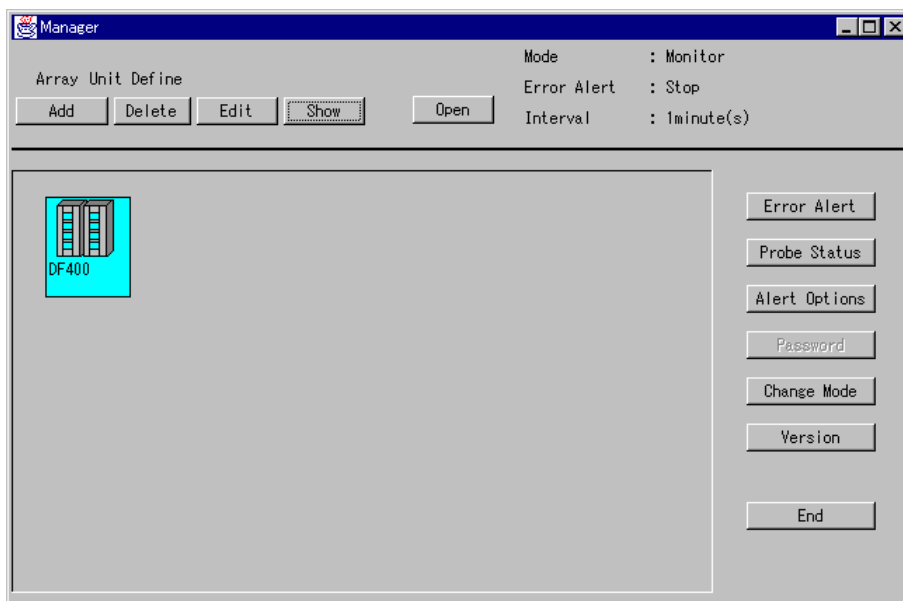
3. The main window is updated and then displayed.



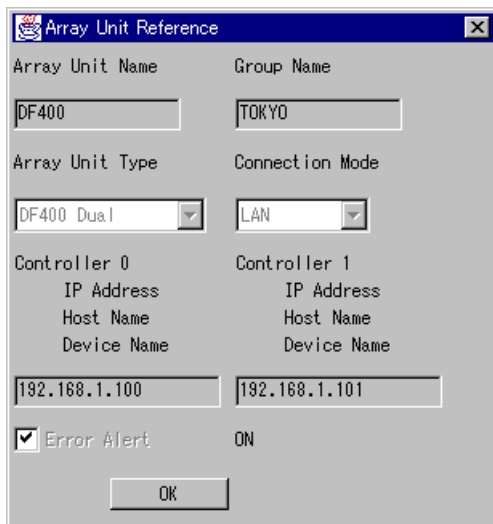
3.1.4.4 Displaying the registration contents

Display the registration contents of an array unit which is registered in the manager.

1. Click the icon of the array unit to be displayed in the main window and click **Show**.



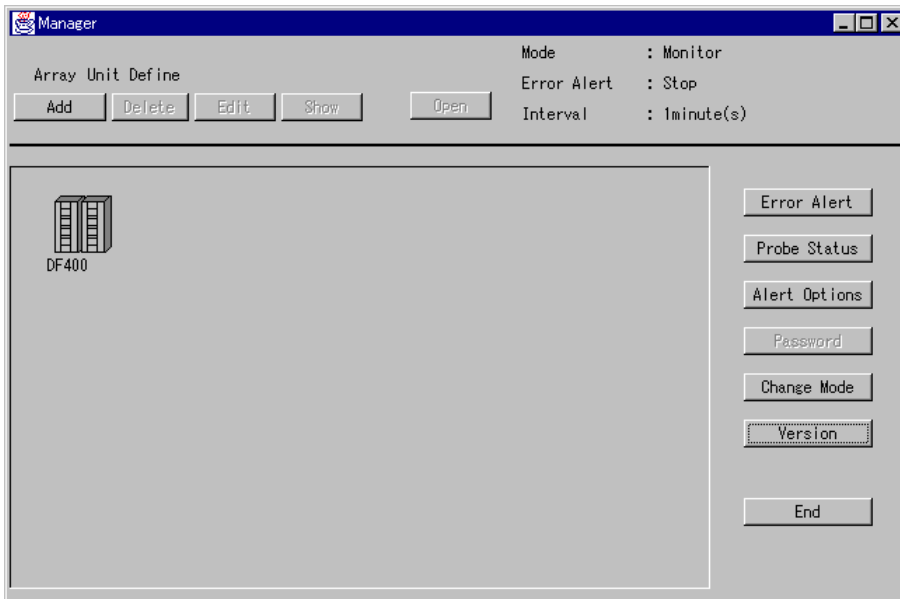
2. The registration contents of the array unit are displayed.



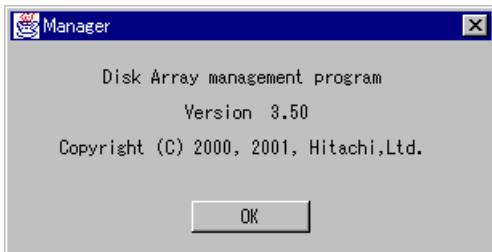
3.1.5 Version display

Display the version of the manager.

1. Click **Version** in the main window.



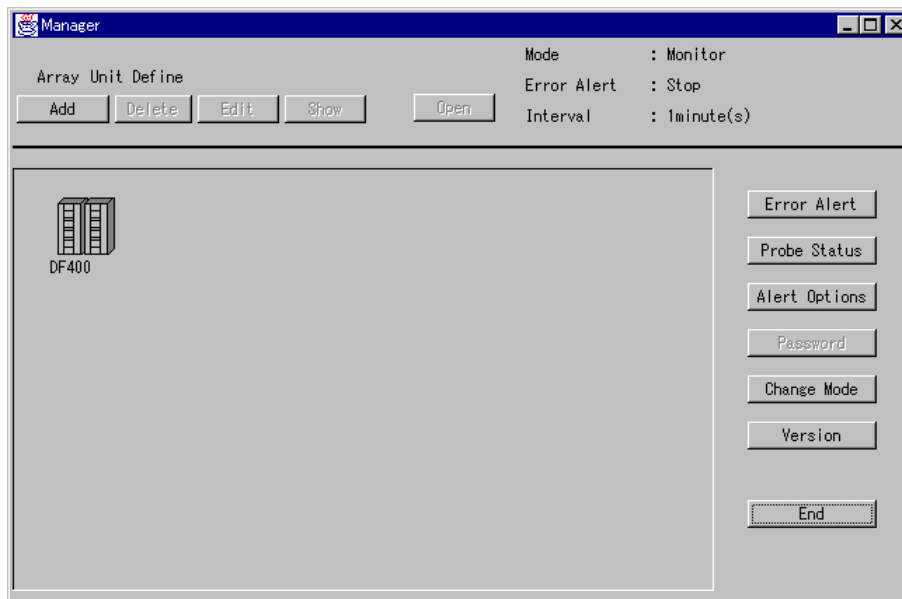
2. The version of the manager is displayed.



3.1.6 Terminating

Terminate the manager. When the unit window is open, close it and terminate the manager.

1. Click **End** in the main window.

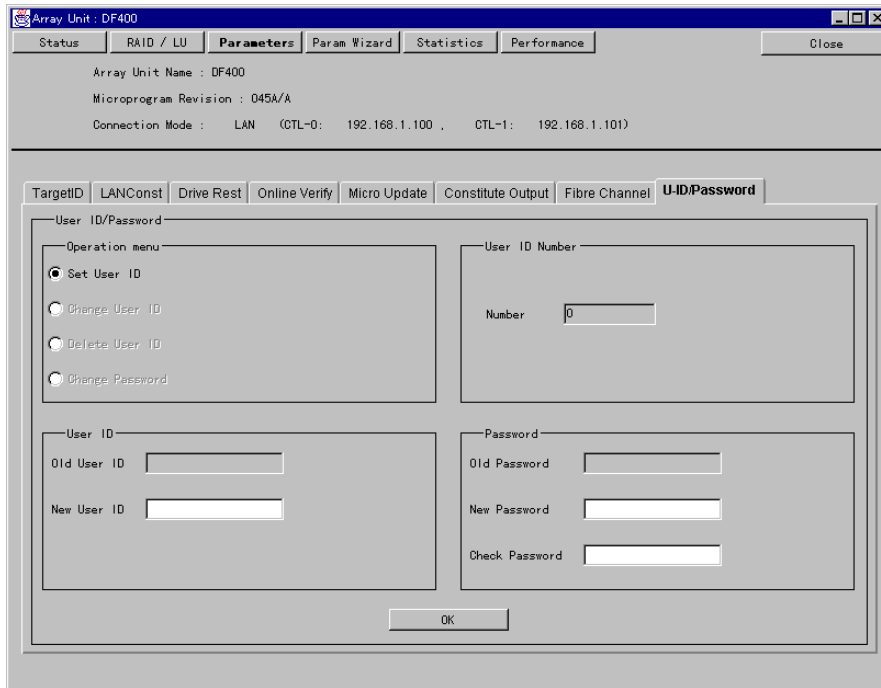


2. The manager is terminated and the main window is closed.

3.2 Array Unit Management by User ID

Operators who operate an array unit are managed by setting user IDs in the array unit. If no user ID has been set, anyone may operate. If a user ID has been set, the set user ID must be entered.

If no user ID has been registered, “0” is displayed in the **Number** field.

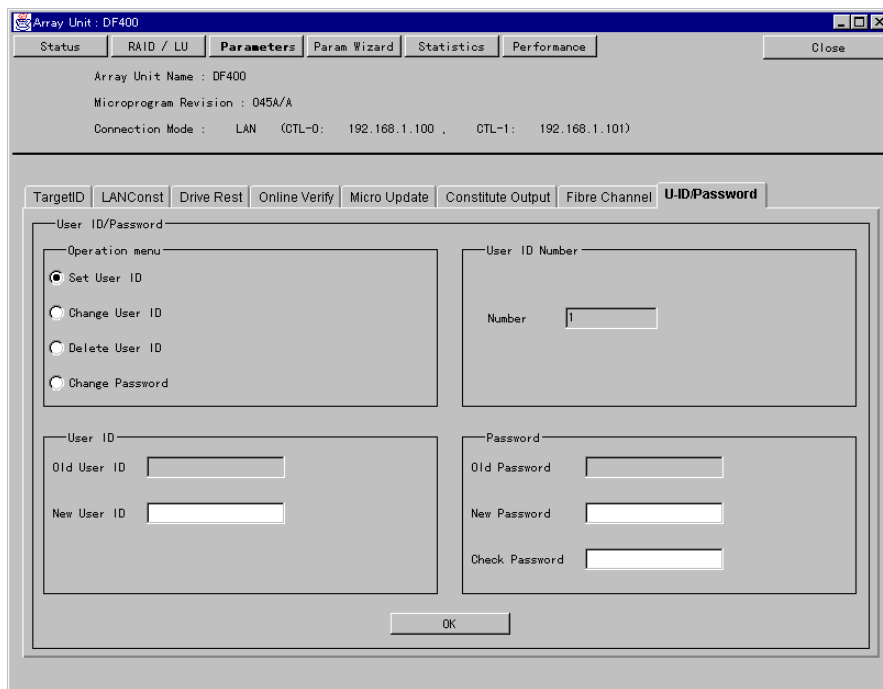


Management of operators by user ID is effective when operating the manager in management mode. When operating the manager in monitor mode, the manager may be operated regardless of whether a user ID has been registered or not.

3.2.1 Setting User ID

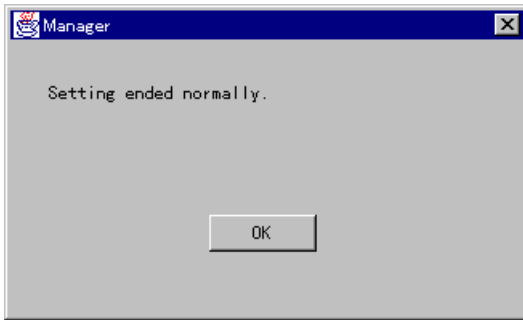
Sets a user ID in an array unit.

1. Clicks the **Parameters** button, then clicks the **U-ID/Password** tab.

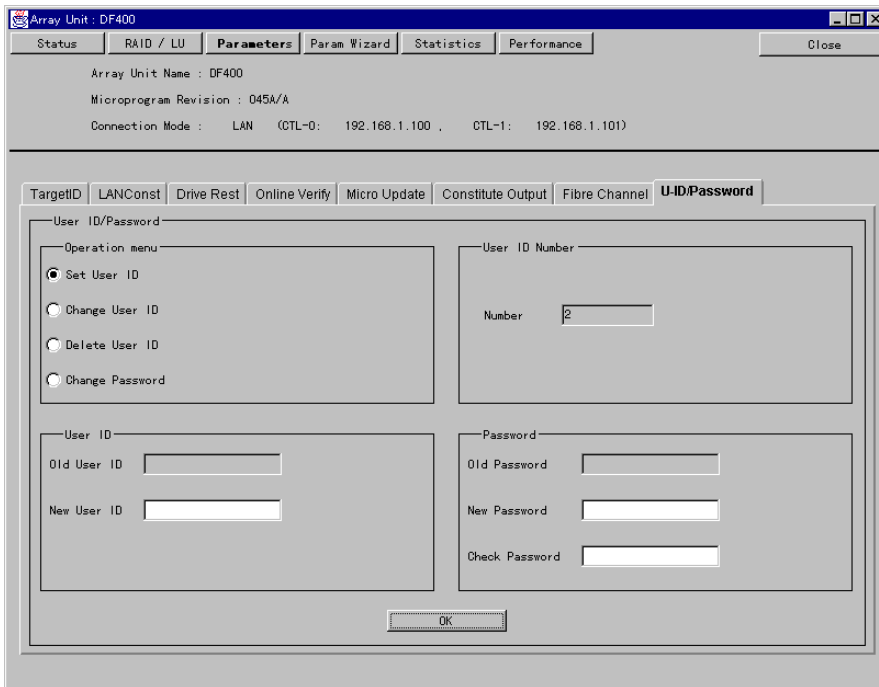


2. From the **Operation menu**, clicks the **Set User ID** option button. Enters into the **New User ID**, **New Password**, and **Check Password** fields their respective data, and then clicks the **OK** button.
 - **New User ID:** Specifies a user ID to register. Specifies with alphanumeric and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.
 - **New Password:** Specifies the password of a user ID to register. Specifies with alphanumeric and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.
 - **Check Password:** Specifies the same password as that of a user ID to register. Specifies with alphanumeric and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.

3. A message indicating completion of registering is displayed, so clicks the **OK** button.



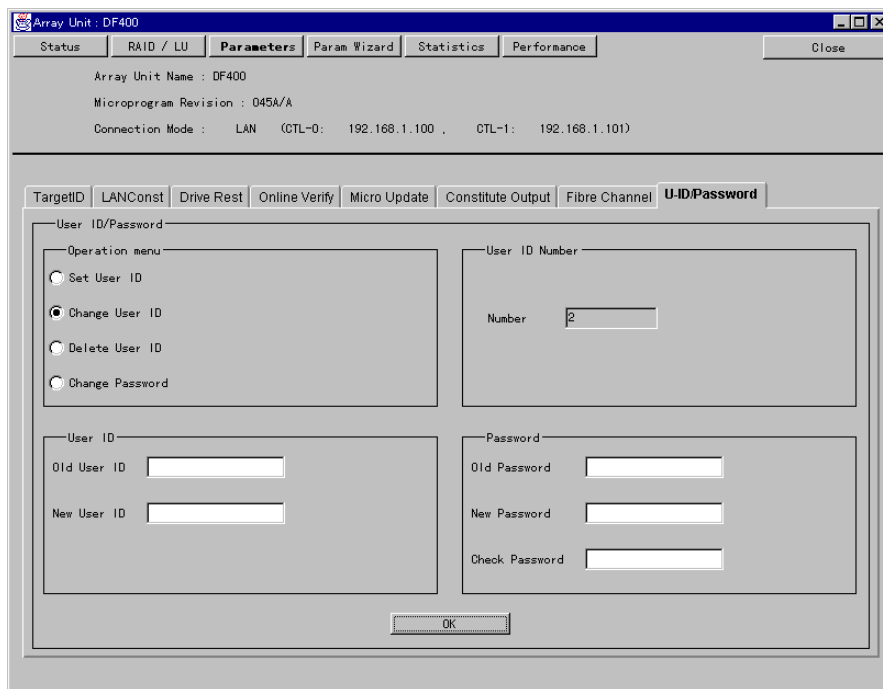
4. The number of user IDs registered is updated, and is displayed.



3.2.2 Changing User ID

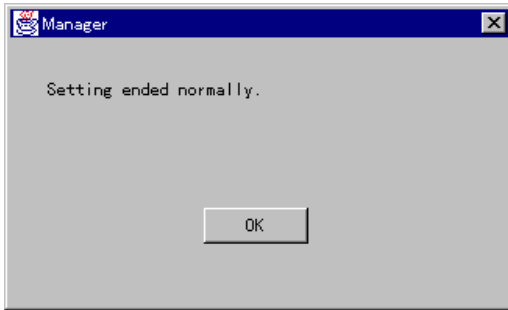
Changes a user ID already registered in an array unit.

1. Clicks the **Parameters** button, then clicks the **U-ID/Password** tab.



2. From the **Operation menu**, clicks the **Change User ID** option button. Enters into the **Old User ID**, **Old Password**, **New User ID**, **New Password**, and **Check Password** fields their respective data, and then clicks the **OK** button.
 - **Old User ID:** Specifies a user ID to change.
 - **New User ID:** Specifies a user ID to register. Specifies with alphanumerics and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.
 - **Old Password:** Specifies the password of a user ID to change.
 - **New Password:** Specifies the password of a user ID to register. Specifies with alphanumerics and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.
 - **Check Password:** Specifies the same password as that of a user ID to register. Specifies with alphanumerics and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.

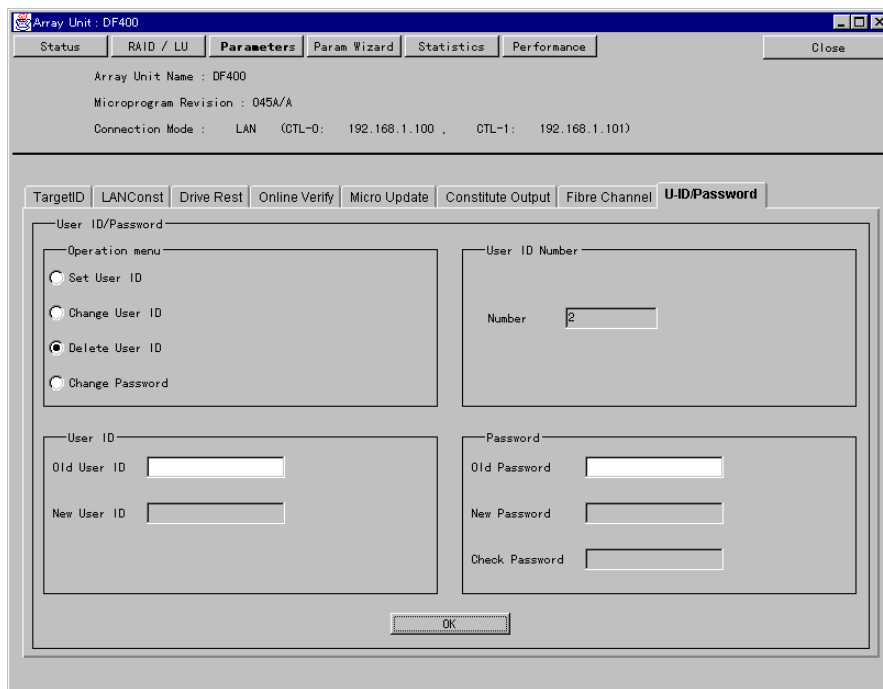
3. A message indicating completion of changing is displayed, then clicks the **OK** button.



3.2.3 Deleting User ID

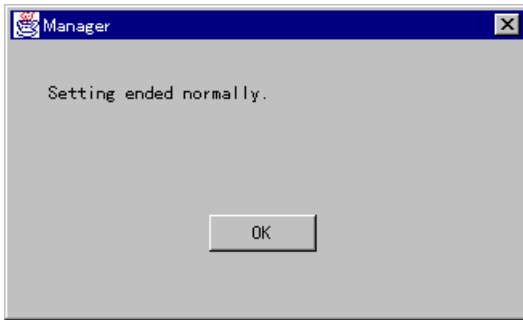
Deletes a user ID already registered in an array unit.

1. Clicks the **Parameters** button, then clicks the **U-ID/Password** tab.

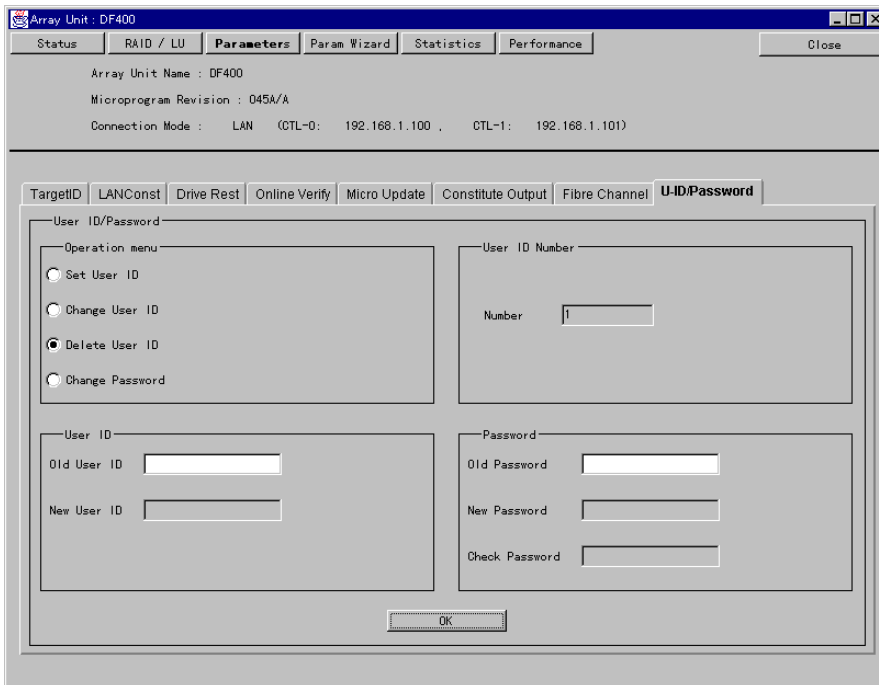


2. From the **Operation menu**, clicks the **Delete User ID** option button. Enters into the **Old User ID** and **Old Password** fields their respective data, and then clicks the **OK** button.
 - **Old User ID:** Specifies a user ID to change.
 - **Old Password:** Specifies the password of a user ID to change.

3. A message indicating completion of deleting is displayed, then clicks the **OK** button.



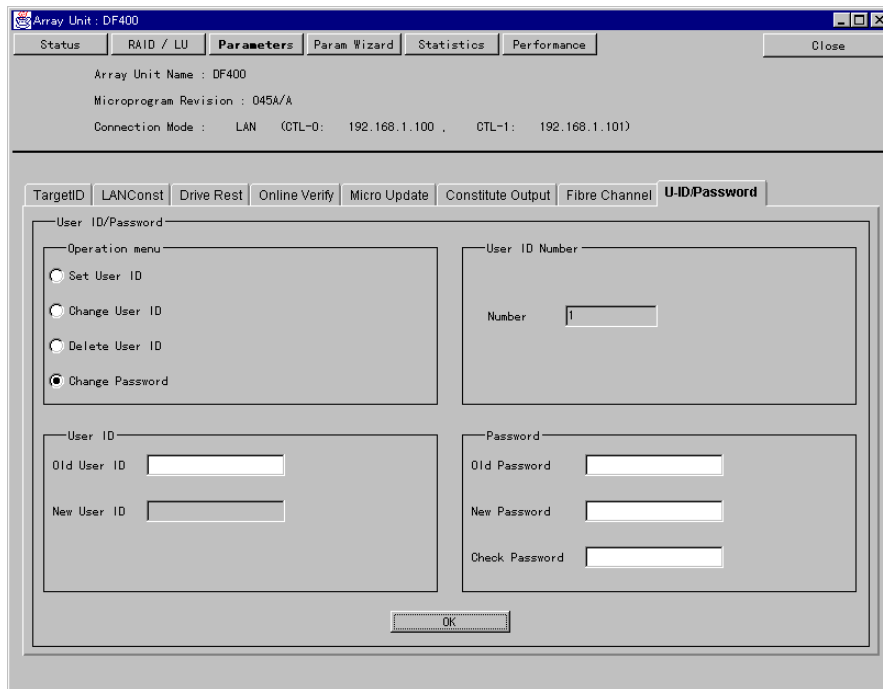
4. The number of user IDs registered is updated, and is displayed.



3.2.4 Changing Password

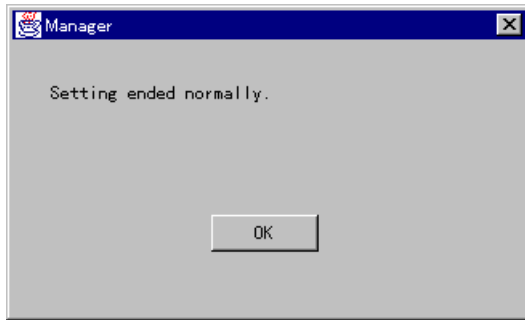
Changes the password of a user ID already registered in an array unit.

1. Clicks the **Parameters** button, then clicks the **U-ID/Password** tab.



2. From the **Operation menu**, clicks the **Change Password** option button. Enters into the **Old User ID**, **Old Password**, **New Password**, and **Check Password** fields their respective data, and then clicks the **OK** button.
 - **Old User ID:** Specifies a user ID to change.
 - **Old Password:** Specifies the password of a user ID to change.
 - **New Password:** Specifies the password of a user ID to register. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.
 - **Check Password:** Specifies the same password as that of a user ID to register. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.

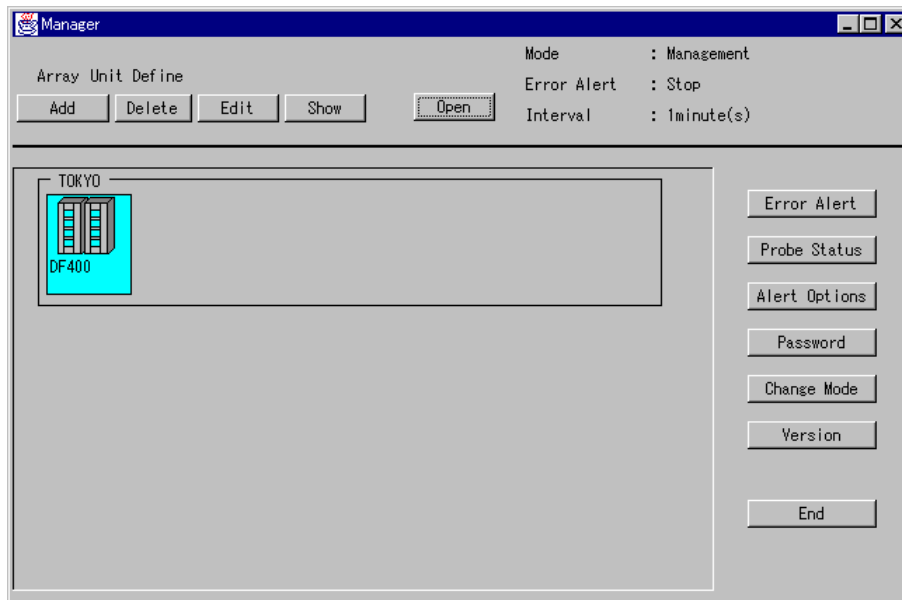
3. A message indicating completion of changing is displayed, then clicks the **OK** button.



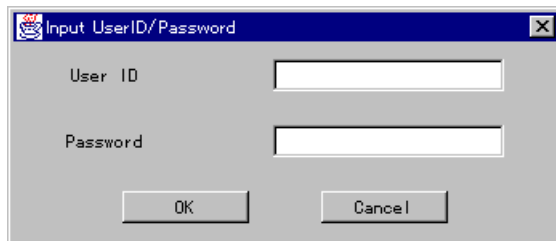
3.2.5 Logging into Array Unit

Logs into an array unit in which a user ID has been already registered.

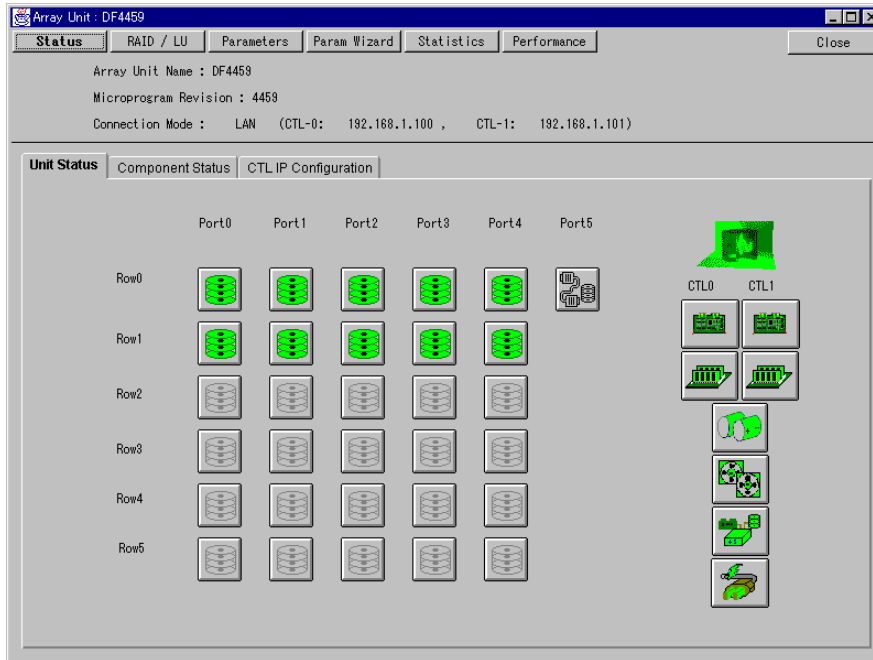
1. Sets the mode of operation to management mode.
2. Clicks the icon of an array unit to be connected on the main window, then clicks the **Open** button.



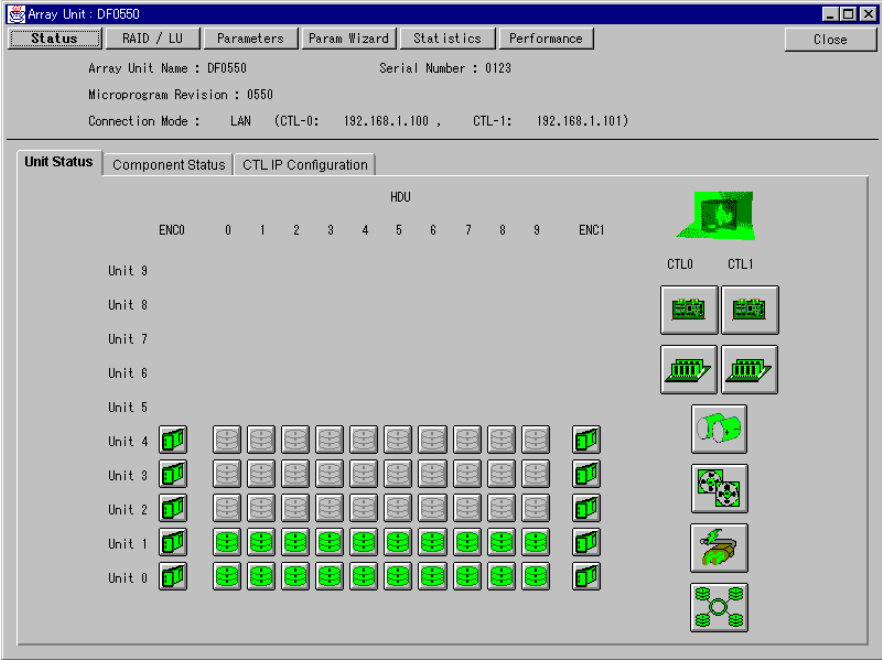
3. Enters a registered user ID and its password, then clicks the **OK** button.



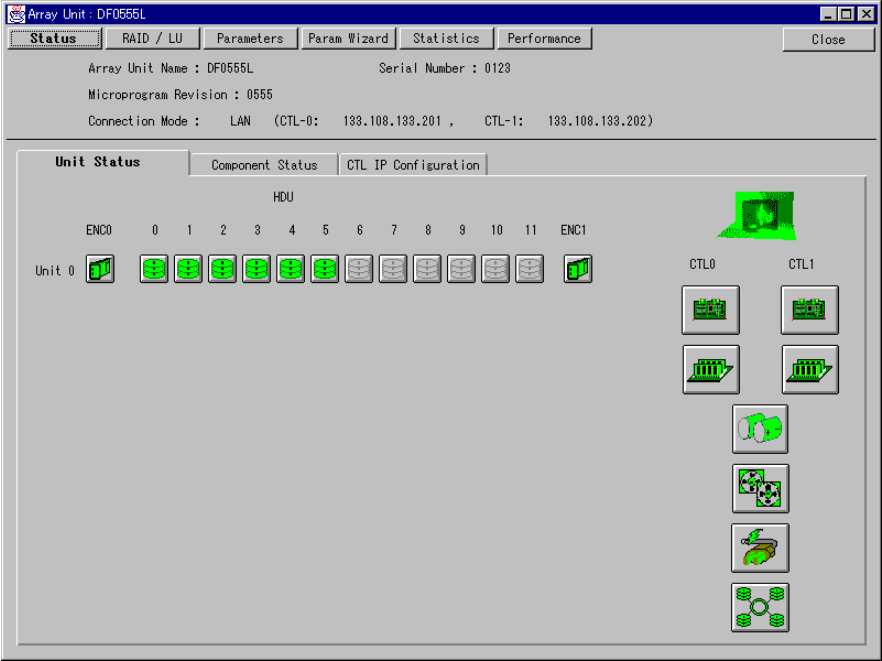
4. Logs in with the registered user ID, and the unit window is displayed.
 - a) For DF350 and DF400



b) For DF500 (CK, and RK model)



c) For DF500 (MK, and RKL model)

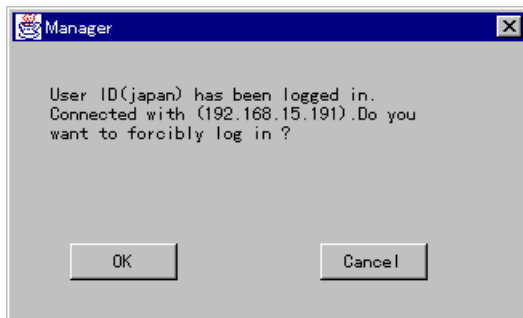


3.2.6 Logging into Array Unit Forcibly

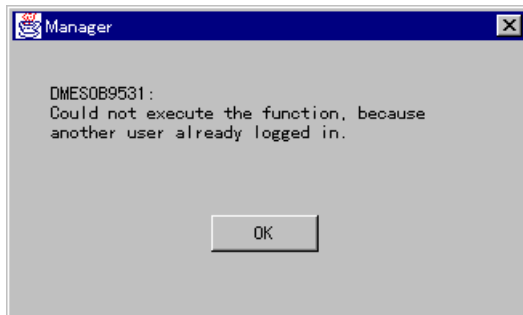
Logs out a user ID forcibly from an array unit to which a user has already logged in with the user ID, then logs in forcibly with another registered user ID.

When clicking the icon of an array unit to which a user has already logged in and then the **Open** button, a message indicating that a user has already logged in is displayed. The message indicates the user ID of an already logged-in user and connection information.

- Message when opening the unit window

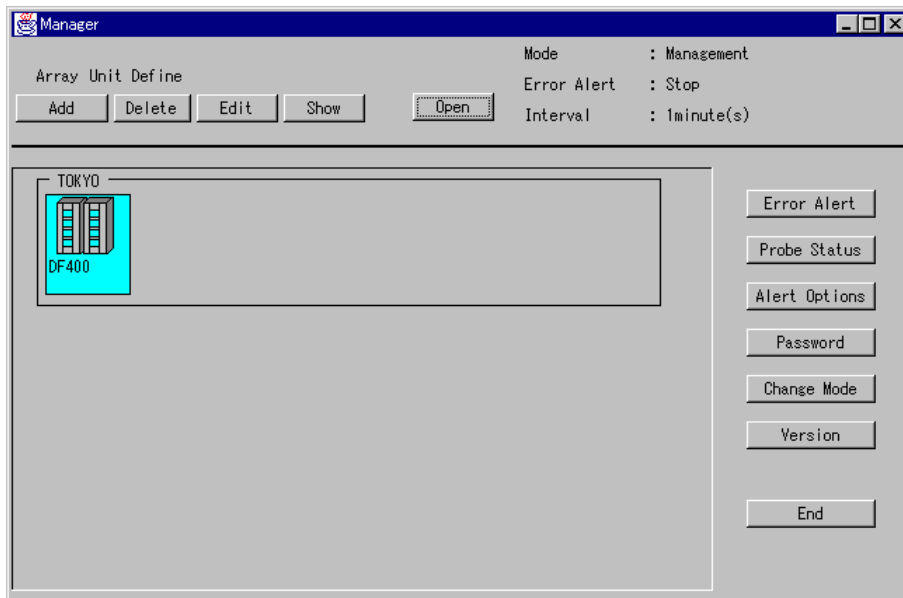


- Message while operating on the unit window

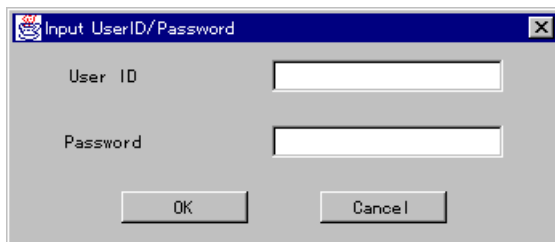


A user ID with which a user has logged in and connection information are not displayed. Close the unit window, then open it again, and check a user ID with which a user has logged in.

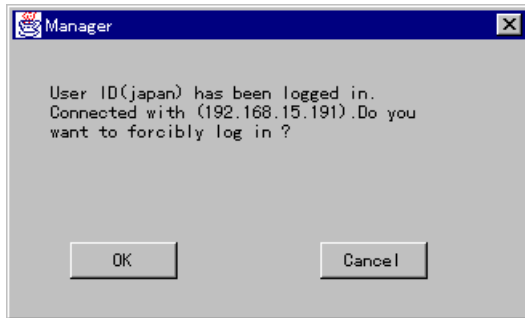
1. Terminates the manager, and restarts the manager by appending the “-discon” option of the Forcibly Logging In command.
 - a) With Windows, edits the description contents of startmgr.bat (a batch file used to start the manager) and adds the “-discon” option.
Example : jrew -cp .\CONFMNG.JAR jp.co.hitachi.str.diskarray.DiskArrayManager -discon
 - b) With Solaris and IRIX, it is started with the “-discon” option appended when starting the manager.
Example : ./ startmgr -discon
2. Restarts the manager, and sets the mode of operation to management mode.
3. Clicks the icon of an array unit to be connected on the main window, then clicks the **Open** button.



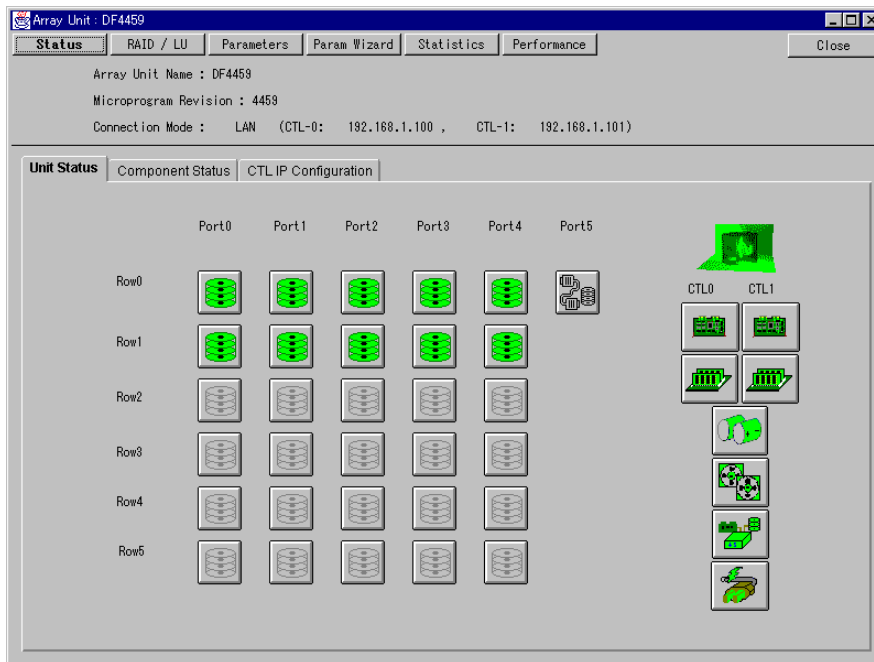
4. Enters a registered user ID and its password, then clicks the **OK** button.



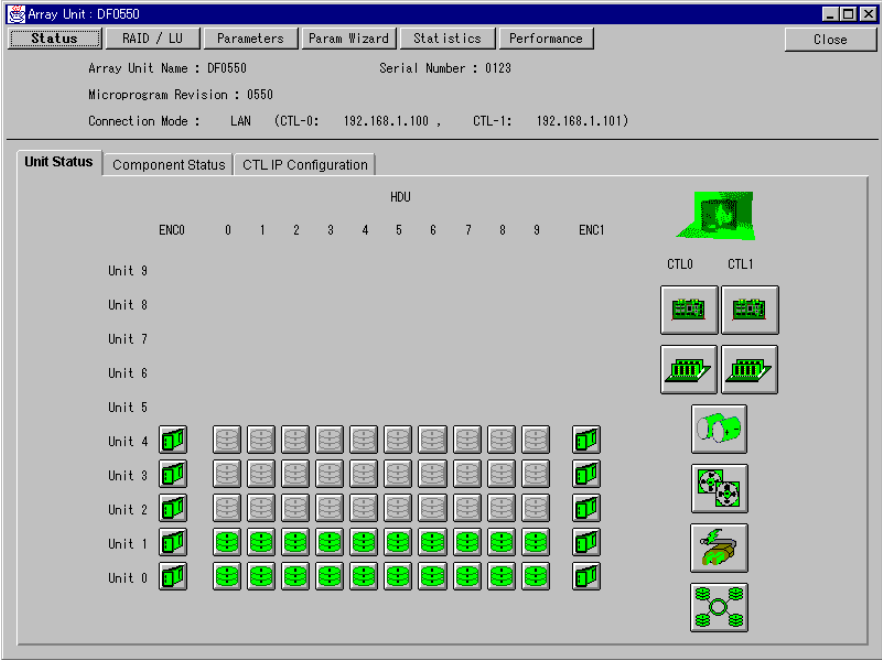
5. A user ID with which a user has logged in and its password are displayed. When logging in forcibly, clicks the **OK** button.



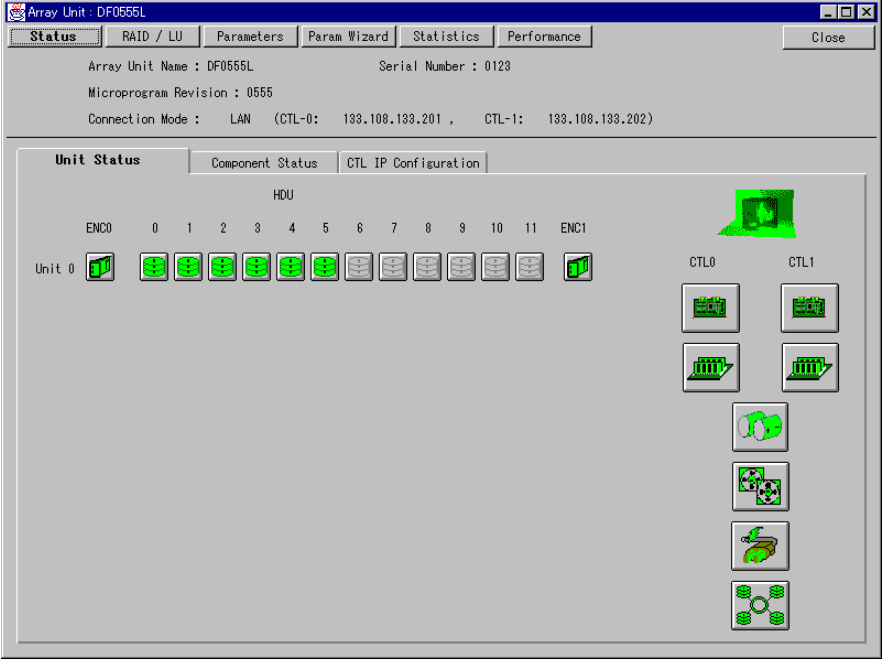
6. Logging in with an entered user ID is done, and the unit window is displayed.
 - a) For DF400



b) For DF500 (CK, and RK model)



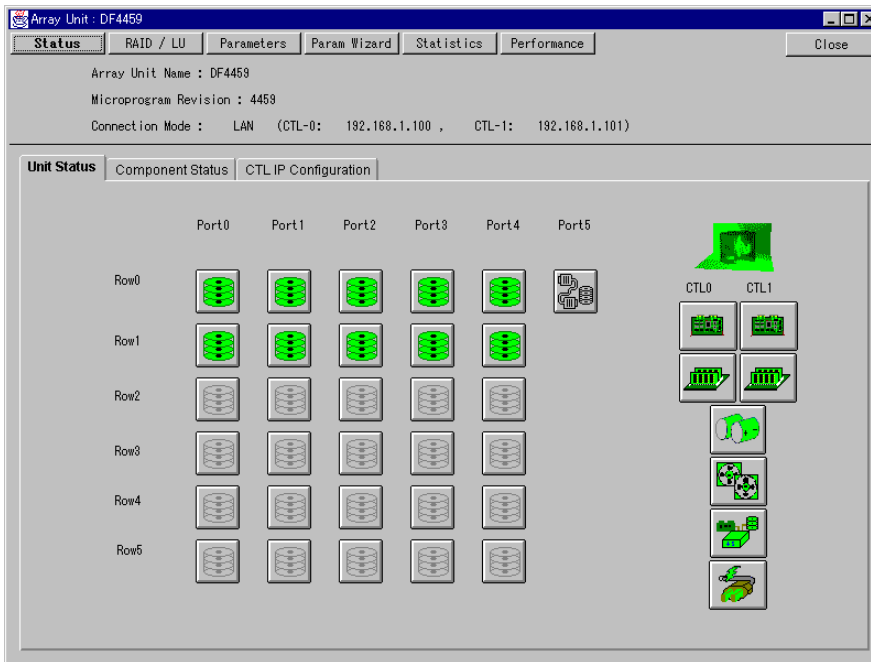
c) For DF500 (MK, and RKL model)



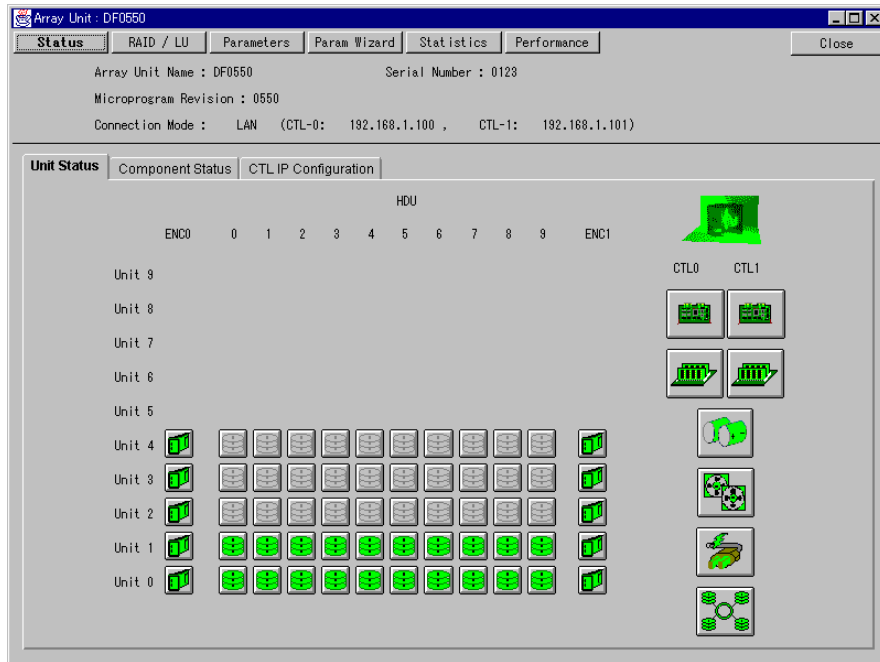
3.2.7 Logging Out from Array Unit

Logs out a user ID forcibly from an array unit to which a user has already logged in with the user ID, then logs in forcibly with another registered user ID.

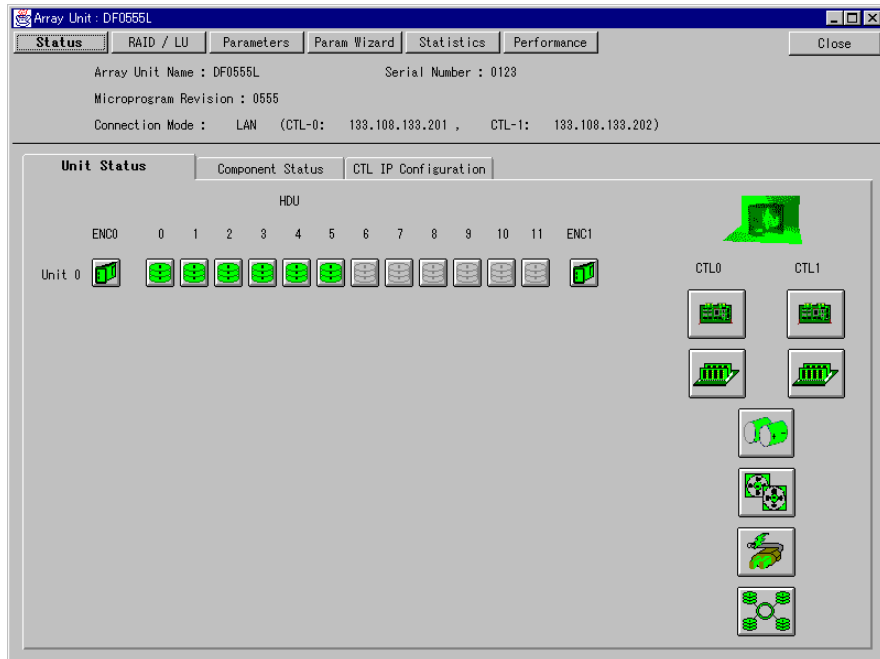
1. Clicks the **Close** button on the unit window .
 - a) For DF400



b) For DF500 (CK, and RK model)



c) For DF500 (MK, and RKL model)



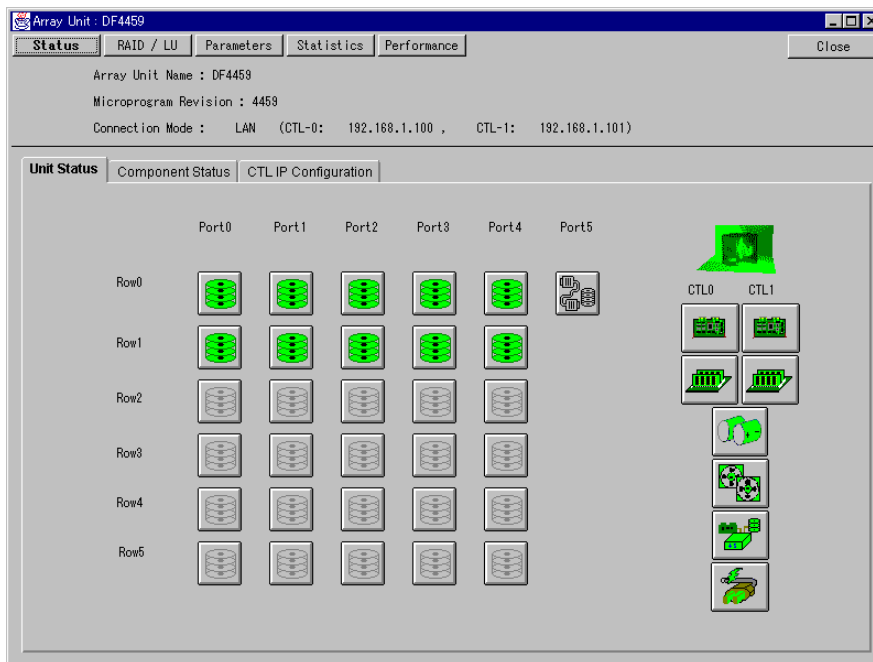
2. Logging out is done, and the unit window is closed.

3.3 Displaying the Array Unit Configuration

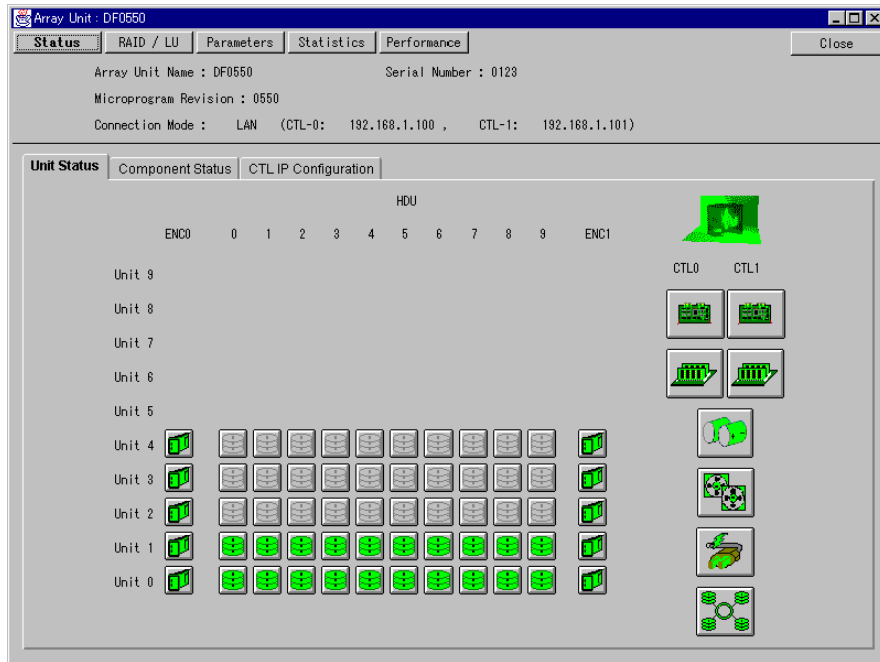
3.3.1 Displaying the array unit components by icons

Display the array unit component status and information by using icons. When you click the icon of each component, the information of each component is displayed.

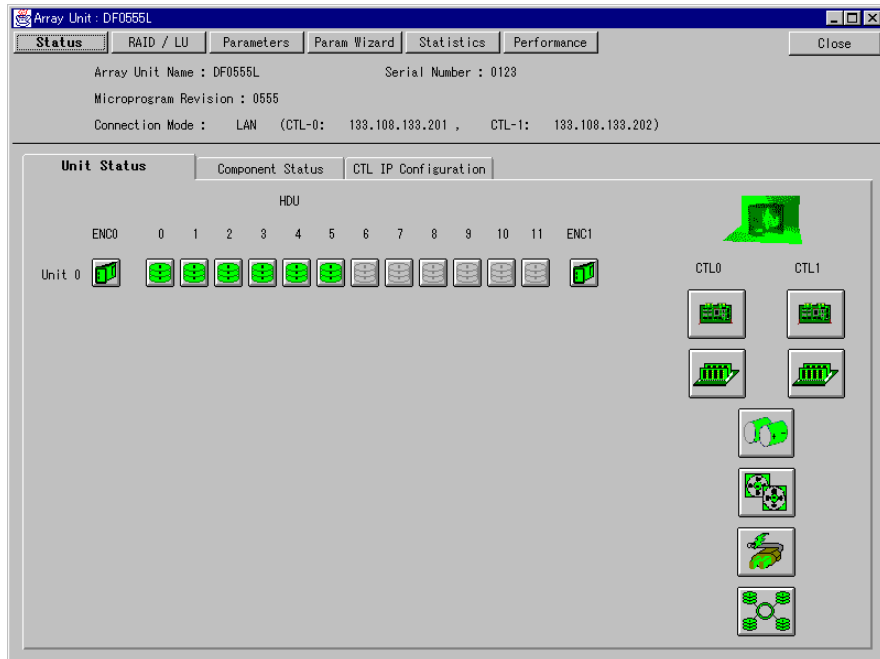
1. Click **Status**, then click the **Unit Status** tab.
The array unit component status is displayed.
To update the component display, click the **Status** button once.
- Display when both controllers are connected in the dual system
 - a) For DF350, DF350F, and DF400



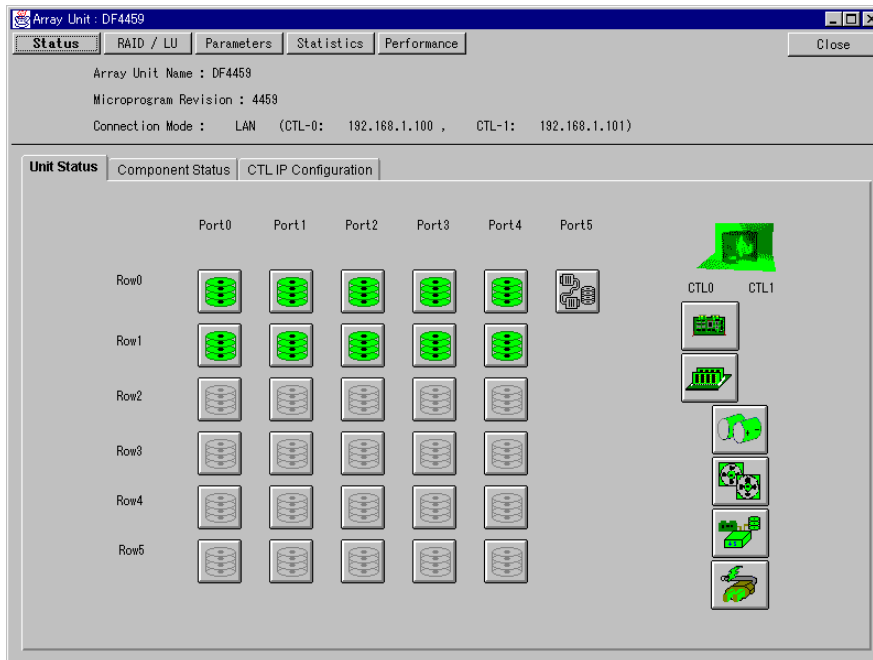
b) For DF500 (CK, and RK model)



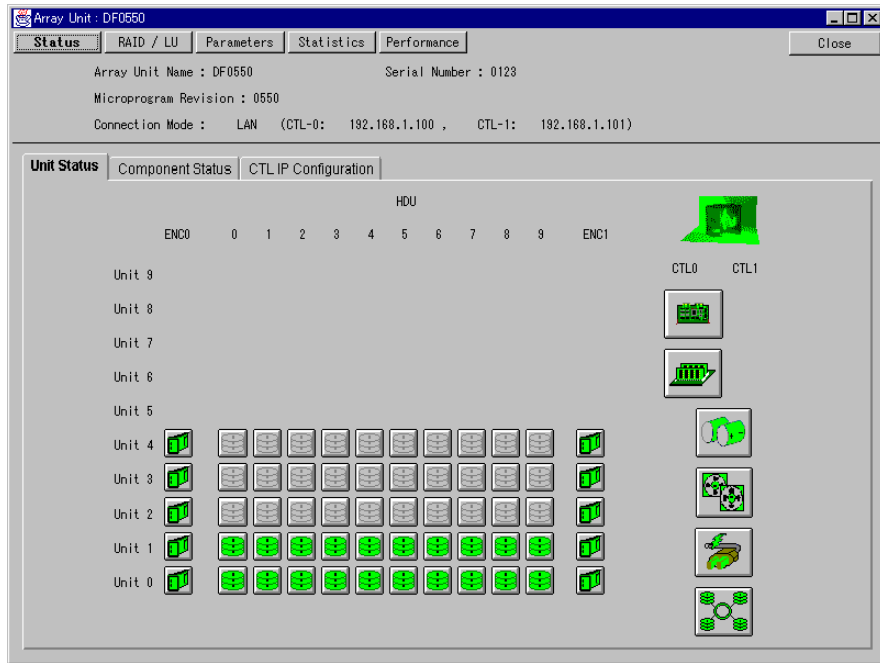
c) For DF500 (MK, and RKL model)



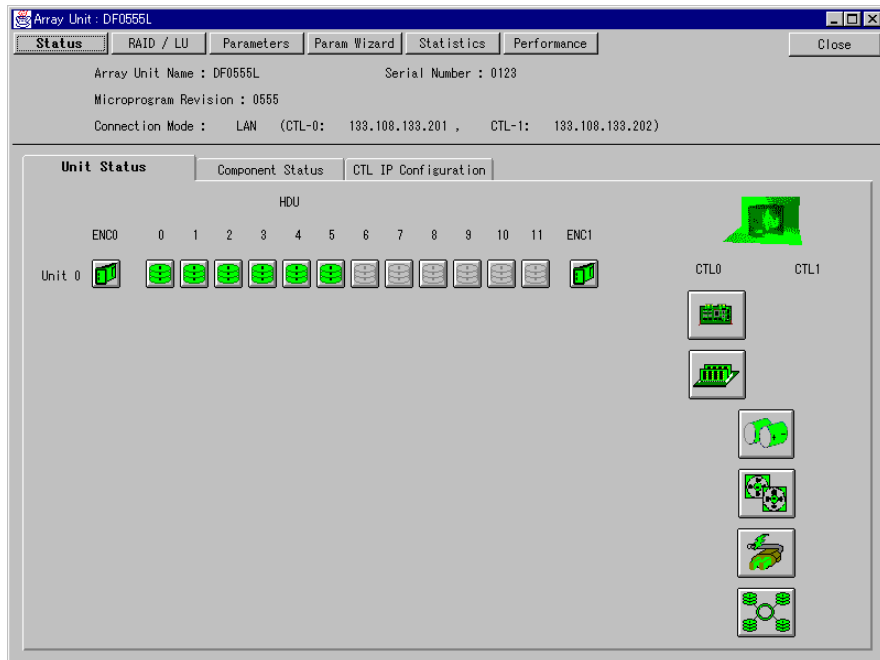
- Display when a single controller is connected in the dual system
 - a) For DF350, DF350F, and DF400



b) For DF500 (CK, and RK model)

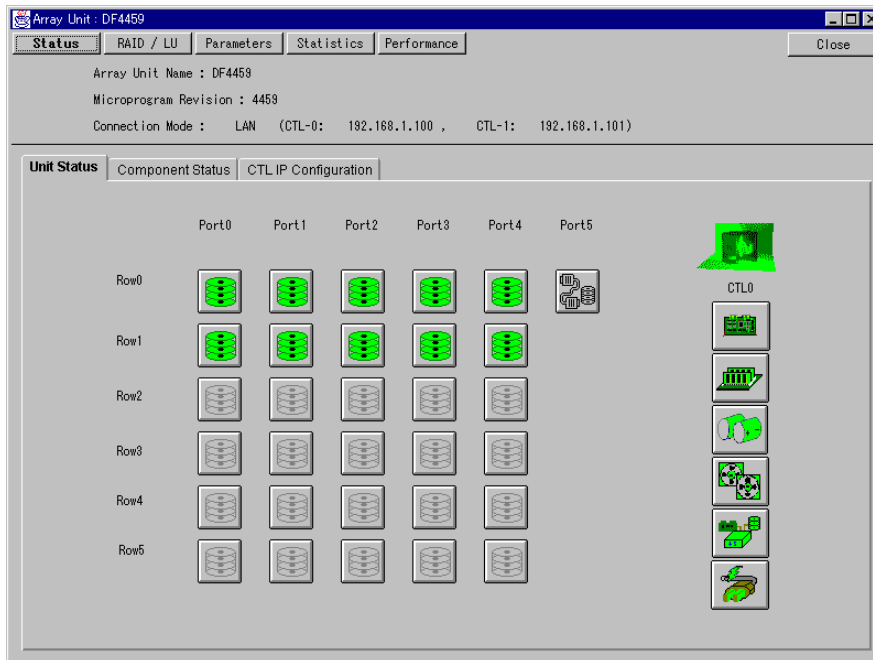


c) For DF500 (MK, and RKL model)

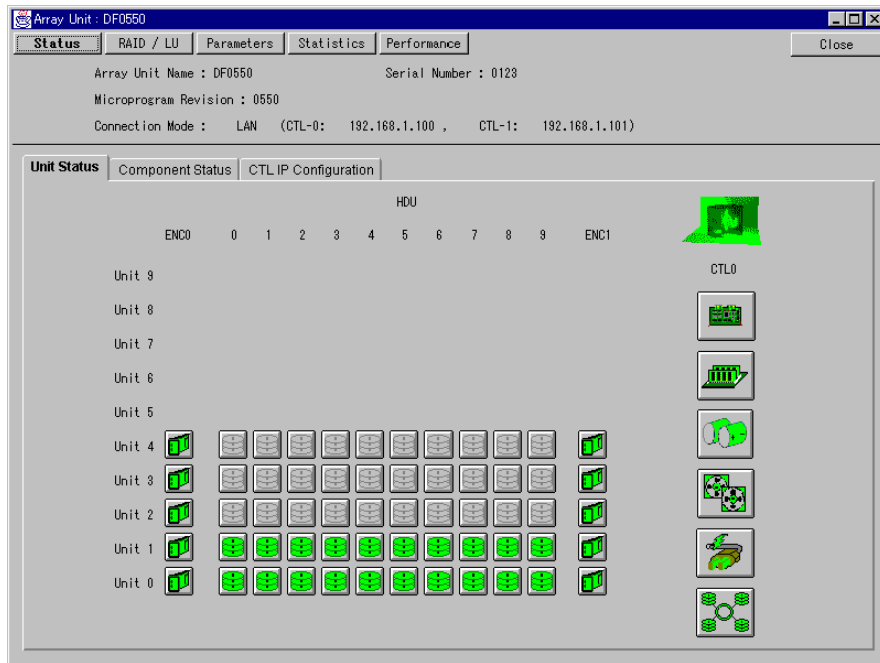


Regarding the display of the controller and cache icons, only the connected controller side is displayed.

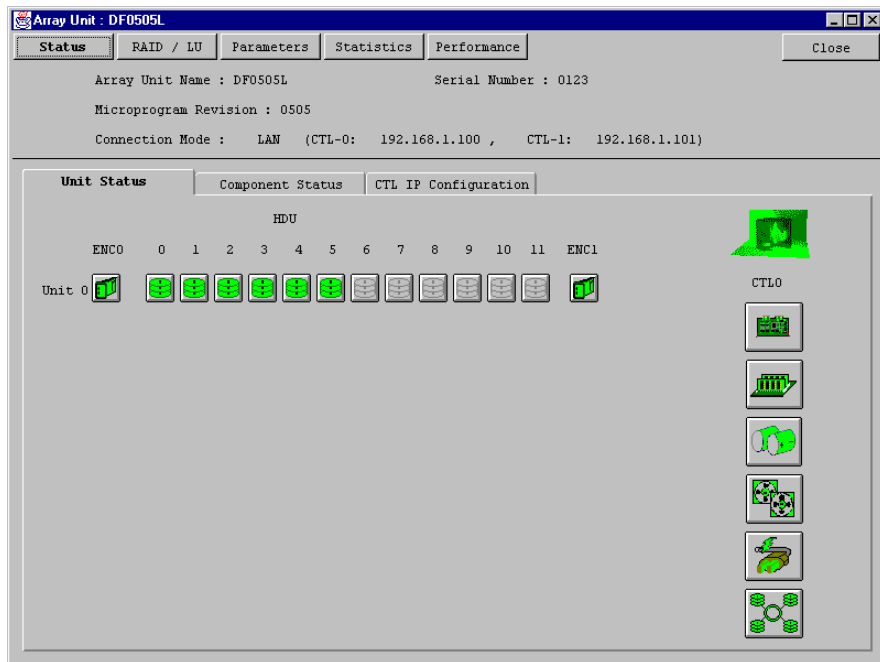
- Display when the single system is connected
 - a) For DF350, DF350F, and DF400



b) For DF500 (CK, and RK model)



c) For DF500 (MK, and RKL model)










The icon of each component to be displayed represents the status by its color. The relationship between icons and status represented by colors is shown below.

a) Array unit status






 Green	<ul style="list-style-type: none"> • Normal
 Yellow	<ul style="list-style-type: none"> • Warned

Note: “Warned” is displayed in the status that the array unit is given a warning. It is displayed when the microprogram revision is 0404 or later in the case of the DF400 or 0307/J or later in the case of the DF350 and when one of the failure factors shown in b) to i) below is generated or the array unit is given a warning owing to other cause. If the microprogram revision is other than the above, “Warned” is displayed only when one of the failure factors shown in b) to i) below is generated.



b) Data drive

 Green	<ul style="list-style-type: none"> • Normal (There is a formatted LU.)
 Yellow	<ul style="list-style-type: none"> • Collection reconstruction status • Copy-back status from the spare disk
 Red	<ul style="list-style-type: none"> • Blockade
 Green line	<ul style="list-style-type: none"> • RAID group defined, LU not defined • LU defined, unformatted
 Red line	<ul style="list-style-type: none"> • Not mounted in the blockade status
 Yellow line	<ul style="list-style-type: none"> • RAID group defined, Drive not mounted
 Gray line	<ul style="list-style-type: none"> • RAID group not defined, Drive mounted
No indication	<ul style="list-style-type: none"> • RAID group not defined, Drive not mounted • Not supported location




c) Spare drive

 Green	<ul style="list-style-type: none"> • Spare drive in use
 Yellow	<ul style="list-style-type: none"> • Data reconstruction to spare drive • Copy-back from spare disk to data disk
 Gray	<ul style="list-style-type: none"> • Waiting
No indication	<ul style="list-style-type: none"> • Spare drive not available
 Red	<ul style="list-style-type: none"> • Busy or Disk Drive Detached for Restoring
 Red line	<ul style="list-style-type: none"> • Spare disk not mounted though Use of Spare Disk is set as array unit



d) Enclosure

 Green	<ul style="list-style-type: none"> • Normal
 Red	<ul style="list-style-type: none"> • Failure



e) Controller

 Green	<ul style="list-style-type: none"> • Normal
 Red	<ul style="list-style-type: none"> • Failure
 Yellow	<ul style="list-style-type: none"> • Battery backup circuit failure
No indication	<ul style="list-style-type: none"> • Only one controller registered in the dual system



f) Cache

 Green	<ul style="list-style-type: none"> • Normal
 Red	<ul style="list-style-type: none"> • Failure
No indication	<ul style="list-style-type: none"> • Only one controller registered in the dual system • Status judgement is impossible because connection with the controller is disabled.



g) Battery

 Green	<ul style="list-style-type: none"> • Normal
 Red	<ul style="list-style-type: none"> • Failure



h) Fan

 Green	<ul style="list-style-type: none"> • Normal
 Red	<ul style="list-style-type: none"> • Failure


i) DC power supply

 Green	<ul style="list-style-type: none"> • Normal
 Red	<ul style="list-style-type: none"> • Failure

j) AC power supply

 Green	<ul style="list-style-type: none"> • Normal
 Red	<ul style="list-style-type: none"> • Failure

k) Loop

 <p>Green</p>	<ul style="list-style-type: none"> • Normal
 <p>Red</p>	<ul style="list-style-type: none"> • Failure

- When you click each icon, the information of the component part indicated by the icon is displayed.
The following information is displayed by clicking the icon of each component.
For data drives and spare drives, information when clicking their respective icons is displayed. For other components of an array unit, information when displaying a screen is displayed.

a) Data drive and spare drive

- For DF350, DF350F, and DF400

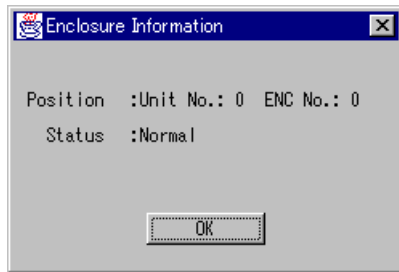


- For DF500



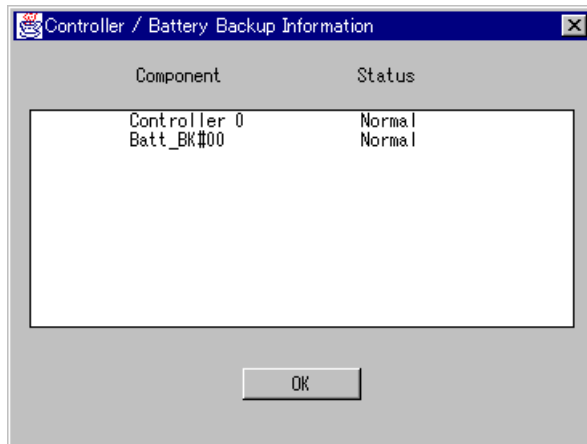
- **Vendor ID:** Vendor ID of drive
 - **Product ID:** Product ID of drive
 - **Revision:** Firmware revision of drive
 - **Drive Type:** Drive using form
 - Data:** Data drive
 - Spare:** Spare drive
 - **Position:** Array unit mounting position
Port No. and row No. for DF350, DF350F, and DF400
Unit No. and HDU No. for DF500
 - **Drive State:** Drive status
 - Normal:** Normal
 - Detached:** Blockade
 - Detached (Unmount):** The drive in the blockade status is not installed.
 - Standby:** Normal (LU not defined)
 - Out of RG:** Normal (RAID not defined)
 - Undefine:** Normal (LU not defined)
 - Unmount:** The drive is not installed.
 - (nn%):** Under recovery (correction copy or copyback in progress)
The progressing condition (in %) of recovery is displayed in parentheses.
For DF350, DF350F, and DF400
 - PortX RowY:** Position of a corresponding data drive when using spare disk drives.
For DF500
 - UnitX HDUY:** Position of a corresponding data drive when using spare disk drives.
 - Waiting:** Spare drive not used
 - **Drive capacity:** Storage capacity of a drive
- Note:** **Vendor ID**, **Product ID**, and **Revision** may not be displayed depending on the drive mounting and drive status.

b) Enclosure



- **Position:** Mounting position of an enclosure (Unit No. and ENC No.)
- **Status:** Status
 - **Normal:** Normal
 - **Alarm:** Failure

c) Controller and battery backup circuit

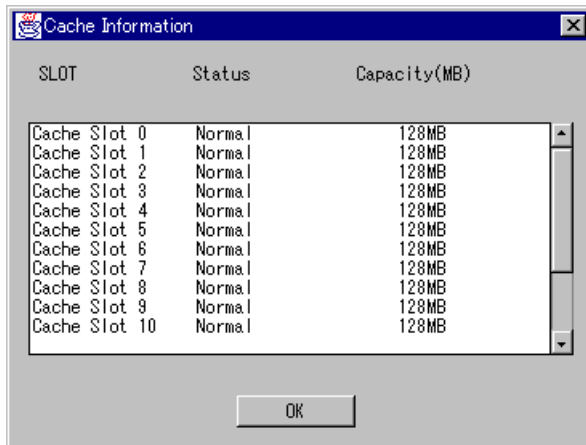


Controller: Controller n (n : Controller No.)

Battery backup circuit: Batt_bk#nn (nn : No.)

- **Component:** Mounting position
- **Status:** Status
 - **Normal:** Normal
 - **Alarm:** Failure
 - **Nothing:** Not installed

d) Cache

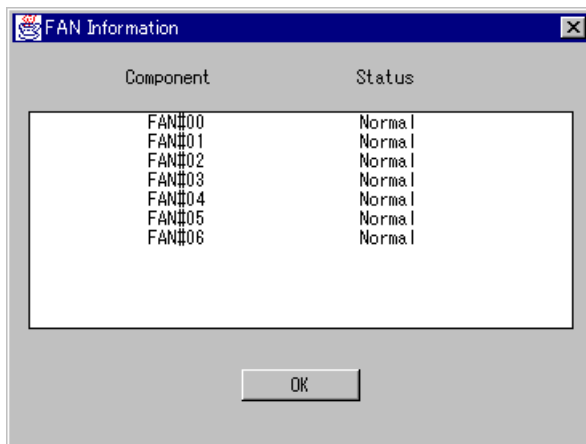


The image shows a dialog box titled "Cache Information" with a table of cache slots. The table has three columns: SLOT, Status, and Capacity(MB). All slots from 0 to 10 are listed with a status of "Normal" and a capacity of "128MB".

SLOT	Status	Capacity(MB)
Cache Slot 0	Normal	128MB
Cache Slot 1	Normal	128MB
Cache Slot 2	Normal	128MB
Cache Slot 3	Normal	128MB
Cache Slot 4	Normal	128MB
Cache Slot 5	Normal	128MB
Cache Slot 6	Normal	128MB
Cache Slot 7	Normal	128MB
Cache Slot 8	Normal	128MB
Cache Slot 9	Normal	128MB
Cache Slot 10	Normal	128MB

- **SLOT:** Mounting position
- **Status:** Status
 - **Normal:** Normal
 - **Alarm:** Failure
 - **Nothing:** Not installed
 - **---**: Unsupported slot
- **Capacity (MB):** Installed capacity

e) Fan

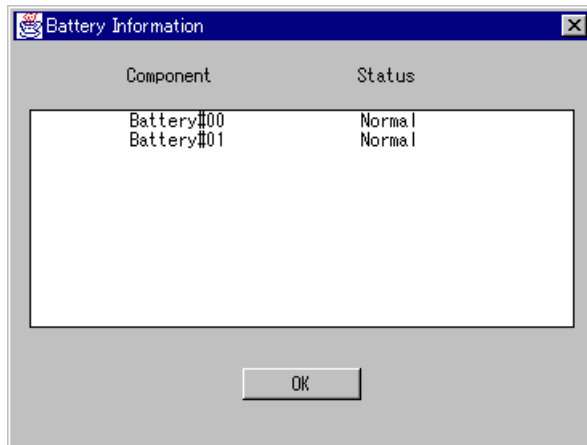


The image shows a dialog box titled "FAN Information" with a table of fan components. The table has two columns: Component and Status. All components from FAN#00 to FAN#06 are listed with a status of "Normal".

Component	Status
FAN#00	Normal
FAN#01	Normal
FAN#02	Normal
FAN#03	Normal
FAN#04	Normal
FAN#05	Normal
FAN#06	Normal

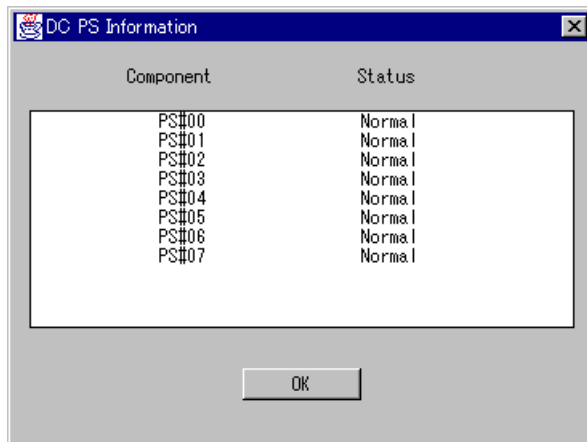
- **Component:** Mounting position
- **Status:** Status
 - **Normal:** Normal
 - **Alarm:** Failure
 - **Nothing:** Not installed

f) Battery



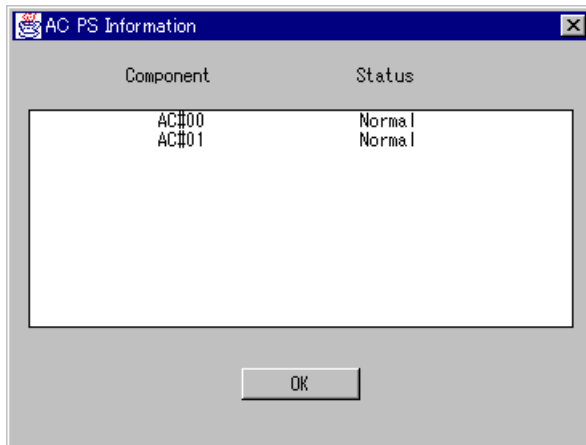
- **Component:** Mounting position
- **Status:** Status
 - **Normal:** Normal
 - **Alarm:** Failure
 - **Nothing:** Not installed

g) DC power supply



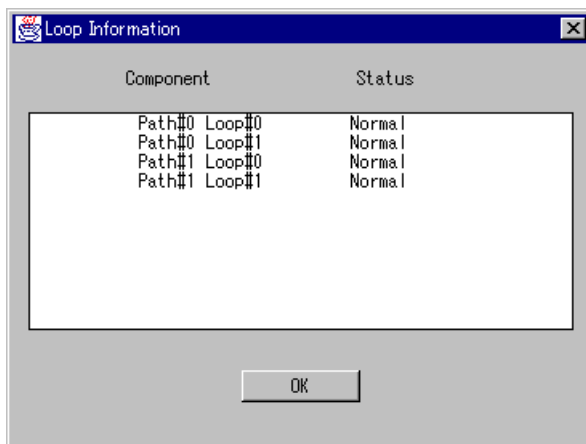
- **Component:** Mounting position
- **Status:** Status
 - **Normal:** Normal
 - **Alarm:** Failure
 - **Nothing:** Not installed

h) AC power supply



- **Component:** Mounting position
- **Status:** Status
 - **Normal:** Normal
 - **Alarm:** Failure
 - **Nothing:** Not installed

i) Loop

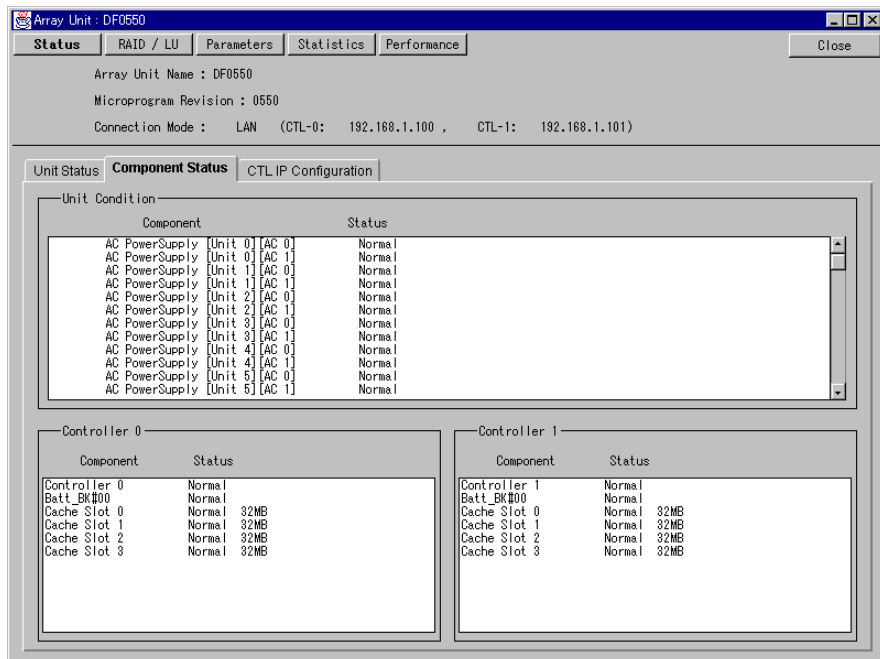


- **Component:** Mounting position
- **Status:** Status
 - **Normal:** Normal
 - **Alarm:** Failure
 - **Nothing:** Not installed

3.3.2 Displaying the array unit component list

Display the array unit component information list.

1. Click **Status**, then click the **Component Status** tab.
The array unit component status is displayed as a list.
To update the component display, click the **Status** button once again.



This list display is made in two divided portions, namely, array unit components and controller components. The contents of the displayed list are the same as those displayed by clicking the icon of each component.

When the array unit is connected to the single system, the controller 1 side is not displayed.

When a single controller is connected in the dual system, only the connected controller side is displayed.

3.3.3 Displaying the array unit configuration information

Display the array unit configuration information.

1. Click **Status**, then click the **CTL IP Configuration** tab.
The IP Address and Subnet Mask of the LAN configuration information that is validated in the array unit are displayed.
To update the component display, click the **Status** button.

The screenshot shows a web-based configuration interface for an Array Unit. The window title is "Array Unit : DF0550". At the top, there are tabs for "Status", "RAID / LU", "Parameters", "Statistics", and "Performance". A "Close" button is located in the top right corner. Below the tabs, the following information is displayed:

- Array Unit Name : DF0550
- Microprogram Revision : 0550
- Connection Mode : LAN (CTL-0: 192.168.1.100 , CTL-1: 192.168.1.101)

The main content area has three sub-tabs: "Unit Status", "Component Status", and "CTL IP Configuration". The "CTL IP Configuration" tab is active. It contains a table with two columns: "Controller 0" and "Controller 1". The rows are "IP Address", "Subnet Mask", and "Default Gateway". Each cell in the table contains an empty text input field.

	Controller 0	Controller 1
IP Address	<input type="text"/>	<input type="text"/>
Subnet Mask	<input type="text"/>	<input type="text"/>
Default Gateway	<input type="text"/>	<input type="text"/>

3.4 Definition of RAID/LU

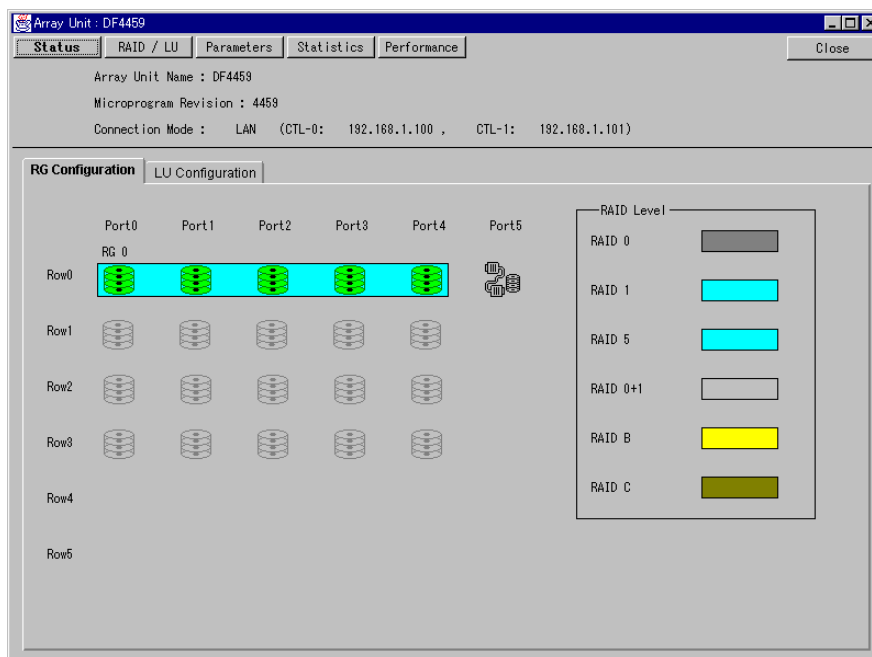
Setting, expanding and deleting the RAID group, and creating, expanding, and deleting etc. the logical unit are executed.

In the monitor mode, the current definition information is displayed but no button for definition is displayed.

- Displaying the **RAID group definition**

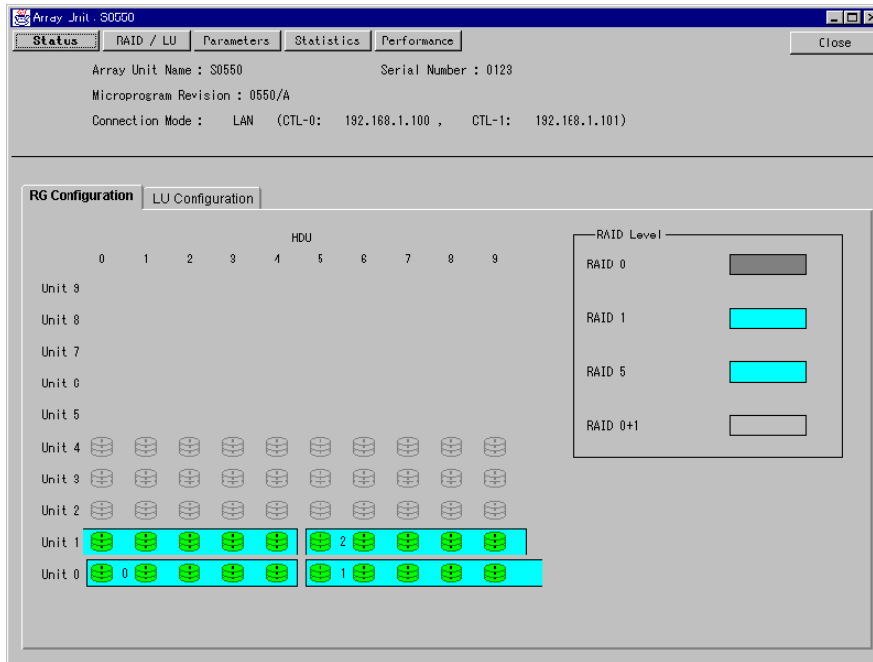
Click **RAID/LU** in the unit window, then click the **RG Configuration** tab.

a) For DF350, DF350F, and DF400



The drive mounting status of an array unit is displayed with the logical position of the port and row. Defined RAID groups are displayed in colors corresponding to individual RAID levels, and defined RAID group Nos. are displayed at the upper side of the object of the top disk drive in individual groups.

b) For DF500

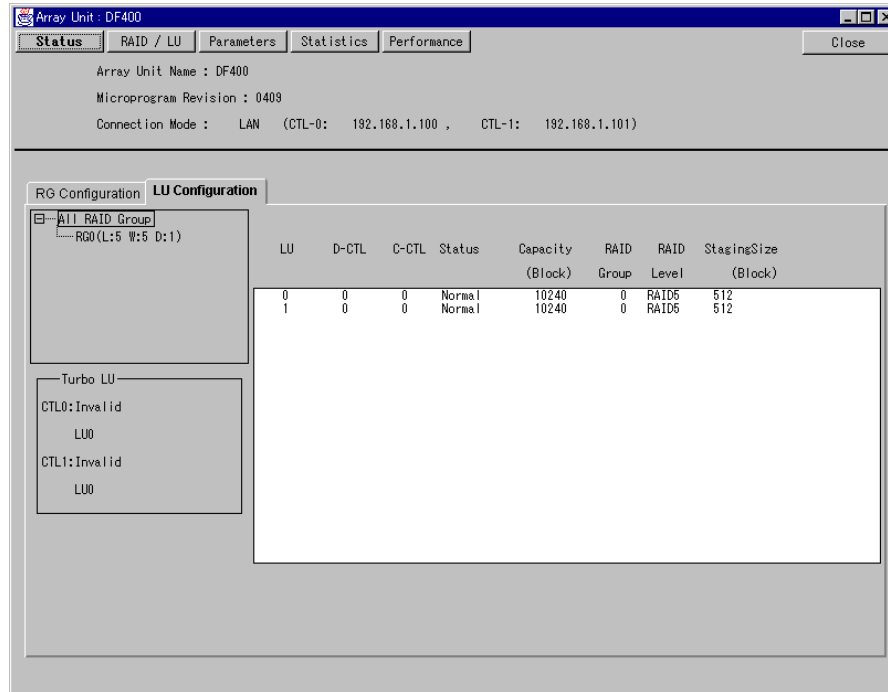


The drive mounting status of an array unit is displayed with the unit No. and HDU No.. Defined RAIDs are classified by RAID level and defined RAID group numbers are displayed with the left side of the first drive of the respective groups. If a created RAID group spans between units (RAID group 1 in the figure above), the group is displayed with the right side of the Unit0, HDU9 frame and the left side of the Unit1, HDU0 frame both deleted, and with the frames expanded sideways.

The drive display is the same as the window displayed by clicking **Status** and then clicking the **Unit Status** tab.

- Displaying the **LU definition**

Click **RAID/LU** in the unit window, then click the **LU Configuration** tab.



As the logical unit display, select the contents to be displayed by selecting an item indicating the RAID information in the right part of the window.

- **All RAID Group:** Displays the definition information of all logical units defined in the array unit.
- **RGn:** Displays the definition information of all logical units defined in RAID group No.n.

As the logical unit information, the following 8 items are displayed.

- **LU:** Logical unit number
- **D-CTL:** Controller No. in charge of the default LU
- **C-CTL:** Controller No. in charge of the current LU
- **Status:** Logical unit status
- **Capacity:** Capacity in which the logical unit is defined (Unit : Block)
- **RG:** RAID group number in which logical units are defined
- **RAID:** RAID level of the RAID group in which logical units are defined
- **StagingSize:** Prefetch amount defined in the logical unit (Unit : Block)

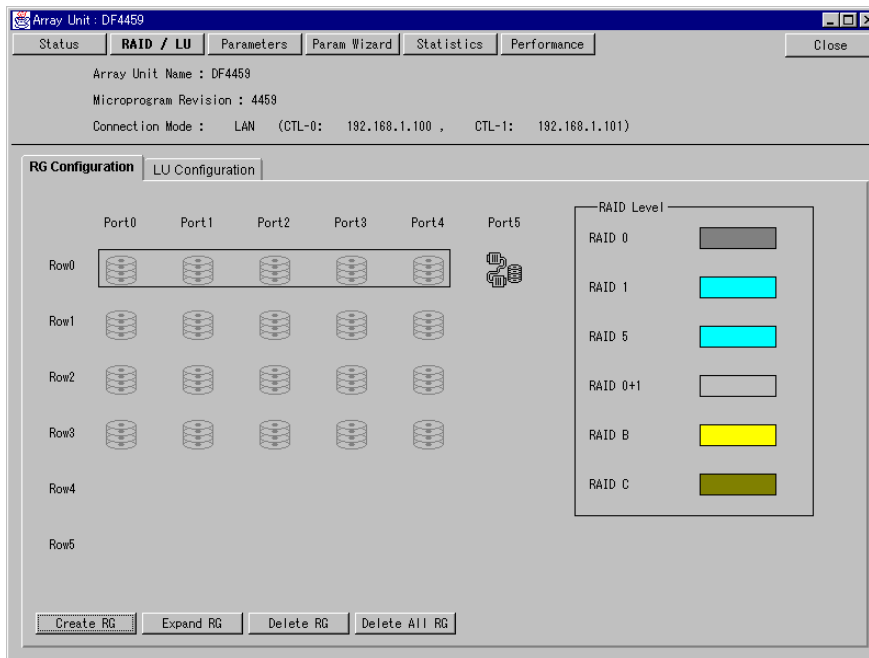
In the lower left part of the screen, the Turbo LU assignment information is displayed.

3.4.1 Creating a RAID group

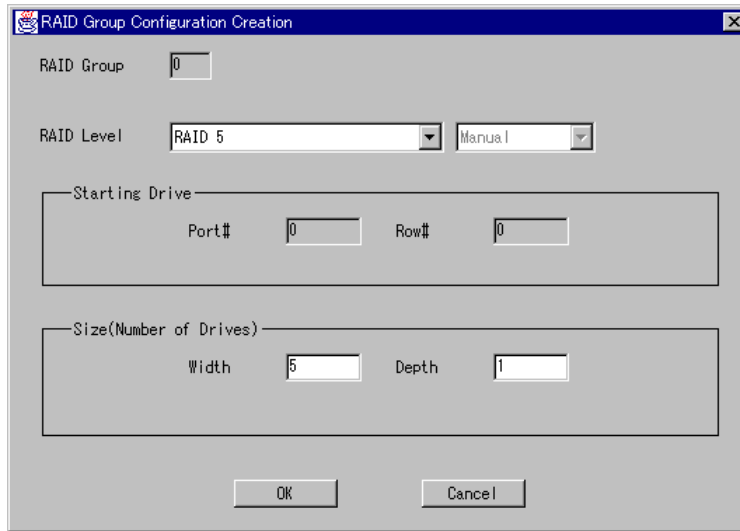
Create a new RAID group.

3.4.1.1 For DF350 and DF400

1. Click **RAID/LU** in the unit window, then click the **RG Configuration** tab.
2. Enclose the HDD to create a RAID group with a rectangle by dragging and click **Create RG**.

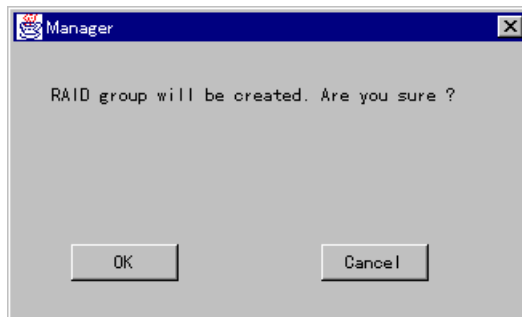


3. Select a RAID level and click **OK**.

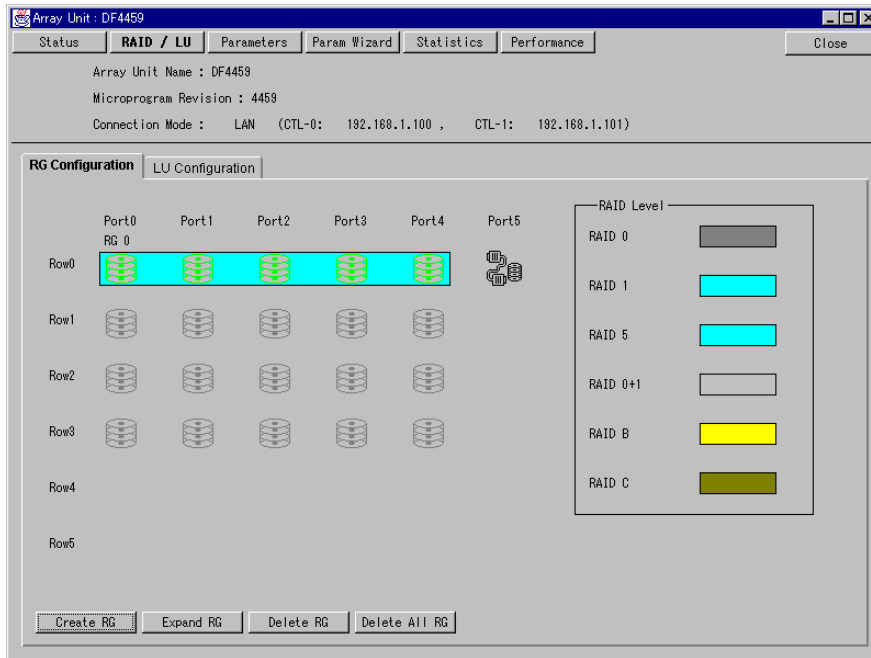


In **RAID Group**, RAID group No. to be added is set. In **Starting Drive** and **Size (Number of Drives)**, the dragged information is set.

4. When a confirmation window of RAID setting appears, click **OK**.

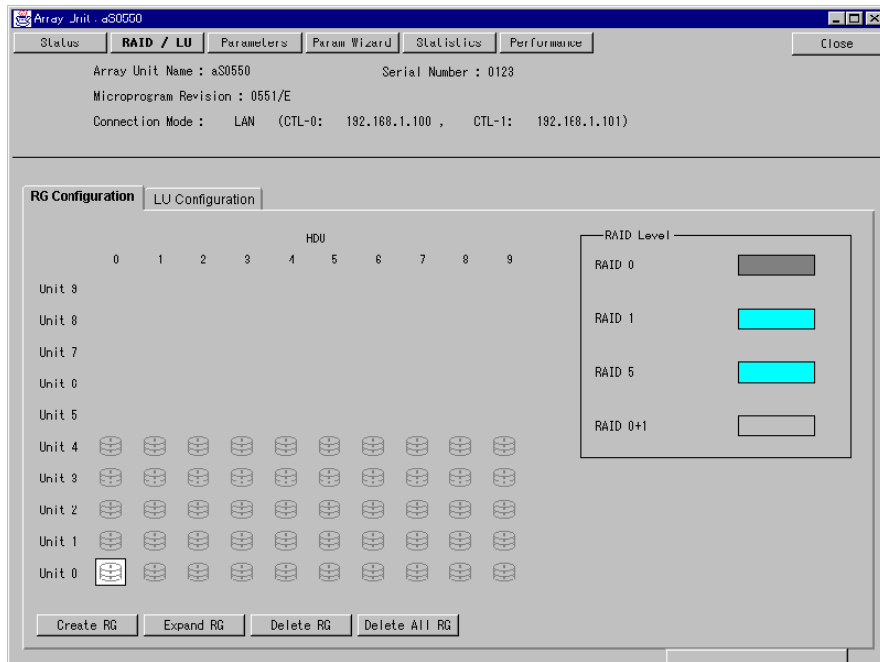


5. The set RAID group is updated and then the window is displayed.

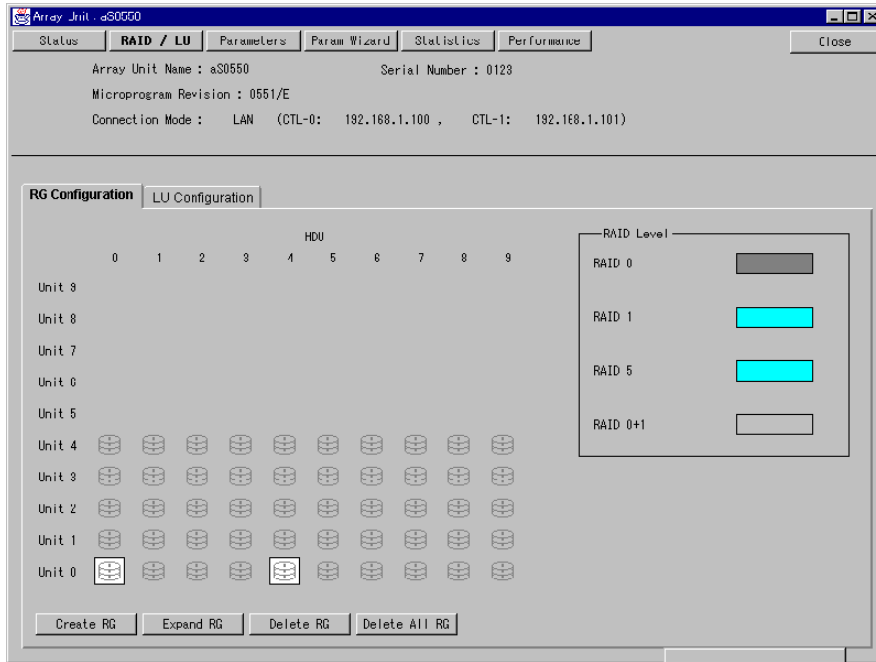


3.4.1.2 For DF500 (CK, and RK model)

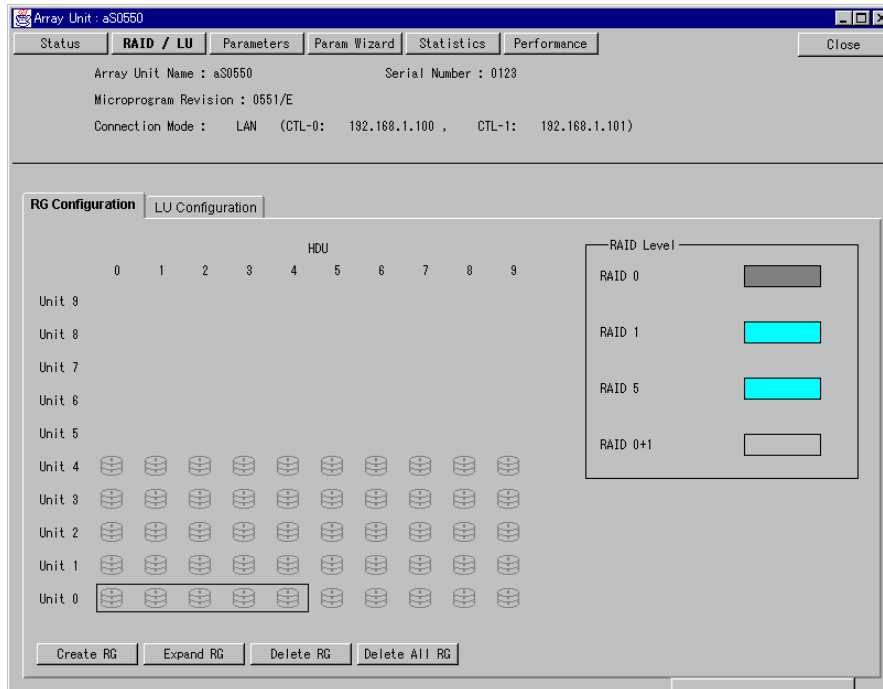
1. Click **RAID/LU** in the unit window, then click the **RG Configuration** tab.
2. Clicks the top HDU of which an RAID group is comprised. The HDU that is clicked is displayed with a selected appearance.



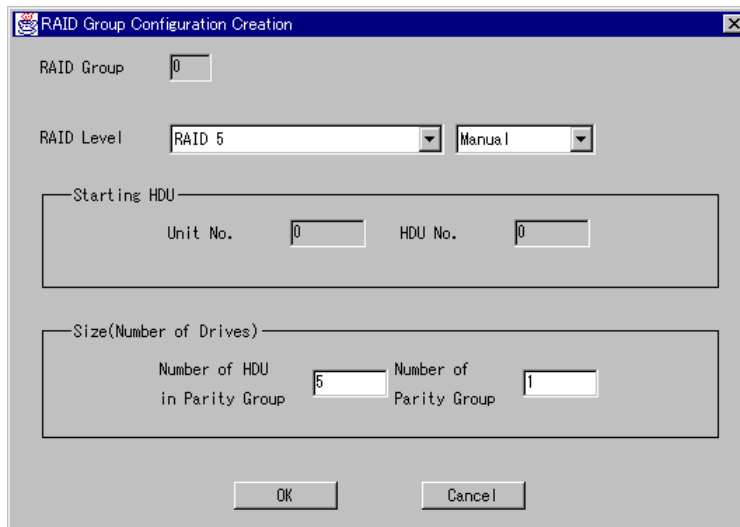
3. Drags the pointer up to the last HDU of which a RAID group is comprised. HDUs of the top and the last are displayed with a selected appearance.



- Since the HDUs selected by dragging are displayed in a rectangular shape, click the **Create RG** button.

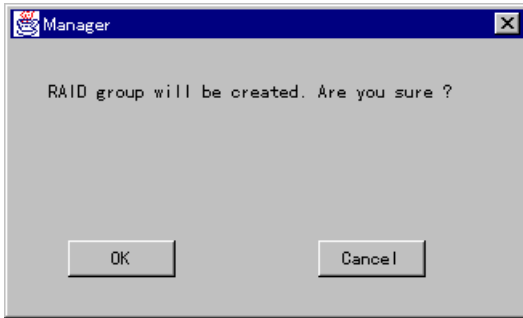


- Select a RAID level and click **OK**.

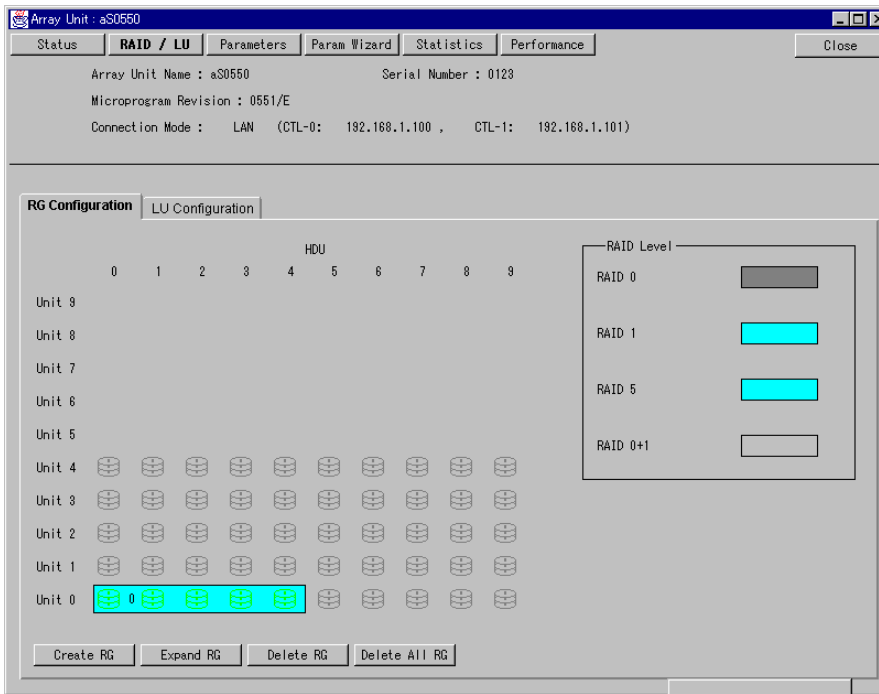


In **RAID Group**, RAID group No. to be added is set. In **Starting HDU** and **Size(Number of Drives)**, the dragged information is set. The RAID level specifies a RAID level and a configuration of the specified level. If you select an option other than **Manual** as configuration specification, the size is automatically set so as to match with the specified level. If you specify any size optionally, specify **Manual** by the configuration specification.

When a confirmation window of RAID setting appears, click **OK**.

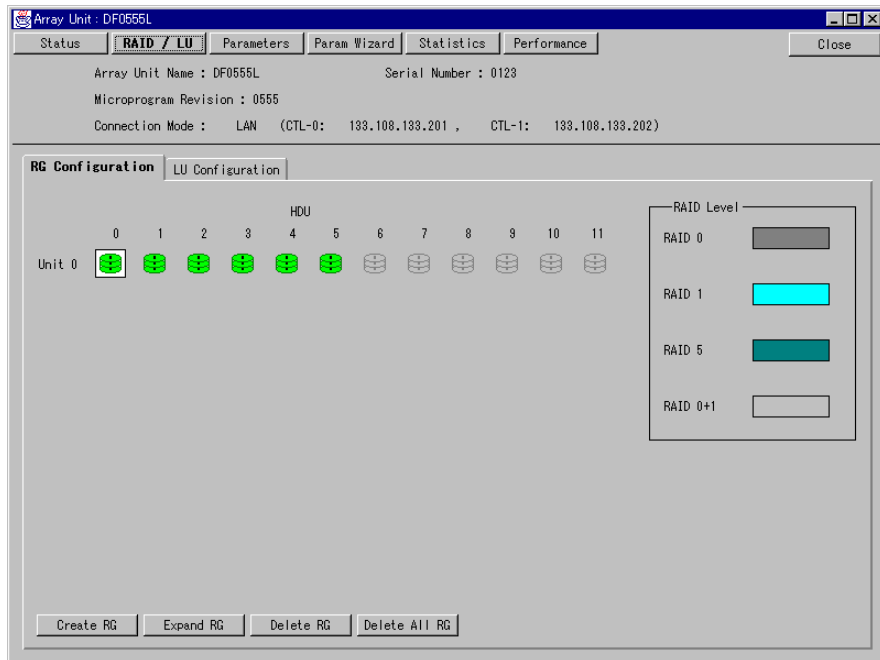


6. The set RAID group is updated and then the window is displayed.

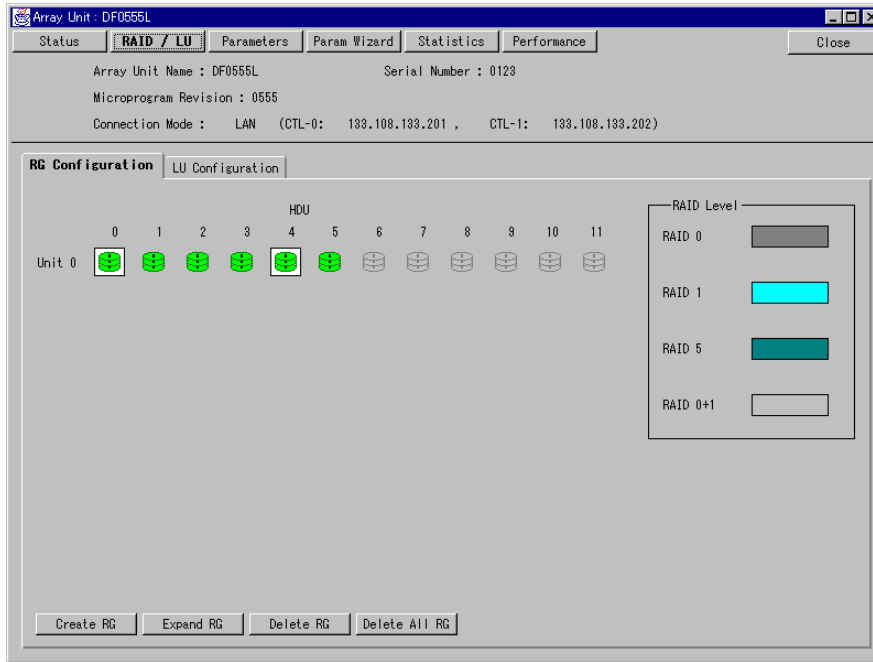


3.4.1.3 For DF500 (MK, and RKL model)

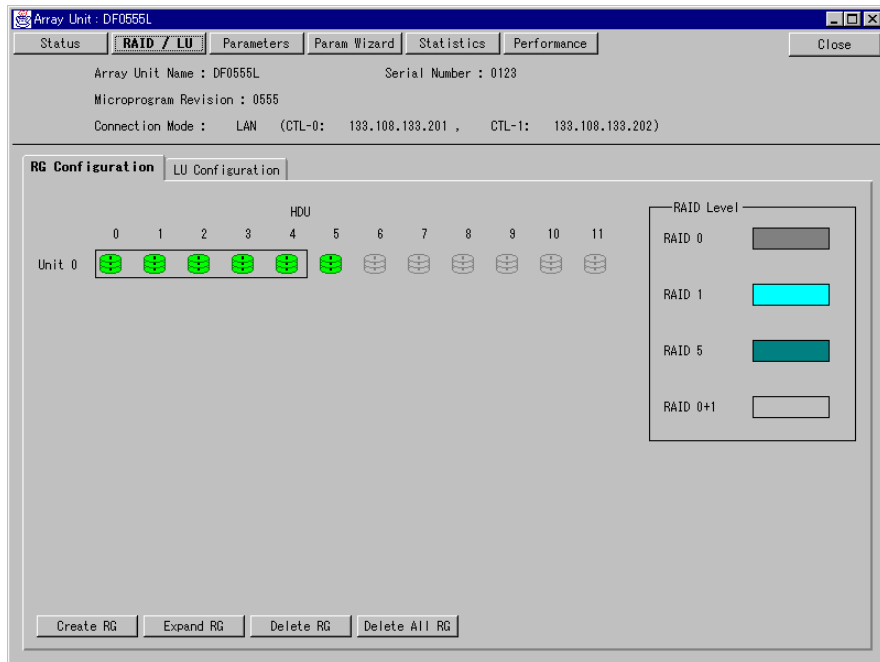
1. Click **RAID/LU** in the unit window, then click the **RG Configuration** tab.
2. Clicks the top HDU of which an RAID group is comprised. The HDU that is clicked is displayed with a selected appearance.



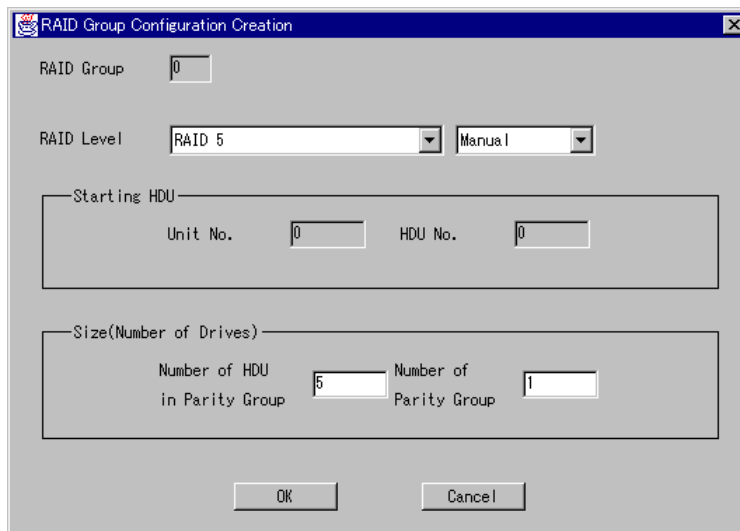
3. Drags the pointer up to the last HDU of which a RAID group is comprised. HDUs of the top and the last are displayed with a selected appearance.



- Since the HDUs selected by dragging are displayed in a rectangular shape, click the **Create RG** button.

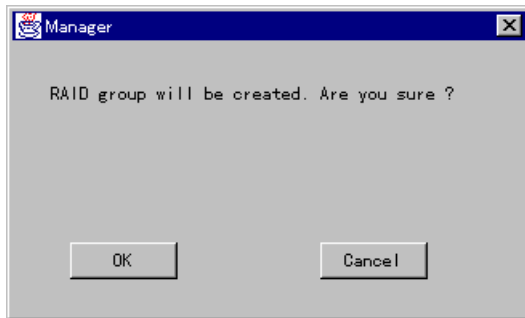


- Select a RAID level and click **OK**.

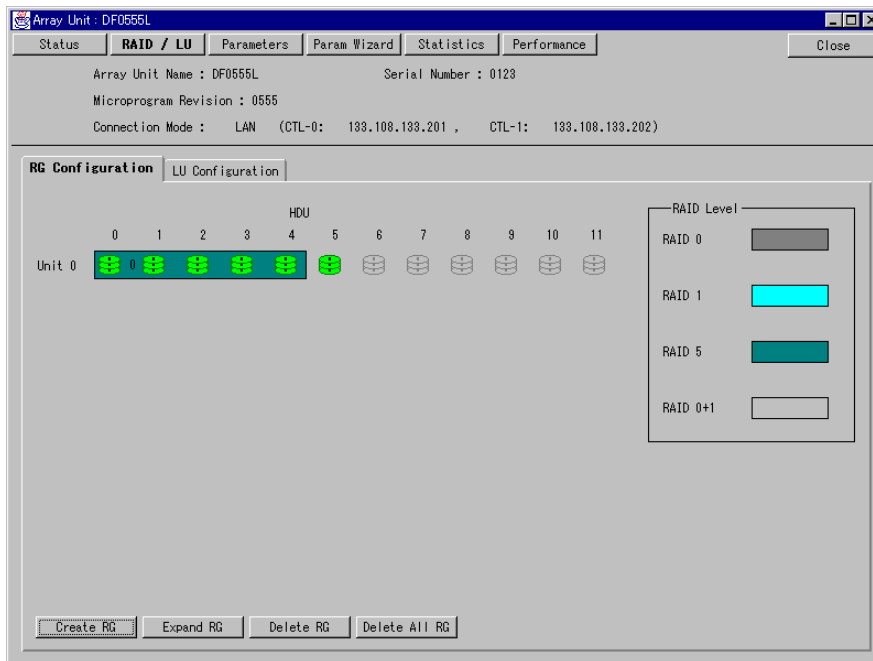


In **RAID Group**, RAID group No. to be added is set. In **Starting HDU** and **Size(Number of Drives)**, the dragged information is set. The RAID level specifies a RAID level and a configuration of the specified level. If you select an option other than **Manual** as configuration specification, the size is automatically set so as to match with the specified level. If you specify any size optionally, specify **Manual** by the configuration specification.

When a confirmation window of RAID setting appears, click **OK**.



6. The set RAID group is updated and then the window is displayed.

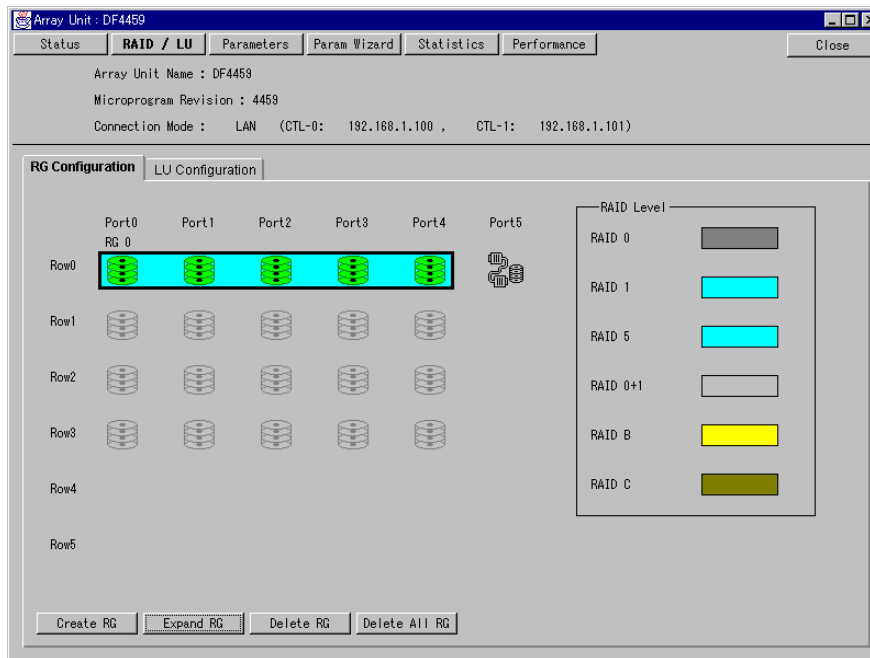


3.4.2 Expanding a RAID group

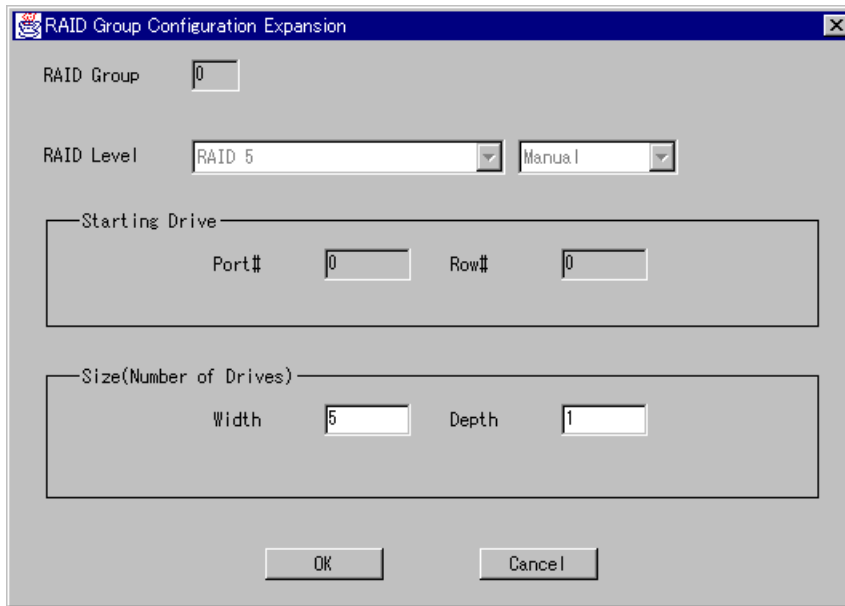
Expand a set RAID group.

3.4.2.1 For DF350 and DF400

1. Click **RAID/LU** in the unit window, then click the **RG Configuration** tab.
2. Click the RAID group to be expanded, then click **Expand RG**.
The clicked RAID group is enclosed in a back tick line on the display.



3. Specify the width and depth after expansion, then click **OK**.

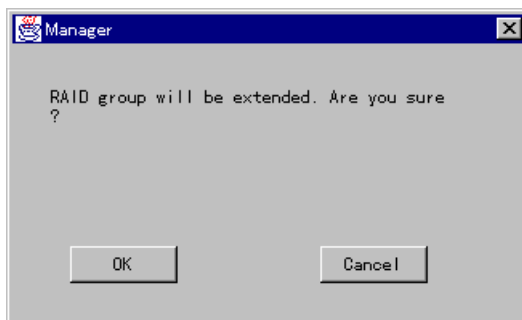


The image shows a dialog box titled "RAID Group Configuration Expansion". It contains the following fields and controls:

- RAID Group:** A text input field containing the value "0".
- RAID Level:** A dropdown menu set to "RAID 5" and a secondary dropdown menu set to "Manual".
- Starting Drive:** A section containing two text input fields: "Port#" with the value "0" and "Row#" with the value "0".
- Size(Number of Drives):** A section containing two text input fields: "Width" with the value "5" and "Depth" with the value "1".
- Buttons:** "OK" and "Cancel" buttons at the bottom.

In **RAID Group**, the RAID group No. to be expanded is displayed. In **RAID Level**, the RAID level of RAID group to be expanded is displayed. In **Starting Drive**, the position of the RAID group to be expanded is displayed.

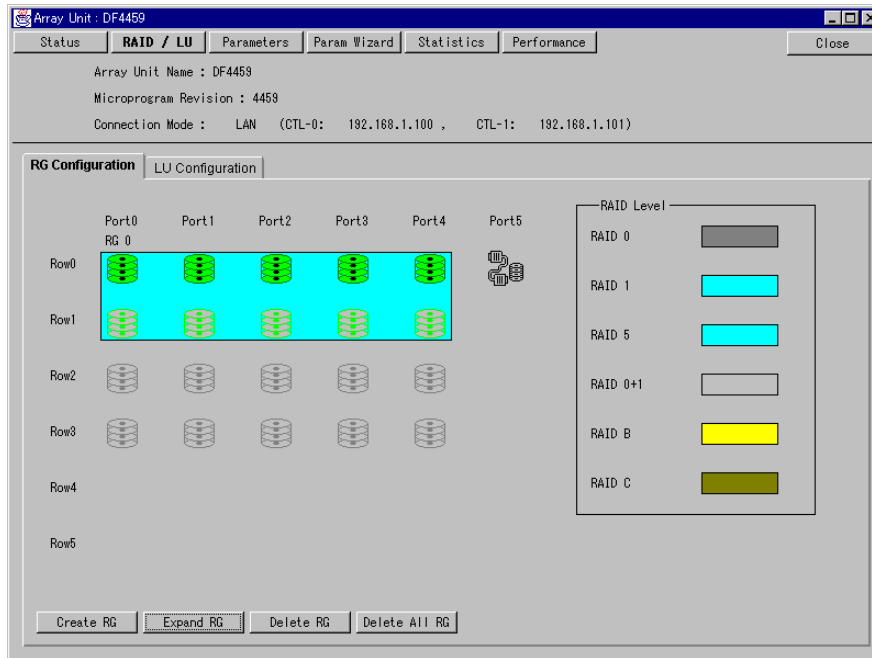
4. When a confirmation window of RAID expansion appears, click **OK**.



The image shows a confirmation dialog box titled "Manager". It contains the following text and controls:

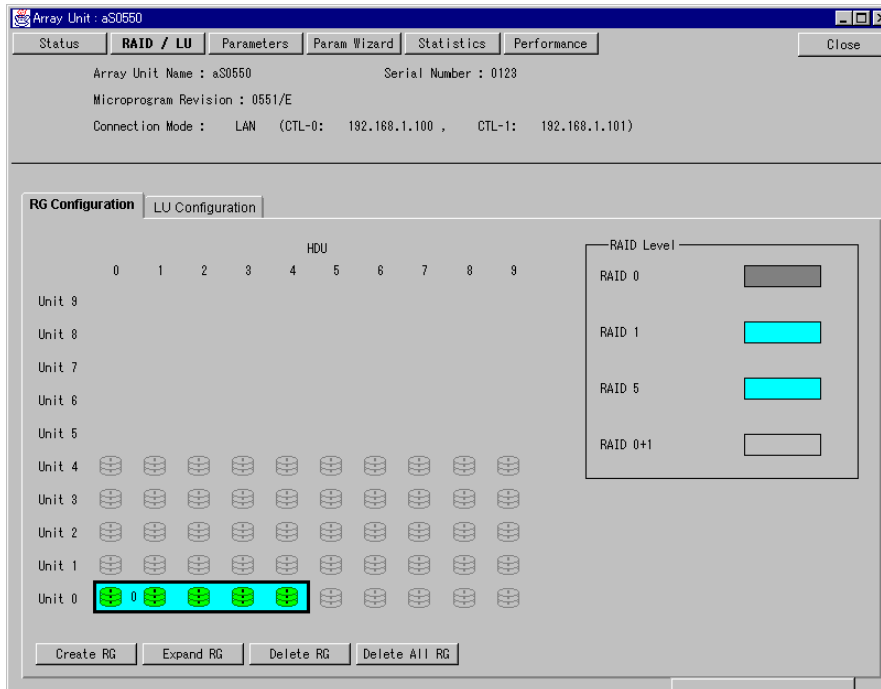
- Text:** "RAID group will be extended. Are you sure ?"
- Buttons:** "OK" and "Cancel" buttons at the bottom.

5. The expanded RAID group is updated and then the window is displayed.

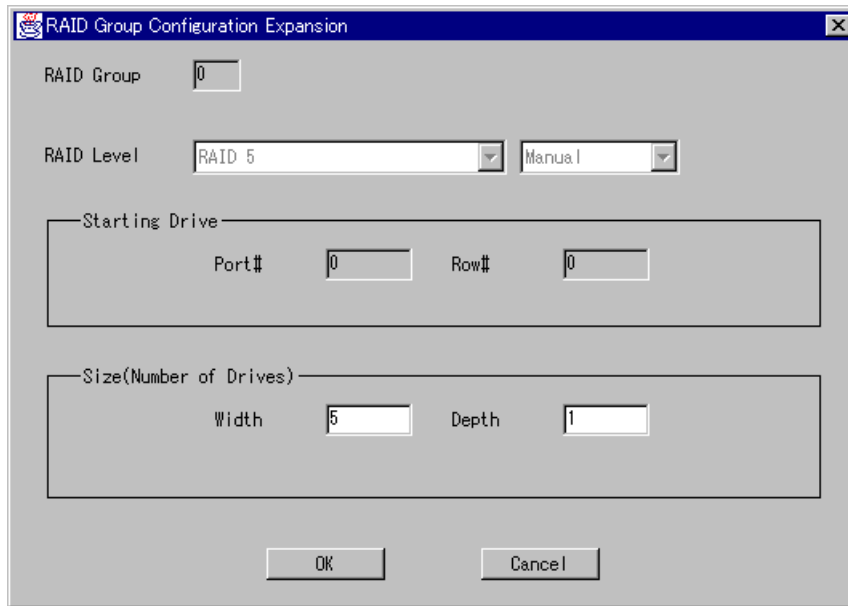


3.4.2.2 For DF500 (CK, and RK model)

1. Click **RAID/LU** in the unit window, then click the **RG Configuration** tab.
2. Click the RAID group to be expanded, then click **Expand RG**.
The clicked RAID group is enclosed in a back tick line on the display.



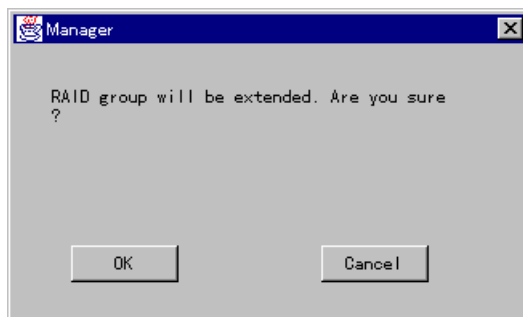
- Specifies the number of parity groups after expansion, and then clicks the **OK** button.



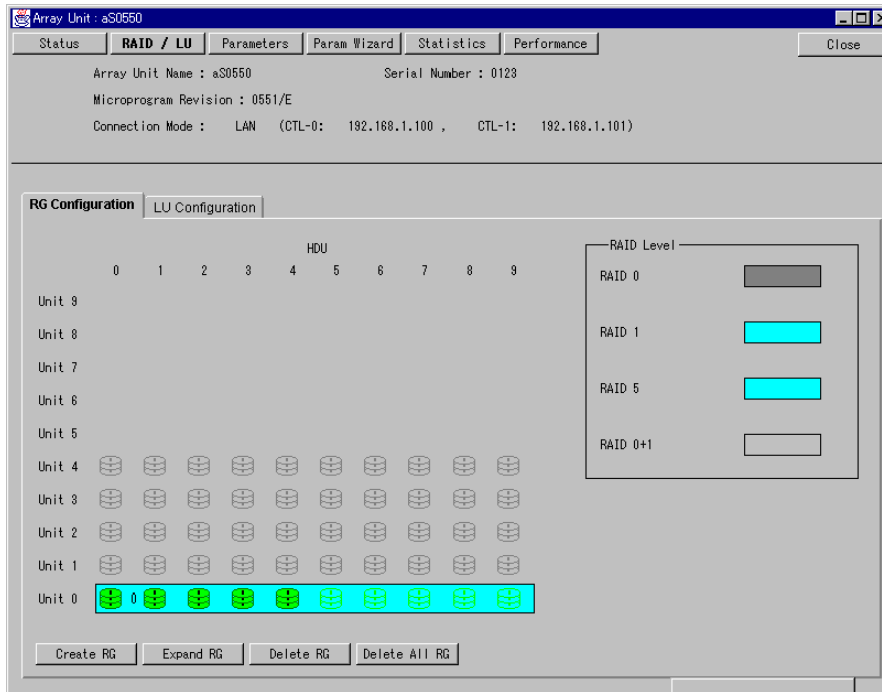
The RAID group expansion is expansion of the number of parity groups, and hence the number of HDUs in parity groups cannot be expanded.

In **RAID Group**, the RAID group No. to be expanded is displayed. In **RAID Level**, the RAID level of RAID group to be expanded is displayed. In **Starting HDU**, the position of the RAID group to be expanded is displayed.

- When a confirmation window of RAID expansion appears, click **OK**.

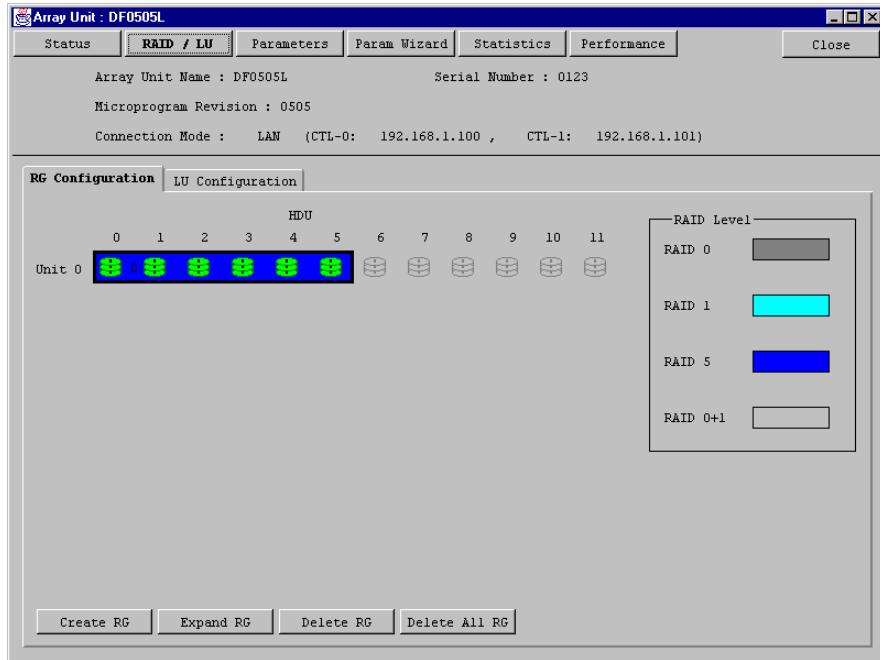


5. The expanded RAID group is updated and then the window is displayed.

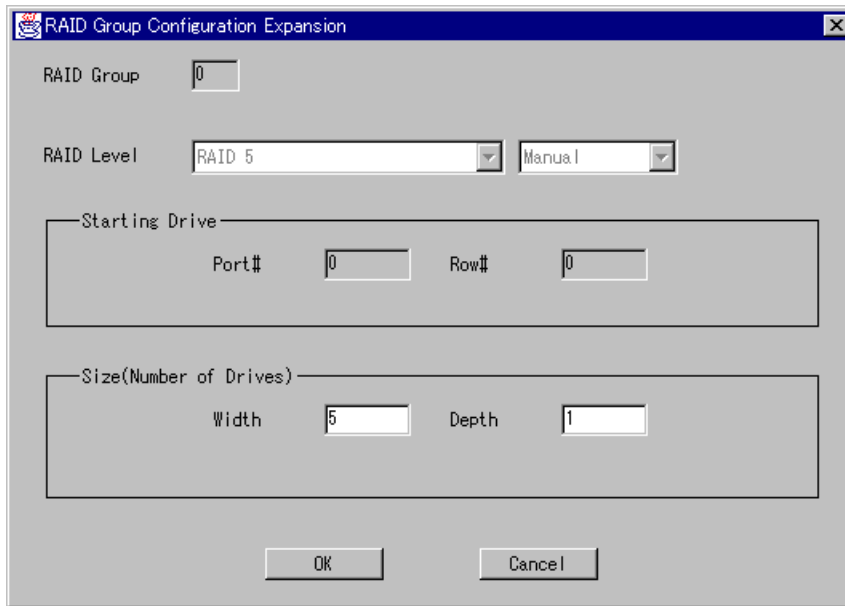


3.4.2.3 For DF500 (MK, and RKL model)

1. Click **RAID/LU** in the unit window, then click the **RG Configuration** tab.
2. Click the RAID group to be expanded, then click **Expand RG**.
The clicked RAID group is enclosed in a back tick line on the display.



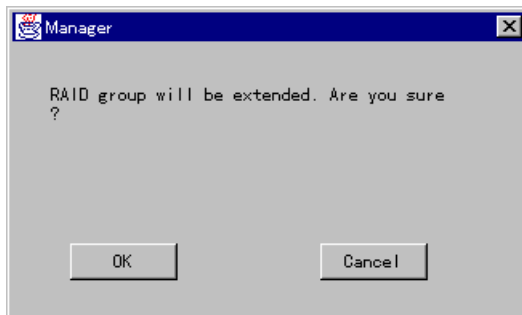
3. Specifies the number of parity groups after expansion, and then clicks the **OK** button.



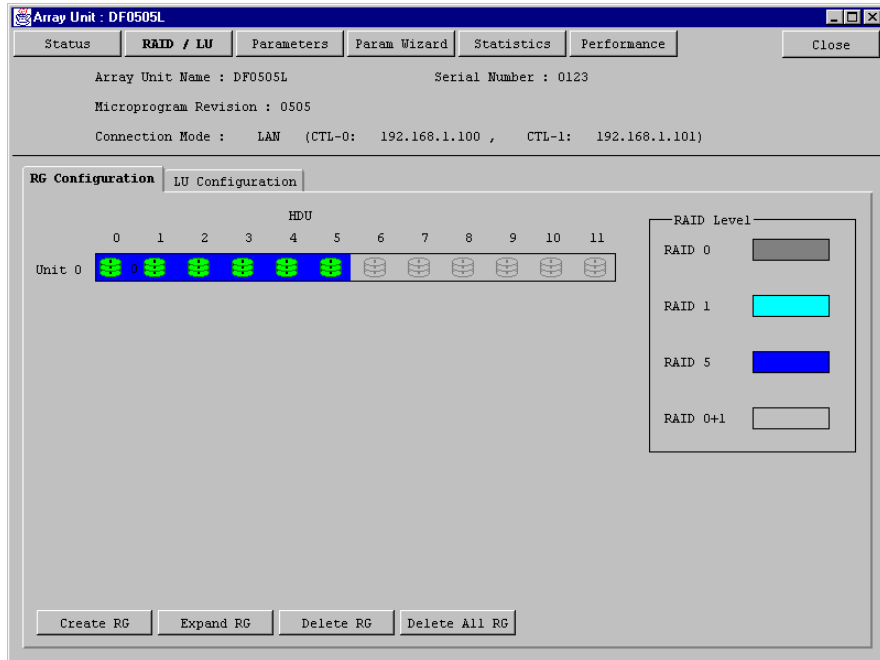
The RAID group expansion is expansion of the number of parity groups, and hence the number of HDUs in parity groups cannot be expanded.

In **RAID Group**, the RAID group No. to be expanded is displayed. In **RAID Level**, the RAID level of RAID group to be expanded is displayed. In **Starting HDU**, the position of the RAID group to be expanded is displayed.

4. When a confirmation window of RAID expansion appears, click **OK**.



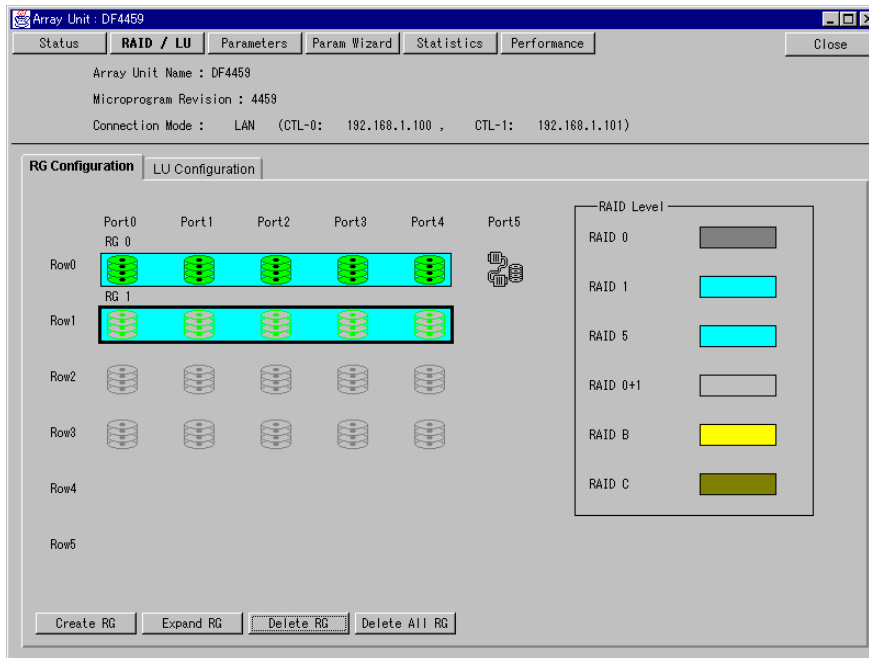
5. The expanded RAID group is updated and then the window is displayed.



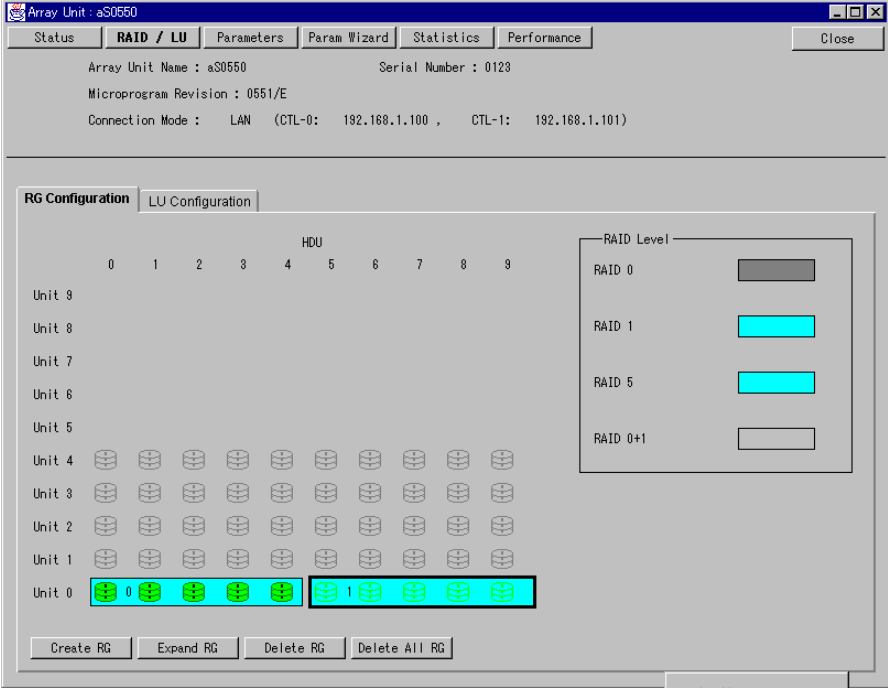
3.4.3 Deleting a specified RAID group

Delete a specified RAID group out of set RAID groups.

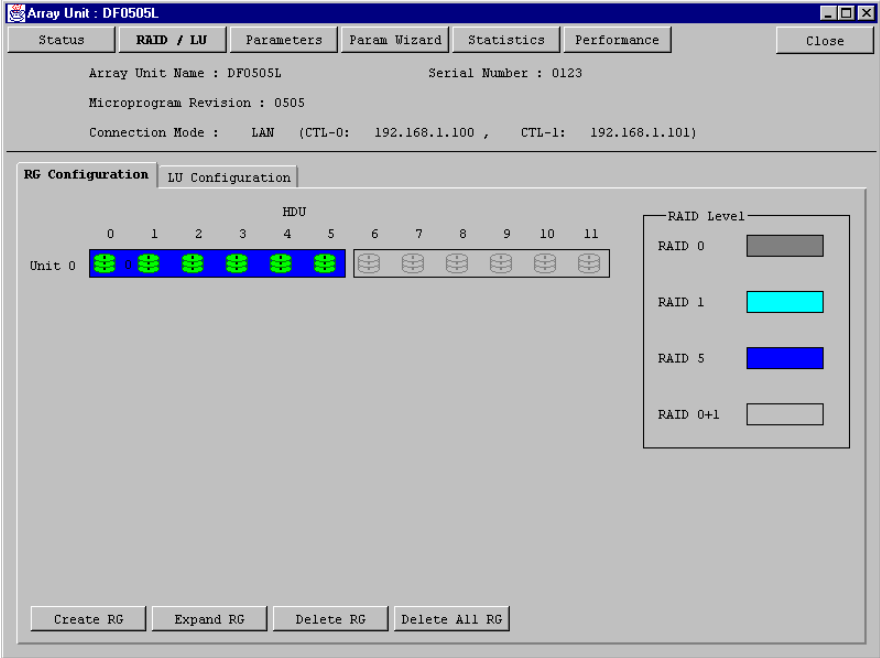
1. Click **RAID/LU** in the unit window, then click the **RG Configuration** tab.
2. Click the RAID group to be deleted, then click **Delete RG**.
 - a) For DF350, DF350F, and DF400



b) For DF500 (CK, and RK model)



c) For DF500 (MK, and RKL model)

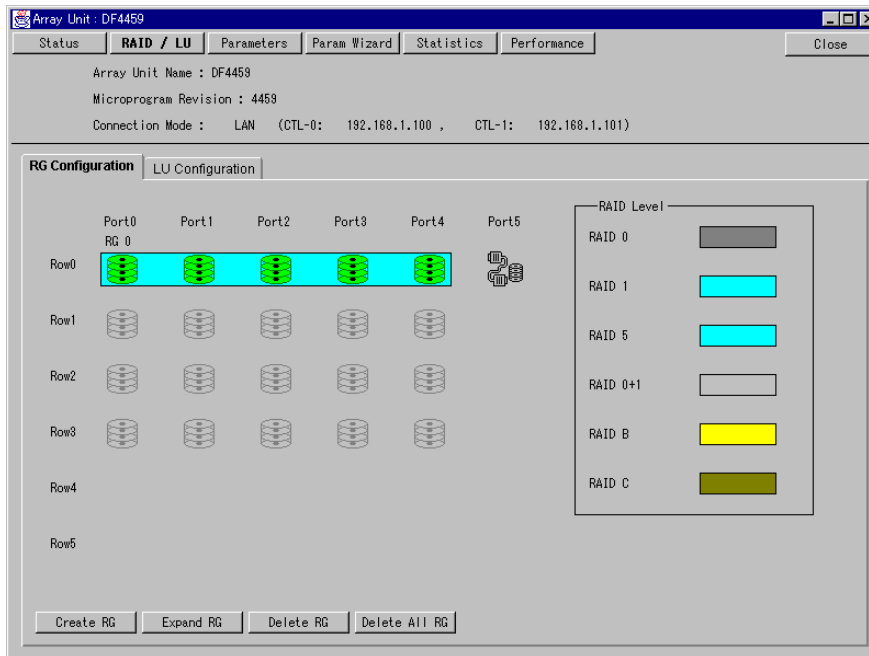


3. When a confirmation message appears, click **OK**.

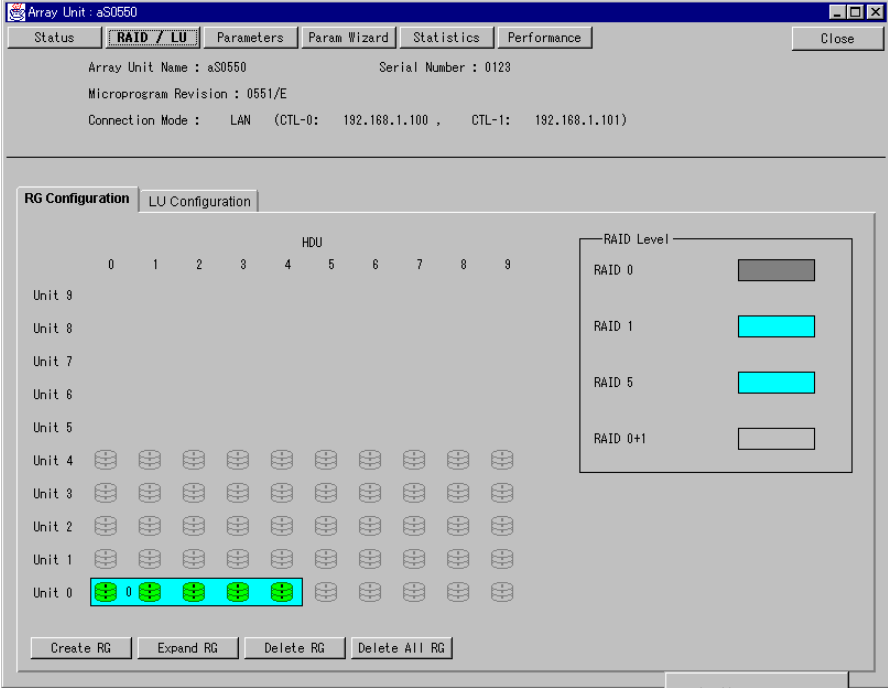


Note: If an LU is defined in the specified RAID group, this RAID group cannot be deleted. To delete the specified RAID group, first delete all LUs in the specified RAID group, and then perform it.

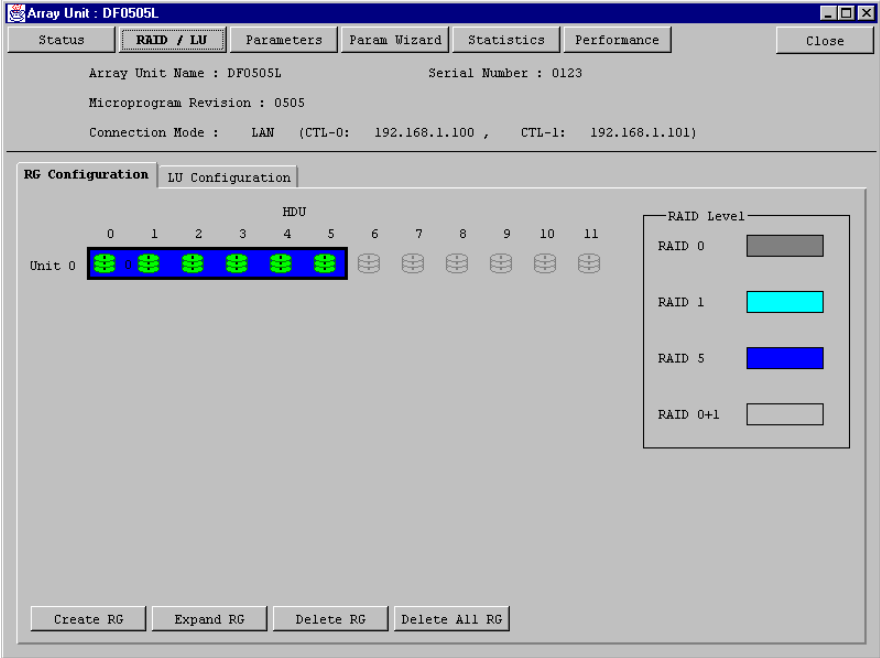
4. The deleted RAID group is updated and then the window is displayed.
 - a) For DF350, DF350F, and DF400



b) For DF500 (CK, and RK model)



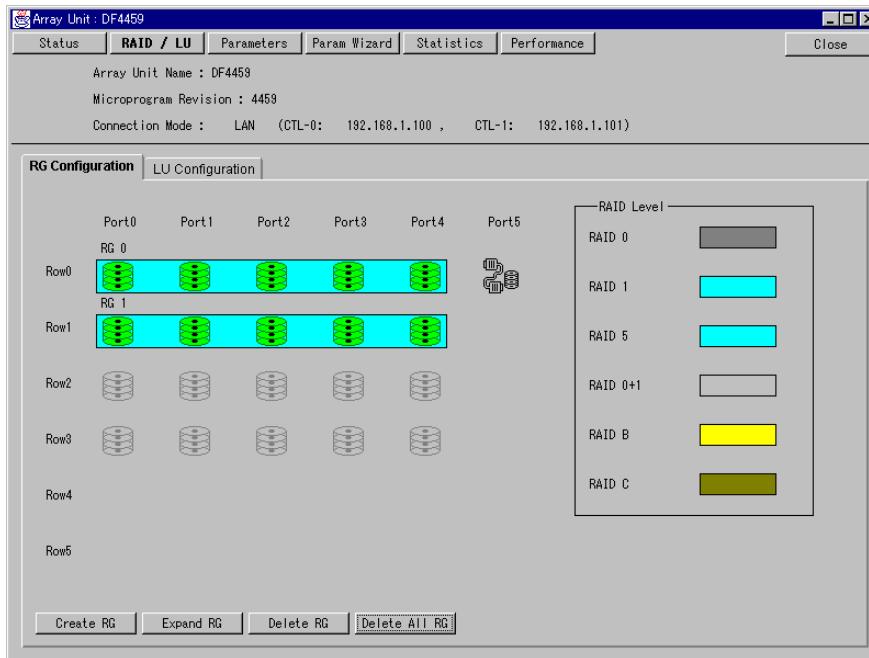
c) For DF500 (MK, and RKL model)



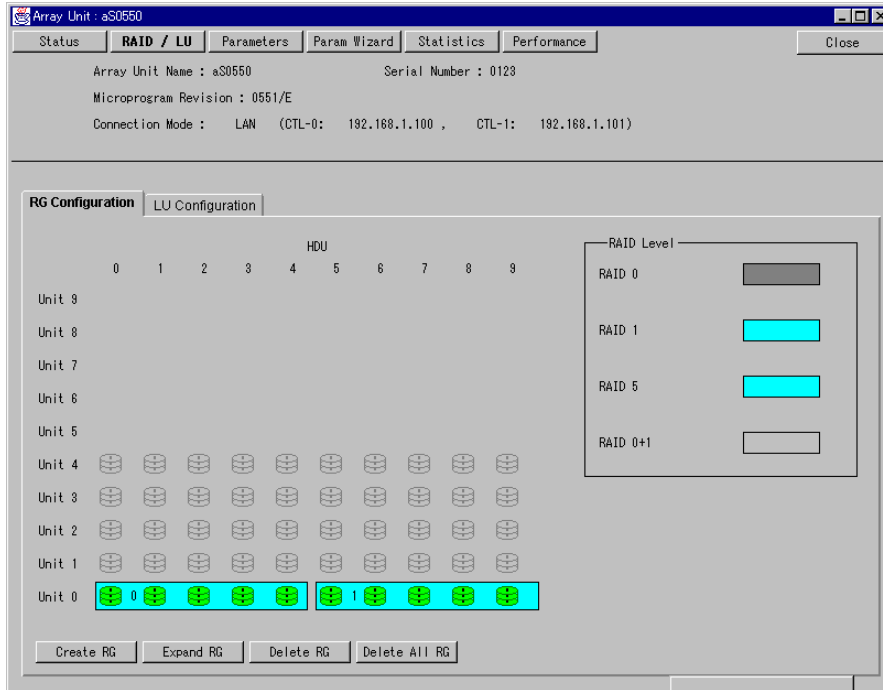
3.4.4 Deleting all RAID groups

Delete all the RAID groups that are set.

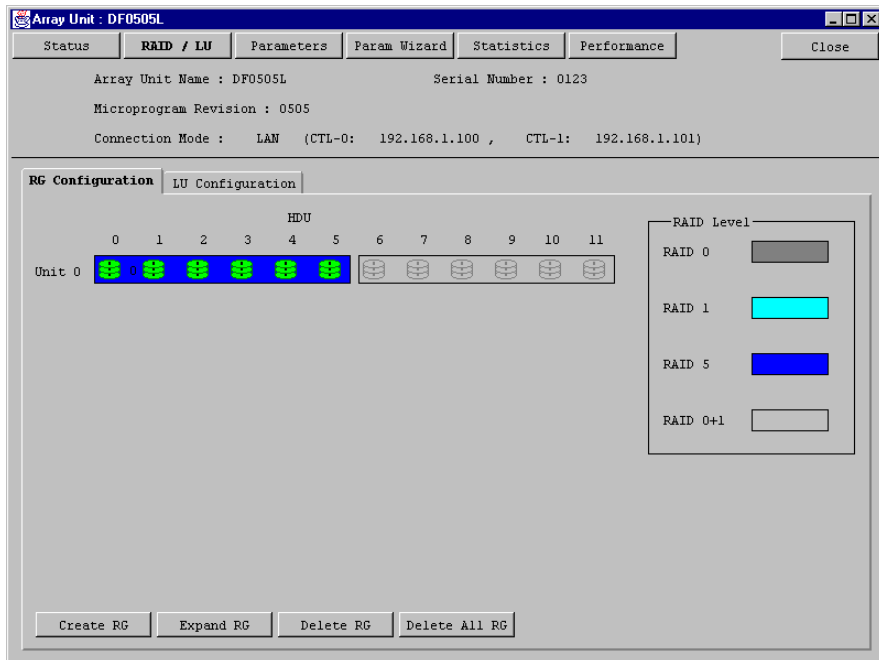
1. Click **RAID/LU** in the unit window, then click the **RG Configuration** tab.
2. Click **Delete All RG**.
 - a) For DF350, DF350F, and DF400



b) For DF500 (CK, and RK model)



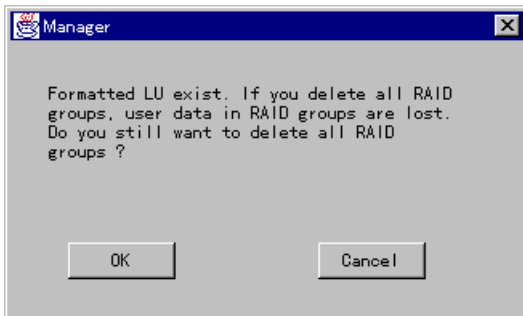
c) For DF500 (MK, and RKL model)



3. When a confirmation message appears, click **OK**.
 - a) When there is no formatted LU in the RAID group

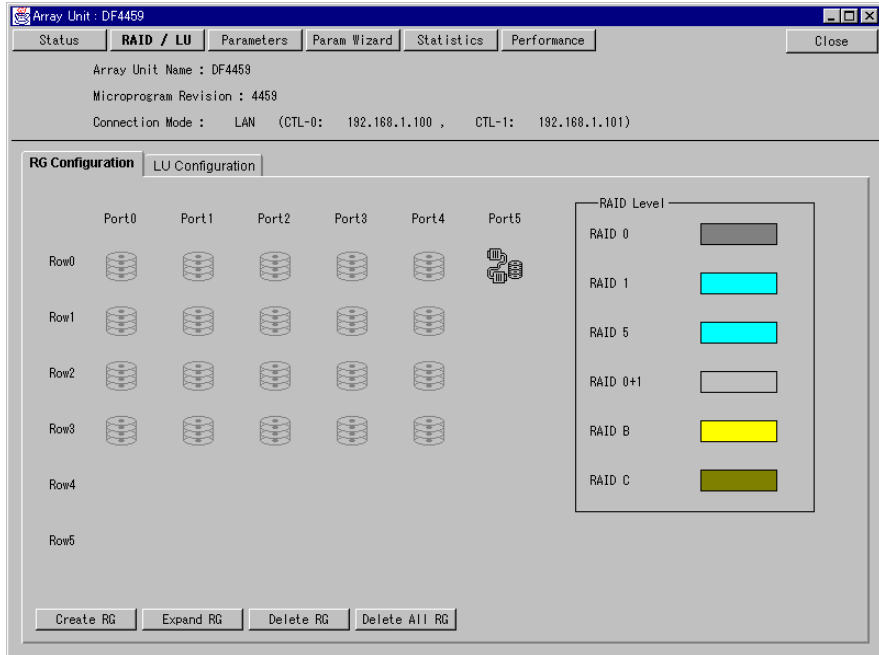


- b) When there is any formatted LU in the RAID group

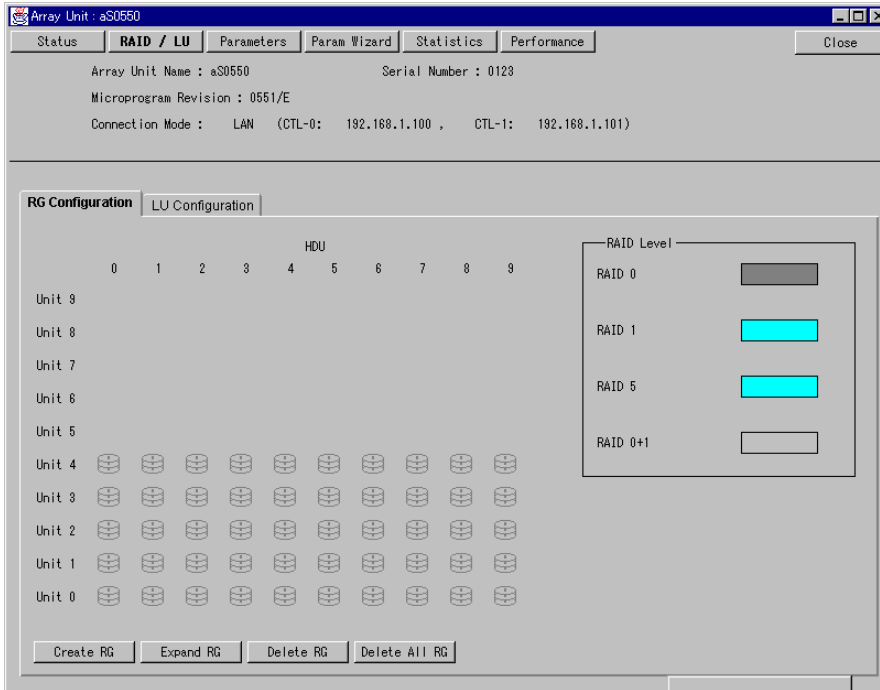


Note: If any LU is defined in the RAID group, all the user data will be invalidated by deleting the RAID group.

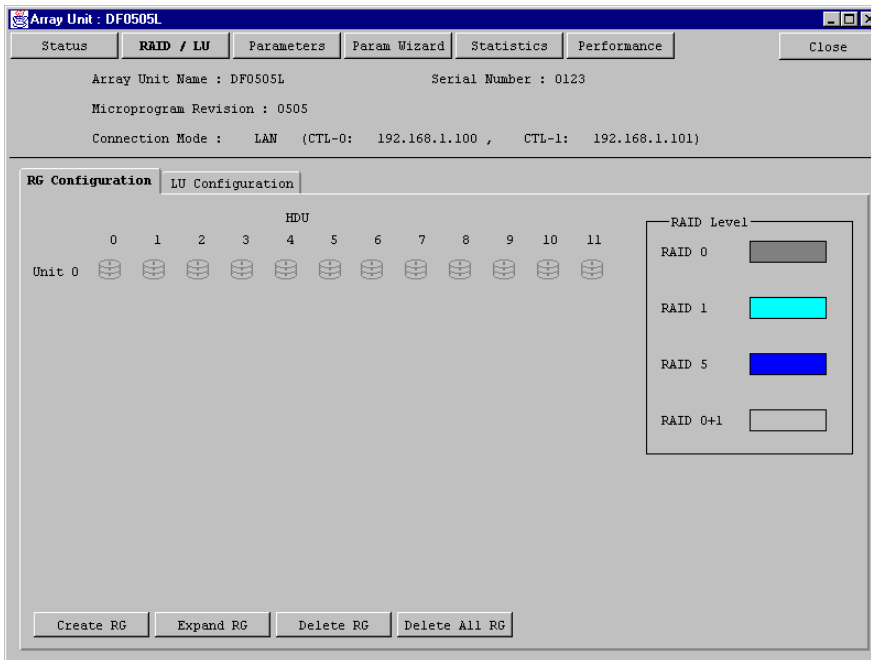
4. The deleted RAID group is updated and the window is displayed.
 - a) For DF350, DF350F, and DF400



b) For DF500 (CK, and RK model)

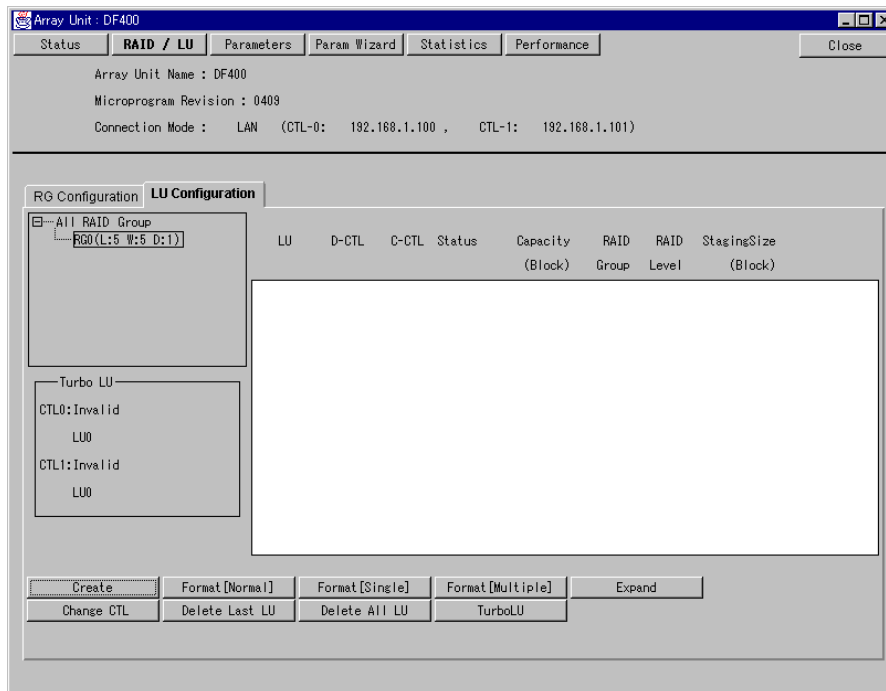


c) For DF500 (MK, and RKL model)



3.4.5 Constituting a logical unit

1. Click **RAID/LU** in the unit window, then click the **LU Configuration** tab.



2. Select a RAID group for creating an LU and click **Create**.

3. Input **Number of Block Increased** and select a controller in charge in **Controller No.**

LU Creation

LU No. 0

RAID Group No. 0

Number of Block Increased

Specified Value : 0

All Data to the Extent of the RAID Group

Host Block Size

512 Bytes

520 Bytes

Controller No.

CTL0

CTL1

OK Cancel

A created LU No. is displayed for the LU No., and a created RAID group No. for the RAID group No.. In addition, if the DF500 is connected, an LU capacity that can be created is displayed.

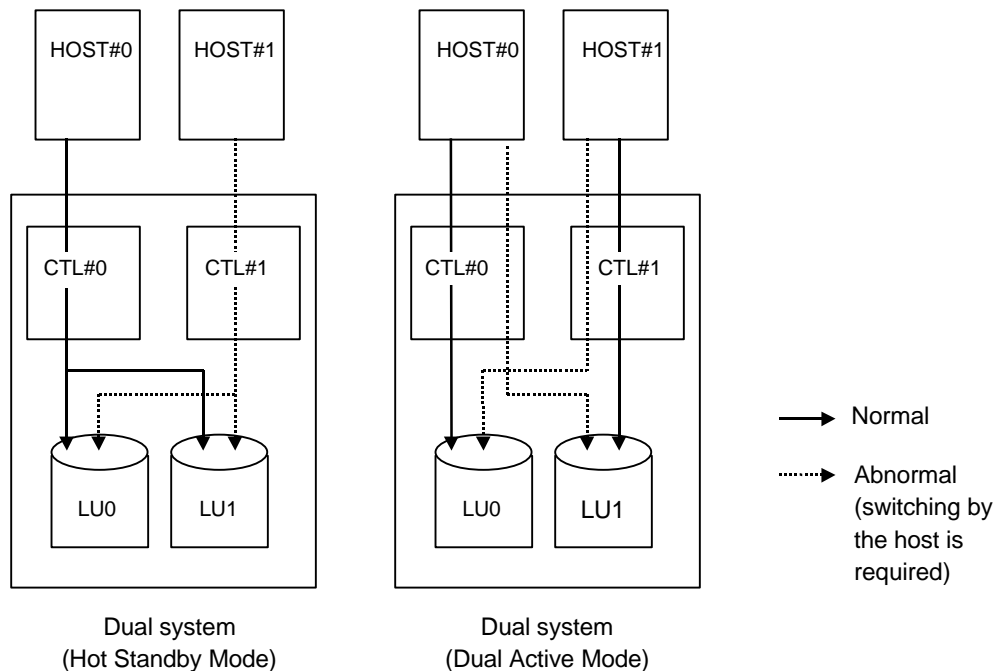
- Specifying **Number of Block Increased**
 - a) To specify a value clearly, click the **Specified Value** option button and specify the allocation (number of blocks) in a decimal number.
 - b) To allocate all the remaining amount of the corresponding RAID group, click the **All Data to the Extent of the RAID Group** option button.

- Specifying the **controller No.**

Click the option button of **CTL0** or **CTL1** to select the controller in charge of the LU. (If you wrongly select a controller, LU may unexpectedly switch when it is operating, causing to deteriorate the performance.)

This is a specification necessary in the case of the dual system connection. Accordingly, it is not displayed in the case of the single system connection.

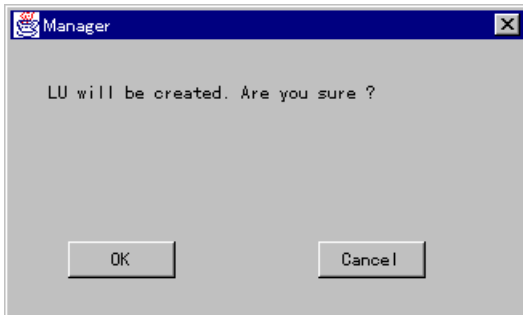
Note: When a dual active mode is selected in the dual system, a controller in charge of an LU must be selected to setup an LU. Perform the LU setting including the selection of the controller referring the following drawing. When you change a controller in charge of the LU, see “Changing the default controller in charge of an LU”.



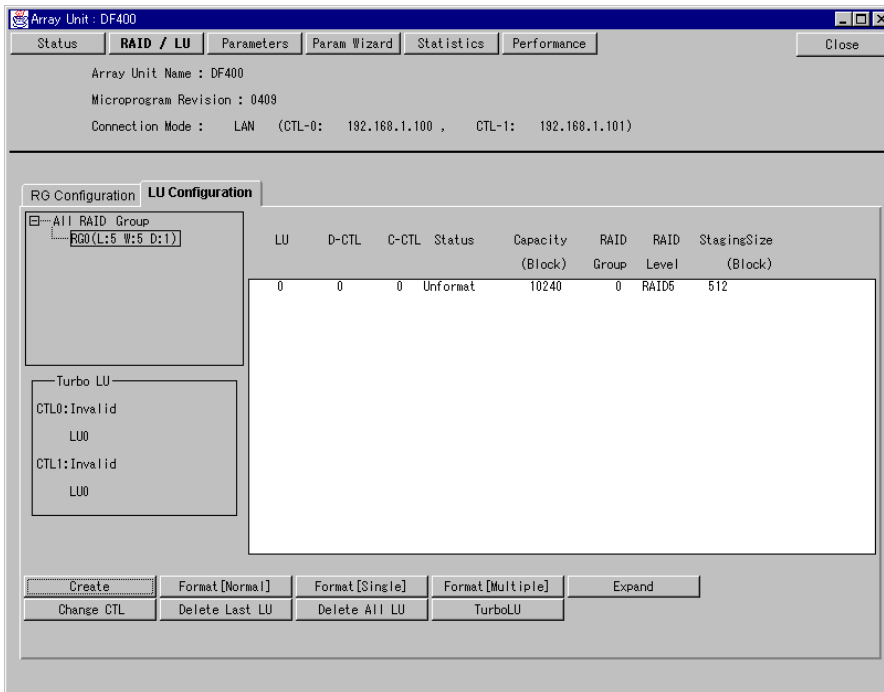
- **Hot Standby Mode:** When a failure in the host or in the controller occurred, process can be continued by switching host command destination to another controller.
- **Dual Active Mode:** Select a controller to access from the host to the LU as the controller for the LU.

In the above drawing, CTL#0 is in charge of the LU0 and CTL#1 is in charge of the LU1 respectively. In this example, setup the LU selecting an optional button of **CTL#0** to select LU0 and **CTL#1** to select LU1 respectively.

4. After completion of the setting, click **OK**.
5. When a confirmation message appears, click **OK**.



6. The set LU information is updated and the window is displayed.

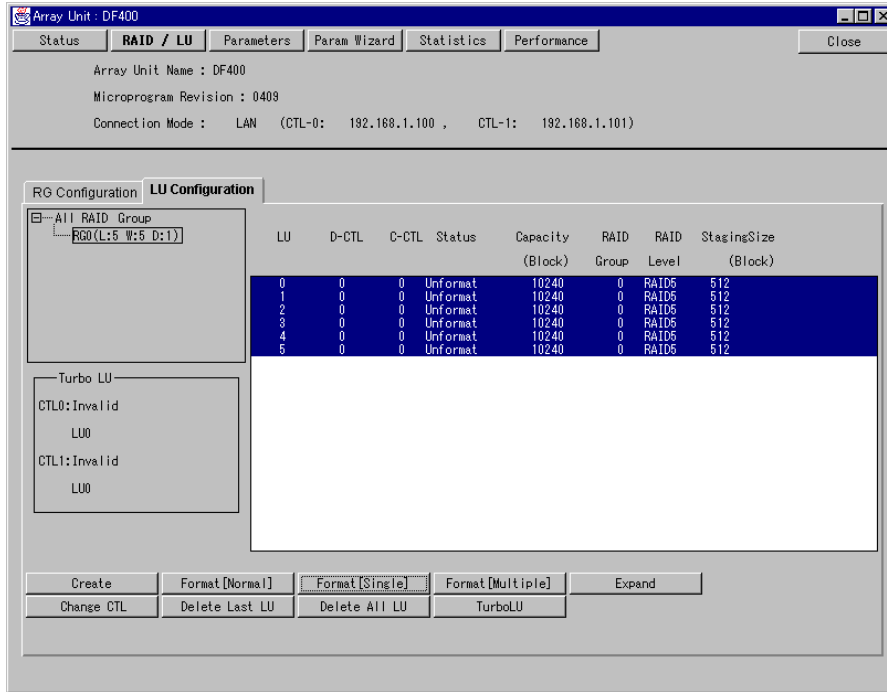


Controller No. at LU creation specifies the default controller in charge of an LU. After LU creation, **C-CTL** is the same as the default controller current in charge of an LU. However, when LU switching is performed, **C-CTL** is not the same.

3.4.6 Formatting a logical unit

Format the LU.

1. Click **RAID/LU** in the unit window, then click the **LU Configuration** tab.



The executing method for formatting includes 3 modes.

- **Format (Normal):** Specified LUs are formatted one by one.
- **Format (Single):** Specified LUs are formatted one by one and the progress of the formatting is displayed in percentage (%).
- **Format (Multiple):** If multiple LUs are specified, up to six LUs are formatted concurrently, and the progress of formatting is displayed in (%).
When the LUs are configured for each drive, the time required for the formatting is reduced by 30 to 50 (%).
 - Configuration example : An array unit configured to form six rows
Each row is configured as RAID5 and each RAID group is set to one LU.
 When the two or more LUs are specified, the formatting and a command being executed may be terminated abnormally. When formatting the LUs online, select **Format (Single)**.

Note: When you format an LU whose capacity is less than 100,000 blocks, formatting may be terminated abnormally. When you format an LU whose capacity is less than 100,000 blocks, select **Format (Single)**.

The executability of the formatting corresponding to each LU formatting menu item varies with the manager connection type and array unit configuration as shown in the following table.

No.	LU formatting mode	manager connection type and array unit configuration	
		Single system Dual system + Both connectors are connected to a LAN:	Dual system + RS232C connection Dual system + one of the controllers is connected to a LAN:
1	Format (Normal)	The formatting cannot be executed in the online status.	The formatting cannot be executed in the online status.
2	Format (Single)	The formatting can be executed in the online status.	The formatting can be executed in the online status. Only the LU currently controlled by the controller connected with the PC manager can be selected. (When formatting an LU not connected by the controller, cable connections must be changed.)
3	Format (Single) Format (Multiple)	The formatting can be executed in the online status. Format (Normal) or Format (Single) is selected. Only one LU is selected in Format (Multiple) .	The formatting can be executed in the online status. Format (Normal) or Format (Single) is selected and only an LU currently controlled by the controller connected with the manager is selected. Format (Multiple) is selected and only an LU currently controlled by the controller connected with the manager is selected.
		The formatting cannot be executed in the online status. Two or more LUs are selected in Format (Multiple) .	The formatting cannot be executed in the online status. An LU not controlled by the controller connected with the manager is selected. Two or more LUs are selected in Format (Multiple) .

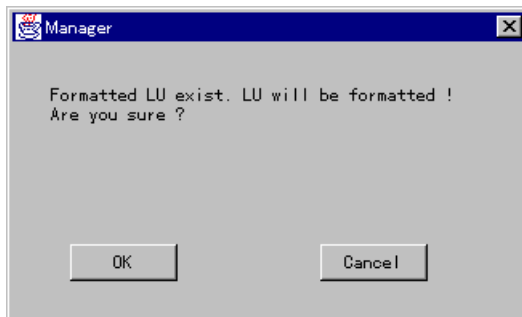
Note: The formatting may be interrupted if a host rebooting, I/O path switching, or an access to the LU by the host which is not controlling it occurs while a formatting executable in the online status is executed.

2. Select one or more LUs to be formatted (multiple LUs may be selected) and click **OK**. A confirmation message appears to confirm whether all the selected LUs may be formatted or not.

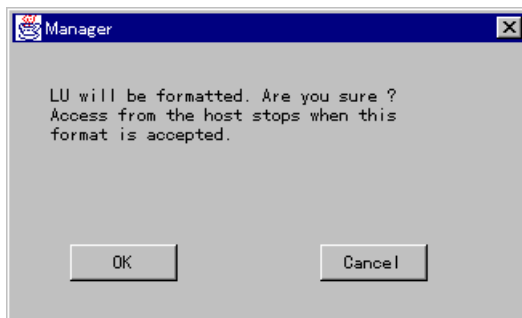
- a) When no formatted LU exists



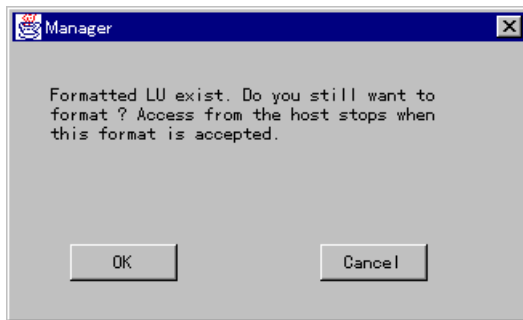
- b) When one or more formatted LUs exist



- c) In the case where two or more LUs are specified in **Format (Multiple)** and no formatted LU exists



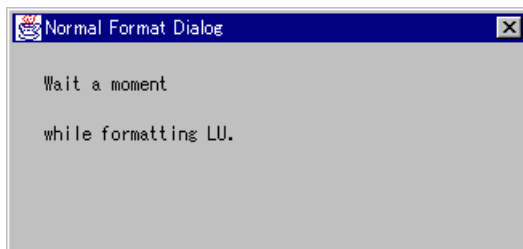
- d) In the case where two or more LUs are specified in **Format (Multiple)** and one or more formatted LUs exist



Click **OK** to format the specified LUs. When the specified LU is formatted, the user data in the specified LU will be lost. If the LUs have been specified by mistake, click **Cancel**.

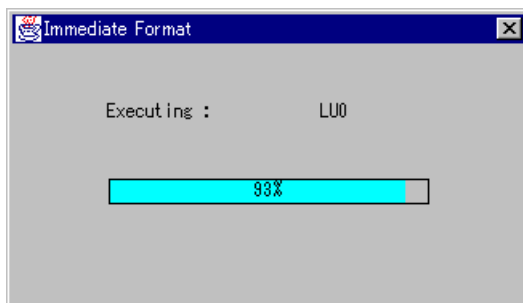
3. When formatting starts, a message is displayed indicating that formatting is in progress.
- a) When **Format (Normal)** is specified

The following screen is displayed until the specified LU is formatted.



- b) When **Format (Single)** is specified

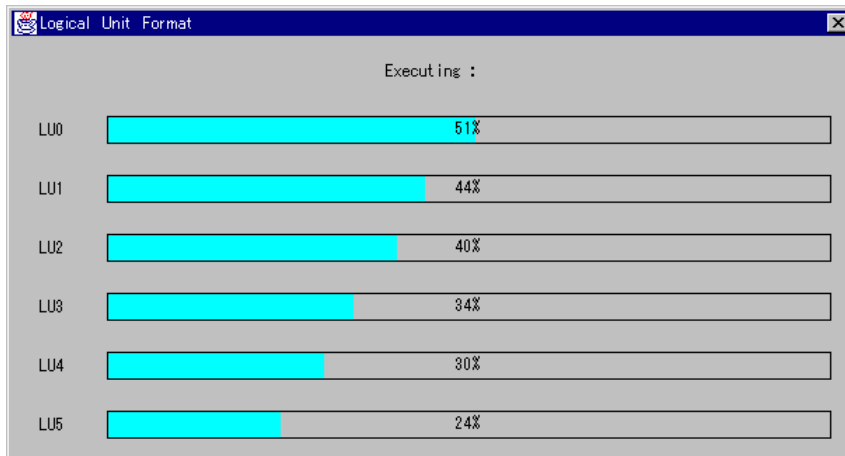
The LU number being formatted and the percentage (%) of execution progress are displayed for the specified LU. The progress status indication is renewed every 10 seconds.



When multiple LUs are specified, the progress of the formatting is displayed in the order starting with the smallest LU number. After one LU is formatted, the next LU is executed and its progress is displayed.

c) When **Format (Multiple)** is specified

The LU number being formatted and the progress (%) of the formatting are displayed for the specified LU. The progress of the formatting is renewed every 10 seconds.

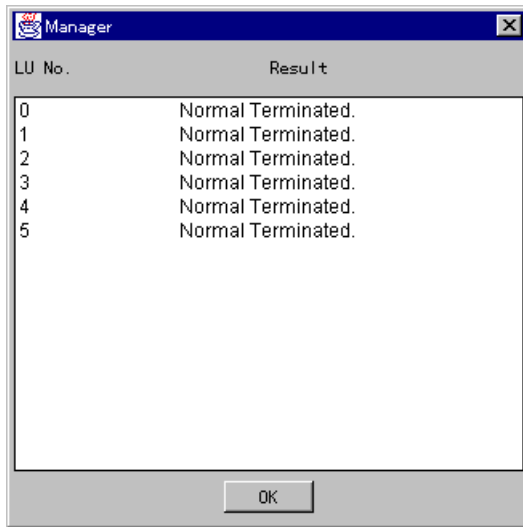


When multiple LUs are specified, up to 6 LUs are formatted in the order starting with the smallest LU number and the progress of the formatting is displayed. After one LU is formatted, the next LU is formatted and the progress of the formatting is displayed.

4. When a message is displayed indicating that the specified LU has been formatted, click **OK**.



- When a format result is displayed, check the format result and then click **OK**.



If formatting is terminated abnormally, see the contents of the result.

- The formatted LU information is updated and then the window is displayed.

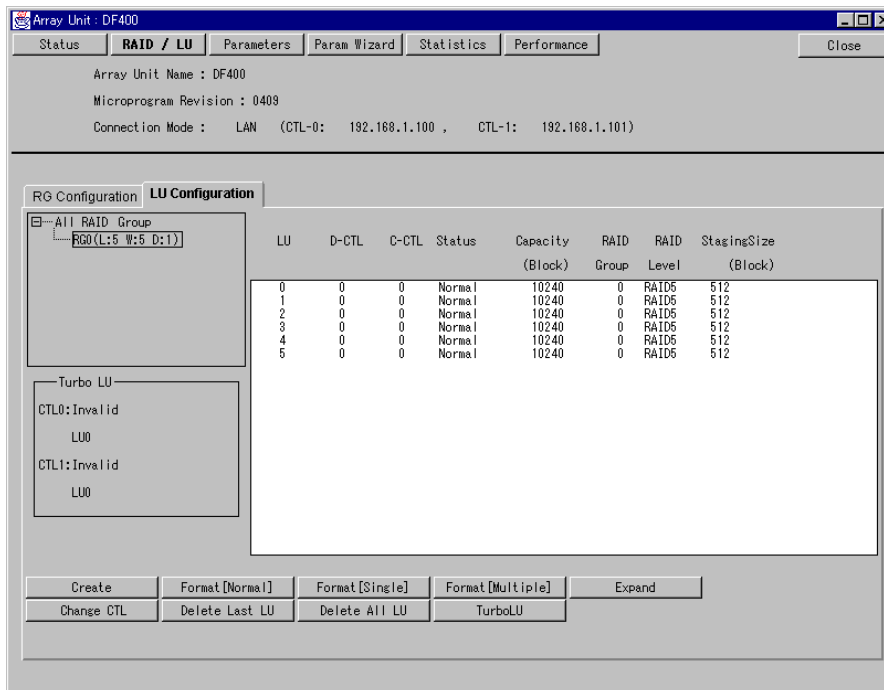


Table 3.1 Interpretation of “Logical Unit Format Results” Window

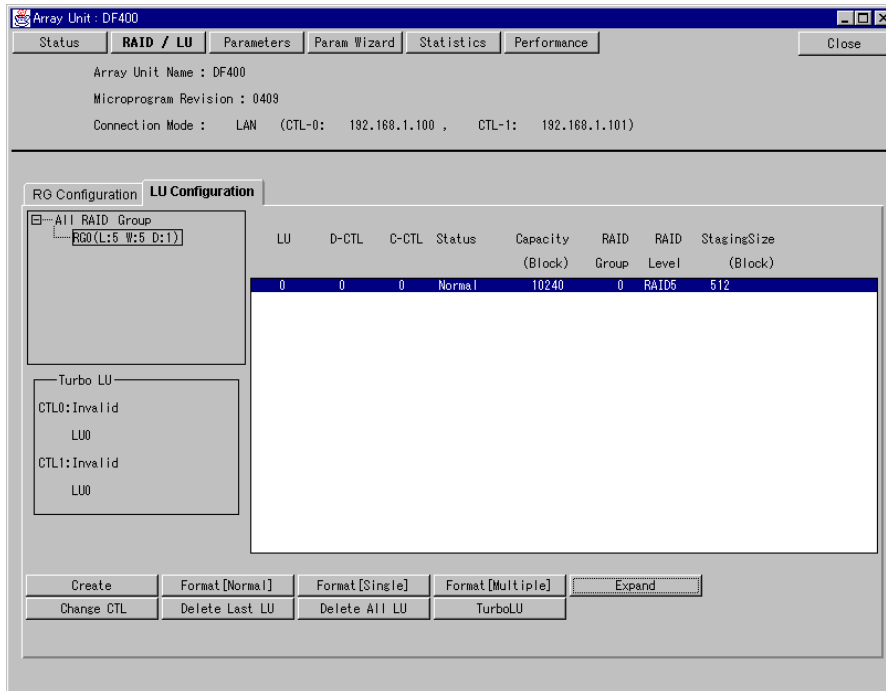
No.	Result of LU formatting	“Result” column	
1	Succeeded	Normal Terminated	
2	Failed (02-xxxx) Failure of a FORMAT UNIT command	Abnormal end	# CHK CONDITION * This function internally uses a FORMAT UNIT command. A sense key and a sense code for the case the command returns the CHECK CONDITION status are displayed.
3	Failed The other error		A message is displayed.

When “Abnormal end” is displayed in the “Result” column, a sense key and a sense code are displayed.

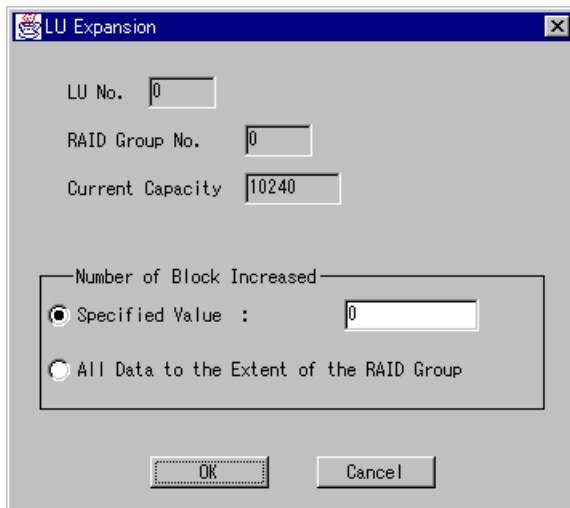
- Sense key - sense code = 02-xxxx, 03-xxxx, 04-xxxx, or 0B-xxxx
The fault may possibly be caused by a hardware failure. Retry. Call maintenance personnel if the problem persists.
- Sense key - sense code = 05-xxxx
The error may possibly be caused by a wrong operation. Check the items below and retry. Call maintenance personnel if the problem persists.
 - **Logical unit #0 defined?**
The related sense-key and sense-code combinations are 05-2500 and 05-2581.
 - **LU formatting by ALL RAID and ALL CAPA although not all drives installed?**
Related sense-key and sense-code combination is 05-2600.
 - **Attempt made to define an LU over the capacity of the defined RAID group?**
Related sense-key and sense-code combination is 05-2580.
- Sense key - sense code = 0B-FD01
A switching of the controller in charge of the LU occurred during a formatting. Check the controller in charge of the LU and reexecute the formatting by the controller.
- Message text = See “Messages”.
A message “Failed in a connection with the Array Unit” issued when selecting **Format (Single)** is caused by an error (an interface error between the manager and array unit) which disables the progress state indication window to be displayed. The LU formatting is continued nevertheless.

3.4.7 Expanding a logical unit

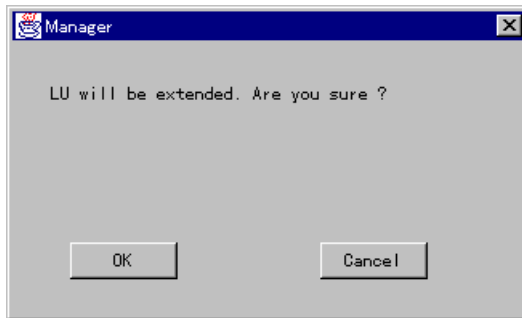
1. Click **RAID/LU** in the unit window, then click the **LU Configuration** tab.



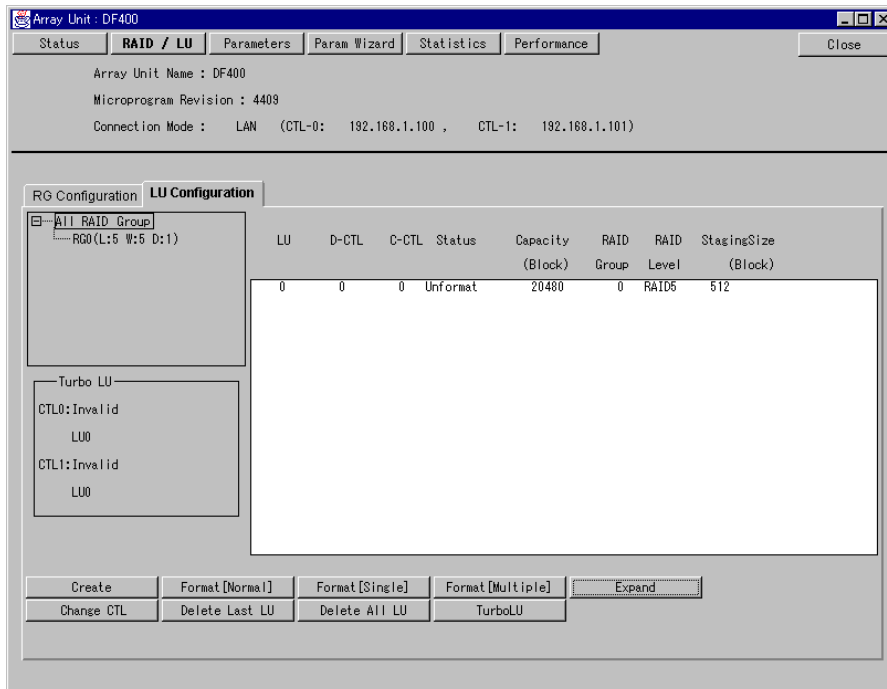
2. Click the last LU in the RAID group, then click **Expand**.



3. Specify the capacity in **Number of Block Increased**.
 - a) To increase the specific value, click the **Specified Value** option button and then specify the increment value (number of blocks) in a decimal number.
 - b) To extend by all remaining capacities of the RAID group, click the **All Data to the Extent of the RAID Group** option button.
4. After completion of the setting, click **OK**.
5. When a confirmation window of LU expansion appears, click **OK**.



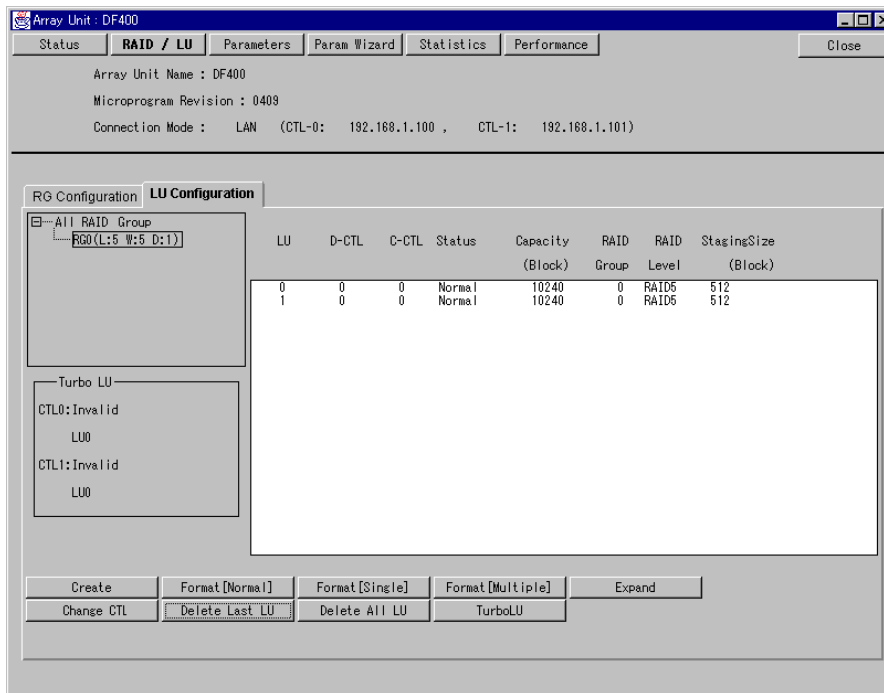
6. The expanded LU information is updated and the window is displayed.



3.4.8 Deleting the last logical unit

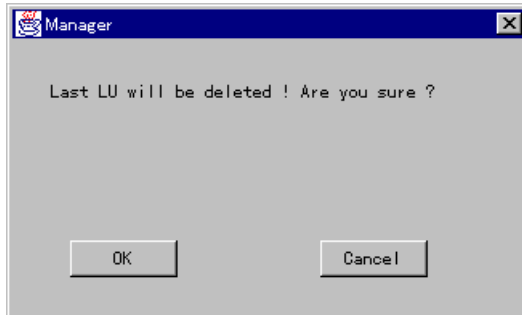
Delete the last LU.

1. Click **RAID/LU** in the unit window, then click the **LU Configuration** tab.

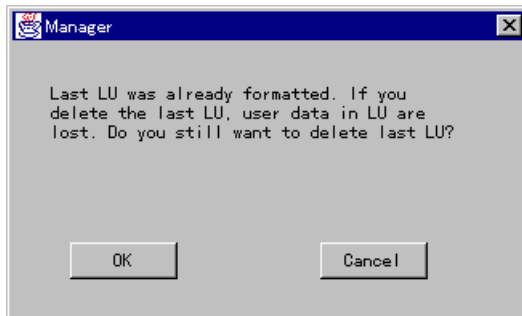


2. Click **Delete Last LU**.

3. A confirmation message is displayed indicating whether last LUs should be deleted or not.
 - a) When no formatted LU exists

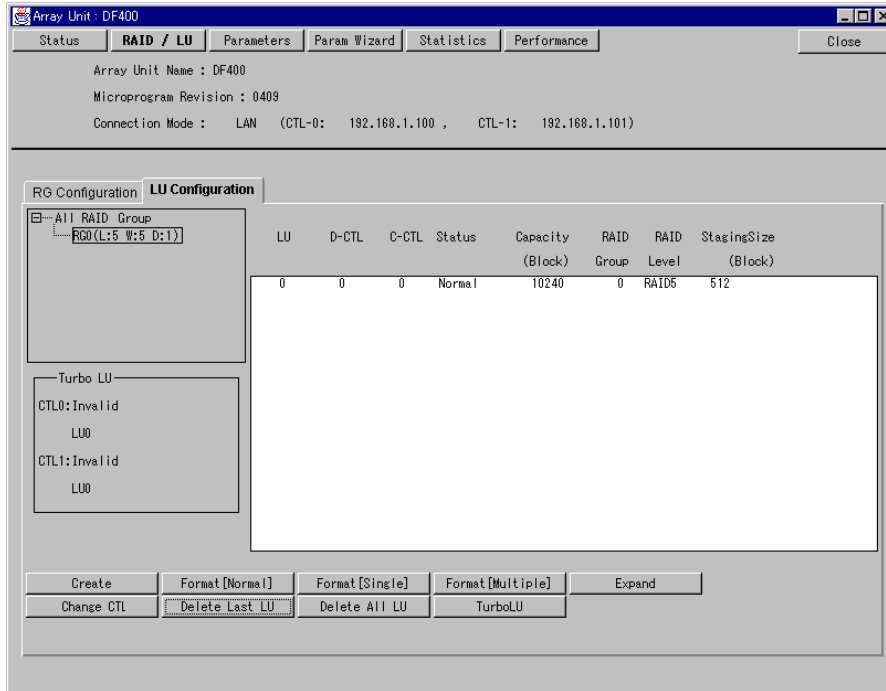


- b) When any formatted LU exists



Click **OK**, and last LUs will be deleted. When the last LUs have been deleted, the user data in the LUs will be lost.

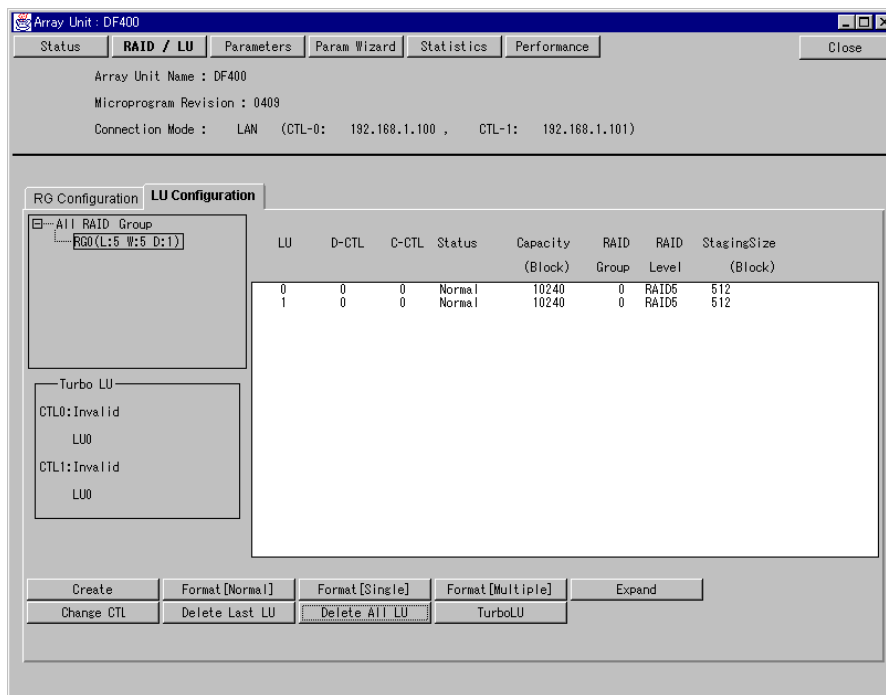
- The LU information in which the last LU has been deleted is updated and the window is displayed.



3.4.9 Deleting all logical units

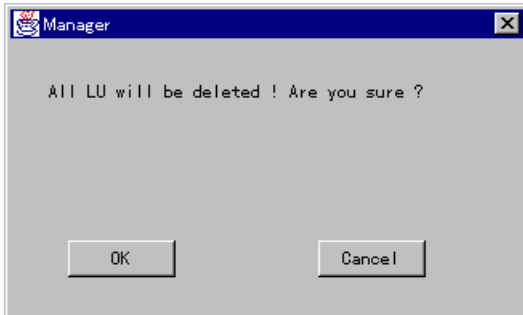
Delete all logical units.

1. Click **RAID/LU** in the unit window, then click the **LU Configuration** tab.

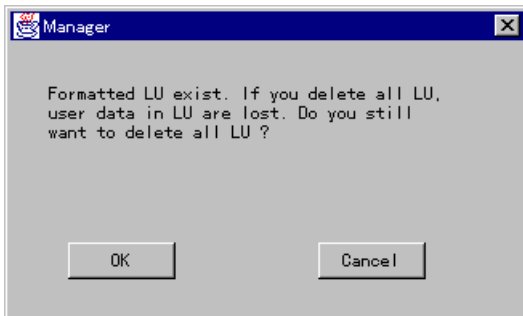


2. Click **Delete All LU**.

3. A confirmation message is displayed indicating whether all LUs should be deleted or not.
 - a) When no formatted LU exists

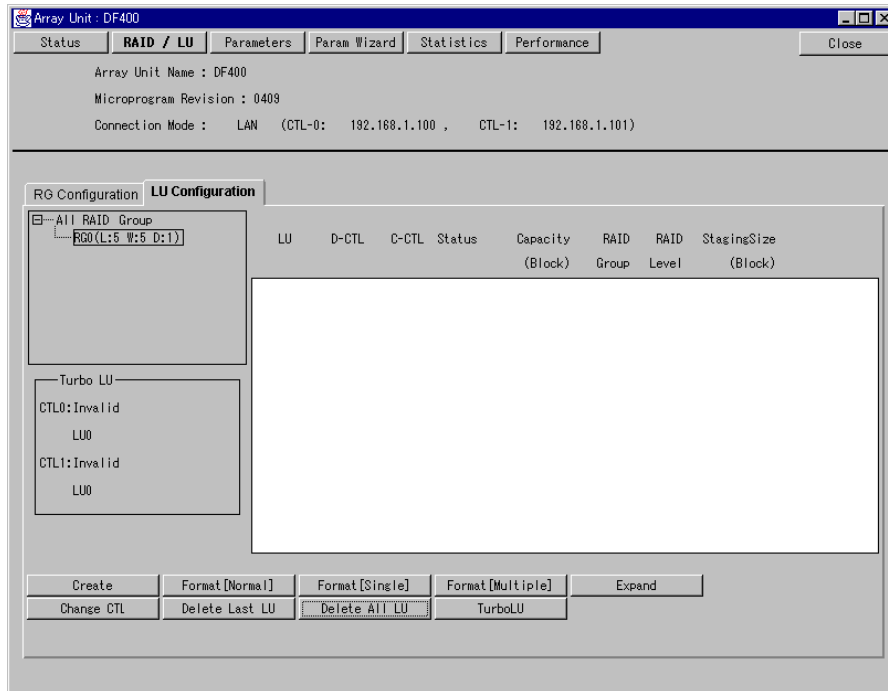


- b) When any formatted LU exists



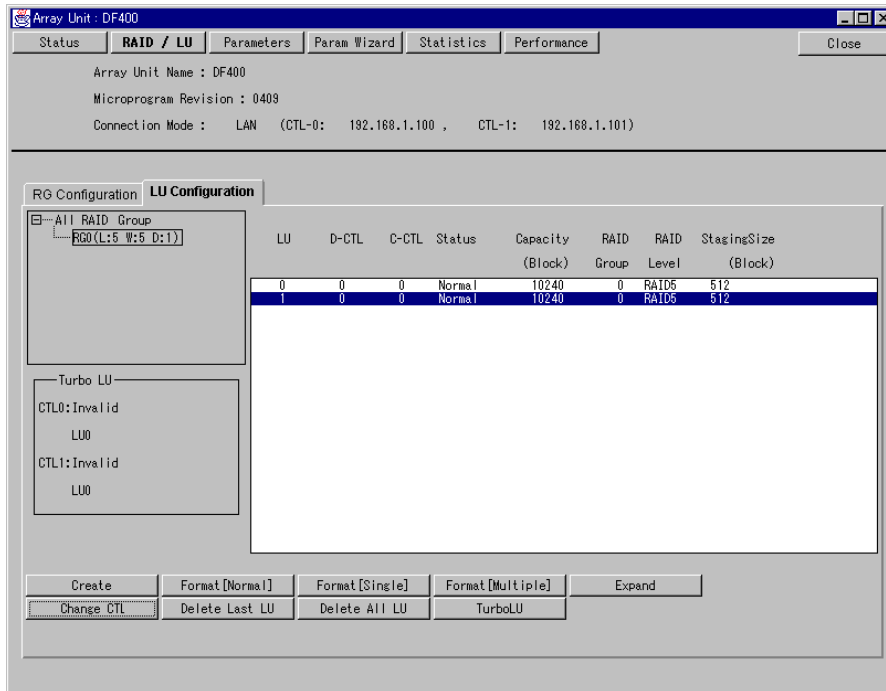
Click **OK**, and all LUs will be deleted. When all the LUs have been deleted, the user data in the LUs will be lost.

- The LU information in which all the LUs have been deleted is updated and the window is displayed.



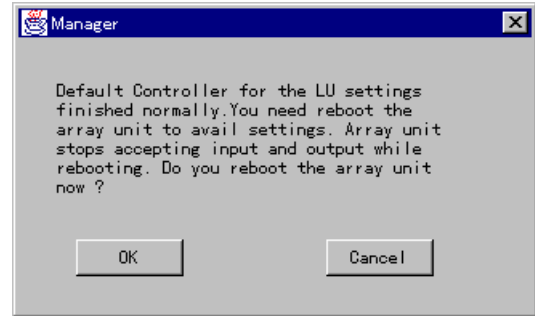
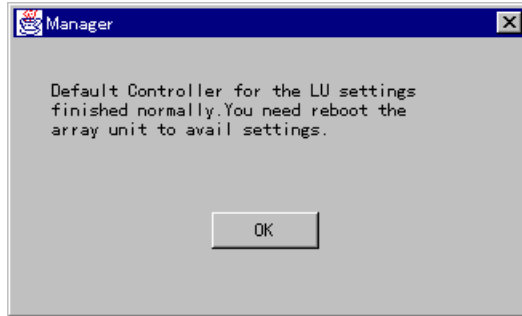
3.4.10 Changing the default controller in charge of an LU

1. Click **RAID/LU** in the unit window, then click the **LU Configuration** tab.



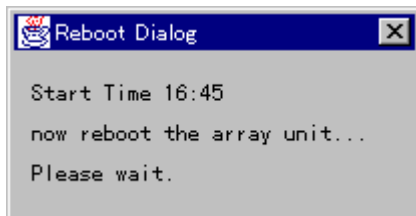
2. Select an LU you want to switch the default controller in charge of it and the click **Change CTL**.

3. A message indicating that the default controller with which an LU is connected has been changed. If an array unit supports restarting, a confirmation message indicating a request for restarting is displayed, so clicks the **OK** button when restarting.
 - If an array unit does not support restarting
 - If an array unit supports restarting



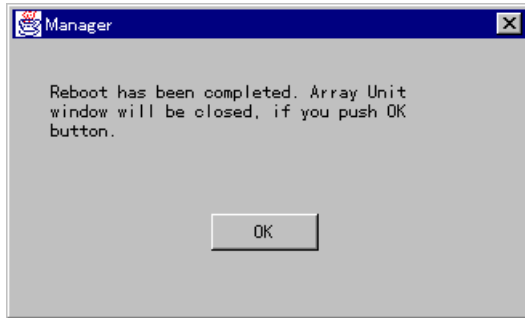
Note: To validate the setup default controller of an LU, restart the array unit. The previous setting stays valid until restarting. When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

- a) When instructing to restart an array unit, the time the restarting has began is displayed. The restarting takes about two to six minutes.

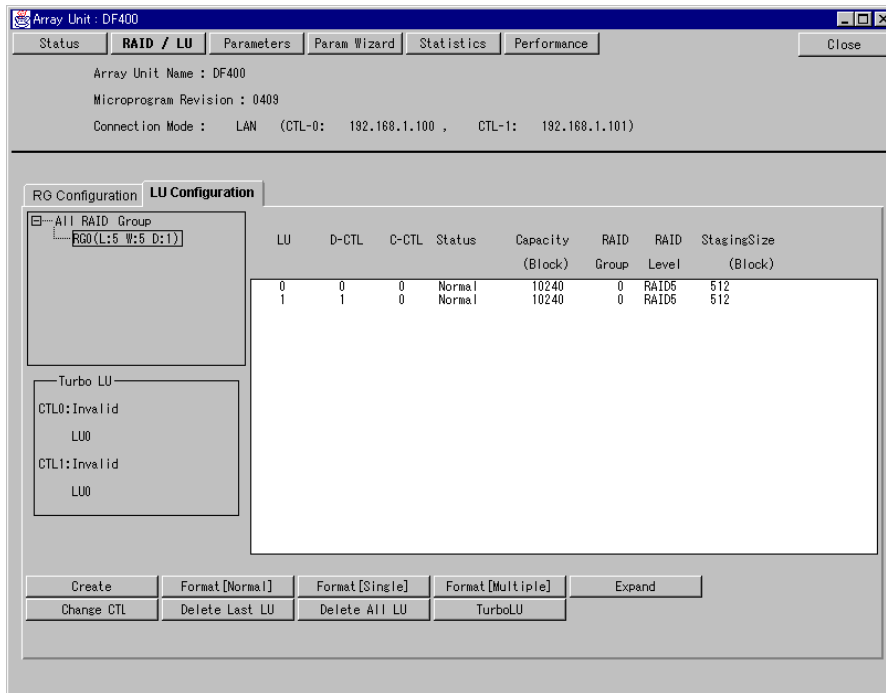


Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

- b) A message indicating that the restarting has terminated is displayed, so clicks the **OK** button.
 When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.



4. When not restarting, LU information, in which the default controller of an LU has been changed, is displayed on the screen after being updated.

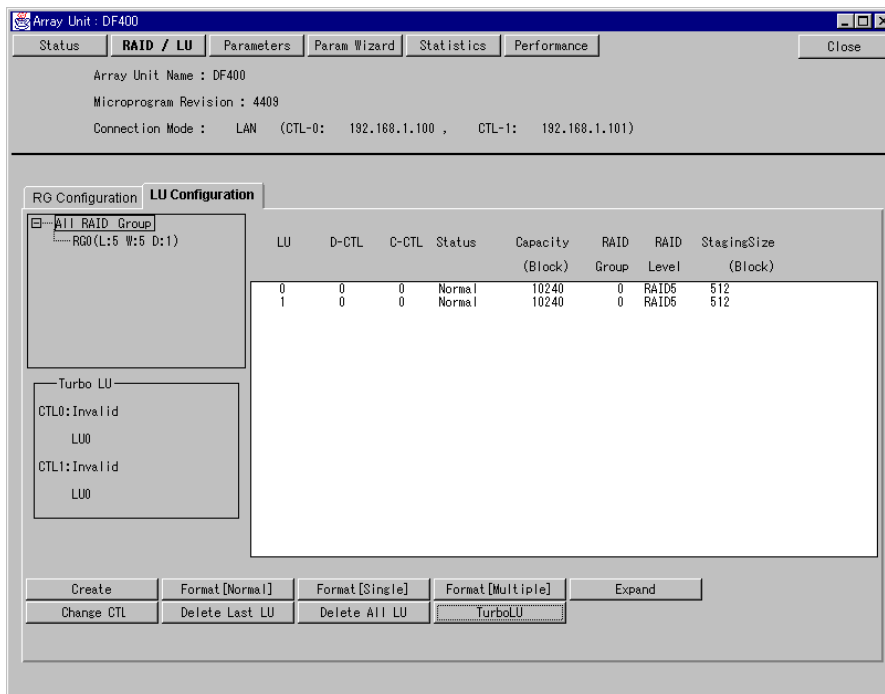


Note: Execution of a switching of the default controller controlling the LU changes the default controller currently displayed. When the switching is continuously executed twice, the specified controller is changed to the original default controller controlling the LU.

3.4.11 Setting Turbo LU

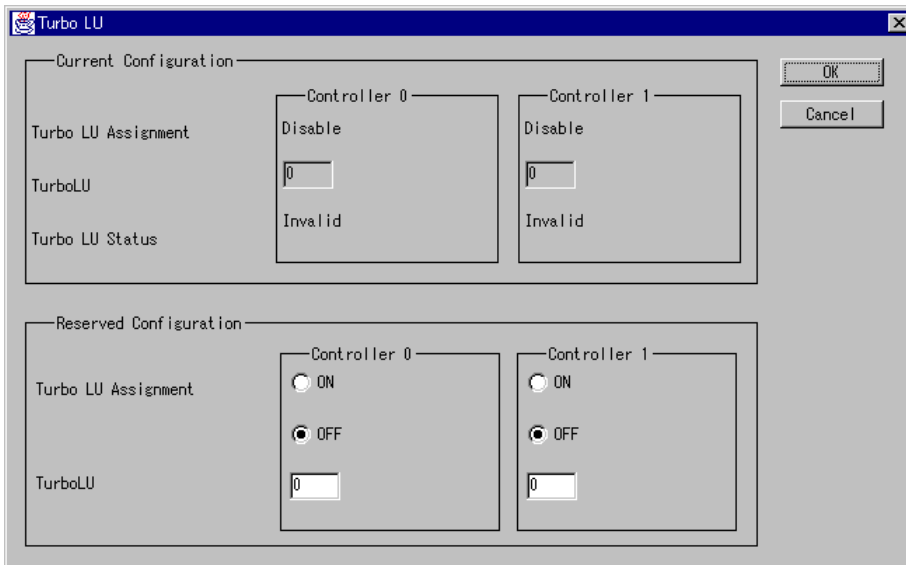
This function sets an LU to be resident in the cache.

1. Click **RAID/LU** in the unit window, then click the **LU Configuration** tab.



2. Click **Turbo LU**.

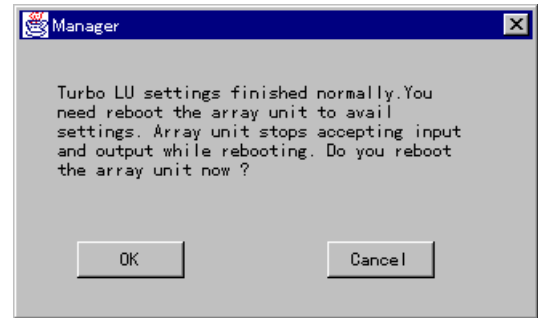
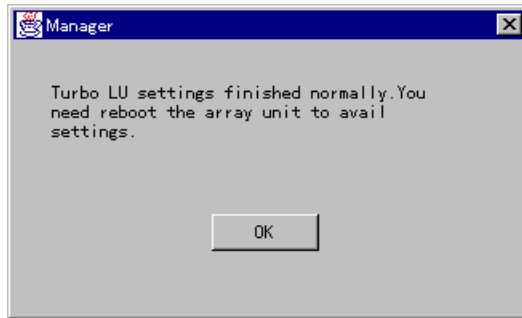
3. Input the setting item to the **Reserved Configuration**.



- **Current Configuration:** Indicates the currently set configuration.
 - **Turbo LU Assignment:** Setting status of whether to validate or invalidate the Turbo LU function.
 - Enable:** Valid
 - Disable:** Invalid
 - **Turbo LU:** Turbo LU number
 - **Turbo LU Status:** Status of the Turbo LU.
This status is not displayed when the **Turbo LU Assignment** is set to DISABLE.
 - Valid:** Usable
 - Invalid:** Unusable
 - **Reserved Configuration:** Indicates the configuration to be reserved.
 - **Turbo LU Assignment:** Specifies the setting of whether to validate or invalidate the Turbo LU function.
 - ON:** To validate.
 - OFF:** To invalidate.
 - **Turbo LU:** Specifies the Turbo LU number.
4. Click **OK**.

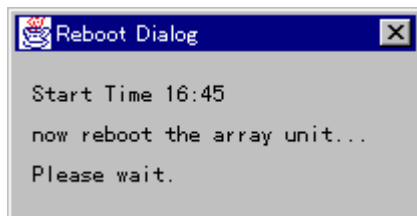
5. A message indicating that LU cache has been set resident is displayed. If an array unit supports restarting, a confirmation message indicating a request for restarting is displayed, so clicks the **OK** button when restarting.

- If an array unit does not support restarting
- If an array unit supports restarting



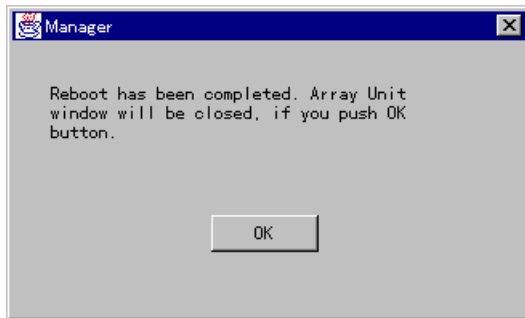
Note: To validate the set LU cache resident condition, restart the array unit. The previous setting stays valid until restarting. When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

- c) When instructing to restart an array unit, the time the restarting has began is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

- d) A message indicating that the restarting has terminated is displayed, so clicks the **OK** button.
When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.



Note: The LU cache resident function is available as a priced optional feature. If the LU cache resident function is not yet installed or the priced optional feature is not yet made effective, LU cache cannot be set resident.

3.5 Setting System Parameters and RTC Setting Wizard

3.5.1 Setting system parameters

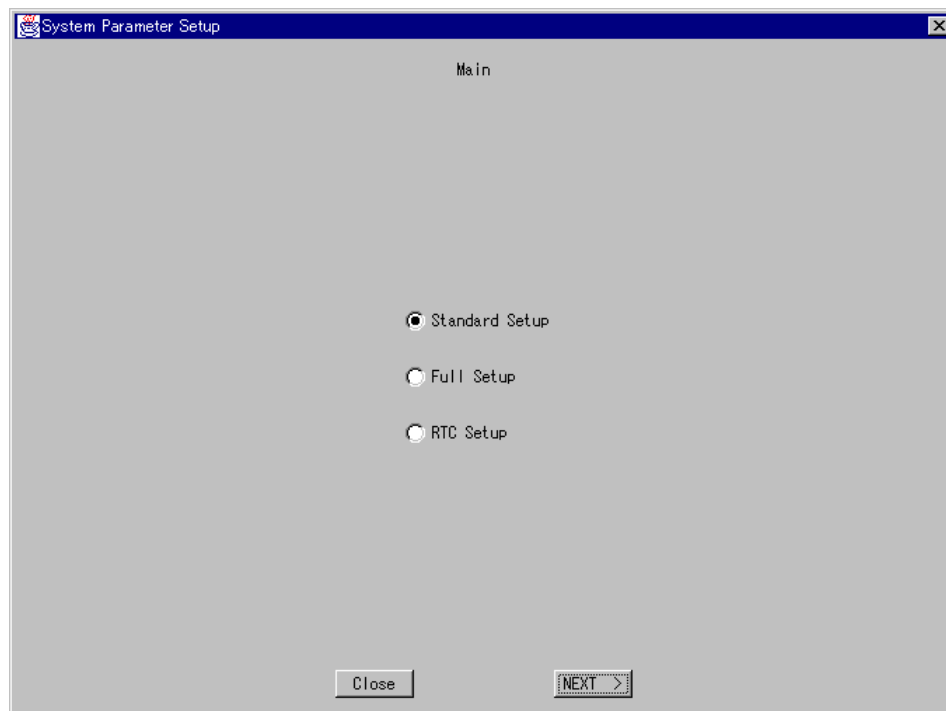
Set the system parameters of the array unit in the wizard format.

When connected to the dual system, if the controller on one side is blocked, no setting can be made. Before starting operation, make sure that the array unit is not in a warning status.

When setting the dual system in the RS232C connection, be sure to set the controller 0 side first.

When the system parameter is set, the array unit cannot execute any command from the host. After this, the functions of the manager can no longer work, except the wizard for setting system parameters and error monitoring. After the setting is completed, restart the array unit, make sure that the array unit has been started up, and then connect it to the host and the manager.

1. Click **Param Wizard**.
The **Param Wizard** can be clicked, no matter what is displayed on the screen.
2. Click the **Standard Setup** or **Full Setup** option button, and click **NEXT >**.



- **Standard Setup** can set the standard parameters for use of the array unit.
- **Full Setup** can set all the system parameters of the array unit.

The parameters are displayed in 18 screens in wizard form. As for the items shown in each screen, the parameters vary according to of the type of array unit that is connected. The correspondence of the parameters in each screen with array units is shown in Table 3.2.

Table 3.2 List of supported parameters on the screens

Window No.	Setting item	DF400		DF500	
		SCSI	Fibre	SCSI	Fibre
1	System Startup Attribute	○	○	○	○
	Spare Disk	○	○	×	×
	Host Connection Mode	○	○	○	○
	Host Connection Mode 1	○	○	○	○
	Standard Mode	○	○	○	○
	Open VMS Mode	○	○	○	○
	TRESSPASS Mode	○	○	○	○
	WolfPack Mode	○	○	○	○
	IBM7135 I/O path switch Mode	○	×	○	×
	NCR I/O path switch Mode	○	×	○	×
	Host Connection Mode 2	○	○	○	○
	VxVM DMP mode enable	×	×	○	○
	ODE Mapper mode enable	×	×	○	×
	HP Connection mode enable	×	×	×	○
	Report inquiry page 83H	×	×	○	○
	UA (06/2A00) suppress mode enable	×	×	○	○
	HISUP mode enable	×	×	○	○
	CCHS convert mode enable	×	×	○	○
Serial Number	○	○	○	○	
2	Drive Capacity	○	○	×	×
3	Option 1	○	○	○	○
	VxVM DMP mode enable	○	○	×	×
	CLAM mode enable	○	○	×	×
	SUN Solaris 2.5.1 mode enable	○	○	×	×
	Drive Detach mode enable	○	○	○	○
	MP5400 mode enable	○	○	×	×
	ODE Mapper mode enable	○	×	×	×
	HP Connection mode enable	○	○	×	×

Table 3.2 List of supported parameters on the screens (Continued)

Window No.	Setting item	DF400		DF500	
		SCSI	Fibre	SCSI	Fibre
4	Option 2	○	○	○	○
	Multipath (Controller)	○	○	○	○
	Report inquiry page 83H	○	○	×	×
	PROCOM mode enable	○	○	○	○
	Report status (normal / warning)	○	○	○	○
	Multipath (Array Unit)	○	○	○	○
	Turbo LU Warning	○	○	○	○
	UA (06/2A00) suppress mode enable	○	○	×	×
	SGL Mode enable	○	○	×	×
Port ID Take-over Mode	○	○	×	×	
5	Target ID (Controller 0 side)	○	○	○	○
6	Target ID (Controller 1 side)	○	○	○	○
7	Data Striping Size	○	○	○	○
	LU Size Report to the Host	○	×	○	×
	Buzzer	○	○	×	×
	SCSI Reset/LIP Mode for all port	○	○	×	×
	Operation if the Processor failures Occurs	○	○	○	○
8	INQUIRY Information	○	○	○	○
	Command Queuing	○	○	○	○
	ANSI Version	○	×	○	×
	Web Title	×	×	○	○
	Cache Mode	○	○	○	○
	All off	○	○	○	○
	Random mode	○	○	○	○
	Sequential mode	○	○	×	×
	Random & Sequential mode	○	○	×	×
	Host Connection Mode	×	×	×	○
Link Separation	×	×	×	○	

Table 3.2 List of supported parameters on the screens (Continued)

Window No.	Setting item	DF400		DF500	
		SCSI	Fibre	SCSI	Fibre
9	Port Type (Controller 0 side)	○	○	○	○
	Port Option (Controller 0 side)	○	○	○	○
	Reset/LIP Mode (Signal)	×	×	○	○
	Reset/LIP Mode (Process)	×	×	○	○
	LIP Port All Reset Mode	×	×	×	○
	Target Reset (Bus Device Reset) Mode	×	×	○	○
	Reserve Mode	×	×	○	○
	Logical Unit Reset Mode	×	×	×	○
	Third Party Process Logout Mode	×	×	×	○
	SGL mode enable	○	○	×	×
	HP Connection mode enable	○	○	×	×
10	Port Type (Controller 1 side)	○	○	○	○
	Port Option (Controller 1 side)	○	○	○	○
	Reset/LIP Mode (Signal)	×	×	○	○
	Reset/LIP Mode (Process)	×	×	○	○
	LIP Port All Reset Mode	×	×	×	○
	Target Reset (Bus Device Reset) Mode	×	×	○	○
	Reserve Mode	×	×	○	○
	Logical Unit Reset Mode	×	×	×	○
	Third Party Process Logout Mode	×	×	×	○
	SGL mode enable	○	○	×	×
	HP Connection mode enable	○	○	×	×
11	ROM Pseudo-response command processing (Controller 0 side)	○	×	○	×
	Save Data pointer resource (Controller 0 side)	○	×	○	×
12	ROM Pseudo-response command processing (Controller 1 side)	○	×	○	×
	Save Data pointer resource (Controller 1 side)	○	×	○	×

Table 3.2 List of supported parameters on the screens (Continued)

Window No.	Setting item	DF400		DF500	
		SCSI	Fibre	SCSI	Fibre
13	Controller Identifier (Controller 0 side)	○	○	○	○
	RS232C Error Information Outflow Mode (Controller 0 side)	○	○	○	○
	Write & Verify Execution Mode (Controller 0 side)	○	○	○	○
14	Controller Identifier (Controller 1 side)	○	○	○	○
	RS232C Error Information Outflow Mode (Controller 1 side)	○	○	○	○
	Write & Verify Execution Mode (Controller 1 side)	○	○	○	○
15	LAN Const (Controller 0 side)	○	○	○	○
16	LAN Const (Controller 1 side)	○	○	○	○
17	SYNC Control (Controller 0 side)	○	×	○	×
18	SYNC Control (Controller 1 side)	○	×	○	×

Windows for displaying the setting items differ depending on **Standard Setup** or **Full Setup**, SCSI array unit or fibre channel interface array unit, and dual system or single system. Screen displayed by each selection is shown in Table 3.3, for DF350 or DF400 connection, and screen displayed by each selection is shown in Table 3.4 for DF500 connection. The **No. of displayed window** to be displayed is that displayed at the upper right corner of each window for the setting, namely, “Window : xx”.

Table 3.3 Screen display for DF350, DF400 connection

No.	Setting mode	SCSI or Fibre Channel version	Dual system or single system	No. of displayed window
1	Standard Setup	SCSI or Fibre Channel version	Dual system	1,2,3,4,5,6
2			Single system	1,2,3,4,5
3	Full Setup	SCSI version	Dual system	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18
4			Single system	1,2,3,4,5,7,8,9,11,13,15,17
5		Fibre Channel version	Dual system	1,2,3,4,5,6,7,8,9,10,13,14,15,16
6			Single system	1,2,3,4,5,6,7,8,9,13,15

Table 3.4 Screen display for DF500 connection

No.	Setting mode	SCSI or Fibre Channel version	Dual system or single system	No. of displayed window
1	Standard Setup	SCSI or Fibre Channel version	Dual system	1,3,4,5,6
2			Single system	1,3,4,5
3	Full Setup	SCSI version	Dual system	1,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18
4			Single system	1,3,4,5,7,8,9,11,13,15,17
5		Fibre Channel version	Dual system	1,3,4,5,6,7,8,9,10,13,14,15,16
6			Single system	1,3,4,5,7,8,9,13,15

In the case of the **Standard Setup**, the window with a heading **System Parameter** is displayed. In the case of the **Full Setup**, the window with a heading **System Parameter (Option)** is displayed following the window displayed in the case of the **Standard Setup**.

On the top of the screen, the number of the controller that enables the system parameters is shown. For the case of connection with a single system, the screen for Controller 1 is not displayed.

Controller 0/1 Common: common parameters for controller 0 and controller 1

Controller 0: parameters for controller 0 only

Controller 1: parameters for controller 1 only

Items required to be set when the array unit is used in the special mode are shown below. Setting items not shown below are to be set according to the environment in which they are used.

a) When the I/O path switching function is used in the IBM RS6000 connection

No.	Setting item	Set value	No. of windows displayed
1	Host Connection Mode	IBM 7135 I/O pass switch emulation Mode	1
2	Controller Identifier	Enable	13,14
	Controller ID	For the case of DF400: DF400-00C0 (default value)	

b) When the I/O path switching function is used in the NCR WORLDMARK connection

No.	Setting item	Set value	No. of windows displayed
1	Host Connection Mode	NCR I/O pass switch emulation Mode	1
2	Controller Identifier	Enable	13,14
	Controller ID	For the case of DF400: DF400-00C0 (default value)	

c) When the I/O path switching function is used in the Sequent NUMA-Q connection

No.	Setting item	Set value	No. of windows displayed
1	Host Connection Mode	TRESPASS Mode	1
2	Option 2	Multipath (Controller)	4
3	Controller Identifier	Enable	13,14
	Controller ID	For the case of DF400: DF400-00C0 (default value) For the case of DF500: DF500-00C0 (default value)	

d) When the array unit is used in the WolfPack mode

No.	Setting item	Set value	No. of windows displayed
1	Host Connection Mode	Wolfpack Mode	1
2	Port Option of Port Type	For the case of DF500: Reset/LIP Mode (Signal) Reset/LIP Mode (Process) LIP Port All Reset Mode	10

e) When the host uses the VxVM DMP

No.	Setting item	Set value	No. of windows displayed
1	Option 1	VxVM mode	3
2	Controller Identifier	Enable	13,14
	Controller ID	For the case of DF400: DF400-C000 (default value) For the case of DF500: DF500-C000 (default value)	

f) When the host uses Sun OS Solaris 2.5.1 (August, 1997 or later) (DF400)

No.	Setting item	Set value	No. of windows displayed
1	Option 1	SUN Solaris 2.5.1 mode	3

g) When the array unit is used being connected to the MP5400

No.	Setting item	Set value	No. of windows displayed
1	Option 1	MP5400 mode	3

h) When the array unit is connected to Host Board Adapter based on HP Tachyon (via the fibre channel)

No.	Setting item	Set value	No. of windows displayed
1	Option 1	HP Connection mode	3

i) When the host uses IRIX OS (in the fibre channel connection of DF400)

When the port type is normal

No.	Setting item	Set value	No. of windows displayed
1	Option 2	SGL mode	4
2	Port Type	Normal	9/10

When the port type is multiple (Window No. : 9/10)

No.	Setting item	Set value	No. of windows displayed
1	Port Type	Multiple mode	9/10
	Port Option	SGL mode	

- j) When the array unit is used in the Port ID taking over mode (in the fibre channel connection of DF400)

No.	Setting item	Set value	No. of windows displayed
1	System Startup Attribute	Hot Standby Mode (SCSI ID Take-over)	1
2	Option 2	Port ID Take-over	4

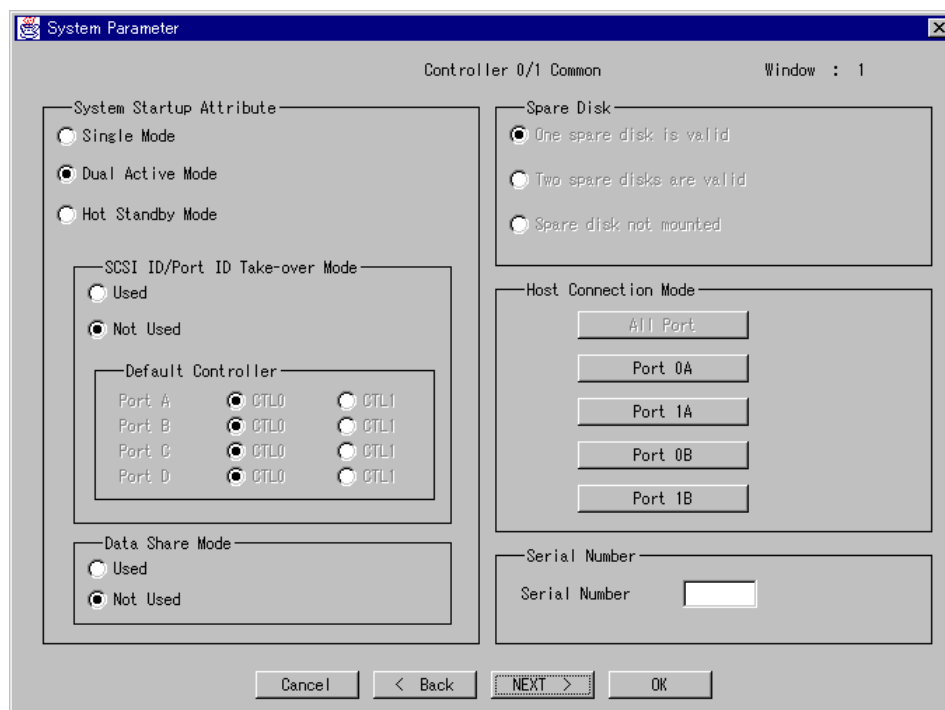
Note: Set the same port IDs for the corresponding ports of the controller 0 and controller 1, that is 0A and 1A, and 0B and 1B.

Example : 0A, 1A = 0x0000EF

0B, 1B = 0x0000E8

Place the Port 0A of the controller 0 and the Port 1A of the controller 1 on the same loop, and the Port 0B of the controller 0 and the Port 1B of the controller 1 on the same loop.

- The system parameter window is displayed starting with Window :1. The window displays the items currently set. Check the displayed contents on the window and set each displayed item to the configuration you want to set. When making the next setting, click **NEXT >**. When you click **< Back**, the previous window will appear. When you click **OK**, no more settings on the next and subsequent windows are made but the conformation window appears. To stop the setting, click **Cancel**. Below, using the screen display when the Fibre version of DF500 is connected, the parameters in every display screen of the wizard will be displayed. For a display screen not shown for the Fibre version of DF500, the screen for connection with DF400 is used.



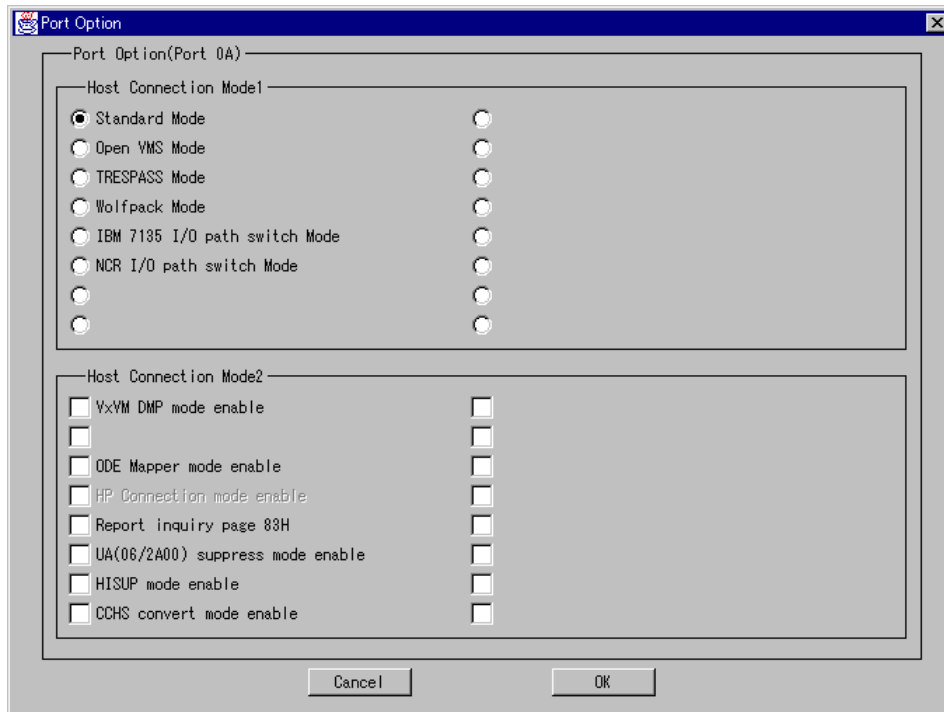
- **System Startup Attribute:** Selects the configuration of the array unit.
 - **Single Mode:** Single configuration
 - **Dual Active Mode:** Dual active configuration
 - **Hot Standby Mode:** Hot standby configuration
 - **SCSI ID/Port ID Take-over Mode:** Specifies the take-over of SCSI ID.
 - Used:** Used the SCSI ID/Port ID Take-over Mode.
 - Not Used:** Not used the SCSI ID/Port ID Take-over Mode.
 - Default Controller:** Specifies the controller to be positioned at the port. This specification is valid only when **Dual Active Mode (connect Host)** is specified.
 - **Data Share Mode:** Specifies the attribute of the data share mode.
 - Used:** Used in the data share mode.
 - Not Used:** Not used in the data share mode.
- **Spare Disk:** Selects the spare drive configuration installed in the array unit.
 - **One spare disk is valid:** Validates one spare drive.
 - **Two spare disks are valid:** Validates two spare drives.
 - **Spare disk not mounted:** No spare drive is mounted.
- **Host Connection Mode:** Specifies the host connection mode of the port.
 - For DF350 or DF400, click the button **All Port**, and specify the host connection mode in the array unit.
 - For DF500, click the button **Port xx** (xx : 0A, 1A, 0B, 1B) to specify each port.
- **Serial Number:** Enters the lower four digits of the manufacturing serial number of an array unit with alphanumeric characters.
 - The number is reflected on the fiber version of the WWN, so do not set any value except for the lower four digits of the manufacturing serial number.** Factory set is the lower four digits of the manufacturing serial number of an array unit.

Note 1: When DF350 or DF400 is connected, to change to **SCSI ID/Port ID Take-over Mode**, please do so when the Target ID's of controller 0 and controller 1 are set to be the same. It cannot be changed when the settings of the Target ID's are different.

When the setting of Target ID's are different in controller 0 and controller 1, to change to **SCSI ID/Port ID Take-over Mode**, set the Target ID's of controller 0 and controller 1 to be the same. After the setting is enabled, please change to **SCSI ID/Port ID Take-over Mode**. When DF500 is connected, if it is changed to **SCSI ID/Port ID Take-over Mode**, the Target ID of controller 0 will be automatically mirrored in the Target ID of controller 1. After setting the Target ID to be set in controller 0, please change **SCSI ID/Port ID Take-over Mode**.

Note 2: Concerning the array unit with a single controller, a change from the **Single Mode** to the other configuration cannot be made.

The screen display for **Port Option** is shown.



- **Host Connection Mode 1:**

- **Standard Mode:** Open system emulation mode
- **Open VMS Mode:** Open VMS mode
- **TRESPASS Mode:** TRESPASS mode
- **Wolfpack Mode:** Wolfpack mode
- **IBM 7135 I/O path switch Mode:** IBM 7135 I/O path switch mode
- **NCR I/O path switch Mode:** NCR I/O path switch mode

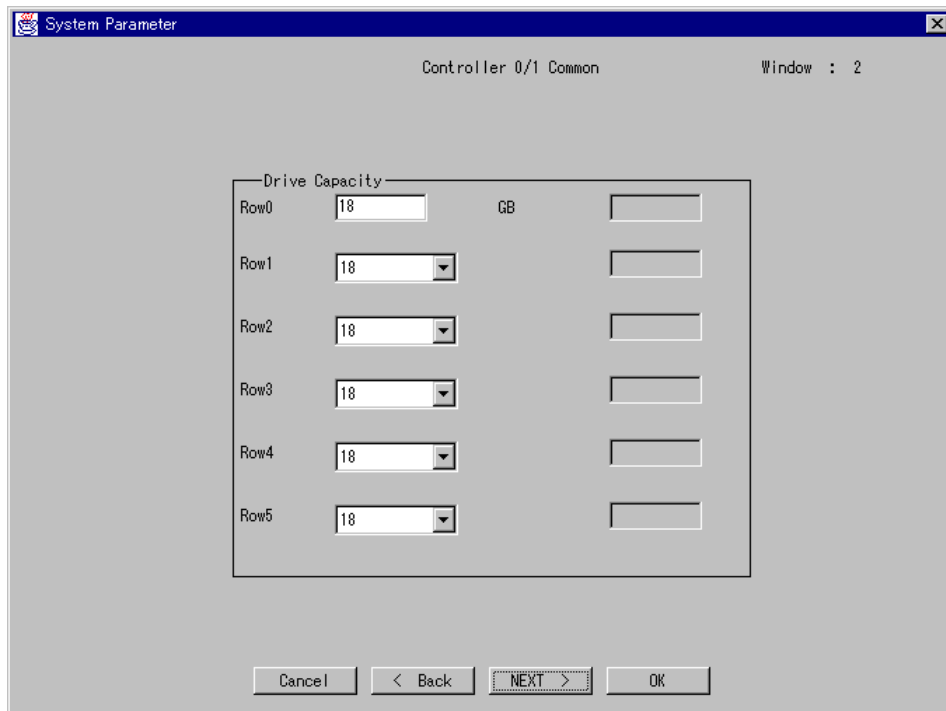
- **Host Connection Mode 2:**

- **VxVM DMP mode enable:** VxVM mode
- **ODE Mapper mode enable:** ODE Mapper mode
- **HP Connection mode enable:** HP connection mode
- **Report inquiry page 83H:** Enables the report of Inquiry Page : 83_H.
- **UA (60/2A00) suppress mode enable:** Suppresses the unit attention (06/2A00).
- **HISUP mode enable:** Enables the HISUP
- **CCHS convert mode enable:** Enables the CCHS convert

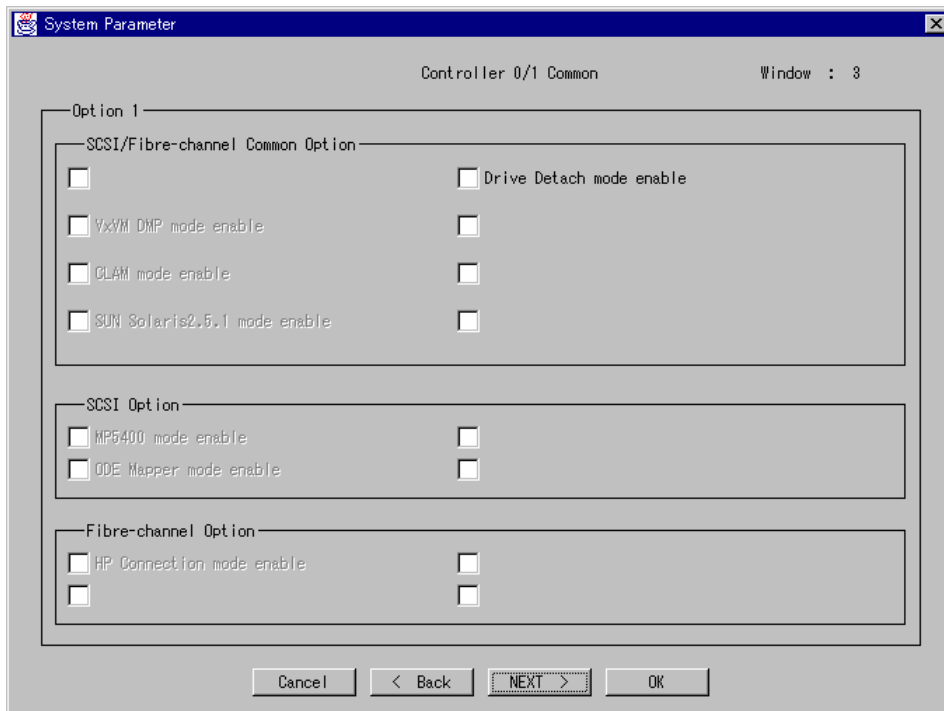
Note 3: In **Host Connection Mode 1**, if the following change is carried out, please delete the **Vendor ID** and **Product ID** in **INQUIRY Information** under “Window : 8”.

- When changing to **IBM 7135 I/O path switch Mode** from other modes
- When change to **NCR I/O path switch Mode** from other modes
- When change from **IBM 7135 I/O path switch Mode** to other modes

- When change from **NCR I/O path switch Mode** to other modes

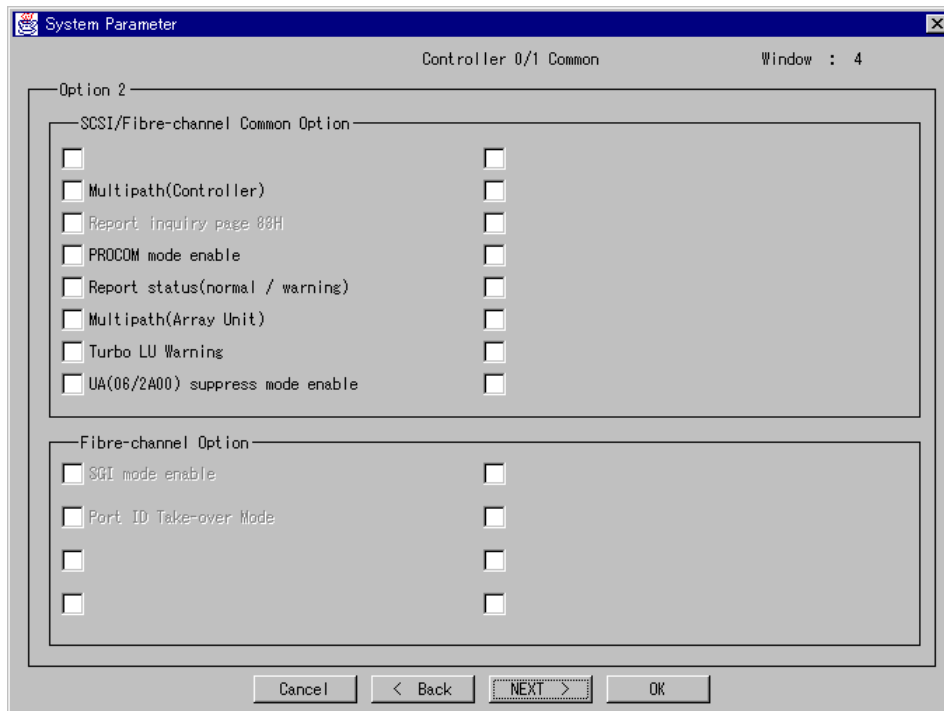


- **Drive Capacity:** Selects the capacity of the installed drive in units of row. Row0 cannot be set.



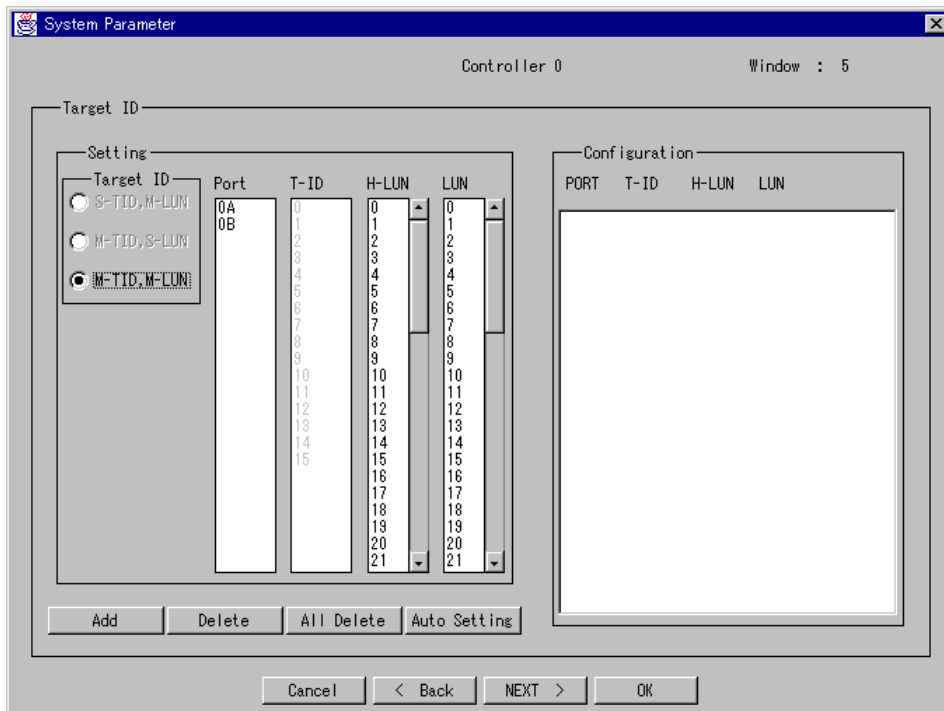
- **Option 1:** Sets the optional functions 1 of the array unit. The two or more optional functions can be selected.
- **SCSI/Fibre-channel Common Option:** Options which can be used by the SCSI and Fibre Channel interface array units. Set the optional function(s) according to the configuration of the array unit.
 - **VxVM DMP mode enable:** Validates the VxVM mode.
 - **CLAM mode enable:** Validates the CLAM mode.
 - **SUN Solaris2:5:1 mode enable:** Validates the SUN Solaris2.5.1 mode.
 - **Drive Detach mode enable:** Validates the drive blockade mode.
- **SCSI Option:** Options exclusive to the SCSI array unit. Set the optional function (s) according to the configuration of the array unit. When the Fibre Channel interface array unit is connected, this item is displayed in half-tone and cannot be set.
 - **MP5400 mode enable:** Validates the MP5400 mode.
 - **ODE Mapper mode enable:** Validates the ODE Mapper mode.
- **Fibre-channel Option:** An option exclusive to the Fibre Channel interface array unit. Set the optional function according to the configuration of the array unit. When the SCSI array unit is connected, this item is displayed in half-tone and cannot be set.
 - **HP Connection mode enable:** Validates the HP connection mode.

Note: It does not normally by the setup though **Option 1** can be setup in the plural. When you set it up, setup only an applicable item referring to the manual of attaching array unit.



- **Option 2:** Sets the optional functions 2 (expanded option) of the array unit. The two or more optional functions can be selected.
- **SCSI/Fibre-channel Common Option:** Options which can be used by the SCSI and Fibre Channel interface array units. Set the optional function(s) according to the configuration of the array unit.
 - **Multipath (Controller):** Sets a unit of the sequential judgment to each controller.
 - **Report inquiry page 83H:** Validates the report of Inquiry Page : 83.
 - **PROCOM mode enable:** Validates the PROCOM mode.
 - **Report status (normal/warning):** Validates the warning status report mode.
 - **Multipath (Array Unit):** Sets a unit of the sequential judgment to each array unit.
 - **Turbo LU Warning:** When the Turbo LU function is invalidated, a warning is reported.
 - **UA (06/2A00) suppress mode enable:** Unit Attention (06/2A00) is inhibited.
- **Fibre-channel Option:** Options exclusive to the Fibre Channel interface array unit. Set the optional function(s) according to the configuration of the array unit. When the SCSI array unit is connected, this item is displayed in half-tone and cannot be set.
 - **SGI mode enable:** Validates the SGI mode in the array unit.
 - **Port ID Take-over Mode:** Validates the port ID take-over.

Note: It does not normally by the setup though **Option 2** can be setup in the plural. When you set it up, setup only an applicable item referring to the manual of attaching array unit.



- **Target ID:** Sets the target IDs of controller 0.

Note: For the cases of DF400 connection, if **System Startup Attribute** is set at **SCSI ID/Port ID Take-over Mode**, please set Target ID of controller 0 and controller 1 to be the same. The array unit is put into an alarm status when it is restarted if the setup of target ID is different. For the cases of DF500 connection, if **System Startup Attribute** is set at **SCSI ID/Port ID Take-over Mode**, the setting of controller 0 automatically sets the Target ID for controller 1.

The text box for the H-LUN and LUN is displayed on a scroll screen, and LUNs from 0 to 63 can be selected. When the manager runs with IRIX, all LUNs may not be displayed by scrolling. If LUNs are not displayed up to 63, operate with the arrowdown (▼) key.

In case that the LUN mapping is used for the controller 0, the LUN mapping shall be also used for the controller 1. Otherwise, all logical unit will be available through all ports of the controller that does not use the LUN mapping.

- **Target ID:** Specifies configuration types of the target ID and the LUN.
 - **S-TID, M-LUN:** Sets a target ID of the port and makes the LUN which shared by the ports can be used by the host with an identical LUN.
 - **M-TID, S-LUN:** Sets a port and a target ID for the LUN and makes the LUN can be used with LUN = '0' and a target ID set by the host.
 - **M-TID, M-LUN:** Sets a port, a target ID, and an H-LUN for the LUN in a map form and makes the LUN can be used in a configuration set by the host.
 - **S-TID:** Single Target ID
 - **M-TID:** Multi Target ID
 - **S-LUN:** Single LUN
 - **M-LUN:** Multi LUN
 - **LUN:** Logical unit number in the array unit.
 - **H-LUN:** Logical unit number that the host can recognize.
 - **Port:** Specifies a port number.
 - **T-ID:** Specifies a target ID.
 - **H-LUN:** Specifies an LUN that the host recognizes. When **S-TID, M-LUN** and **M-TID, S-LUN** are selected for **Target ID**, the display appears in gray and selection is disabled.
 - **LUN:** Specifies the LUN in the array unit. When **S-TID, M-LUN** is selected for **Target ID**, the display appears in gray and selection is disabled.
- **Configuration:** Displays the configuration that is set. When **S-TID, M-LUN** is set, **H-LUN** and **LUN** are displayed as “-”. When **M-TID, S-LUN** is set, **H-LUN** is displayed as “-”.

a) **S-TID, M-LUN** mode setting

Click the **S-TID, M-LUN** option button in **Target ID**.

Select one **Port** to be set, select one **T-ID** to be set, and click **Add**. The added contents are displayed in **Configuration**.

Multiple **Port** and **T-ID** can be selected. In this case, the least significant digit value selected in the text box is validated.

For deletion, click the line to be deleted in **Configuration** and click **Delete**.

The deleted contents disappear from the **Configuration** display.

b) **M-TID, S-LUN** mode setting

Click the **M-TID, S-LUN** option button in **Target ID**.

Select one **LUN** to be set, select one **Port** and one **T-ID** to be set, and click **Add**.

The added contents are displayed in the **Configuration** text box.

Multiple **Port** and **T-ID** can be selected. In this case, the least significant digit value selected in the text box is validated.

For deletion, click the line to be deleted in **Configuration** and click **Delete**.

The deleted contents disappear from the **Configuration** display.

c) **M-TID, M-LUN** mode setting

Click the **M-TID, M-LUN** option button in **Target ID**.

Select one **LUN** to be set, select **Port**, **T-ID**, and **H-LUN** to be set in the mapping setup configuration, and click **Add**. The added contents are displayed in

Configuration.

Multiple **Port**, **T-ID**, and **H-LUN** can be selected.

When connecting an array unit of DF400 fibre version, **T-ID** is displayed in gray and inputting is not required. To clear the **M-TID, M-LUN** setting, delete all in

Configuration.

For deletion, click the line to be deleted in **Configuration** and click **Delete**.

The deleted contents disappear from the **Configuration** display.

d) **Auto setting**

Click **Auto Setting**. The target ID configuration file is read and **Port**, **T-ID**, **H-LUN**, and **LUN** are automatically set. The read contents are displayed in **Configuration**.

Auto setting is performed regardless of **Target ID**.

After execution of auto setting, all of the previous contents are invalidated and changed to the contents of the target ID configuration file.

The file configuration used for executing auto setting is shown in the following figure.

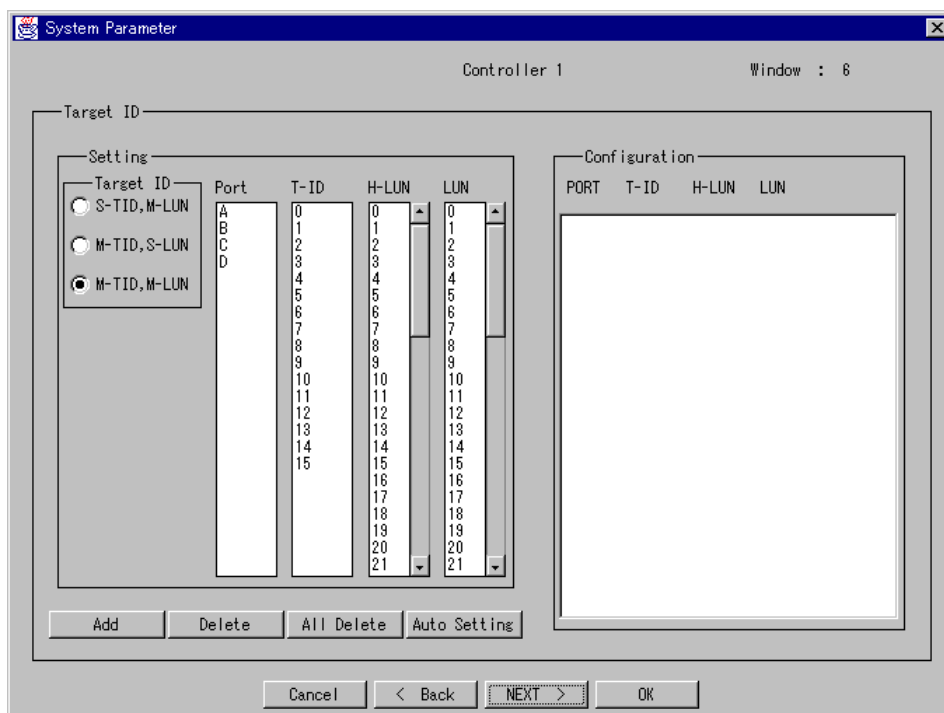
Input "Yes" or "No" in **Target ID** mode. Input necessary data for **Port**, **Target ID**, **H-LUN**, and **LUN** (the same items as those entered in the setting made on the screen).

Put a space between items. If the tabulating function is used, they are regarded as input errors and the inputs are ignored.

```
Information file for Target ID configuration
S-TID, M-LUN : YES
M-TID, S-LUN : NO
M-TID, M-LUN : NO

Data
Port Target ID H-LUN LUN
OA      0
OB      1
1A      2
1B      3
```

Note: When the manager is connected to the DF400 array unit with the Fibre Channel connection, set '--' for the **T-ID**.



- **Target ID:** Sets the target IDs of controller 1.
The setting method is the same as controller 0.

Note: For the cases of DF400 connection, if **System Startup Attribute** is set at **SCSI ID/Port ID Taking-over Mode**, please set Target ID of controller 0 and controller 1 to be the same. The array unit is put into an alarm status when it is restarted if the setup of Target ID is different.

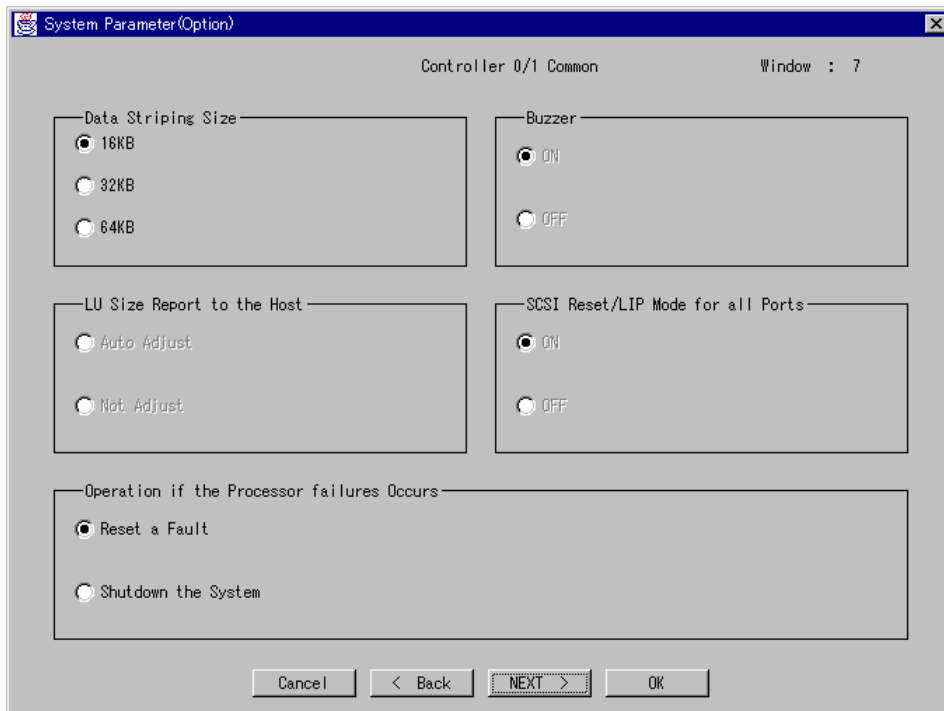
For the cases of DF500 connection, if **System Startup Attribute** is set at **SCSI ID/Port ID Taking-over Mode**, the setting of controller 0 automatically sets the Target ID for controller 1, and screen display is not shown.

The text box for the H-LUN and LUN is displayed on a scroll screen, and LUNs from 0 to 63 can be selected. When the manager runs with IRIX, all LUNs may not be displayed by scrolling. If LUNs are not displayed up to 63, operate with the arrow down (▼) key.

When the **Standard Setup** is selected, the window for the **Target ID** setting is the final window and the **NEXT >** button is not displayed. Click the **OK** button and set the system parameters for the array unit.

When the **Full Setup** is selected, the next system parameter setting can be made continuously. When the **NEXT >** button is clicked, the window under the heading of **System Parameter (Option)** is displayed.

The window displayed when the **Full Setup** is selected

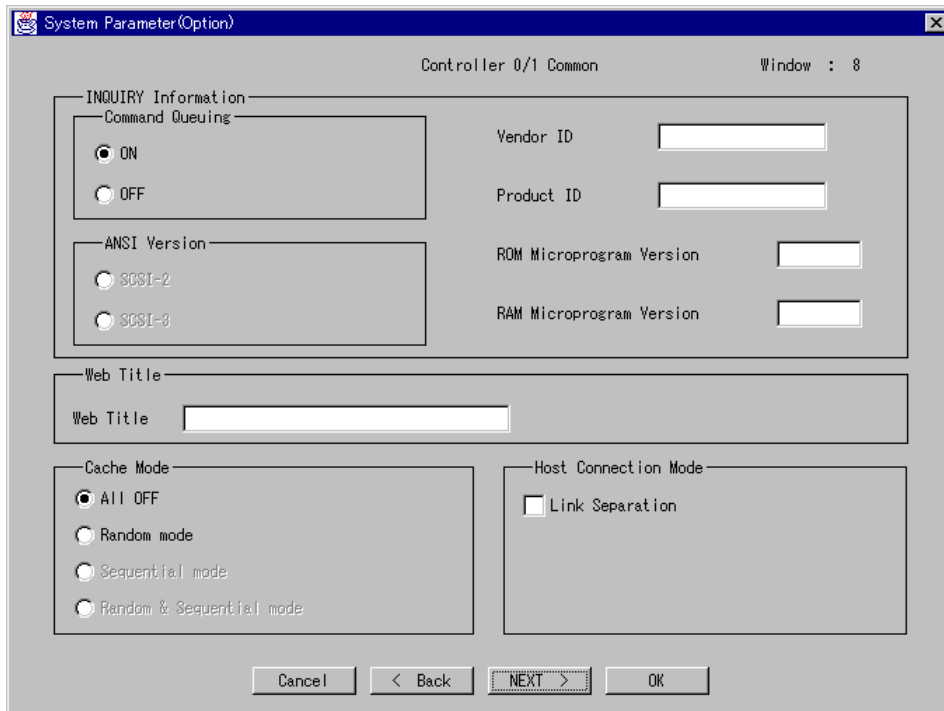


- **Data Striping Size:** Sets the striping size. In cases in which LU is already defined, it cannot be changed. In case of change, please do so after deleting all the LU.
- **LU Size Report to the Host:** Sets the LU size to be reported to the host. When the Fibre Channel interface array unit is connected, this item is displayed in half-tone and cannot be set.
 - **Auto Adjust:** The LU size to be reported to the host is determined by the array unit automatically.
 - **Not Adjust:** The LU size to be reported to the host is set to the consistent value.
- **Buzzer:** Sets whether or not to sound the buzzer when a warning or failure message is displayed.
 - **ON:** Sounds the buzzer.
 - **OFF:** Does not sound the buzzer.
- **SCSI Reset/LIP Mode for all Ports:** In the case of the SCSI array unit, sets the SCSI reset mode when the SCSI reset from another port is received. In the case of the Fibre Channel interface array unit, sets the LIP mode when the LIP from another port is received.

When the **Port Type** is **Multiple**, the setting is invalid.

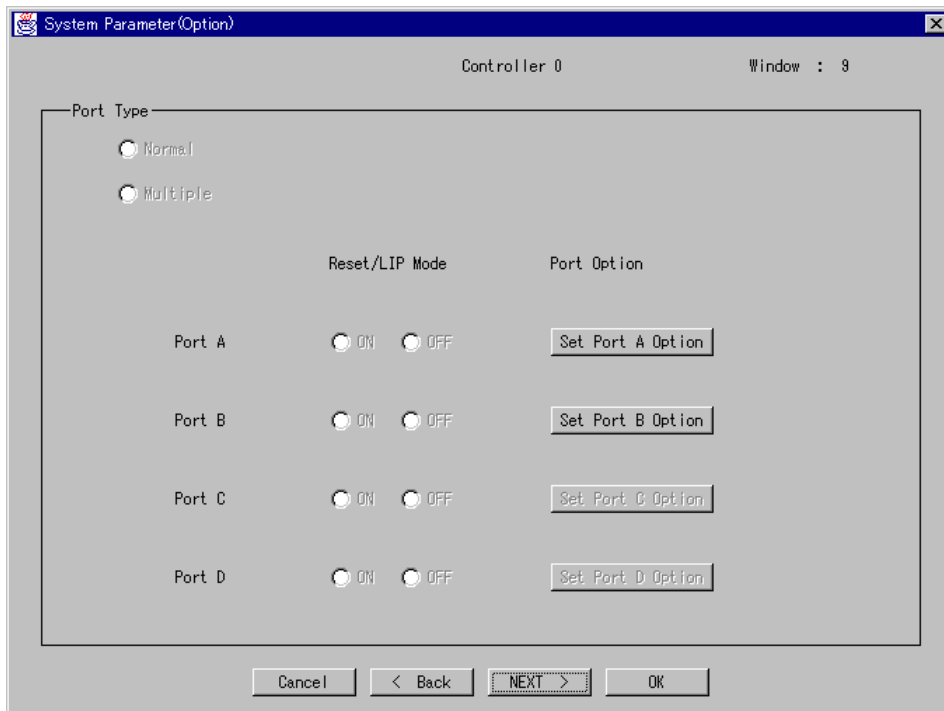
 - **ON:** Validate the SCSI reset/LIP mode from the other port.
 - **OFF:** Invalidate the SCSI reset/LIP mode from the other port.

- **Operation if the Processor failures Occurs:** Sets the operation to be performed when a processor failure occurs.
 - **Reset a Fault:** Resets a failure, and restart the controller.
 - **Shutdown the System:** Make the array unit go down.



- **Web Title:** If the home page of the array unit is displayed with the browser, specifies a character string displayed on the title bar of the browser. Enter up to 32 one-byte coded alphanumeric or characters (except for the ‘ (single quotation mark), “ (double quotation mark), and \ (backslash) symbols) other than numeric.
- **Host Connection Mode:** Sets up functions necessary for the host to which to connect.
 - **Link Separation:** When blocking a controller, shuts down a link.
- **Cache Mode:** Sets the cache memory allocation method.
 - **All OFF:** Use the cache memory with the ordinary allocation method.
 - **Random mode:** Use the cache memory allocating a buffer for random reading exclusively to it.
 - **Sequential mode:** Use the cache memory allocating a buffer for sequential reading exclusively to it.
 - **Random & Sequential mode:** Use the cache memory allocating buffers for random reading and sequential reading exclusively to it.

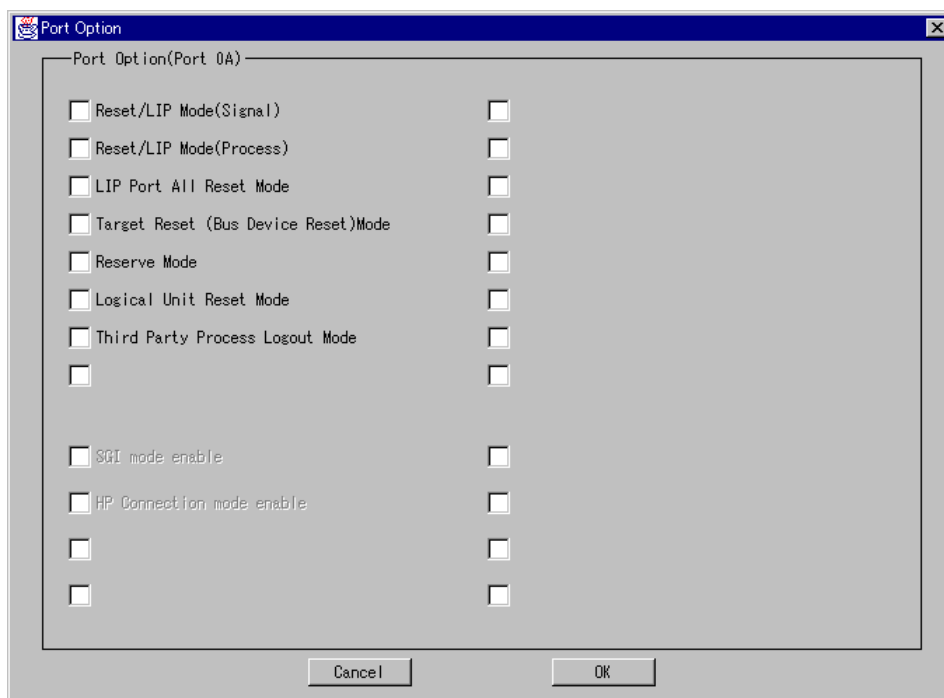
- **INQUIRY Information:** Sets the vendor name, model name, and command queuing. When the Fibre Channel interface array unit is connected, **ANSI Version** is displayed in half-tone and cannot be set.
 - **Command Queuing:** Specifies an execution of a command queuing.
 - ON:** Executes a command queuing.
 - OFF:** Inhibits a command queuing.
 - **ANSI Version:** Specifies the SCSI 2/3 reporting mode.
 - SCSI-2:** Responds with a setting of “2” for the ANSI version of the standard Inquiry data.
 - SCSI-3:** Responds with a setting of “3” for the ANSI version of the standard Inquiry data.
 - **Vendor ID:** Enter a vendor name with eight characters. When the name consists of less than seven characters, make a eight-character entry by filling the reset with space(s).
The default value set in the **System Startup Attribute** setting on the **Window : 1** is displayed. (“△” denotes a space.)
 - IBM 7135 I/O path switch Mode:** IBM △△△△△△
 - NCR I/O path switch Mode:** SYMBIOS △
 - Others:** HITACHI △
 - **Product ID:** Enter a model name with 16 characters. When the name consists of less than 16 characters, make a 16-character entry by filling the reset with space(s).
In the setting of **System Startup Attribute** under **Window : 1**, for the cases in which the following modes are specified, the values set by default are shown. (“△” denotes a space.)
 - IBM 7135 I/O path switch Mode:** 7135021000000000
 - NCR I/O path switch Mode:** INF-01-00 △△△△△△△△
 - DF400 (SCSI version):** other modes : DF400△△△△△△△△△△△△
 - DF400(Fibre version):** other modes : DF400F△△△△△△△△△△△△
 - DF500:** other modes : DF500△△△△△△
 - **ROM Microprogram Version:** Specifies a microprogram version of a ROM reported by inquiry command.
 - **RAM Microprogram Version:** Specifies a microprogram version of a RAM reported by inquiry command.



- **Port Type:** Sets the multi-port expanding function of the controller 0. The settings of **Normal** or **Multiple** is common to the controllers 0 and 1, and the setting made on the window of the controller 0 is valid and the window of the controller 1 is displayed in half-tone and cannot be set.

When **Multiple** is selected, set the **Reset/LIP Mode**.

- **Normal:** Validates the setting of **SCSI Reset/LIP Mode for all Ports** on the **Window : 7** window.
- **Multiple:** Sets the SCSI reset mode for each port.
- **Reset/LIP Mode:** Specifies the LIP mode from other ports.
 - ON:** Validates the LIP mode from other ports.
 - OFF:** Invalidates the LIP mode from other ports.
- **Port Option:** For the case of connection with Fibre version, port options can be set. Click the button **Set Port x Option** for each port.



- **Port Option (Port X):** Sets the Fibre channel Options.
If the Fibre channel option is set and the button **OK** is clicked, it will return to the setting screen of **Port Type**.

Reset/LIP Mode (Signal): The mode to transmit Reset/LIP signals to other ports.

Reset/LIP Mode (Process): The mode to transmit reset processing to other ports.

LIP Port All Reset Mode: The mode to execute reset on receiving LIP.

Target Reset (Bus Device Reset) Mode: The mode to transmit Target Reset to other ports.

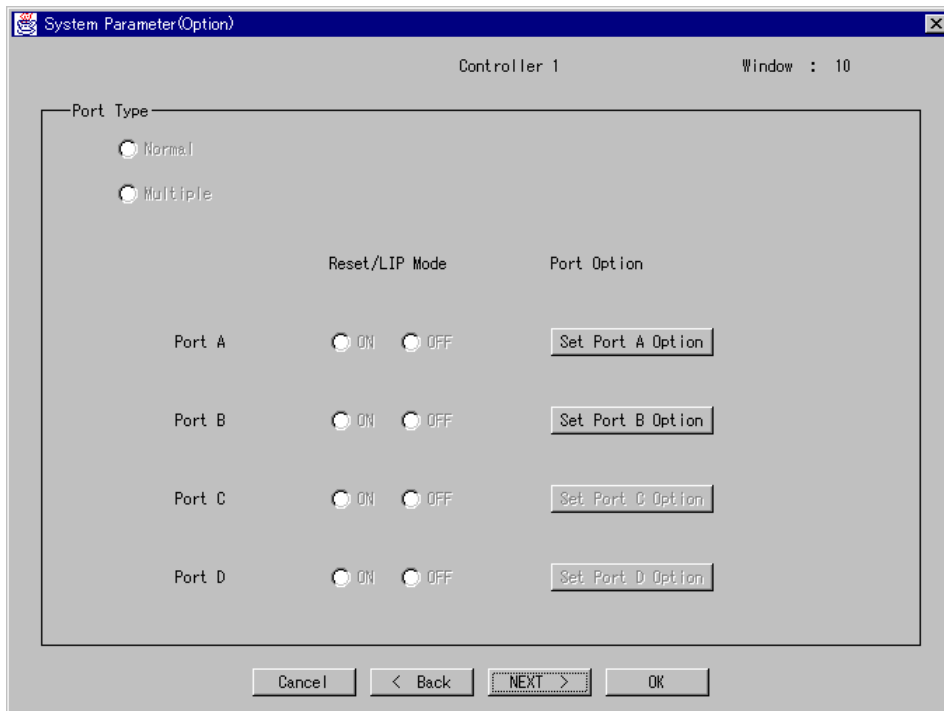
Reserve Mode: The mode to reserve LU in a dual system.

Logical Unit Reset Mode: When the Logical Unit Reset command is issued for an LU, all other commands received by that LU will be reset, regardless of the port.

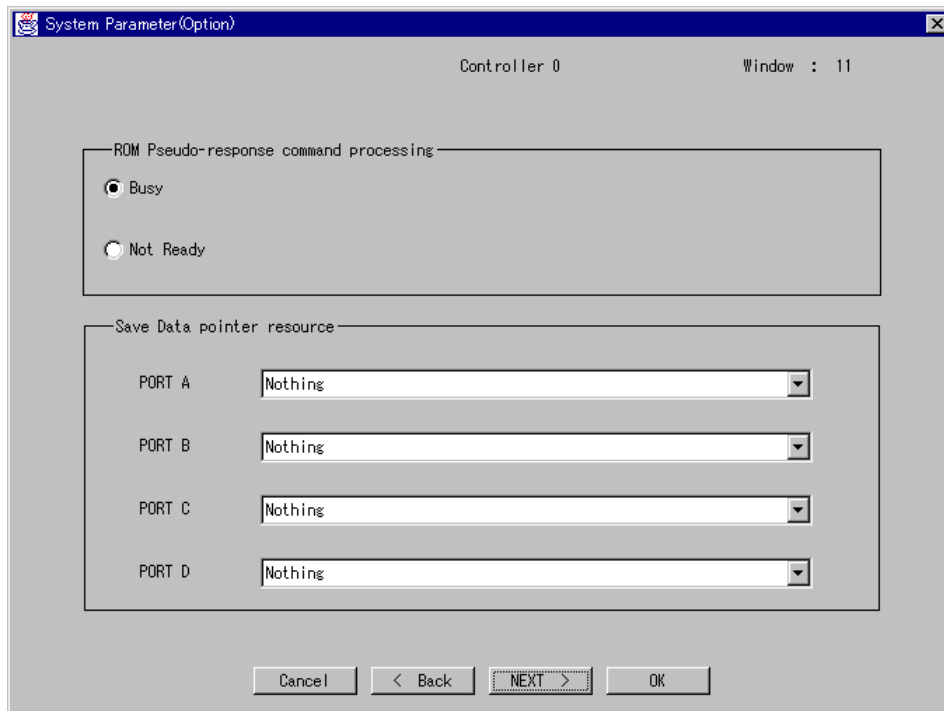
Third Party Process Logout Mode: The mode to transmit Third Party Process Logout to other ports.

Note: **Reset/LIP Mode (signal)** is enabled if the **Reset/LIP Mode (Process)** is set.

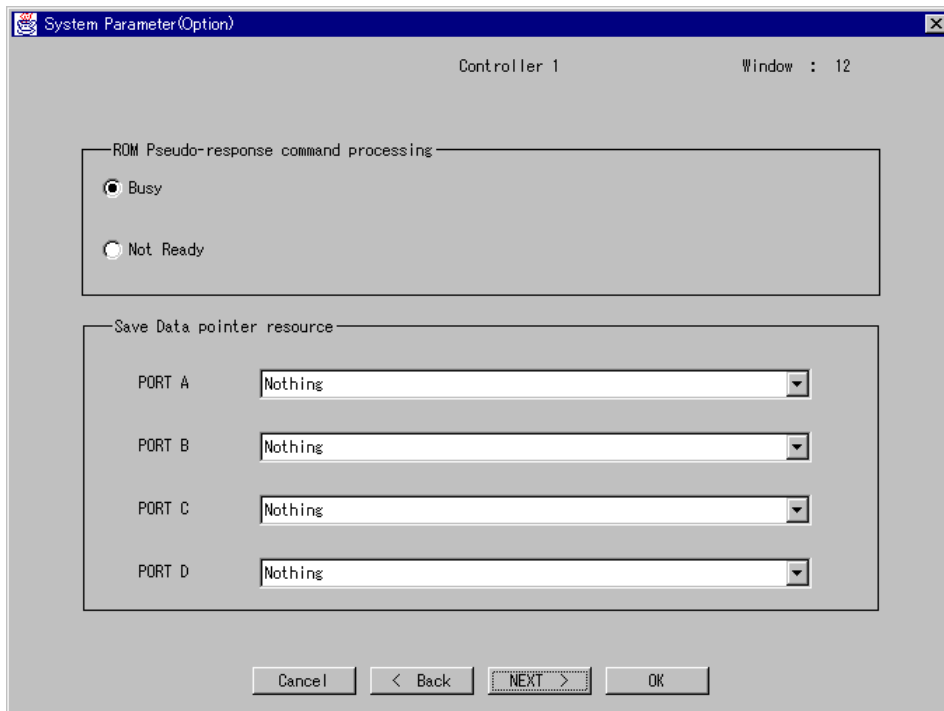
Port Option can be multiply set, but depending on the setting, it may not function properly. If it is to be set, please refer to the appended manual of the array unit and set only the applicable parameters.



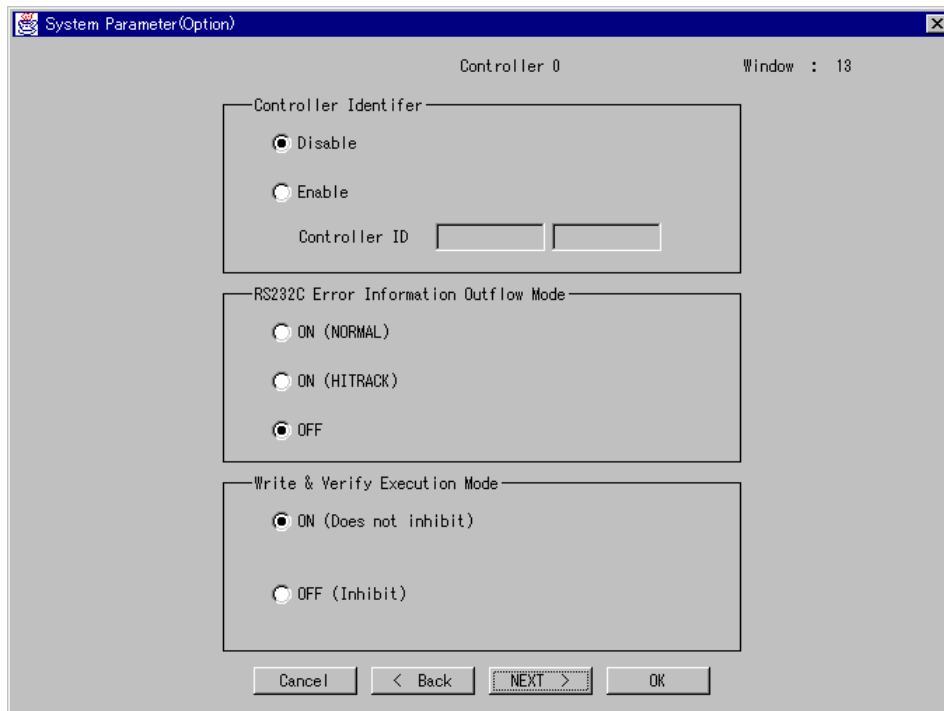
- **Port Type:** Sets the multiport expansion function of controller 1. **Normal** and **Multiple** enable the setting of controller 0. If set, do so on the screen of controller 0. The setting of other procedure is the same as that for the controller 0.



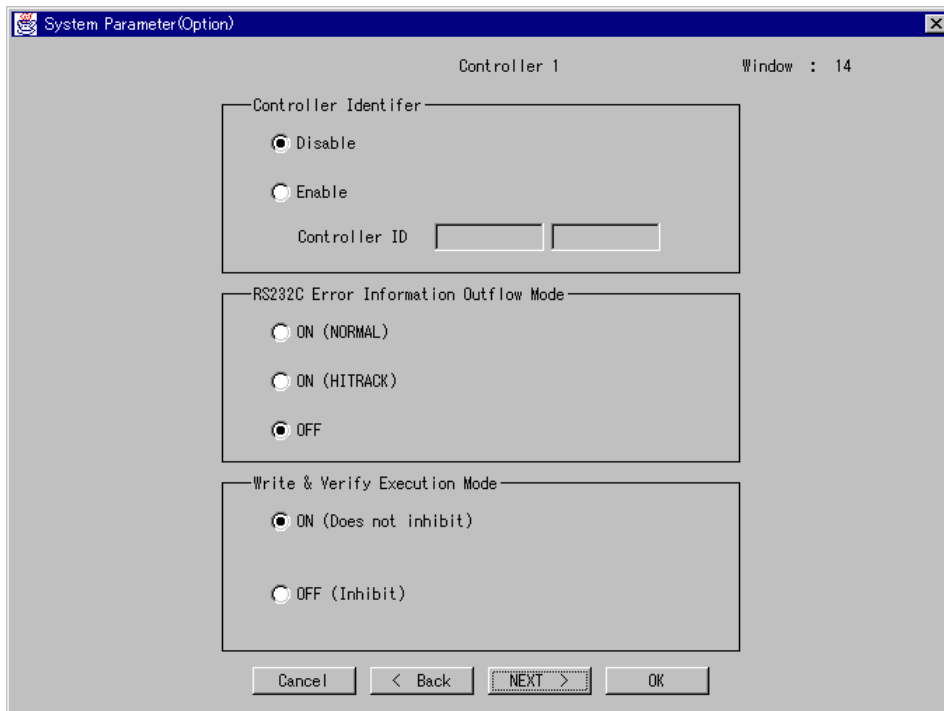
- **ROM Pseudo-response command processing:** Sets the mode of response to the host during a period from powering on to the time when the controller 0 becomes ready.
 - **Busy:** Responds “BUSY”.
 - **Not Ready:** Responds “Not Ready”.
- **Save Data pointer resource:** Sets a Save Data Pointer report request to the host by the controller 0.
 - **Nothing:** Does not report.
 - **After Data & Cmd:** Reports after receiving data and a command.
 - **Only After Data:** Reports after receiving data.
 - **Only After Cmd:** Reports after receiving a command.



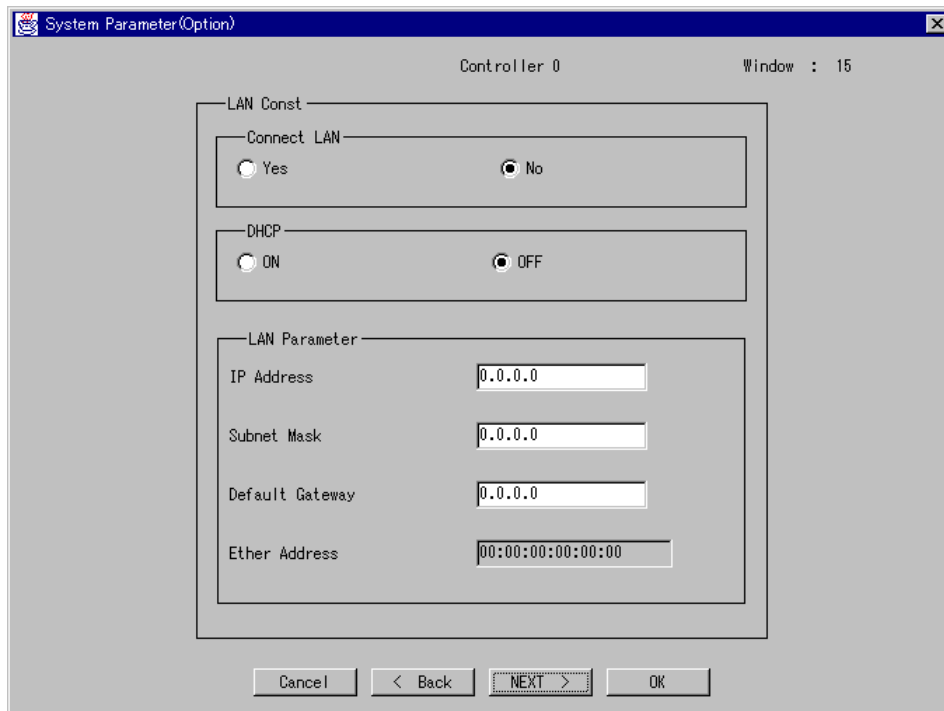
- **ROM Pseudo-response command processing:** Sets the mode of the response to the host during a period from powering on to the time when the controller 1 becomes ready. The setting procedure is the same as that for the controller 0.
- **Save Data pointer resource:** Sets a Save Data Pointer report request to the host by the controller 1. The setting procedure is the same as that for the controller 0.



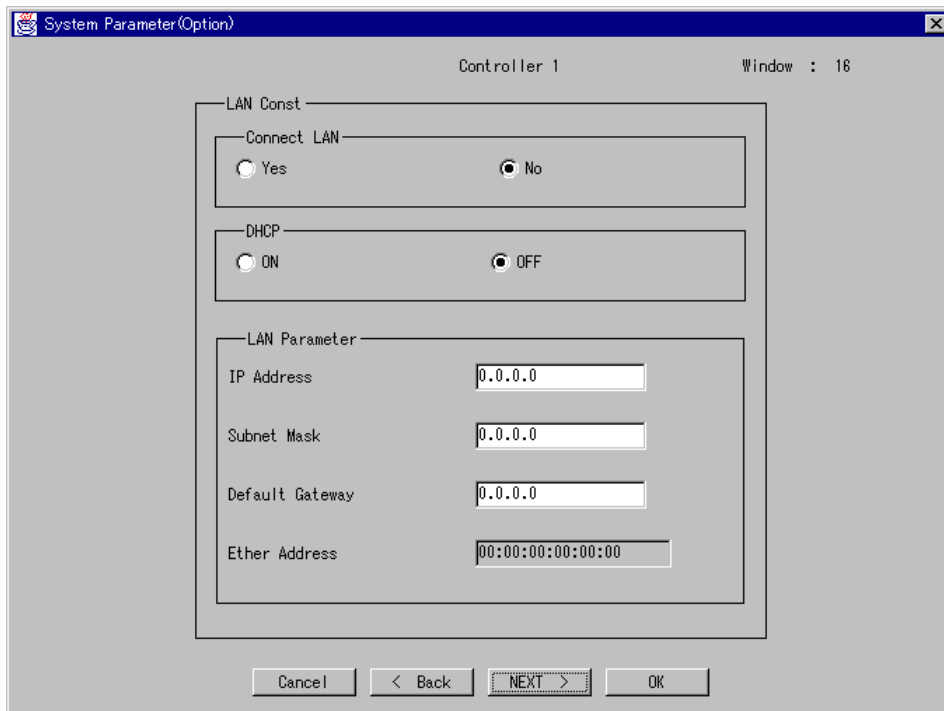
- **Controller Identifier:** Sets the controller identifier of the controller 0.
 - **Disable:** Invalidates a setting of the controller identifier.
 - **Enable:** Validates a setting of the controller identifier.
 - **Controller ID:** Enter a controller identifier. The controller identifier consists of ten characters; only the top eight characters can be changed but the last two characters cannot be changed. They can be changed when the **Enable** is selected.
- **RS232C Error Information Outflow Mode:** Sets the mode of the error information sending to the RS232C of the controller 0.
 - **ON (NORMAL):** Outputs information.
 - **ON (HITRACK):** Outputs HITRACK mode information.
 - **OFF:** Inhibits an output of information.
- **Write & Verify Execution Mode:** Sets the write & verify execution mode of the controller 0.
 - **ON (Does not inhibit):** Executes write and verify.
 - **OFF (Inhibit):** Dose not execute write and verify.



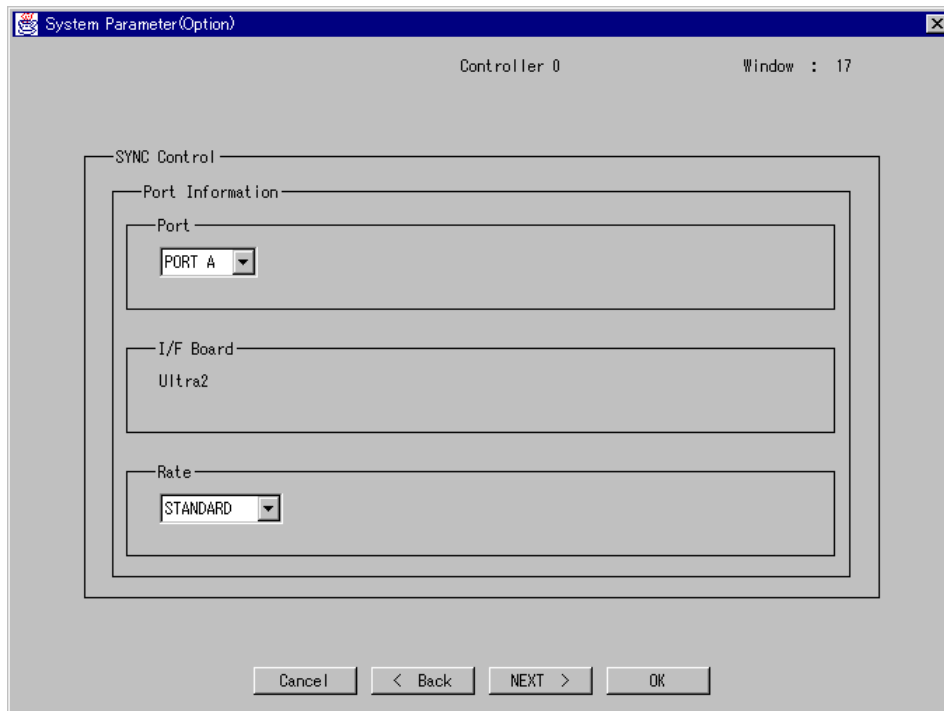
- **Controller Identifier:** Sets the controller identifier of the controller 1.
The setting procedure is the same as that for the controller 0.
- **RS232C Error Information Outflow Mode:** Sets the mode of the error information sending to the RS232C of the controller 1.
The setting procedure is the same as that for the controller 0.
- **Write & Verify Execution Mode:** Sets the write & verify execution mode of the controller 1.
The setting procedure is the same as that for the controller 0.



- **LAN Const:** Sets the LAN configuration information of the controller 0.
 - **Connect LAN:** Sets the LAN communication.
 - Yes:** Validates the LAN communication.
 - No:** Invalidates the LAN communication.
 - **DHCP:** Sets the DHCP function.
 - ON:** Validates the DHCP.
 - OFF:** Invalidates the DHCP.
 - **LAN Parameter:** Sets the LAN parameter. If **ON** is selected in **DHCP**, halftone display will be used.
 - IP Address:** Sets the IP address.
 - Subnet Mask:** Sets the sub net mask.
 - Default Gateway:** Sets the default gateway.
 - Ether Address:** The Ethernet address (MAC address) is displayed. It cannot be changed.



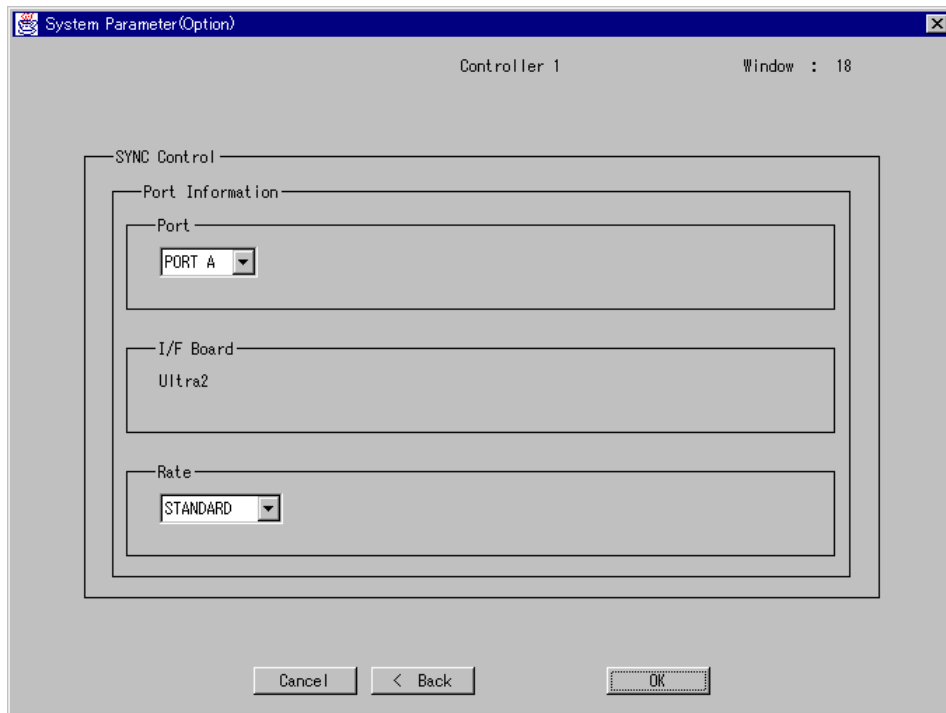
- **LAN Const:** Sets the LAN configuration information of the controller 1. The setting procedure is the same as that for the controller 0.



- **SYNC Control:** Sets the SCSI transfer rate of the controller 0.
 - **Port Information:** Selects the port to be set and sets each port.
 - **Port:** Selects the port to be set.
 - **I/F Board:** Displays types of I/F board.
 - None:** Not installed
 - Single:** Single type
 - Differential:** Differential type
 - Ultra 2:** Ultra 2 type
 - **Rate:** Sets the SCSI transfer rate.
 - STANDARD:** Sets the transfer rate automatically according to the I/F board installed.
 - ASYNC:** Transfers data in the mode without using the synchronous transfer.
 - 5 (10) MB/S:** Sets the maximum transfer rate to 5 M byte/s for narrow SCSI and 10 M byte/s for wide SCSI.
 - 10 (20) MB/S:** Sets the maximum transfer rate to 10 M byte/s for narrow SCSI and 20 M byte/s for wide SCSI.
 - 13 (26) MB/S:** Sets the maximum transfer rate to 13 M byte/s for narrow SCSI and 26 M byte/s for wide SCSI.
 - 20 (40) MB/S:** Sets the maximum transfer rate to 20 M byte/s for narrow SCSI and 40 M byte/s for wide SCSI.

33 (66) MB/S: Sets the maximum transfer rate to 33 M byte/s for narrow SCSI and 66 M byte/s for wide SCSI.

40 (80) MB/S: Sets the maximum transfer rate to 40 M byte/s for narrow SCSI and 80 M byte/s for wide SCSI.



- **SYNC Control:** Sets the SCSI transfer rate of the controller 1. Setting procedure is the same as that for the controller 0.

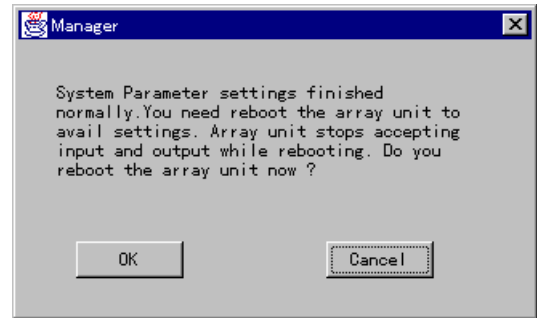
4. Click the **Yes** option button of **FD Backup**, then click **OK**.



- **FD Backup:** The system parameter information is saved on the backup FD in the array unit. When the setting is changed, it is necessary to save the system parameter information once again. **Be sure to select “Yes”:**

5. A message indicating completion of setting is displayed. If an array unit supports restarting, a confirmation message indicating a request for restarting is displayed, so clicks the **OK** button when restarting.

- If an array unit does not support restarting
- If an array unit supports restarting



Note: To validate the set system parameters, restart the array unit. The previous settings stay valid until restarting.

Commands from the host and part of the manager functions cannot be executed until the array unit is restarted.

When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

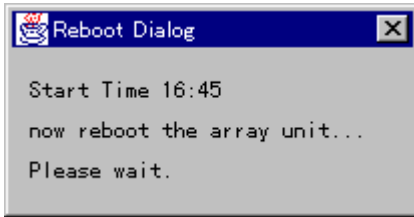
Note: If LAN configuration information (Window : 15, 16) is modified, an error message (Interface Error) may be displayed without displaying a restart completion message when restarting is initiated. When modifying LAN configuration information, after closing the unit window without specifying restart, restart an array unit. After the array unit restarts, modify registered information on the main window, and then open the unit window again.

Note: When failing to write onto the FD drive, the message "DMES04EB02 : Backup floppy disk write error." is displayed.

When this message is displayed, writing onto the FD is not yet completed normally, but the setting of a target ID has terminated normally.

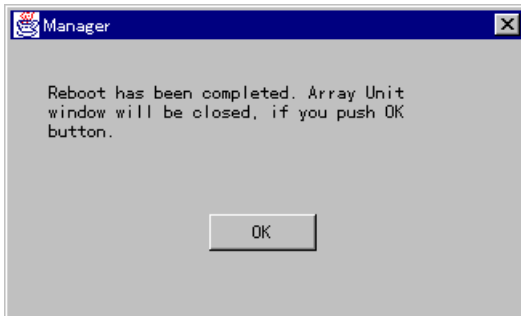
Check the FD drive in the array unit. After making sure that the FD drive is normal and that the previous settings are valid, click the **Yes** option button in the **FD Backup** box, then click the **OK** button.

- When instructing to restart an array unit, the time the restarting has began is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

A message indicating that the restarting has terminated is displayed, so clicks the **OK** button.



When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

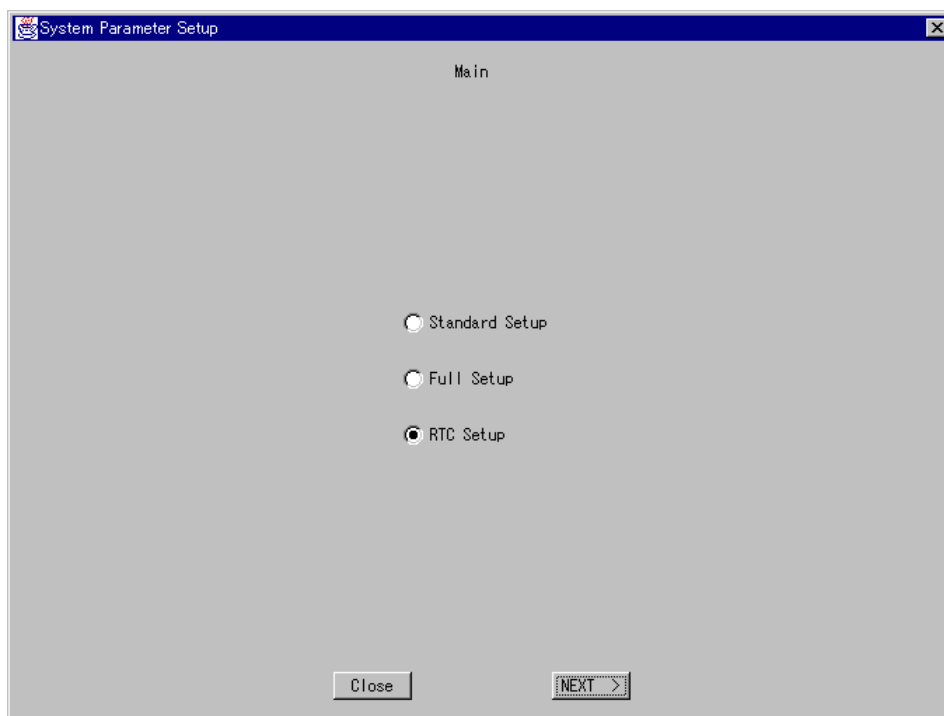
3.5.2 Setting RTC

Set the RTC of the array unit. When the array unit is connected to the dual system, any setting cannot be performed if the controller on one side is blocked. Make sure that the array unit is not put in a warning status.

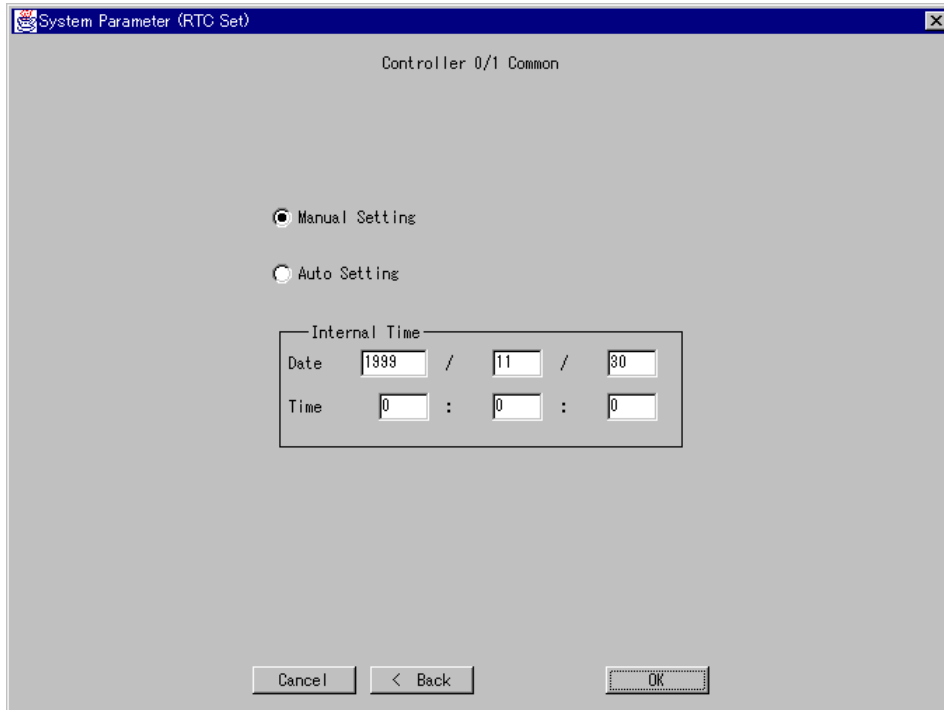
When setting the RTC by connecting the controller of one side of the dual system, be sure to do it from the controller 0 side.

When the RTC is set, the array unit cannot execute any command from the host. Neither can the manager execute any functions other than the system parameter setting wizard, SNMP configuration information file setting and outputting, and error monitoring (LAN connection). After the setting is completed, restart the array unit, make sure that the array unit has started up, and then connect it to the host and the manager.

1. Click **Param Wizard**.
The **Param Wizard** button can be clicked regardless of screens displayed.
2. Click the **RTC Setup** option button and click **NEXT >**.



3. The currently set time is displayed. Specify the time you want to set and click **OK**. To stop the setting, click **< Back** or **Cancel**.



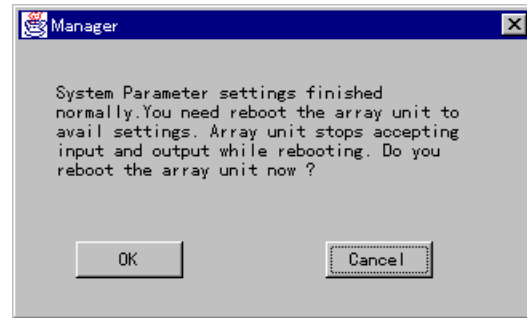
- **Manual Setting:** Sets the date and time to be set.
- **Auto Setting:** Sets the time of the PC or SUN server/workstation executing the manager.

4. When a setting confirmation window appears, click **OK**.



5. A message indicating completion of setting is displayed. If an array unit supports restarting, a confirmation message indicating a request for restarting is displayed, so clicks the **OK** button when restarting.

- If an array unit does not support restarting
- If an array unit supports restarting



Note: To validate the set system parameter (RTC), restart the array unit. The previous settings stay valid until restarting.

Commands from the host and part of the manager functions cannot be executed until the array unit is restarted.

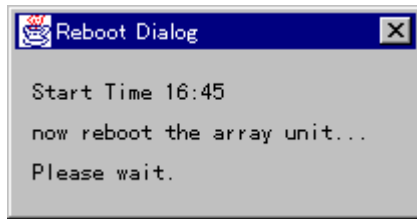
When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

Note: When failing to write onto the FD drive, the message "DMES04EB02 : Backup floppy disk write error." is displayed.

When this message is displayed, writing onto the FD is not yet completed normally, but the setting of a target ID has terminated normally.

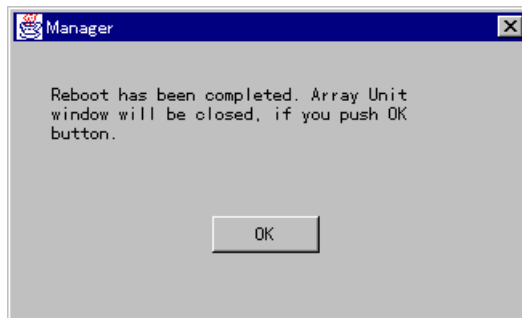
Check the FD drive in the array unit. After making sure that the FD drive is normal and that the previous settings are valid, click the **Yes** option button in the **FD Backup** box, then click the **OK** button.

- When instructing to restart an array unit, the time the restarting has began is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

A message indicating that the restarting has terminated is displayed, so clicks the **OK** button.



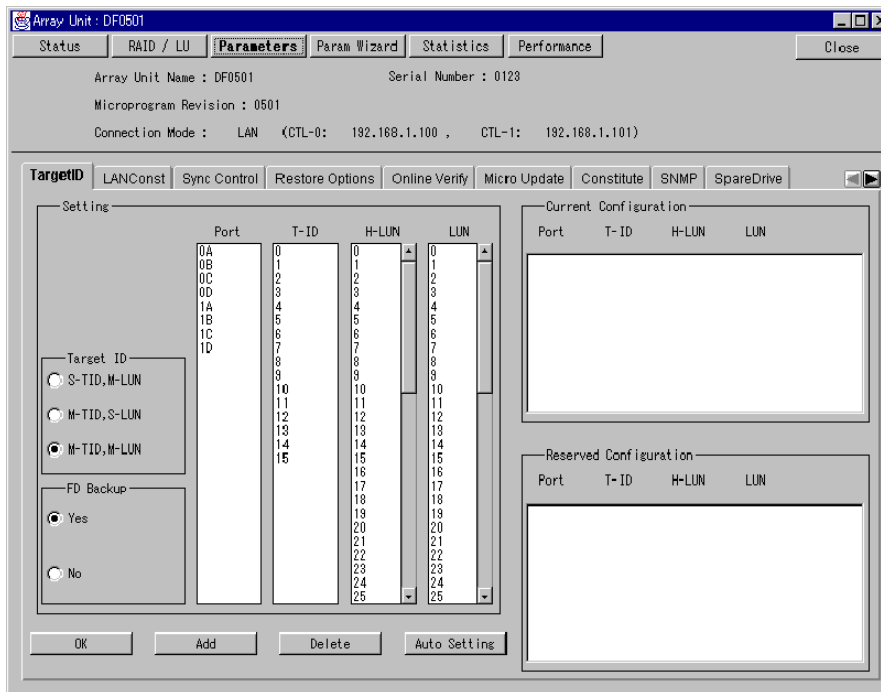
When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

3.6 Setting and Displaying System Parameters

3.6.1 Target ID

Set the configuration of the target ID and the LUN which are recognized when the array unit is connected to the host.

1. Click **Parameters** in the unit window, then click **Target ID** tab.



The condition currently set is displayed in **Current Configuration**. When it is displayed once again after the setting, the setting contents are displayed in **Reserved Configuration**.

- **Target ID:** Specifies configuration types of the target ID and the LUN.
 - **S-TID, M-LUN:** Sets a target ID of the port and makes the LUN which shared by the ports can be used by the host with an identical LUN.
 - **M-TID, S-LUN:** Sets a port and a target ID for the LUN and makes the LUN can be used with LUN = '0' and a target ID set by the host.
 - **M-TID, M-LUN:** Sets a port, a target ID, and an H-LUN for the LUN in a map form and makes the LUN can be used in a configuration set by the host.

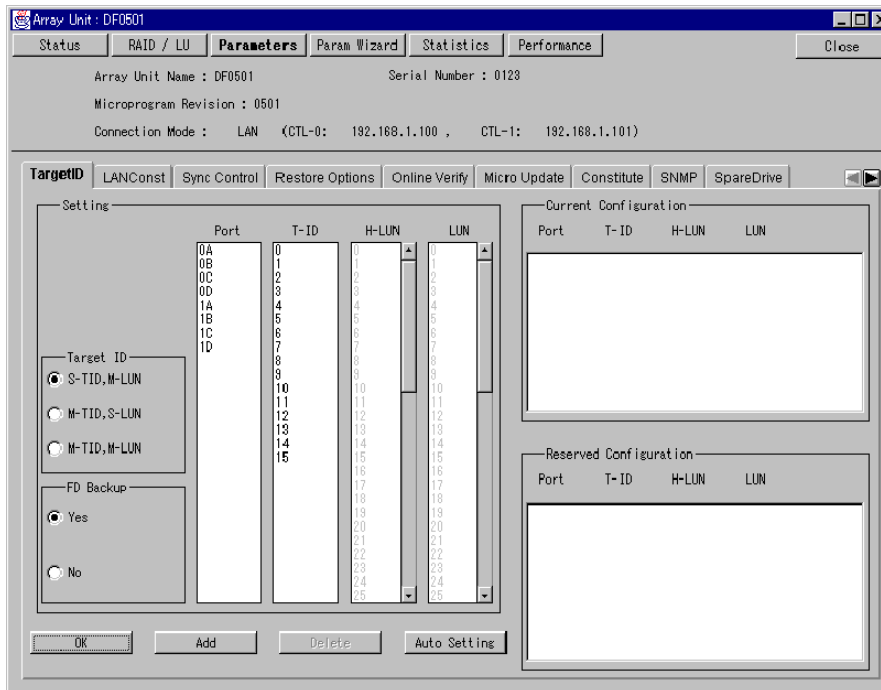
S-TID: Single Target ID
M-TID: Multi Target ID
S-LUN: Single LUN
M-LUN: Multi LUN
LUN: Logical unit number in the array unit.
H-LUN: Logical unit number that the host can recognize.
- **FD Backup:** The target ID information is saved as system parameter information to a backup floppy disk. **Always select “Yes”** because when the information is modified, it must be saved to the floppy again.
- **Port:** Displays a port number.
- **T-ID:** Displays a target ID to be specified.
- **H-LUN:** Displays an LUN that the host recognizes.
When **S-TID, M-LUN** and **M-TID, S-LUN** are selected for **Target ID**, the display is grayed and cannot be selected.
- **LUN:** Displays the LUN in the array unit.
When **S-TID, M-LUN** is selected for **Target ID**, the display is grayed and cannot be selected.
- **Current Configuration:** Displays a currently set configuration.
H-LUN and **LUN** are displayed as “--” when **S-TID, M-LUN** is selected.
H-LUN is displayed as “--” when **M-TID, S-LUN** is selected.
- **Reserved Configuration:** Displays a currently reserved configuration.
H-LUN and **LUN** are displayed as “--” when **S-TID, M-LUN** is selected.
H-LUN is displayed as “--” when **M-TID, S-LUN** is selected.

2. Set the target ID and the LUN for each target ID according to the following procedure.

When only one controller has been registered for the array unit, the setting of the **Target ID** will be valid only for the registered controller.

In this case, if the **M-TID, M-LUN** is selected in the **Target ID** menu, all logical units will be available through the ports of the non-registered controller.

- a) When S-TID, M-LUN mode is specified



Click the **S-TID, M-LUN** option button in **Target ID**.

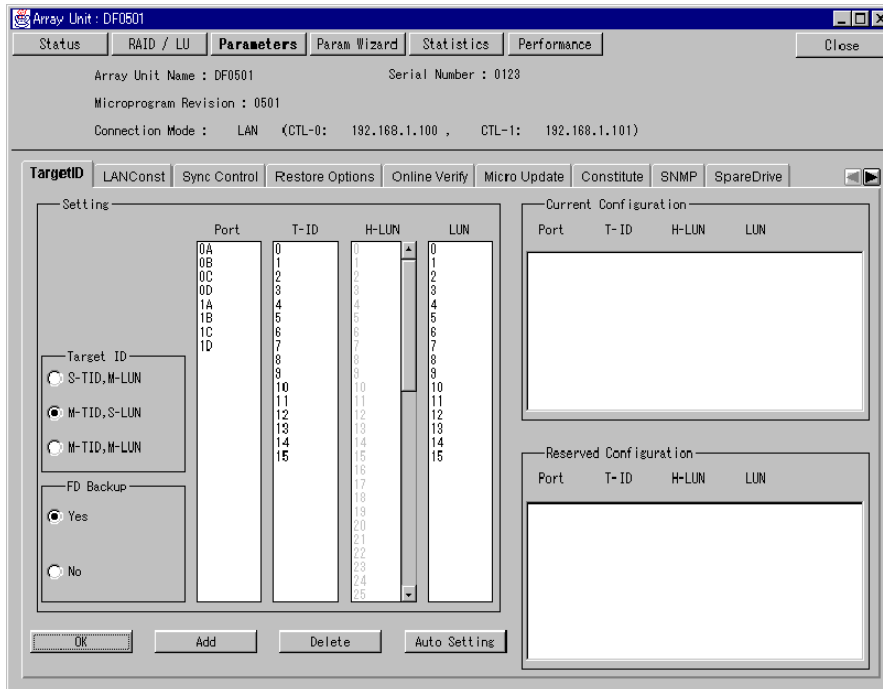
For addition, select one **Port** to be added, select one **T-ID** to be set, and click **Add**. The added contents are displayed in **Reserved Configuration**.

Multiple **Port** and **T-ID** can be selected. When you select multiple ones, the selected least significant digit value in the text box is validated.

For deletion, click the line to be deleted in **Reserved Configuration** and click **Delete**. The deleted contents disappear from the display of **Reserved Configuration**.

Note: When connecting to the fibre version of a DF400 array unit, the options are displayed in halftone and cannot be selected.

b) When M-TID, S-LUN Mode is specified



Click the **M-TID, S-LUN** option button in the **Target ID**.

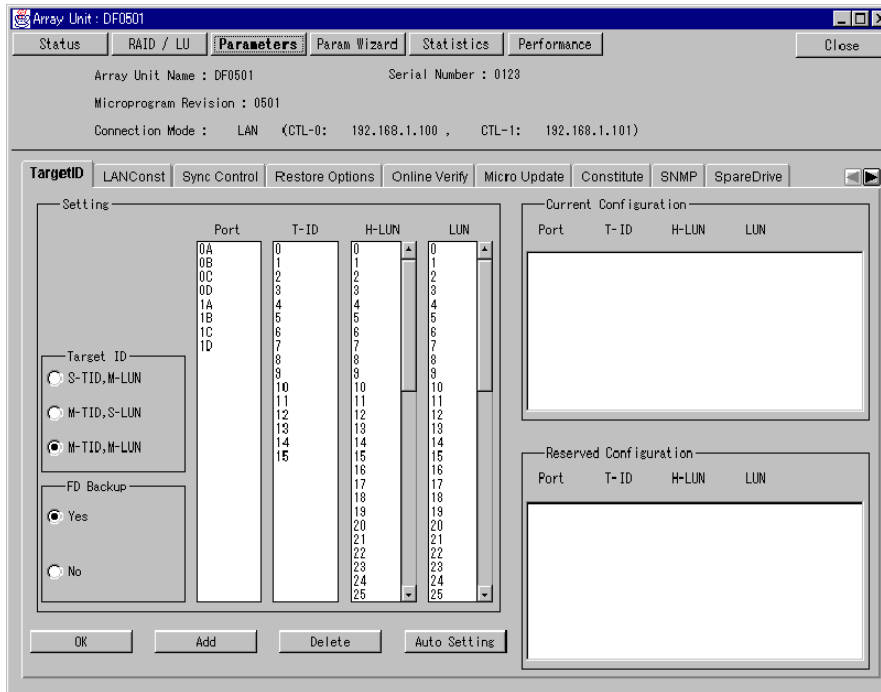
Select one **LUN** to be set, select one **Port** and one **T-ID** to be set, and click **Add**. The added contents are displayed in **Reserved Configuration**.

Multiple **Port** and **T-ID** can be selected. When you select multiple ones, the item selected in the least significant digit in the table is set.

For deletion, click the line to be deleted in **Reserved Configuration** and click **Delete**. The deleted contents disappear from the display of **Reserved Configuration**.

Note: When connecting to the fibre version of a DF400 array unit, the options are displayed in halftone and cannot be selected.

c) When M-TID, M-LUN Mode is specified



Click the **M-TID, M-LUN** option button in **Target ID**.

Select one **LUN** to be added, select **Port**, **T-ID**, and **H-LUN** in the mapping configuration, and click **Add**. The added contents are displayed in **Reserved Configuration**.

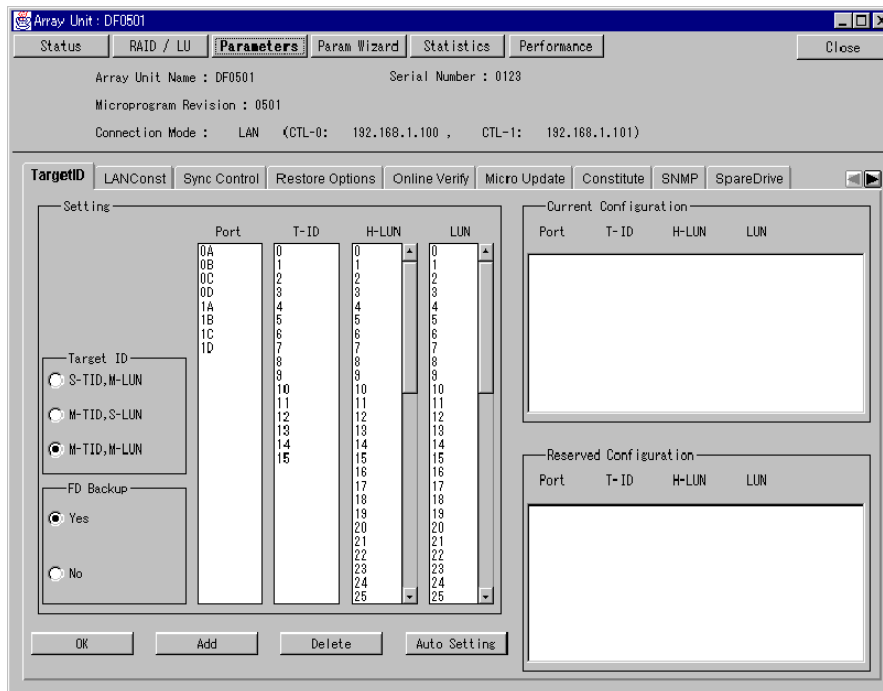
Multiple **Port**, **T-ID**, and **H-LUN** can be selected.

For deletion, click the line to be deleted in **Reserved Configuration** and click **Delete**. The deleted contents disappear from the display of **Reserved Configuration**.

To cancel the setting of the **M-TID, M-LUN**, delete all of the **Reserved Configuration**.

Note: When connecting to the fibre version of a DF400 array unit, the **T-ID** field shall be displayed in halftone and does not need to be entered. In addition, in order to cancel the setting of M-TID and M-LUN mode, delete all data in the **Reserved Configuration** field.

d) Auto setting



The target ID configuration file is stored, and **Port**, **T-ID**, **H-LUN**, and **LUN** are set automatically.

They can be set regardless of **Target ID**.

When **Auto setting** is set, all configurations that have been set are invalidated and changed to that of the target ID configuration file.

Click **Auto Setting**. A window for specifying a file to be stored appears.

Specify the file and click **OK**, the setting from the file is started and the set information is displayed in **Reserved Configuration**.

The file configuration used for executing the automatic setting is shown below. Enter the **Target ID** by specifying “Yes” or “No”. Input necessary data, which are the same as those entered in the setting made on the screen, for **Port**, **Target ID**, **H-LUN**, and **LUN**. Put spaces between the items. If the tabulating function is used, they are regarded as input errors and the inputs are ignored.

Example 1 M-TID, M-LUN Mode

```
Information file for Target ID configuration
S-TID, M-LUN : NO
M-TID, S-LUN : NO
M-TID, M-LUN : YES

Data
Port Target ID H-LUN LUN
OA 0 0 0
OA 0 1 1
OA 0 2 2
OA 0 3 3
OA 0 4 4
OA 0 5 5
OA 0 6 6
OA 0 7 7
OB 1 0 8
OB 1 1 9
OB 1 2 10
OB 1 3 11
OB 1 4 12
OB 1 5 13
OB 1 6 14
OB 1 7 15
```

Example 2 S-TID, M-LUN Mode

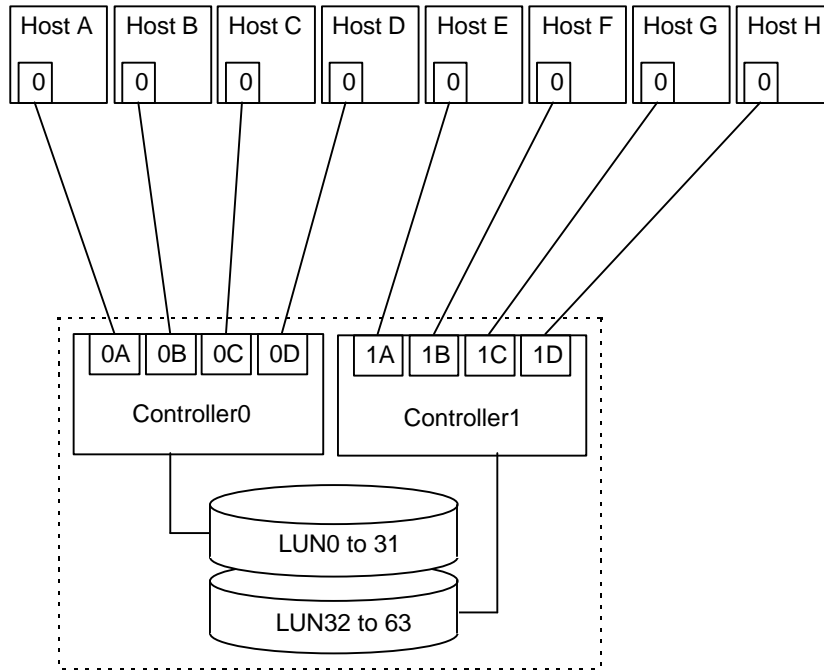
```
Information file for Target ID configuration
S-TID, M-LUN : YES
M-TID, S-LUN : NO
M-TID, M-LUN : NO

Data
Port Target ID H-LUN LUN
OA 0
OB 1
1A 2
1B 3
```

Note: When the manager is connected to the array unit with the Fibre Channel connection, set ‘-’ for the **T-ID**.

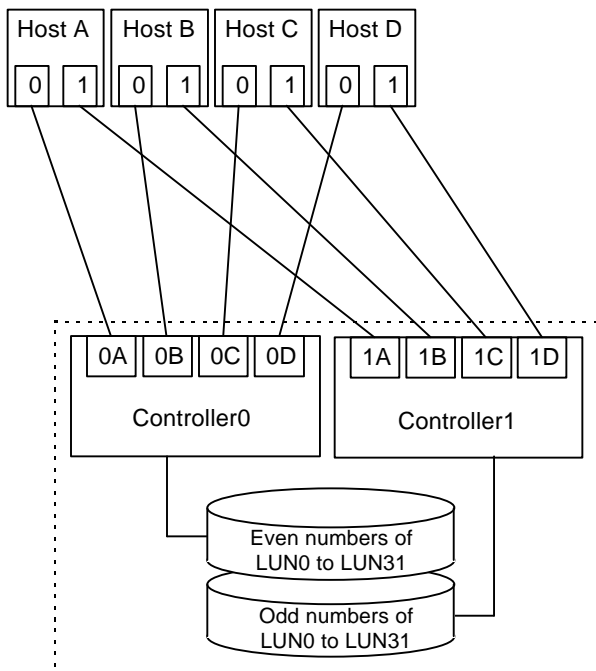
Two types of sample files are provided for automatic setting. The sample file configuration is shown below.

Sample file : id00.txt --- Host LU independent access type



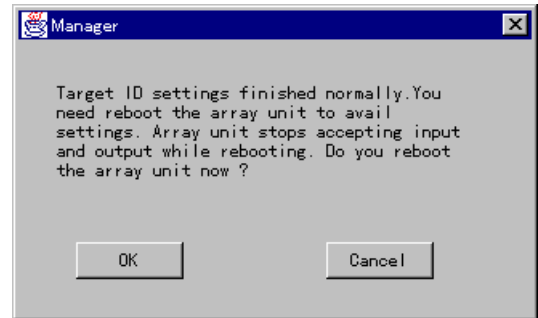
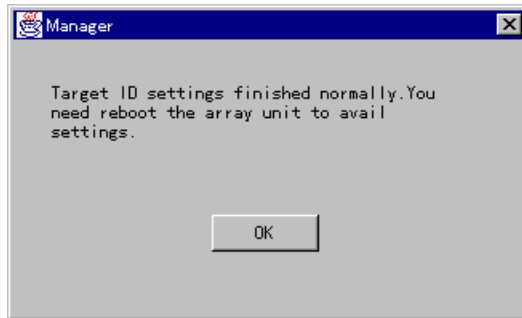
Host	Port	Target ID	H-LUN	LUN
A	0A	0	0 to 7	0 to 7
B	0B	1	0 to 7	8 to 15
C	0C	2	0 to 7	16 to 23
D	0D	3	0 to 7	24 to 31
E	1A	0	0 to 7	32 to 39
F	1B	1	0 to 7	40 to 47
G	1C	2	0 to 7	48 to 55
H	1D	3	0 to 7	56 to 63

Sample file : id01.txt --- Host alternate path access type



Host	Port	Target ID	H-LUN	LUN
A-Path0	0A	0	0 to 7	0 to 7
A-Path1	0B	1	0 to 7	8 to 15
B-Path0	0C	2	0 to 7	16 to 23
B-Path1	0D	3	0 to 7	24 to 31
C-Path0	1A	0	0 to 7	0 to 7
C-Path1	1B	1	0 to 7	8 to 15
D-Path0	1C	2	0 to 7	16 to 23
D-Path1	1D	3	0 to 7	24 to 31

3. Click **OK**.
4. A message indicating completion of setting is displayed. If an array unit supports restarting, a confirmation message indicating a request for restarting is displayed, so clicks the **OK** button when restarting.
 - If an array unit does not support restarting
 - If an array unit supports restarting



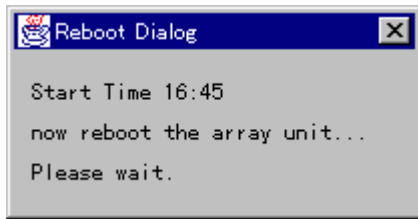
Note: To validate the set Target ID, restart the array unit. The previous settings stay valid until restarting.

When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

Note: When failing to write onto the FD drive, the message “DMES04EB02 : Backup floppy disk write error.” is displayed.

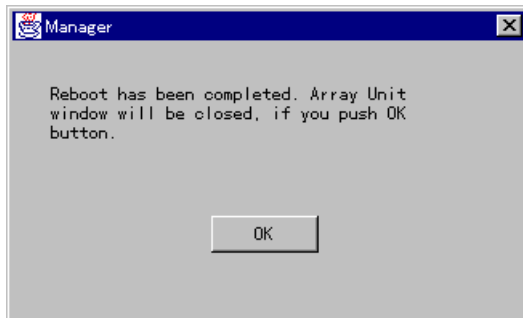
When this message is displayed, writing onto the FD is not yet completed normally, but the setting of a target ID has terminated normally. Check the FD drive in the array unit. After making sure that the FD drive is normal and that the previous settings are valid, click the **Yes** option button in the **FD Backup** box, then click the **OK** button.

5. When instructing to restart an array unit, the time the restarting has began is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

A message indicating that the restarting has terminated is displayed, so clicks the **OK** button.

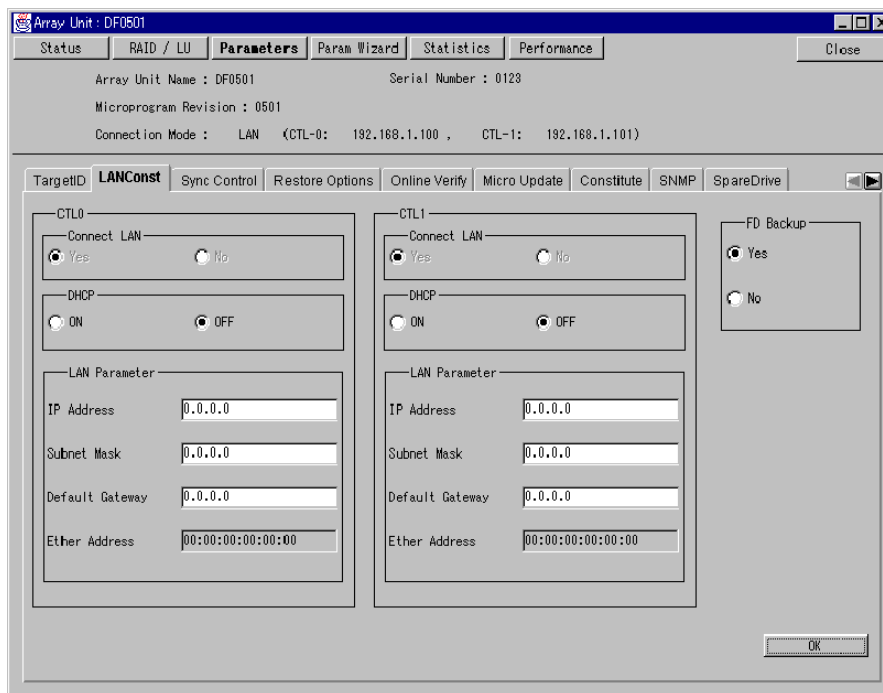


When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

3.6.2 LAN configuration

The LAN configuration information of the array unit is set.

1. Click **Parameters**, then click the **LAN Const** tab.



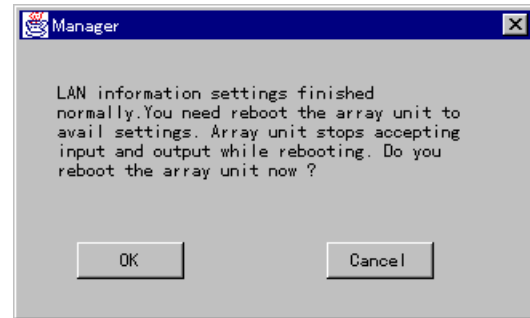
- **Connect LAN:** Specifies whether the LAN function is to be valid or invalid.
- **DHCP:** Specifies whether the DHCP mode is to be valid or invalid.
- **LAN Parameter:** Specifies IP Address, Subnet Mask, or Default Gateway which is a piece of the LAN information. Ether Address is only displayed and cannot be changed.
- **FD Backup:** LAN configuration information is saved onto the backup FD in the array unit as a piece of the system parameter information. **Be sure to select “Yes”** because a saving of it is required again if the setting is changed

Note 1: When selected **ON** in **DHCP**, **LAN Parameter** is displayed in halftone and can not be selected.

Note 2: When the DF300, DF350, and DF350F are connected, **Connect LAN** and **DHCP** are displayed in halftone and can not be selected.

Note 3 : For DF500, **Connect LAN** is displayed in halftone and can not be selected. The **Connect LAN** setting is always **Yes**.

2. After setting items, click **OK**.
3. A message indicating completion of setting is displayed. If an array unit supports restarting, a confirmation message indicating a request for restarting is displayed, so clicks the **OK** button when restarting.
 - If an array unit does not support restarting
 - If an array unit supports restarting



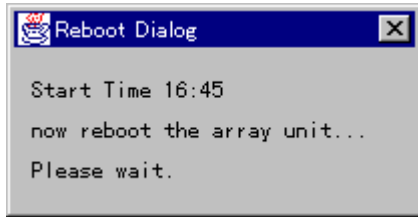
Note: To validate the set LAN configuration information, restart the array unit. The previous settings stay valid until restarting.

When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

Note: When failing to write onto the FD drive, the message “DMES04EB02 : Backup floppy disk write error.” is displayed.

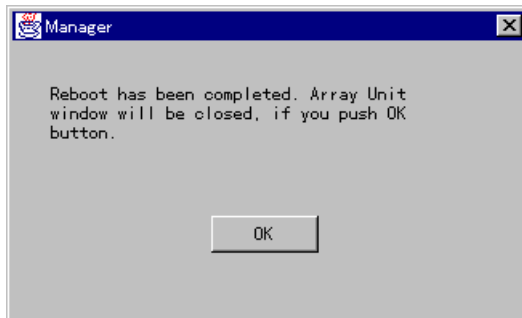
When this message is displayed, writing onto the FD is not yet completed normally, but the setting of a target ID has terminated normally. Check the FD drive in the array unit. After making sure that the FD drive is normal and that the previous settings are valid, click the **Yes** option button in the **FD Backup** box, then click the **OK** button.

4. When instructing to restart an array unit, the time the restarting has began is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

A message indicating that the restarting has terminated is displayed, so clicks the **OK** button.

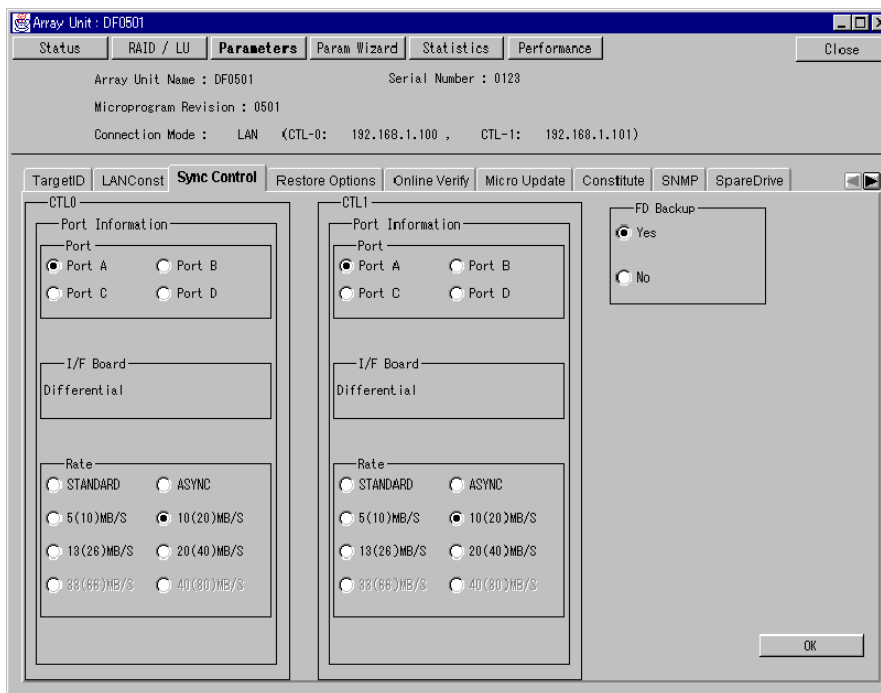


When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

3.6.3 Setting SCSI transfer rate

The transfer rate for each port of the array unit is set.

1. Click **Parameters**, then click the **Sync Control** tab.



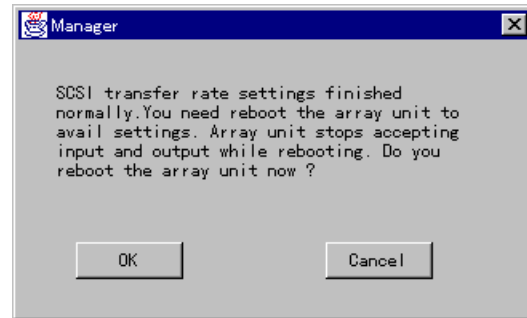
- **Port:** Selects the port number to be set.
- **I/F Board:** The IF board type installed is displayed.
 - **None:** Not installed
 - **Single:** Single type
 - **Differential:** Differential type
 - **Ultra2:** Ultra2 type

- **Rate:** Selects the port transfer rate.
 - **STANDARD:** Transfers data is automatically according to the IF board installed.
 - **ASYNC:** Transfers data in the mode without using the synchronous transfer.
 - **5(10) MB/S:** Sets the maximum transfer rate to 5 M byte/s for narrow SCSI and 10 M byte/s for wide SCSI.
 - **10(20) MB/S:** Sets the maximum transfer rate to 10 M byte/s for narrow SCSI and 20 M byte/s for wide SCSI.
 - **13(26) MB/S:** Sets the maximum transfer rate to 13 M byte/s for narrow SCSI and 26 M byte/s for wide SCSI.
 - **20(40) MB/S:** Sets the maximum transfer rate to 20 M byte/s for narrow SCSI and 40 M byte/s for wide SCSI.
 - **33(66) MB/S:** Sets the maximum transfer rate to 33 M byte/s for narrow SCSI and 66 M byte/s for wide SCSI.
 - **40(80) MB/S:** Sets the maximum transfer rate to 40 M byte/s for narrow SCSI and 80 M byte/s for wide SCSI.

Note: When the **I/F Board** is displayed **None**, it is displayed in halftone and cannot be set. When the **I/F Board** is displayed **Single** or **Differential**, **33(66) MB/S** and **40(80) MB/S** are displayed in halftone and cannot be selected.

- **FD Backup:** The SCSI I/F transfer rate information is saved on the backup floppy disk in the array unit as system parameter information. **Be sure to select “Yes”** because it becomes necessary to save it once again when the setting is changed.

2. After setting items, click **OK**.
3. A message indicating completion of setting is displayed. If an array unit supports restarting, a confirmation message indicating a request for restarting is displayed, so clicks the **OK** button when restarting.
 - If an array unit does not support restarting
 - If an array unit supports restarting



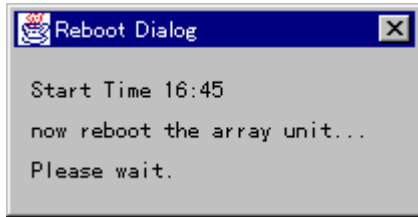
Note: To validate the set transfer rate, restart the array unit. The previous settings stay valid until restarting.

When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

Note: When failing to write onto the FD drive, the message “DMES04EB02 : Backup floppy disk write error.” is displayed.

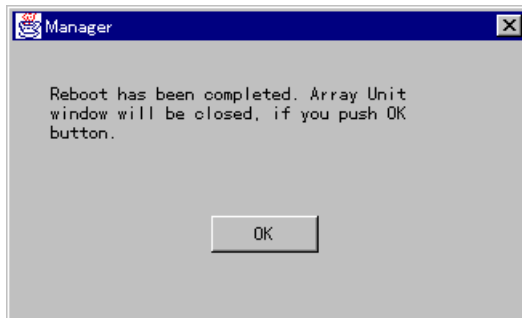
When this message is displayed, writing onto the FD is not yet completed normally, but the setting of a target ID has terminated normally. Check the FD drive in the array unit. After making sure that the FD drive is normal and that the previous settings are valid, click the **Yes** option button in the **FD Backup** box, then click the **OK** button.

4. When instructing to restart an array unit, the time the restarting has began is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

A message indicating that the restarting has terminated is displayed, so clicks the **OK** button.



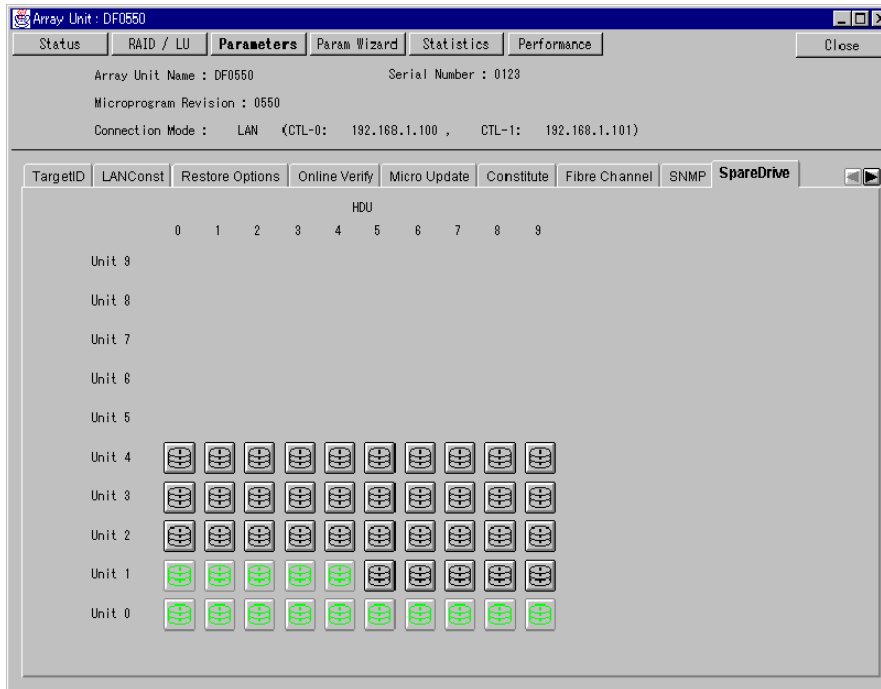
When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

3.6.4 Spare Disk Setup

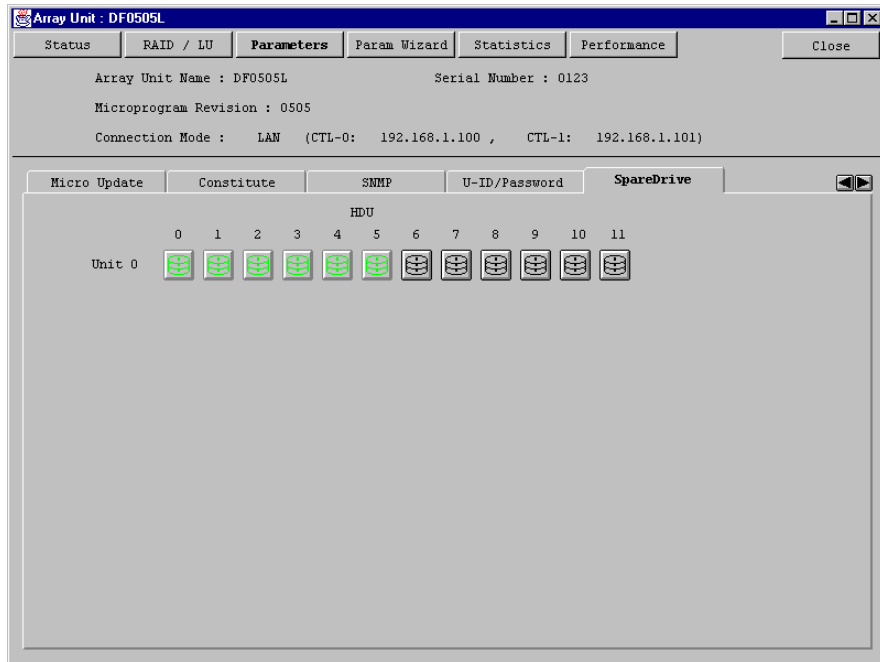
The following procedure sets up and cancels the spare disk.

1. Click **Parameters**, then click the **SpareDrive** tab.

a) For DF500 (CK, and RK model)



b) For DF500 (MK, and RKL model)



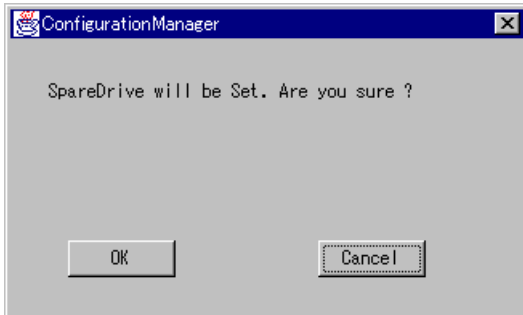
Data disk



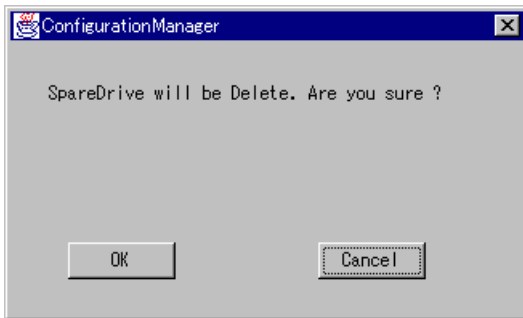
Spare disk

2. To setup the spare disk, click the icon of the HDU to be setup as a spare disk. HDUs that can be set to a spare disk drive are data disk drives for which an RAID group is not yet defined, excluding HDUs 0 and 1 in Unit 0.
To cancel the spare disk setup, click the icon of the HDU to be canceled.

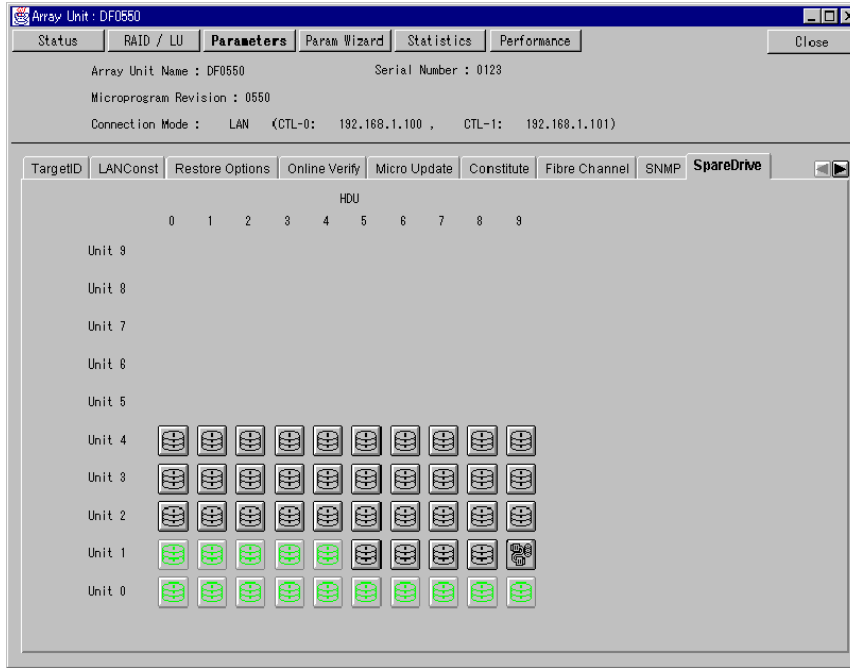
3. The confirmation message for spare disk setup or canceled is displayed.
 - a) When a spare disk is setup



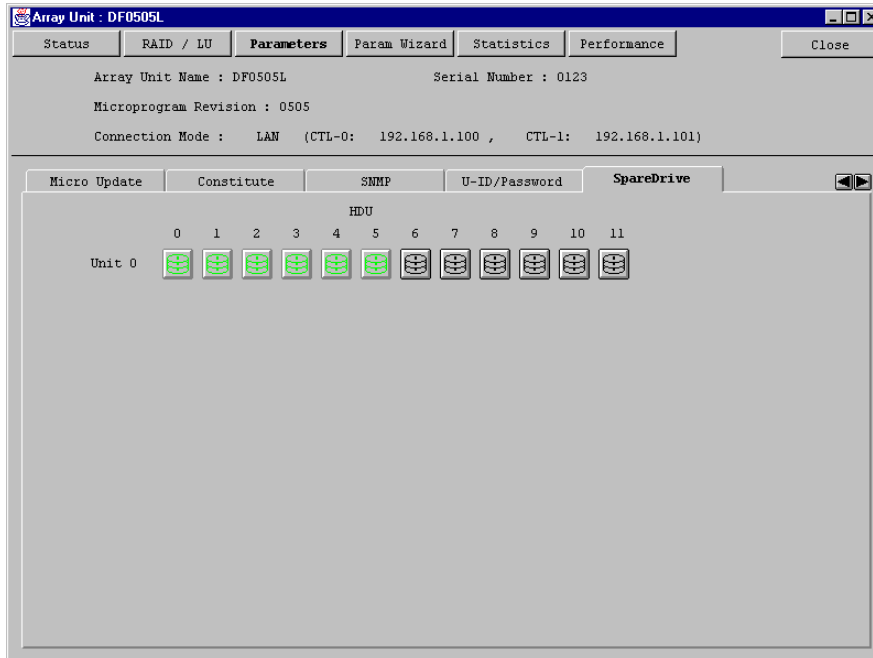
- b) When a spare disk is canceled



4. The icon of the HDU which is setup or canceled is updated and displayed.
 - a) For DF500 (CK, and RK model)



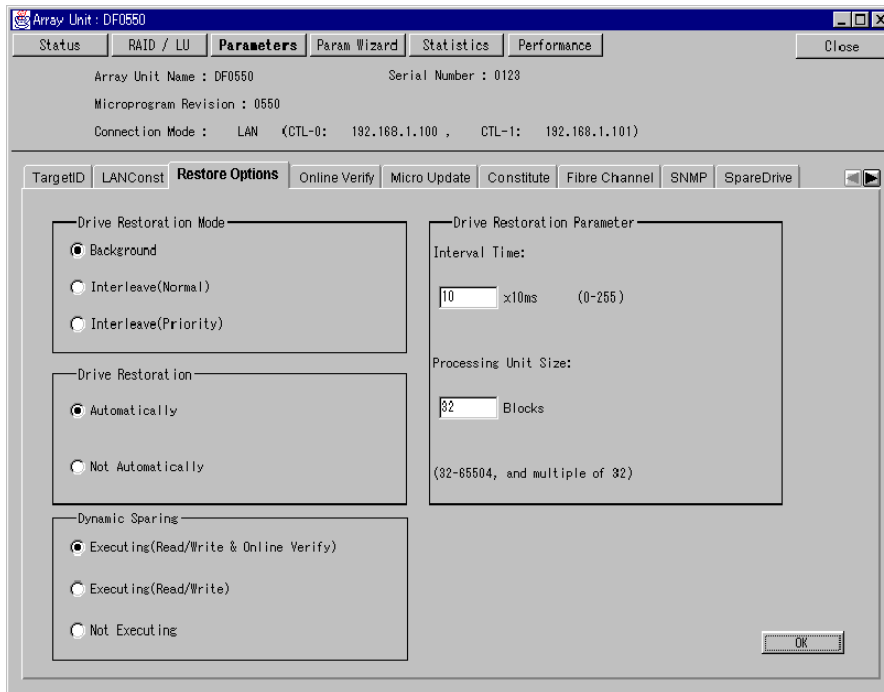
- b) For DF500 (MK, and RKL model)



3.6.5 Setting the drive restoration control option

Selection and setting of this option are not valid when they are made during drive restoration. (Drive restoration is executed according to the option at the start of the processing.) Make sure that the drive is not being restored when changing the option setting.

1. Click **Parameters**, then click the **Restore Options** tab.



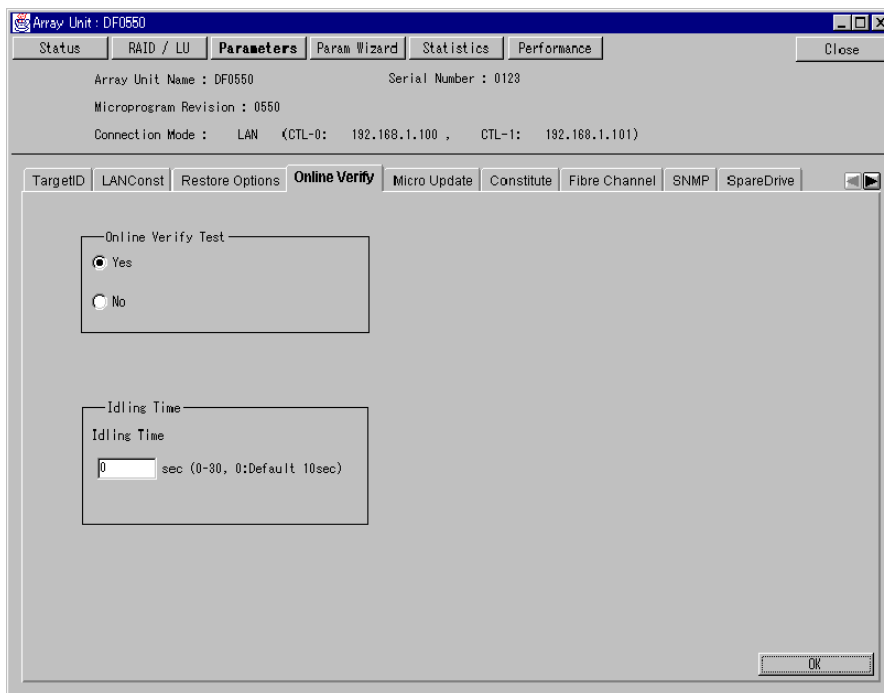
2. Specify **Drive Restoration Mode**, **Drive Restoration**, **Interval Time**, **Processing Unit Size**, and **Dynamic Sparring**.
 - **Drive Restoration Mode:** Specify a mode in which drives are to be restored.
 - **Background:** Executes drive restoration while host I/O processing is not executed.
 - **Interleave (Normal):** Restores the drive at preset time intervals (specified as “Interval Time”) giving preference to a host command (restores after executing the command).
 - **Interleave (Priority):** Restores the drive at preset time intervals (specified as “Interval Time”) taking preference over a host command.

- **Drive Restoration:** Instructs whether to start the following operations automatically or manually. The operations concerned are data restoration to the failed drive or to the spare drive, copy back of the data from the spare drive to the original drive, and dynamic sparing.
 - **Automatically:** Automatically starts restoration of data and copying.
 - **Not Automatically:** Starts restoring data and copying by manual operations.

Note: Use **Automatically**, as the manager does not support a manual operation.
 - **Interval Time:** Specify a time interval of drive restoration. The default interval time is 10×10 ms and drive restoration is executed at intervals of 100 ms. Specify a multiplication factor 0 to 255 in a unit of 10 ms.
 - **Processing Unit Size:** Specify the size of the data block to be restored. The default processing unit size is 32 blocks and data of 16 k byte is restored at a time. When Interleave mode is specified, the function restores data of a processing unit size specified here, waits for a time interval specified here, then starts the next data restoration. Specify a multiplication factor 32 to 65,504 in a unit of 512 bytes in a step of 32.
 - **Dynamic Sparing:** Specify a mode for data restoration for the spare drive when the error occurrence count controlled by preventive maintenance exceeds the threshold value.
 - **Executing (Read/Write & Online Verify):** When the error occurrence count in **Read/Write Error** or **Online Verify Error**, Threshold Value Over and Start of Dynamic Sparing are displayed on the panel and data restoration is performed for the spare drive (when the spare drive is not used), and the error disk is blocked.
 - **Executing (Read/Write):** When the error occurrence count in **Read/Write Error** exceeds the threshold value, Threshold Value Over and Start of Dynamic Sparing are displayed on the panel and data restoration is performed for the spare disk in the spare drive (when the spare disk is not used), and the error disk is blocked.
When the error occurrence count in **Online Verify Error** exceeds the threshold value, Threshold Value Over is displayed on the panel but Dynamic Sparing is not performed.
 - **Not Executing:** When the error occurrence count in **Read/Write Error** or **Online Verify Error** exceeds the threshold value, Threshold Value Over is displayed on the panel but Dynamic Sparing is not performed.
3. After completion of the setting, click **OK**.

3.6.6 Online verify mode

1. Click **Parameters**, then click the **Online Verify** tab.



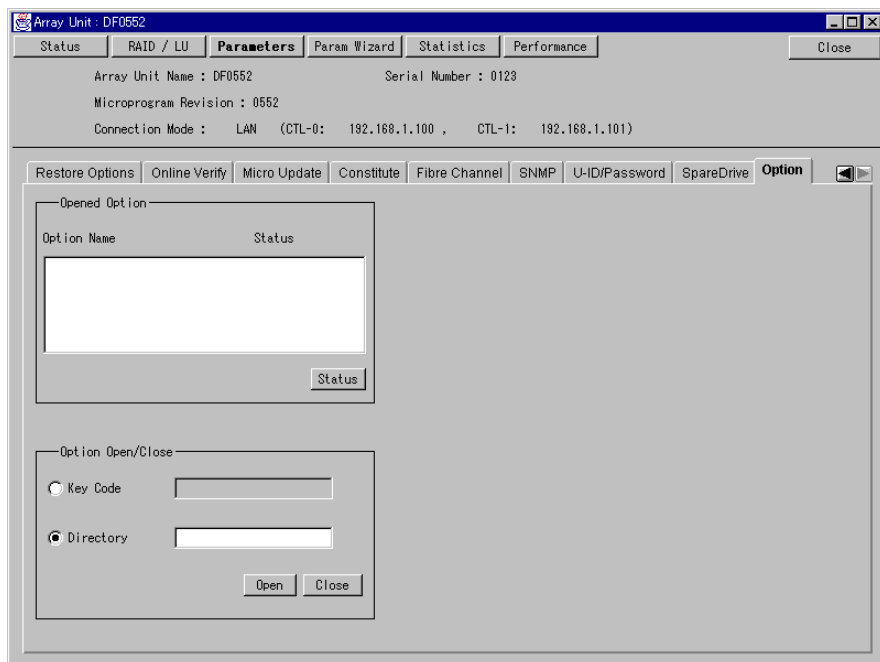
2. Select whether or not to execute **Online Verify** and specify **Idling Time**.
 - **Online Verify Test:** Specifies whether or not to execute **Online Verify**.
 - **Yes:** Execute
 - **No:** Not execute
 - **Idling Time:** Specifies an interval from the end of an I/O operation instructed by the host to the start of the online verify. If "0" is specified, the time is set to 10 [seconds], and hence an online verify operation begins 10 [seconds] after an I/O operation from the host terminates. Specify a value within a range between 1 and 30 seconds in units of seconds.
3. After completion of the setting, click **OK**.

3.7 Setting Fee-Basis Option

3.7.1 Opening Fee-Basis Option

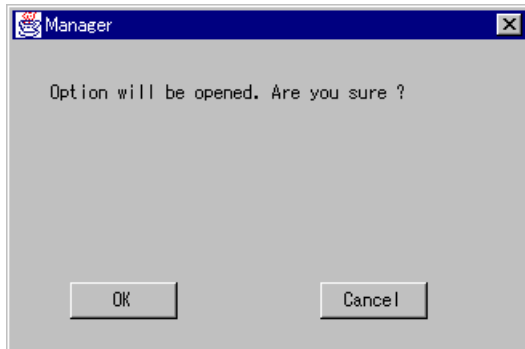
The following procedure opens the key of the fee-basis option for DF500.

1. Click **Parameters**, then click the **Option** tab.

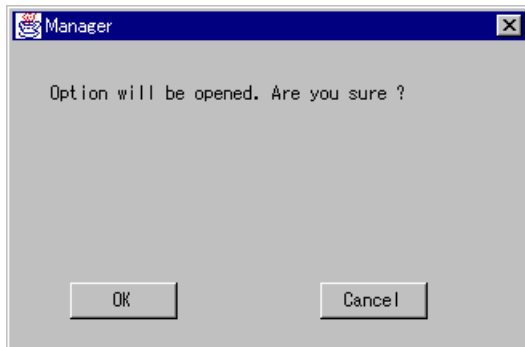


2. Specify whether you are opening the fee-basis option using the FD with the fee-basis option, or if you are using the key code, then setup the directory path or key code, then click the **Open** button.
When you open the option using the FD, click the **Directory** radio button and then setup the path for the FD. When you open the option using the key code, click the **Key Code** radio button and then setup the key code. For the key code of the fee-basis option, refer to the manual of the fee-basis option.

3. When the confirmation screen for fee-basis option opening is displayed, click the **OK** button.

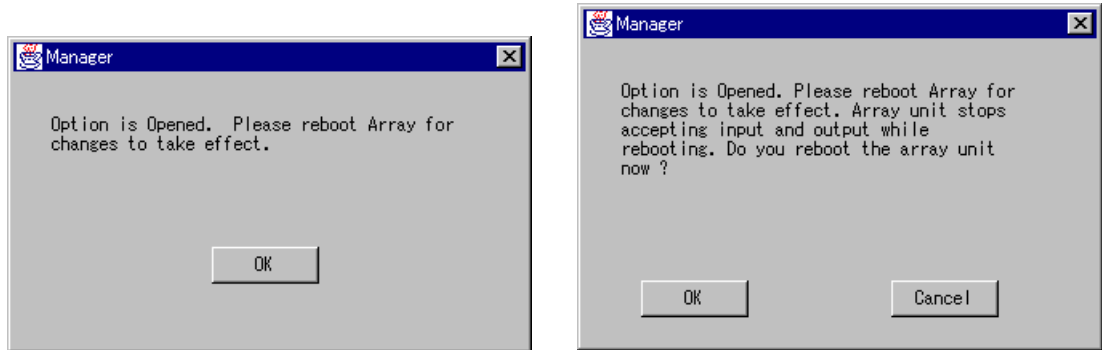


4. A screen confirming that the fee-basis option has been opened appears. Depending on the option, an array unit needs to be restarted in order to set the opening effective. If an array unit supports restarting, a message confirming a restart request will be displayed, clicks the **OK** button when restarting.
 - a) Option that does not require to restart an array unit in order to set the opening effective.



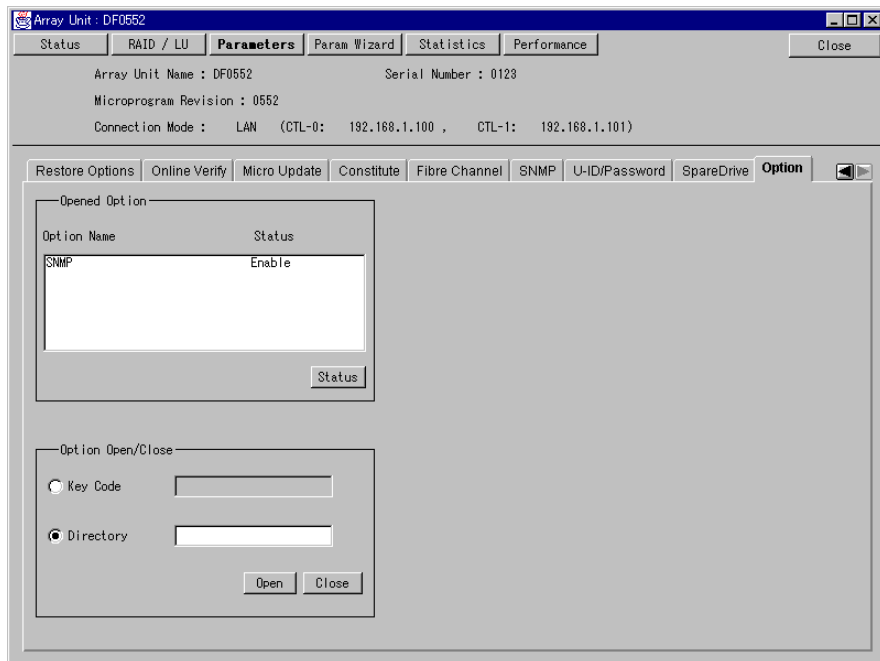
b) Option for which the opening is set effective by restarting an array unit

- If an array unit does not support restarting
- If an array unit supports restarting

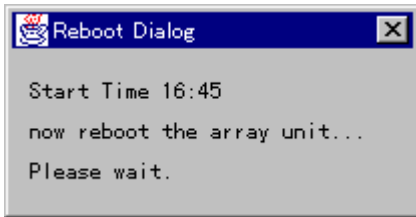


Note: To set effective the opening of the option that you have operated, restart the array unit. The feature is not yet closed until restarting. When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

5. If an array unit fails to restart, the unlocked fee-basis option is displayed.

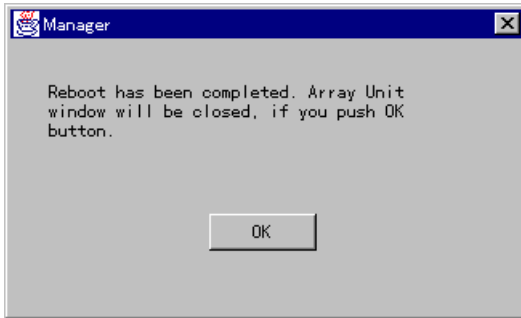


When restarting an array unit, the time the restarting has begun is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

When the restarting terminates, a message is displayed, so clicks the **OK** button.

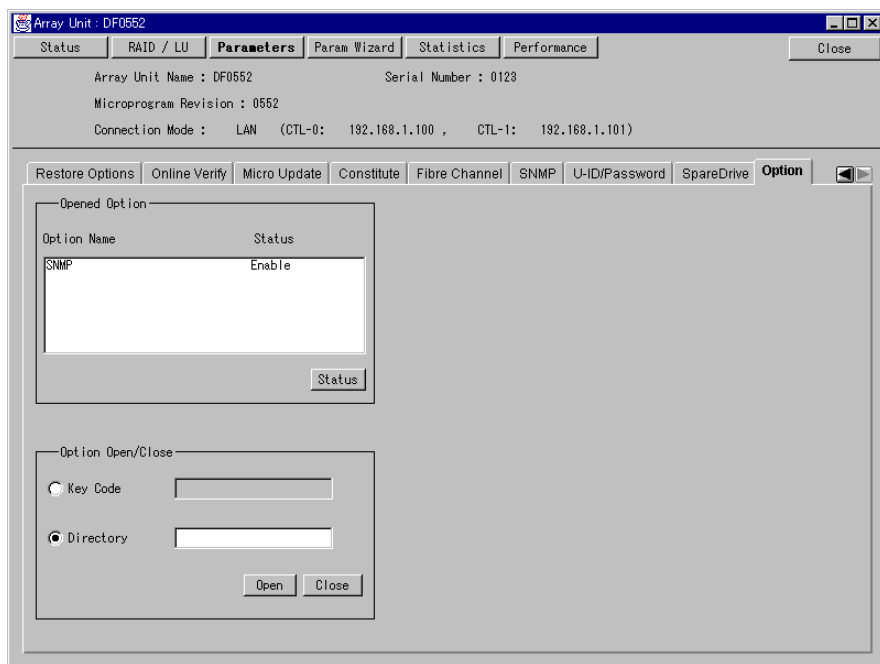


When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

3.7.2 Closing Fee-Basis Option

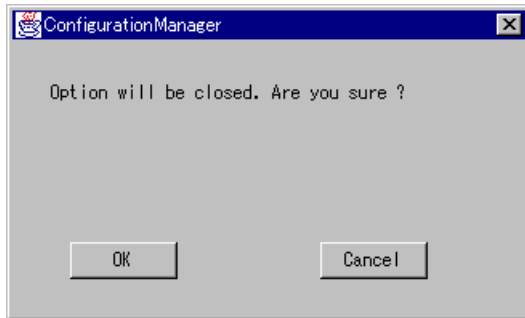
The following procedure closes the key of the fee-basis option for DF500.

1. Click **Parameters**, then click the **Option** tab.



2. Specify whether you are closing the fee-basis option using the FD with the fee-basis option, or if you are using the key code, then setup the directory path or key code, then click the **Close** button.
When you close the option using the FD, click the **Directory** radio button and then setup the path for the FD. When you close the option using the key code, click the **Key Code** radio button and then setup the key code. For the key code of the fee-basis option, refer to the manual of the fee-basis option.

3. When the confirmation screen for fee-basis option closing is displayed, click the **OK** button.

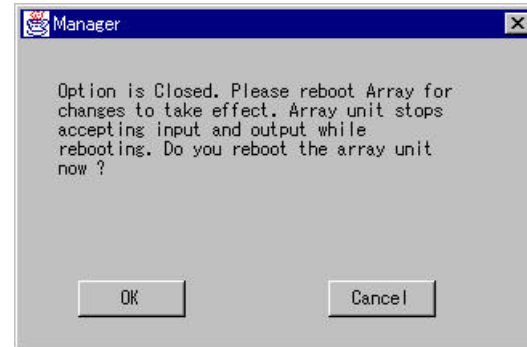


4. A screen confirming that the fee-basis option has been closed appears. Depending on the option, an array unit needs to be restarted in order to set the closing effective. If an array unit supports restarting, a message confirming a restart request will be displayed, clicks the **OK** button when restarting.
 - a) Option that does not require to restart an array unit in order to set the closing effective.



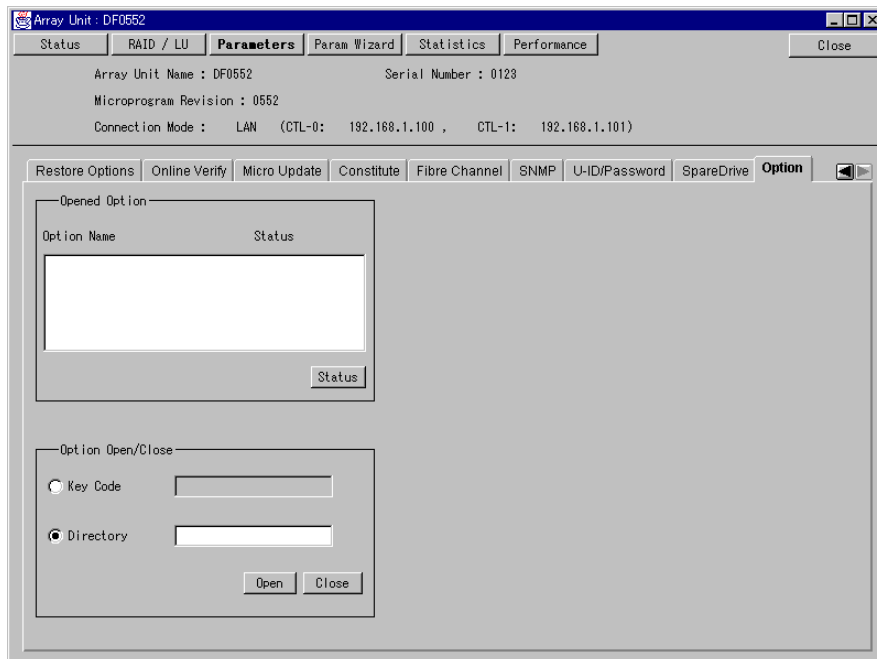
b) Option for which the closing is set effective by restarting an array unit

- If an array unit does not support restarting
- If an array unit supports restarting

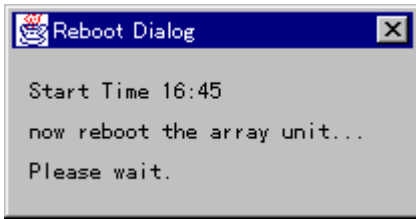


Note: To set effective the closing of the option that you have operated, restart the array unit. The feature is not yet opened until restarting. When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

5. If an array unit fails to restart, the locked fee-basis option is not displayed.

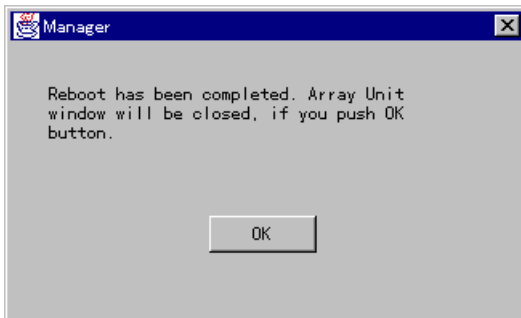


When restarting an array unit, the time the restarting has begun is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

When the restarting terminates, a message is displayed, so clicks the **OK** button.

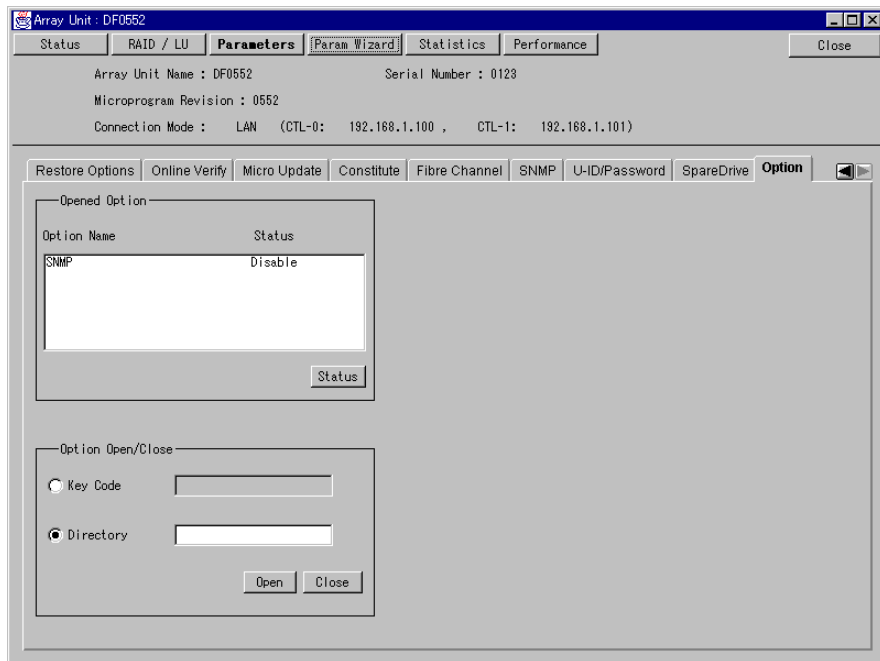


When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

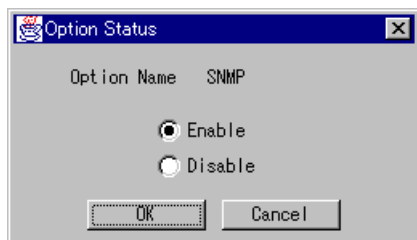
3.7.3 Setting up priced optional features

After releasing the key of DF500 priced optional feature, sets whether to enable or disable the priced optional feature.

1. Click **Parameters**, then click the **Option** tab.

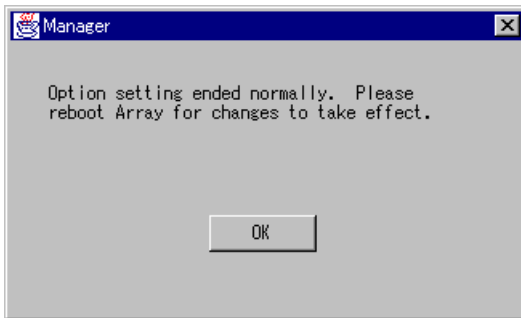


2. Select the fee-basis option to be setup and then click the **Status** button.
3. Select Enable/Disable and then click the **OK** button.



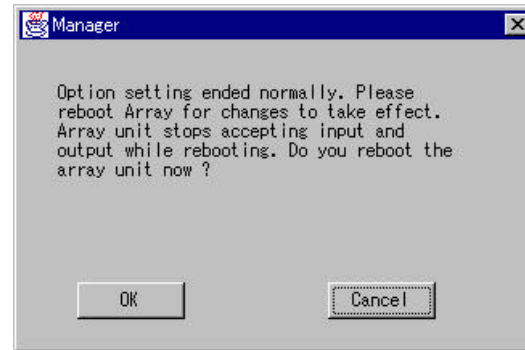
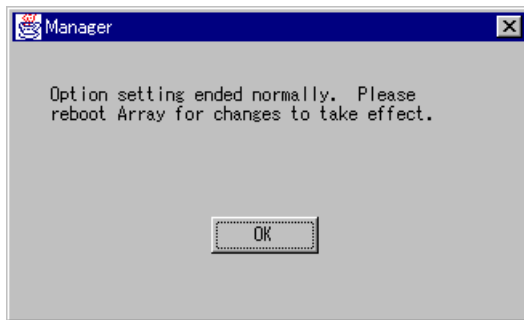
4. A screen confirming that the fee-basis option has been setup appears. Depending on the option, an array unit needs to be restarted in order to set the setup effective. If an array unit supports restarting, a message confirming a restart request will be displayed, clicks the **OK** button when restarting.

a) Option that does not require to restart an array unit in order to set the setup effective.



b) Option for which the setup is set effective by restarting an array unit

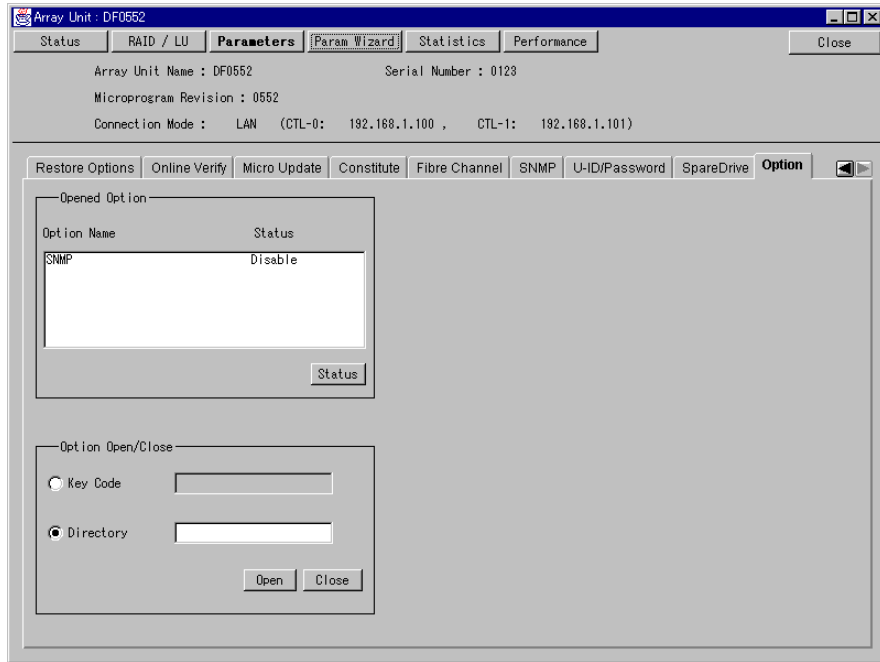
- If an array unit does not support restarting
- If an array unit supports restarting



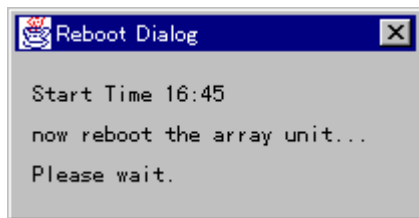
Note: To set effective the setup of the option that you have operated, restart the array unit. The setup is not yet reflected until restarting.

When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

5. When not restarting an array unit, a screen appears with the setup fee-basis option being updated.



When restarting an array unit, the time the restarting has begun is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

When the restarting terminates, a message is displayed, so clicks the [OK] button.

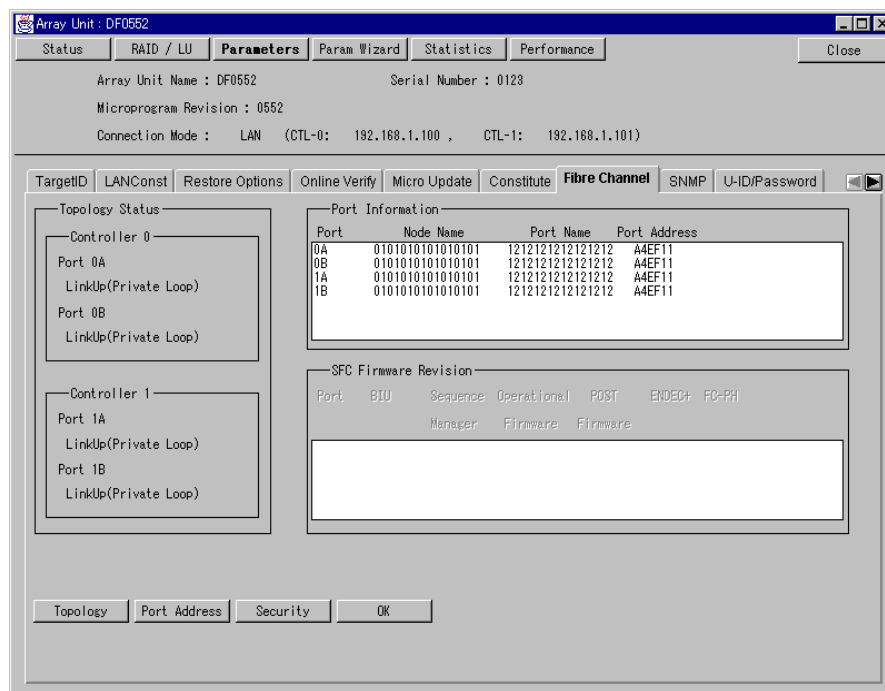


When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

3.8 Setting Fibre Channel Information

The fibre channel information is displayed and set.

Click **Parameters** in the main window, then click the **Fibre Channel** tab. **Topology Status**, **Port Information**, and **SFC Firmware Revision** are displayed.



Topology Status, **Port Information**, and **SFC Firmware Revision** are displayed. **SFC Firmware Revision** is not shown for DF500 connection.

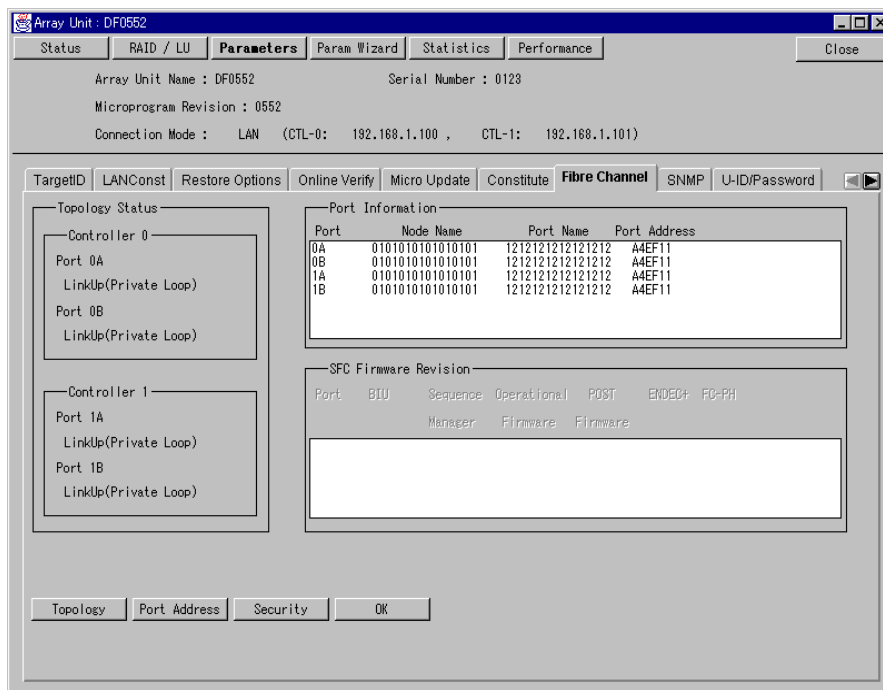
- **Topology Status:** Indicate the topology status.
 - **LinkUp (Private Loop):** Arbitrated Loop not connected with Fibre Channel switch.
 - **LinkUp (Public Loop):** Arbitrated Loop connected with Fibre Channel switch.
 - **LinkUp (N_Port connection):** Connect Point to Point with host.
 - **LinkUp (F_Port connection):** Connect Point to Point with Fibre Channel switch.
 - **Loop Port Bypass:** Bypassed from the loop.
 - **Standby:** Standby state.
 - **LinkDown:** Link is down.
 - **LinkFailure:** Link initialization condition.
- **Port Information:** The information of the own port consisting of a node name (8 bytes), port name (8 bytes), and N_Port ID (3 bytes) is displayed as a hexadecimal number.

- **SFC Firmware Revision:** Firmware revision information of FFC (Firefly Chipset) and SFC (SuperFly Chipset) is displayed. As the revision information, the following are displayed for each port.
 - BIU revision
 - Sequence manager revision
 - Operational firmware revision
 - Power-on self test firmware revision
 - “ENDEC+” revision
 - FC-PH support level

3.8.1 Topology Setup

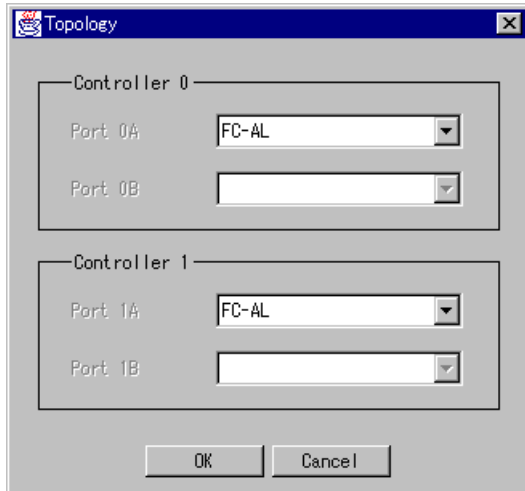
The following procedure sets up the topology. The topology is setup on a controller basis (DF350F and DF400) or on a port basis (DF500).

1. Click **Parameters** in the main window, then click the **Fibre Channel** tab.



2. Click the **Topology** button.

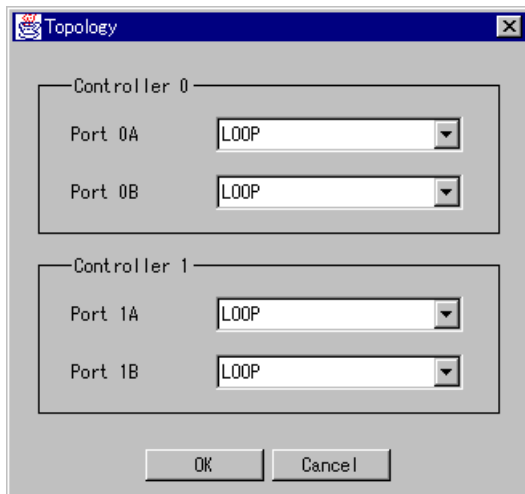
3. Select the topology to be setup, then click the **OK** button.
 - a) For the DF350F and DF400



Specify the topology on a controller basis.

- FC_AL
- Fabric Point-to - Point

- b) For the DF500



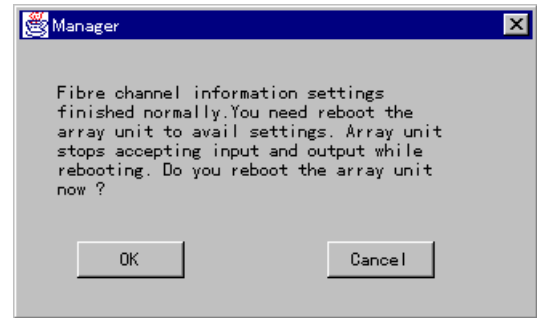
Specify the topology on a port basis.

- Loop
- Point -to -Point

4. Click the **OK** button of the **Fibre Channel** page screen.

5. A message indicating completion of setting is displayed. If an array unit supports restarting, a confirmation message indicating a request for restarting is displayed, so clicks the **OK** button when restarting.

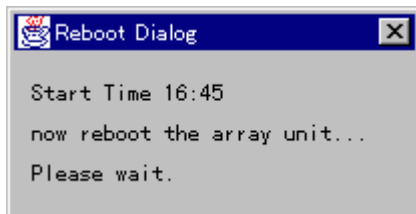
- If an array unit does not support restarting
- If an array unit supports restarting



Note: To validate the set topology, restart the array unit. The previous settings stay valid until restarting.

When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

6. When instructing to restart an array unit, the time the restarting has began is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

A message indicating that the restarting has terminated is displayed, so clicks the OK button.

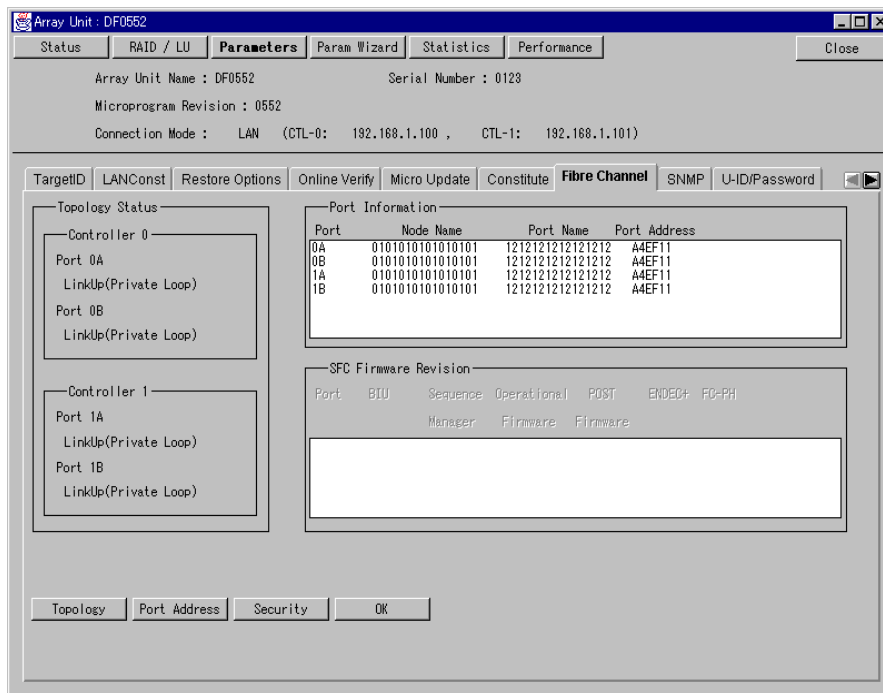


When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

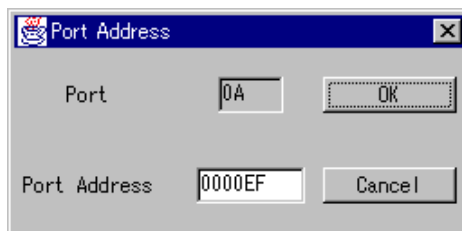
3.8.2 Setting of Port Address

Set the port address of the Fibre Port.

1. Click **Parameters** in the main window, then click the **Fibre Channel** tab.

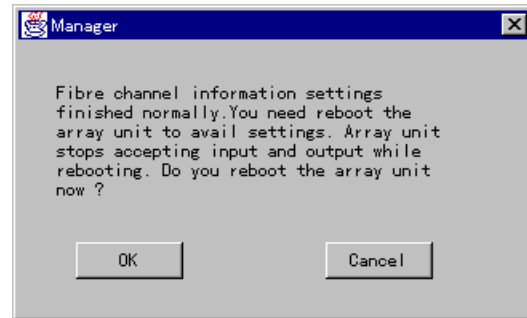


2. Click the port to be set in the **Port Information** box, then click **Port Address**.
3. When **Port Address** window appears, specify a value to be set in the **Port Address** text box and click **OK**.



Specify **Port Address** in a hexadecimal 6-digit number.

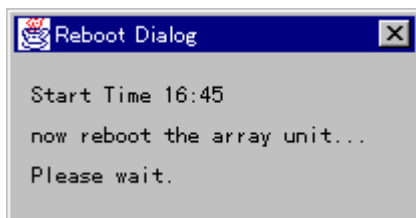
4. Click **OK** in the **Fibre Channel Page** window.
5. A message indicating completion of setting is displayed. If an array unit supports restarting, a confirmation message indicating a request for restarting is displayed, so clicks the **OK** button when restarting.
 - If an array unit does not support restarting
 - If an array unit supports restarting



Note: To validate the set N_Port_ID, restart the array unit. The previous settings stay valid until restarting.

When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

6. When instructing to restart an array unit, the time the restarting has began is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

A message indicating that the restarting has terminated is displayed, so clicks the **OK** button.



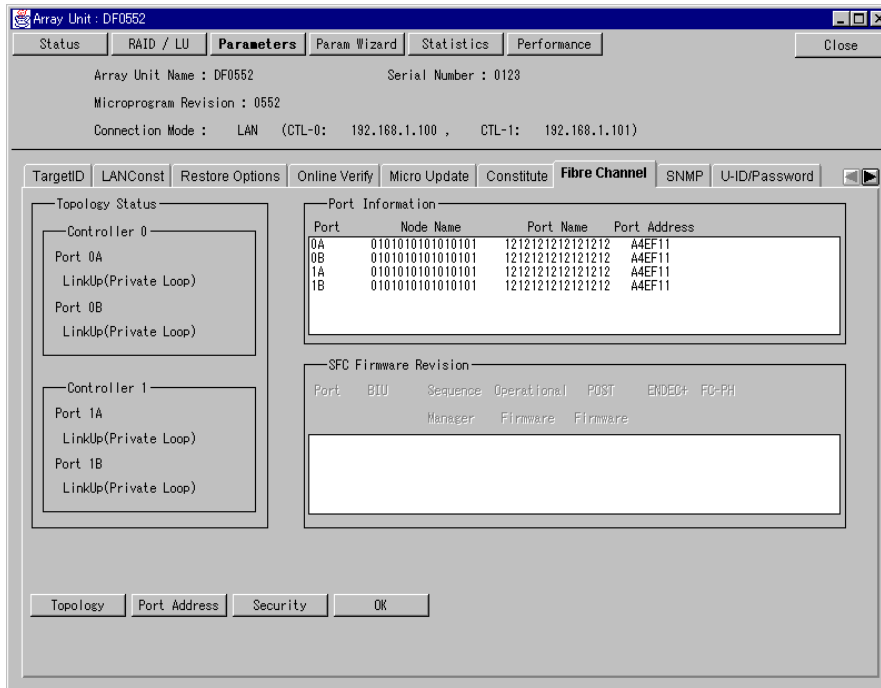
When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

7. When not instructing to restart an array unit, the **Fibre Channel Page** is updated with the set contents reflected into the screen.

3.8.3 Setting port security

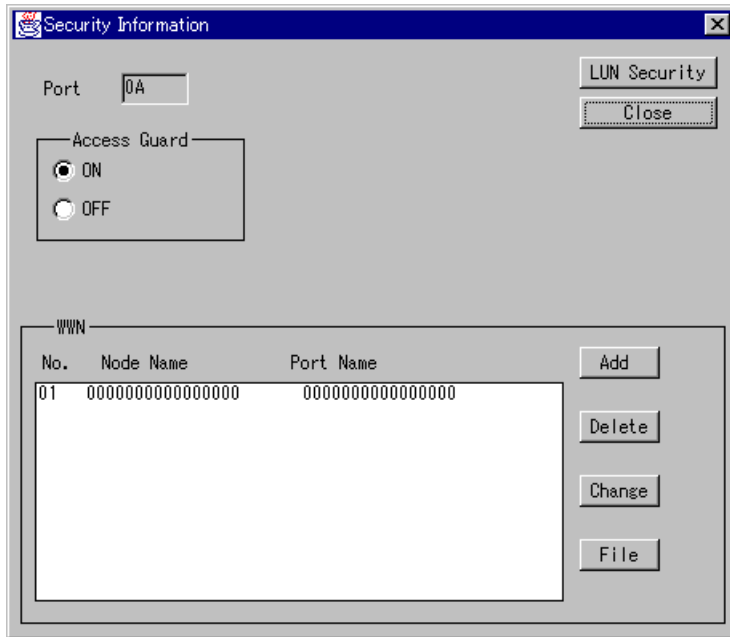
The port security function specifies another port for which access is permitted for each port. Set the WWN (node name and port name) being security information for each port.

1. Click **Parameters** in the main window, then click the **Fibre Channel** tab.



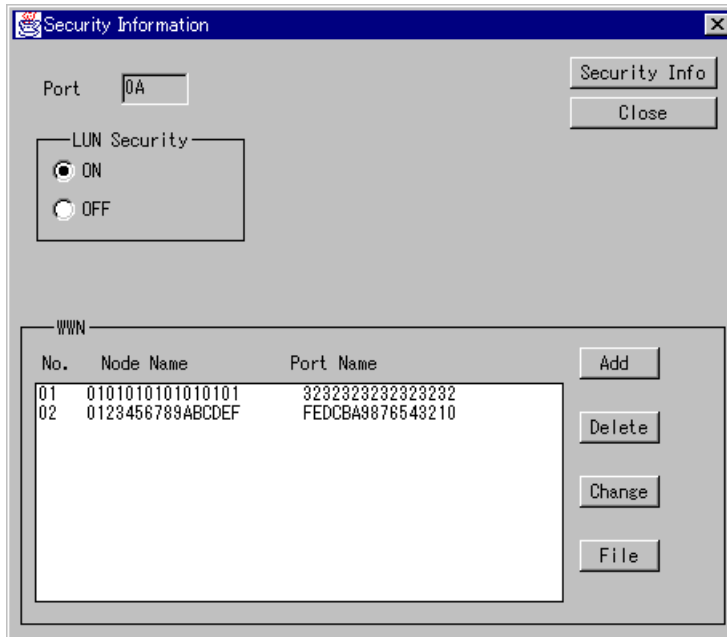
2. Click the port to be set in the **Port Information** box, then click **Security**.

3. The **Security Information** window is displayed.
 - For DF350 and DF400



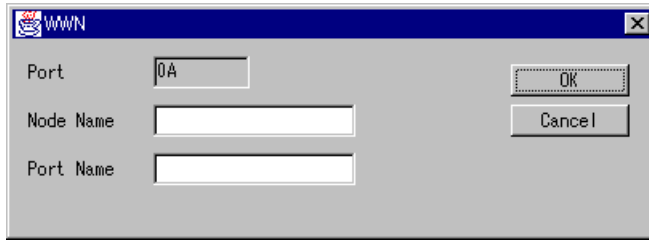
- **Access Guard:** Specifies whether or not to permit access from the WWN of another port registered in WWN. The access permission is applied to all WWNs that are registered.
 - **ON:** Permits access.
 - **OFF:** Not permit access.
- **WWN:** When using the port security and LUN security, the WWN of the host is set. Specify **Node Name** and **Port Name** in a hexadecimal 16-digit number.

- For DF500



- **LUN Security:** Specify whether the LUN security is to be used or not.
 - **ON:** Permits the LUN security.
 - **OFF:** Inhibits the LUN security.
- **WWN:** When using the port security and LUN security, setup the host WWN. Specify **Node Name** and **Port Name** using a 16-digit hexadecimal

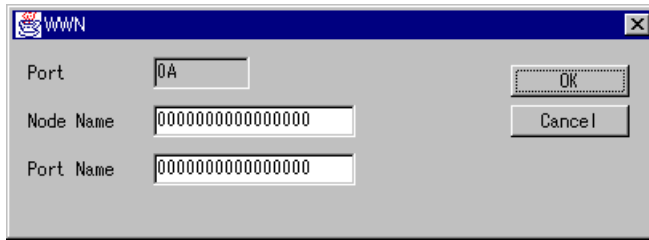
- c) For addition, click **Add**.



The screenshot shows a dialog box titled "WWN" with a blue header bar. It contains three input fields: "Port" with the value "0A", "Node Name" which is empty, and "Port Name" which is empty. To the right of the input fields are two buttons: "OK" and "Cancel".

Specify **Node Name** and **Port Name** of the WWN of the host and click **OK**. The **Security Information** window is updated according to the added WWN.

- d) For deletion, click the **WWN** to be deleted in the **WWN** box and click **Delete**. The **Security Information** window is updated according to the deleted WWN.
- e) For a change, click the **WWN** to be deleted in the **WWN** box and click **Change**.



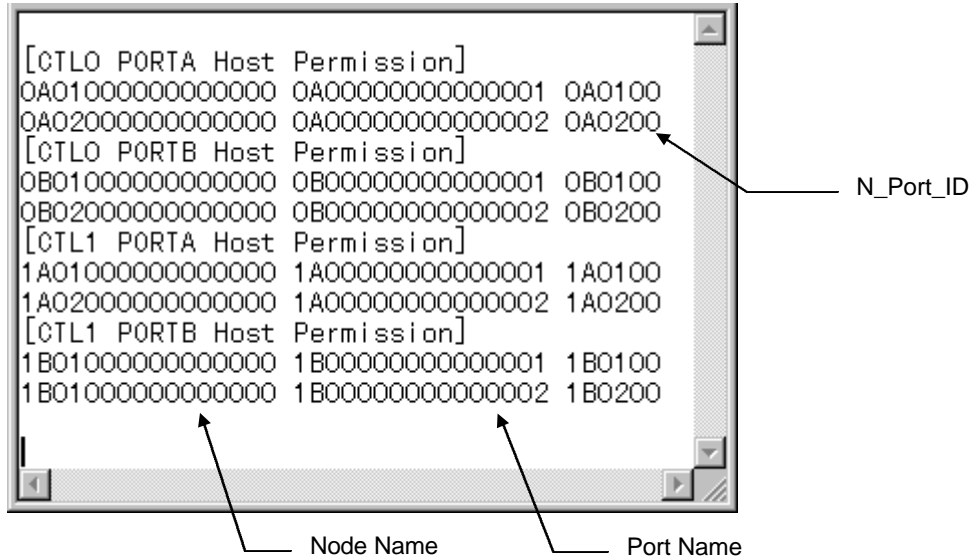
The screenshot shows the same "WWN" dialog box as above, but the "Node Name" and "Port Name" fields are now filled with the hexadecimal string "0000000000000000".

When the WWN of the host that is set appears, change **Node Name** and **Port Name** and click **OK**. The **Security Information** window is updated according to the added WWN.

- f) When settings are made by using File, click **File**. The WWN information is read from the file and **Node Name**, **Port Name**, and **N_Port_ID** are set. When a file reference window appears, select a file to be used and click **OK**. The **Security Information** window is updated according to the WWN of the read file.

Note: When settings have been made by using **File**, all the contents that are previously set are invalidated and changed to that of the read file.

The following figure shows a file format for the case where settings are performed by using “File”. Input necessary items for each port. Put a space between items. If tabs are used, the setting of the line including “tab” are ignored because it is regarded as an input error.



- **Node Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **Port Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **N_Port_ID:** Describes 3 bytes of data hexadecimal (with 6 characters). Concerning the host identification information, this data can be omitted. When the data is omitted, it is assumed to be 0X000000.

When “;” is described at the top, the line is regarded as a comment line.

4. Click **Close**, then click **OK** in the **Fibre Channel Page** window.

5. When a setting completion message appears, click **OK**.

- DF400 microprogram revision : x458 or earlier
- DF400 microprogram revision : x459 or later



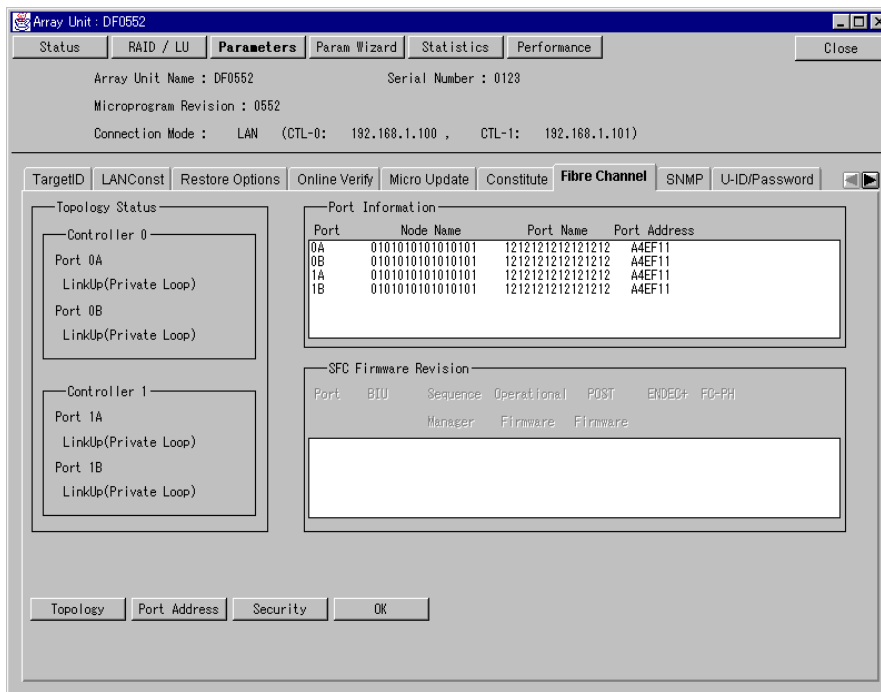
- In the case of DF400 microprogram revision : x459 or later, the setting is reflected as it is.
- In the case of DF400 microprogram revision : x458 or earlier, restart the array unit to validate the setting.

3.8.4 Setting LUN security

The LUN security function specifies another port for which access is permitted for each port and each LUN.

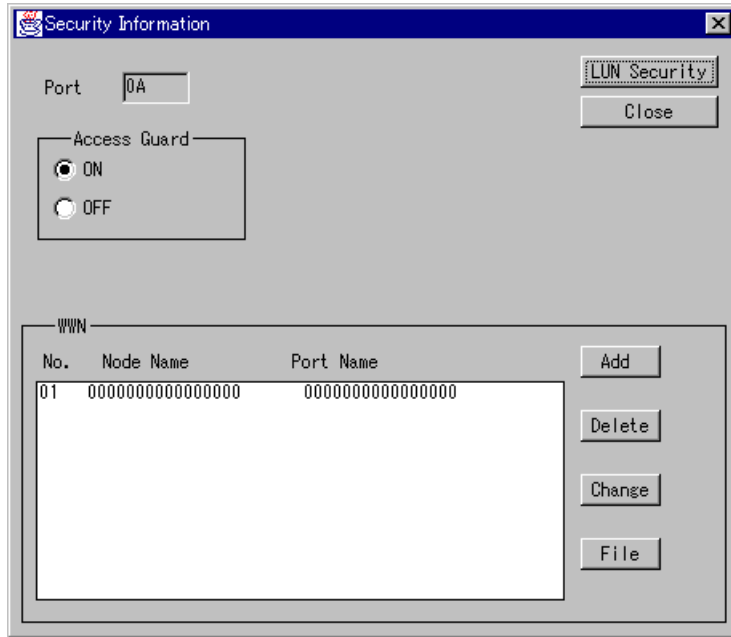
Set the WWN (node name and port name) being security information for each port and for each LUN.

1. Click **Parameters** in the main window, then click the **Fibre Channel** tab.

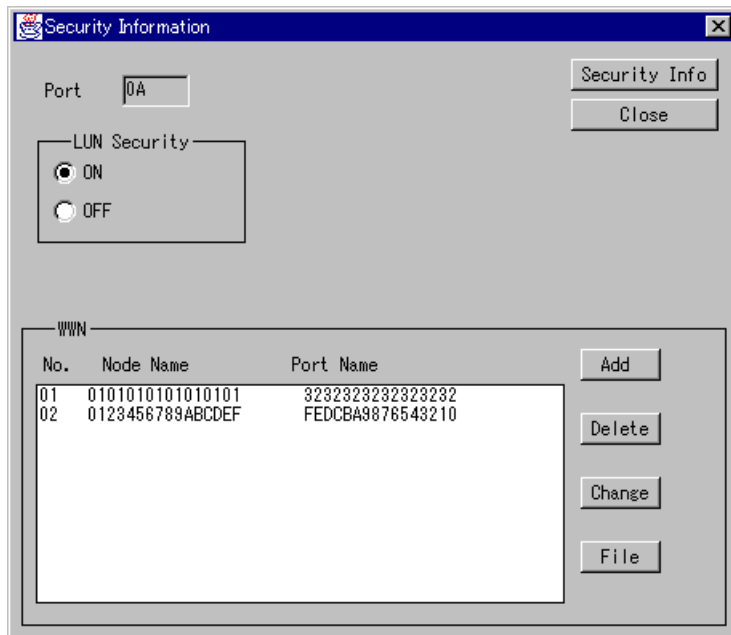


2. Click the port to be set in the **Port Information** box, then click **Security**.

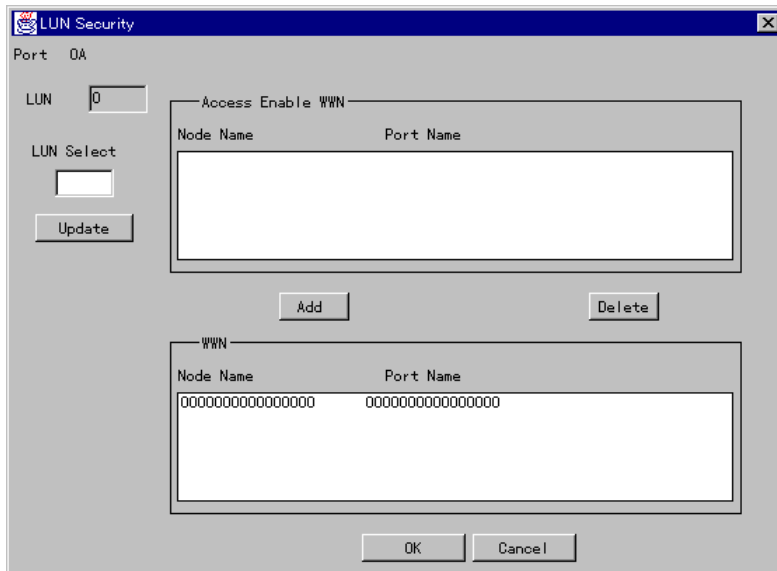
3. When the **Security Information** window appears, click **LUN Security**.
 - a) For DF350 and DF400



- b) For DF500



4. The **LUN Security** window is displayed.



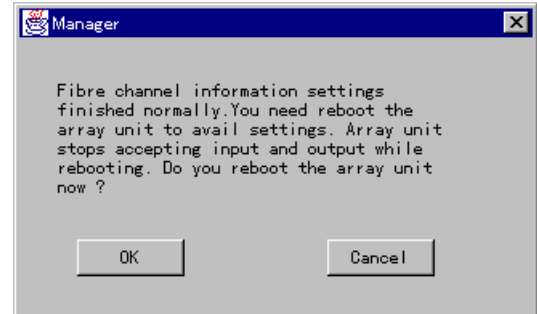
If the HP connection mode is specified with system parameters, you cannot specify **LUN Select**.

In this case, LUN-based setting is not possible and only port-based setting is possible.

5. Enters into the **LUN Select** text box an LU No. to set, then clicks the **Update** button. The LU No. to set is displayed in the **LUN**, and WWN information in the LU No. is displayed. For addition, click the WWN to be added in the **WWN** box and click **Add**. For deletion, click the WWN to be deleted in the **Access Enable WWN** box and click **Delete**. The WWN to be set is displayed in the **Access Enable WWN** box. To setup the security for all LUs, specify **ALL** for **LUN Select**.
6. Clicks the **OK** button, clicks the **Close** button on the **Security Information** screen, and then clicks **OK** button on the **Fibre Channel Page** screen.

7. When a message displayed upon completion of the setting, click **OK**.

- DF400 microprogram revision : x458 or earlier
- DF400 microprogram revision : x459 or later



- In the case of DF400 microprogram revision : x459 or later, the setting is reflected as it is.
- In the case of DF400 microprogram revision : x458 or earlier, restart the array unit to validate the setting.

3.9 Outputting Configuration Information to File

Output in a text file the configuration information of the array unit, or set configuration using a text file.

The configuration information output in a text file is the status of the system parameters, RAID/LU and the constituent parts of the array unit. The configuration to be set is the system parameters and RAID/LU. The status of the constituent parts of the array unit cannot be set. The configuration information is handled with separate text files for the system parameters and for RAID/LU.

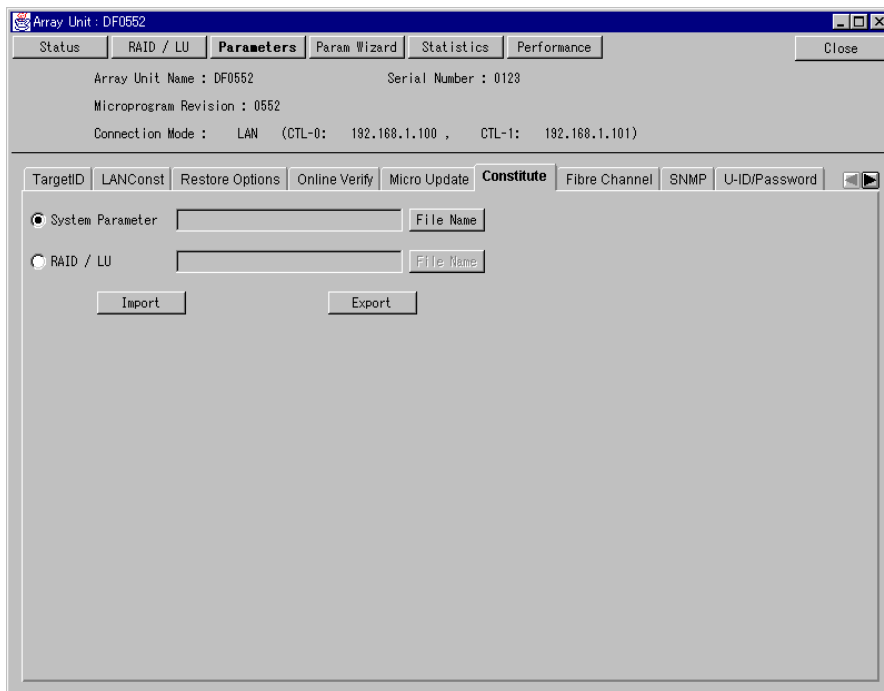
The copying of configuration between array units can be carried out, by outputting a text file of the configuration from an array unit, and then by using the output text file to set another array unit.

Editing a text file to set an array unit can be carried out, but it is recommended that this function be used for the configuration of the same array unit. As for a change in the configuration, please carry out using individual functions.

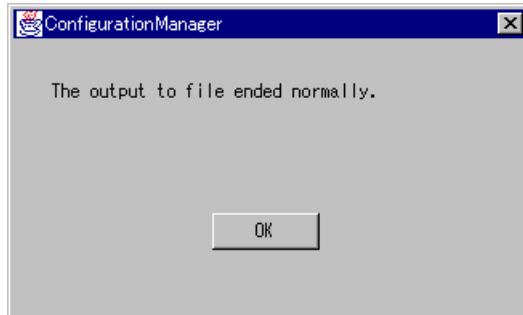
3.9.1 File Output of Configuration : System Parameters

Output in text form to a specified file the setting content of the system parameters set in an array unit.

1. Click the **Parameters** button, and click the tab **Constitute** tab.



2. Click the **System Parameter** radio button. Specify the directory and file name to output the file of the configuration.
3. Click the **File Name** button, and specify the directory and file name to output the file of the configuration. The specified file name will be shown in the text box.
4. Click the **Export** button.
5. When a confirmation message displaying that the system parameter information is output with the specified file name shown, click the **OK** button.



System parameter information is saved in the form of a text file with the specified file name.

The format of the output file consists of the following items. The outline of the layout of the output file is shown in Figure 3.1

- File header
- Registration name with the manager of the array unit
- Output time (Time of the machine where the manager is installed)
- Microprogram revision
- Array unit type
- Common controller parameters
- Controller 0 parameters
- Controller 1 parameters
- Direction for FD backup

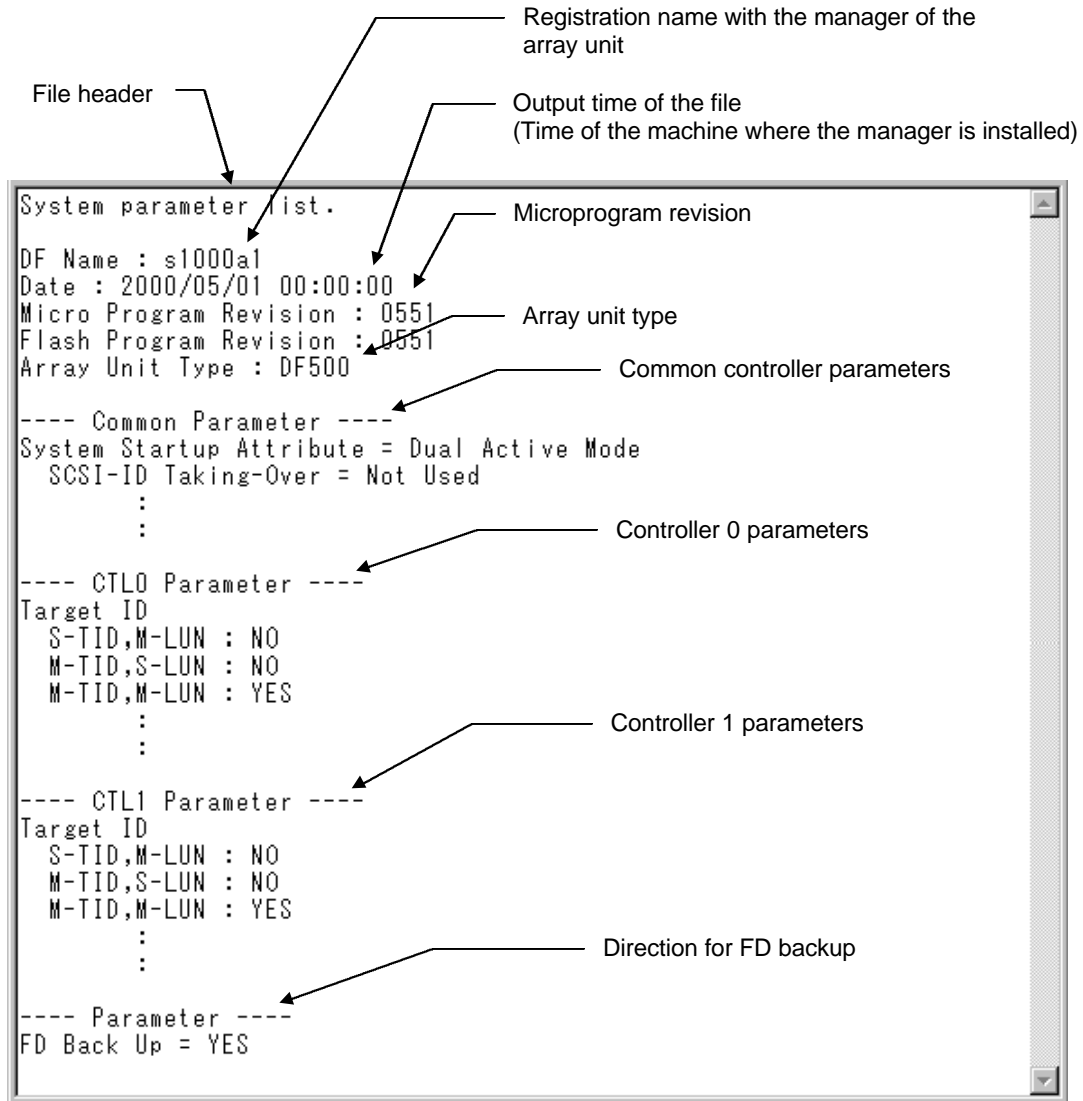


Figure 3.1 Outline of the format of the system parameter output file

a) Common Controller Parameters

The common system parameters of the array unit are output. An output example of the system parameters of DF500 is shown in Figure 3.2.

```
---- Common Parameter ----
System Startup Attribute = Dual Active Mode
SCSI ID/Port ID Take-over Mode = ---
Default Controller
  Port A = ---
  Port B = ---
Data Share Mode = Used
Host Connection Mode 1
  Port 0A = Standard Mode
  Port 0B = Standard Mode
  Port 1A = Standard Mode
  Port 1B = Standard Mode
Host Connection Mode 2
  Port 0A
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
  Port 0B
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
  Port 1A
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
  Port 1B
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
Serial Number =
Option 1
  Drive Detach mode enable = OFF
Option 2
  Multipath(Controller) = OFF
  PROCOM mode enable = OFF
  Report status (normal / warning) = OFF
  Multipath (Array Unit) = OFF
  Turbo LU Warning = OFF
Data Striping Size = 64KB
Operation if the Processor failures Occurs = Reset a Fault
INQUIRY Information
  Command Queuing = ON
  ANSI Version = ---
  Vendor ID =
  Product ID =
  ROM Microprogram Version =
  RAM Microprogram Version =
Web Title
  Web Title = ""
Cache Mode = All OFF
```

Figure 3.2 System parameters: output example of common parameters

The common parameters are the items shown in Table 3.5.

Table 3.5 List of common parameters

Item	Setting item	Wizard window No.
1	System Startup Attribute	1
2	Spare Disk	1
3	Host Connection Mode	1
4	Serial Number	1
5	Drive Capacity	2
6	Option 1	3
7	Option 2	4
8	Data Striping Size	7
9	Buzzer	7
10	LU Size Report to the Host	7
11	SCSI Reset/LIP Mode for all port	7
12	Operation if the Processor failures Occurs	7
13	INQUIRY Information	8
14	Cache Mode	8
15	Host Connection Mode	8

Depending on the array unit in connection, there are items that do not need to be set, and these items will not be output in the file. Moreover, if the value of an item in the parameters is given as “---” it is an item not supported in the configuration of the array unit.

b) Controller 0 Parameters

The parameters of controller 0 in the system parameters of the array unit that make the output are output.

```
---- CTL0 Parameter ----
Target ID
S-TID,M-LUN : NO
M-TID,S-LUN : NO
M-TID,M-LUN : YES

Data
Port Target ID H-LUN LUN
0A      0      0      0
0B      0      1      1
Port Type
Port Option
Reset/LIP Mode(Signal)
Port A = OFF
Port B = OFF
Reset/LIP Mode(Process)
Port A = OFF
Port B = OFF
LIP Port All Reset Mode
Port A = OFF
Port B = OFF
Target Reset (Bus Device Reset) Mode
Port A = OFF
Port B = OFF
Reserve Mode
Port A = OFF
Port B = OFF
Logical Unit Reset Mode
Port A = OFF
Port B = OFF
Third Party Process Logout Mode
Port A = OFF
Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
Port A = ---
Port B = ---
Controller Identifier = Disable
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
DHCP = OFF
IP Address = 0.0.0.0
Subnet Mask = 0.0.0.0
Default Gateway = 0.0.0.0
Ether Address = 00:00:00:00:00:00
SCSI transfer rate
Port A = ---
Port A = ---
```

Figure 3.3 System parameters: output example of controller 0 parameters

The parameters of controller 0 are the items shown in Table 3.6.

Table 3.6 List of parameters of controller 0

Item	Setting item	Wizard window No.
1	Target ID	5
2	Port Type	9
3	ROM Pseudo-response command processing	11
4	Save Data pointer resource	11
5	Controller Identifier	13
6	RS232C Error Information Outflow Mode	13
7	Write & Verify Execution Mode	13
8	LAN Const	15
9	SYNC Control	17

Depending on the array unit in connection, there are items that do not need to be set, and these items will not be output in the file. Moreover, if the value of an item in the parameters is given as “---” it is an item not supported in the configuration of the array unit.

c) Controller 1 Parameters

The parameters of controller 1 in the system parameters of the array unit that make the output are output.

```
---- CTL1 Parameter ----
Target ID
S-TID,M-LUN : NO
M-TID,S-LUN : NO
M-TID,M-LUN : YES

Data
Port Target ID H-LUN LUN
0A      0      0      0
0B      0      1      1
Port Type
Port Option
Reset/LIP Mode(Signal)
Port A = OFF
Port B = OFF
Reset/LIP Mode(Process)
Port A = OFF
Port B = OFF
LIP Port All Reset Mode
Port A = OFF
Port B = OFF
Target Reset (Bus Device Reset) Mode
Port A = OFF
Port B = OFF
Reserve Mode
Port A = OFF
Port B = OFF
Logical Unit Reset Mode
Port A = OFF
Port B = OFF
Third Party Process Logout Mode
Port A = OFF
Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
Port A = ---
Port B = ---
Controller Identifier = Disable
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
DHCP = OFF
IP Address = 0.0.0.0
Subnet Mask = 0.0.0.0
Default Gateway = 0.0.0.0
Ether Address = 00:00:00:00:00:00
SCSI transfer rate
Port A = ---
Port A = ---
```

Figure 3.4 System parameters: output example of the parameters of controller 1

The parameters of controller 1 are the items shown in Table 3.7.

Table 3.7 List of parameters of controller 1

Item	Setting item	Wizard window No.
1	Target ID	6
2	Port Type	10
3	ROM Pseudo-response command processing	12
4	Save Data pointer resource	12
5	Controller Identifier	14
6	RS232C Error Information Outflow Mode	14
7	Write & Verify Execution Mode	14
8	LAN Const	16
9	SYNC Control	18

Depending on the array unit in connection, there are items that do not need to be set, and these items will not be output in the file. Moreover, if the value of an item in the parameters is given as “---” it is an item not supported in the configuration of the array unit.

d) Parameters for Backup Use in the System Parameter Information

The specification of whether the system parameter information is backed up from the FDD of the array unit to FD is shown. The indication is always shown as “YES”.

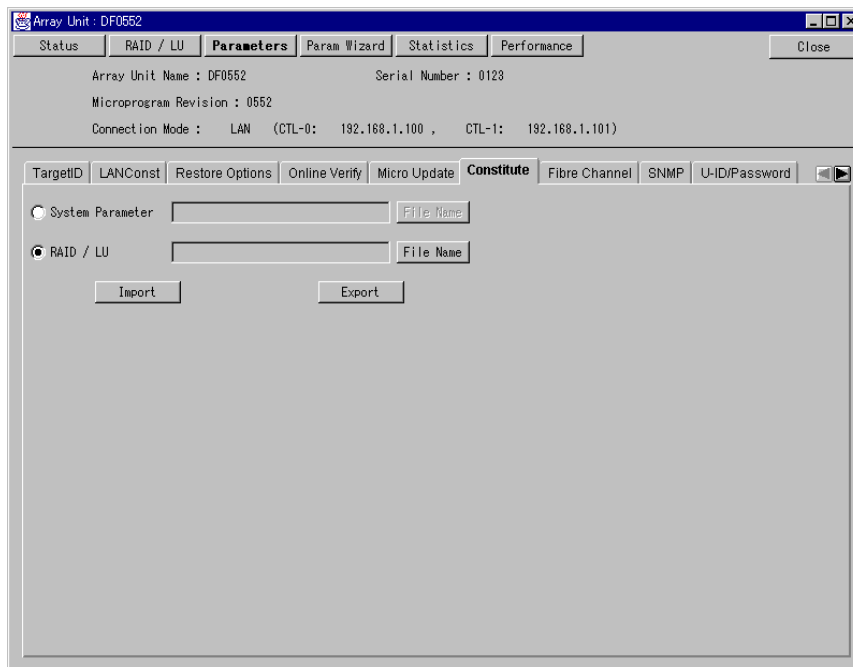


Figure 3.5 Output example for FD backup specification

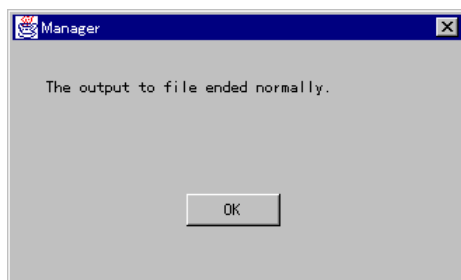
3.9.2 Outputting configuration information to file : RAID/LU and component status

The RAID/LU definition information already set in an array unit is output to a specified file in a text format.

1. Click **Parameters**, then click the **Constitute** tab.



2. Click the **RAID/LU** radio button.
3. Click the **File Name** button, and specify the directory and file name to output the configuration file. The specified file name will be shown in the text box.
4. Click the **Export** button.
5. When a confirmation message that the system parameter information is output with the specified file name is shown, click the **OK** button.



System parameter information is saved in the form of a text file with the specified file name.

The format of the output file consists of the following items. The outline of the layout of the output file is shown in Figure 3.6. Figure 3.6 is the outline of the layout of the output file for the case of DF500.

- File header
- Registration name at the manager of the array unit
- Output time (Time of the machine where the manager is installed)
- Microprogram revision
- Array unit type
- RAID/LU configuration
- Status of constituent parts

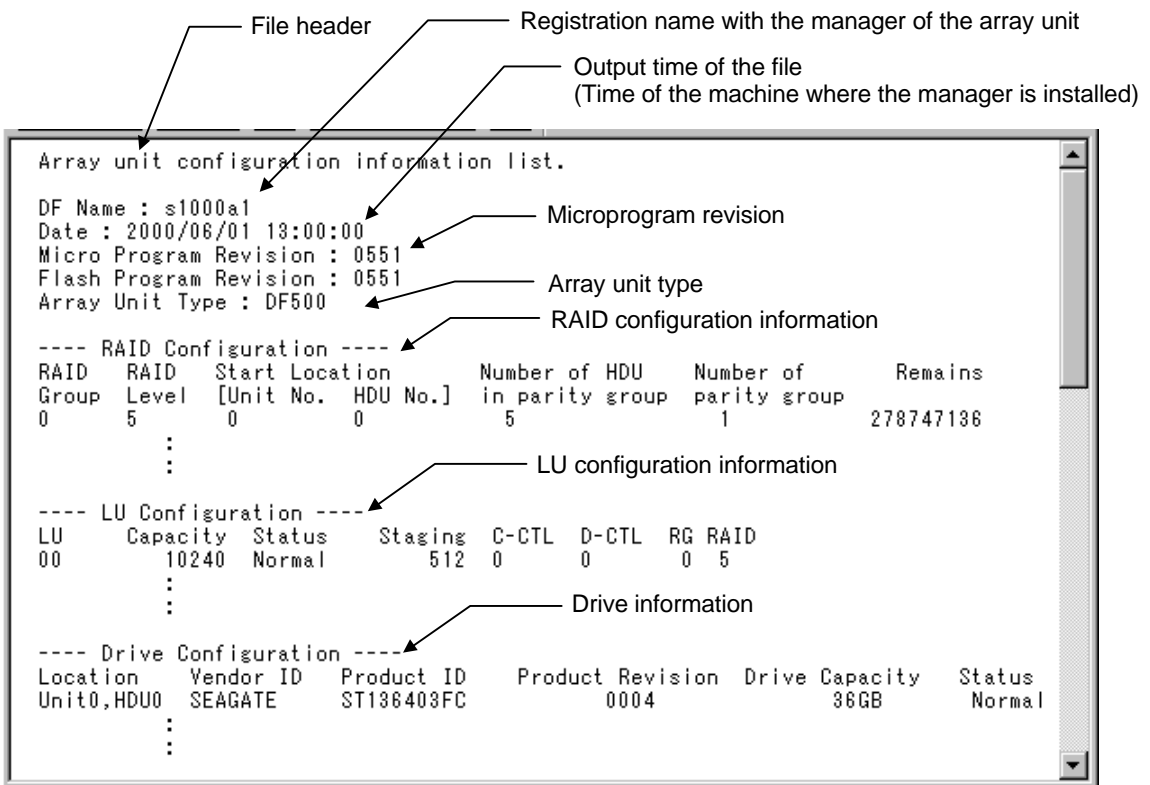


Figure 3.6 The outline of the format of RAID/LU configuration information output file

In the cases in which DF300, DF350 or DF350F is connected, “---” will be shown for Flash Program Revision.

```

---- Cache Information ----
      Controller 0
Slot  Capacity  Status
0      256      Normal
      :
      :

---- Fan Information ----
Location  Status
0         Normal
      :
      :

---- Battery Information ----
Location  Status
0         Normal
      :
      :

---- AC Power Information ----
Location  Status
Unit0,AC0 Normal
      :
      :

---- Battery Backup Information ----
Location  Status
0         Normal
      :
      :

---- Loop Information ----
Location  Status
0         Normal
      :
      :

---- ENC Information ----
Location  Status
Unit0,ENCO Normal
      :
      :

```

Cache information

Fan information

Battery information

AC power information

Battery backup information

Loop information

Enclosure information

Figure 3.6 The outline of the format of RAID/LU configuration information output file
(Continued)

a) Format of RAID configuration information

The function outputs the RAID configuration of the array unit. RAID groups which have not been created are displayed as “-” in the “Level” column.

■ For the case of DF350, DF400

```

---- RAID Configuration ----
RAID  RAID
Group Level Row Port Width Depth
0     5     0   0   5   1
1     5     1   0   5   1
2     -
3     -
4     -
5     -

```

- **RAID Group:** RAID group number
- **RAID Level:** RAID level
When no RAID is set, “-” is displayed. No other information is displayed.
- **Row:** Starting row number of RAID group
- **Port:** Starting port number of RAID group
- **Width:** Width of RAID group
- **Depth:** Depth of RAID group

■ For the case of DF500

```

---- RAID Configuration ----
RAID  RAID  Start Location      Number of HDU   Number of      Remains
Group Level [Unit No. HDU No.] in parity group parity group
0     5     0       0           5             1           278747136
1     5     0       5           5             1           278747136
      :
18    -
19    -

```

- **RAID Group:** RAID group number
- **RAID Level:** RAID level
When no RAID is set, “-” is displayed. No other information is displayed.
- **Start Location:**
Unit No.: Starting unit number of RAID group
HDU No.: Starting HDU number of RAID group
- **Number of HDU in parity group:** The number of HDU in the parity group of the RAID group
- **Number of parity group:** The number of parity groups in the RAID group
- **Remains:** The capacity (in units of block) that can be defined by LU of the RAID group

b) Formatting LU configuration information

The function outputs the LU configuration information of the array unit. The information is displayed up to the created LU numbers .

```
---- LU Configuration ----
LU      Capacity  Status   Staging  C-CTL  D-CTL  RG RAID
00      10240    Normal   512      0      0      0  5
01      10240    Normal   512      1      1      1  5
After 02, not define.
```

- **LU:** LU number
- **Capacity:** LU capacity (in units of block)
- **Status:** The status of the LU
 - Normal:** Normal status in which the LU is defined and formatted
 - Unformat:** Status in which the LU is defined but not formatted
 - Detached:** Status in which the LU is blocked
 - Regressed:** Status in which the LU is regressed
- **Staging:** Preread data amount (in units of block)
- **C-CTL:** The number of the controller currently in use
- **D-CTL:** Default number of controller controlling the LU
- **RG:** The number of the RAID group that creates the LU
- **RAID:** The RAID level of the RAID group that creates the LU

c) Format for Drive Information

The information and status of the drive of the array unit are output.

- For the case of DF400

```

---- Drive Configuration ----
Location  Vendor ID  Product ID  Product Revision  Drive Capacity  Status
Row0,Port0  HITACHI  DK319H-18WS  APY6  4GB  Normal
Row0,Port1  HITACHI  DK319H-18WS  APY6  4GB  Normal
Row0,Port2  HITACHI  DK319H-18WS  APY6  4GB  Normal
:
:
Row5,Port3  Nothing
Row5,Port4  Nothing
Row5,Port5  Nothing
  
```

- For the case of DF500

```

---- Drive Configuration ----
Location  Vendor ID  Product ID  Product Revision  Drive Capacity  Status
Unit0,HDU0  SEAGATE  ST136403FC  0004  36GB  Normal
Unit0,HDU1  SEAGATE  ST136403FC  0004  36GB  Normal
Unit0,HDU2  SEAGATE  ST136403FC  0004  36GB  Normal
:
:
Unit9,HDU7  Nothing
Unit9,HDU8  Nothing
Unit9,HDU9  Nothing
  
```

- **Location:** The installation location of the drive
- **Vendor ID:** The vendor ID of the drive
- **Product ID:** The product ID of the drive
- **Product Revision:** Firmware revision of the drive
- **Drive Capacity:** The capacity of the drive
- **Status:** The status of the drive

Normal: Normal (RAID, LU defined)

Detached: Detached

Standby: Normal (LU undefined)

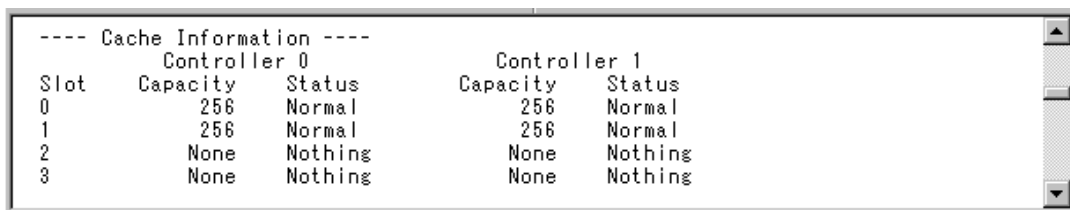
Undefine: Normal (RAID undefined)

Recon.: Reconfiguring (copying from collection or backup)

“Nothing” is shown after **Location** for the location of a HDU not installed.

d) Format for Cache Information

The configuration information and status of the cache of the array unit are output.



```
---- Cache Information ----
      Controller 0          Controller 1
Slot  Capacity  Status    Capacity  Status
0      256      Normal    256      Normal
1      256      Normal    256      Normal
2      None     Nothing   None     Nothing
3      None     Nothing   None     Nothing
```

- **Slot:** The installation location of the cache

Controller 0

- **Capacity:** The capacity (in units of M byte) of the cache of controller 0
- **Status:** The status of the cache of controller 0

Normal: Normal

Detached: Detached

Nothing: Not installed

---: Slot not supported

Controller 1

- **Capacity:** The capacity (in units of M byte) of the cache of controller 1
- **Status:** The status of the cache of controller 1

Normal: Normal

Detached: Detached

Nothing: Not installed

---: Slot not supported

e) Format for Fan Information

The status of the fan of the array unit is output.



```
---- Fan Information ----
Location  Status
0         Normal
```

- **Location:** The installation location of the fan
- **Status:** The status of the fan

Normal: Normal

Alarm: Abnormal

Nothing: Not installed

f) Format for Battery Information

The status of the battery of the array unit is output.

```
---- Battery Information ----
Location  Status
0         Normal
```

- **Location:** The installation location of the battery
- **Status:** The status of the battery
- Normal:** Normal
- Alarm:** Abnormal
- Nothing:** Not installed

g) Format for DC power (Controller) Information : for connection with DF400

The status of the DC power supply (controller) of the array unit is output.

```
---- DC Power Information(Controller) ----
Location  Status
Ct11-0    Normal
Ct11-1    Normal
Ct11-0    Normal
Ct11-1    Normal
```

- **Location:** The installation location of the DC power supply (controller)
- **Status:** The status of the DC power supply (controller)
- Normal:** Normal
- Alarm:** Abnormal
- Nothing:** Not installed

h) Format for DC power (Driver) Information : for connection with DF400

The status of the DC power supply (driver) of the array unit is output.

```
---- DC Power Information(Drive) ----
Location  Status
0         Normal
1         Normal
2         Normal
3         Normal
```

- **Location:** The installation location of the DC power supply (driver)
- **Status:** The status of the DC power supply (driver)
- Normal:** Normal
- Alarm:** Abnormal
- Nothing:** Not installed

- i) Format for DC power Information : for connection with DF350 or DF350F
The status of the DC power supply of the array unit is output.

```

---- DC Power Information ----
Location      Status
0             Normal
1             Normal
2             Normal
3             Normal
4             Normal

```

- **Location:** The installation location of the DC power supply
- **Status:** The status of the DC power supply
 - Normal:** Normal
 - Alarm:** Abnormal
 - Nothing:** Not installed

- j) Format for AC power Information : for connection with DF400 or DF500 only
The status of the AC power supply of the array unit is output.

- For the case of DF350, DF400

```

---- AC Power Information ----
Location      Status
0             Normal
1             Normal

```

- For the case of DF500

```

---- AC Power Information ----
Location      Status
Unit0,AC0     Normal
Unit0,AC1     Normal
              :
              :
Unit9,AC0     Nothing
Unit9,AC1     Nothing

```

- **Location:** The installation location of the AC power supply
- **Status:** The status of the AC power supply
 - Normal:** Normal
 - Alarm:** Abnormal
 - Nothing:** Not installed

- k) Format for Battery Backup Status Information : for connection with DF400 or DF500 only
The status of the battery backup circuit of the array unit is output.



--- Battery Backup Information ---

Location	Status
0	Normal
1	Normal

- **Location:** The installation location of the battery backup circuit
- **Status:** The status of the battery backup circuit
 - Normal:** Normal
 - Alarm:** Abnormal

- l) Format for Loop Information : for connection with DF500 only
The status of the loop of the array unit is output.



Location	Status
0	Normal
1	Normal
2	Normal
3	Normal

- **Location:** The installation location of the loop
- **Status:** The status of the loop
 - Normal:** Normal
 - Alarm:** Abnormal
 - Nothing:** Not installed

- m) Format for Enclosure Information : for connection with DF500 only
The status of the enclosure of the array unit is output.

```
---- ENC Information ----
Location      Status
Unit0,ENC0    Normal
Unit0,ENC1    Normal
      :
      :
Unit9,ENC0    Nothing
Unit9,ENC1    Nothing
```

- **Location:** The installation location of the enclosure
- **Status:** The status of the enclosure
 - Normal:** Normal
 - Alarm:** Abnormal
 - Nothing:** Not installed

3.9.3 Setting the Configuration With a File: System Parameters

Set the array unit with the setting information for the system parameters described in the file. If you set by use of a file that was output under the condition in which any priced optional feature is in an unlocked state, setting may terminate abnormally. For a file for setting, use a file that was output under the condition in which all priced optional features are in a locked state.

In the case of connection with a dual system, setting cannot be carried out if one of the controllers is detached. Please confirm that the array unit is not in warning status.

If the setting of the dual system is carried out through RS232C connection, please do it without fail at controller 0.

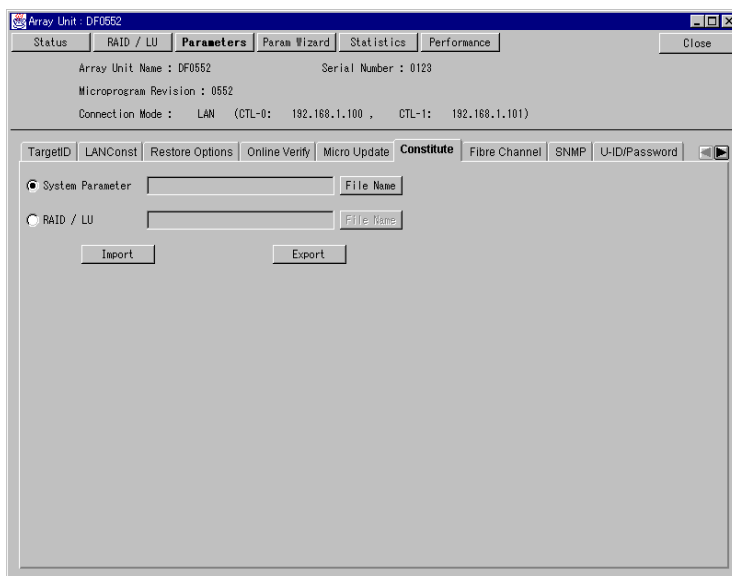
In the case that system parameters are set, the array unit cannot execute commands from the host. Moreover, the functions of the manager can no longer work, except the Wizard for setting the system parameters and failure monitoring. After the setting, please restart the array unit, and after confirming that it is up and running, connect to the host and the manager.

1. Edit the file for setting the system parameters to set the array unit. The file has a specified format. The format of the file is the same as that of the file output by the array unit. Please refer to the following for the format and parameters of the file respectively.

- For the format of the file : **3.9.1 File Output of Configuration : System Parameters**
- For the parameters : **3.5.1 Setting system parameters**

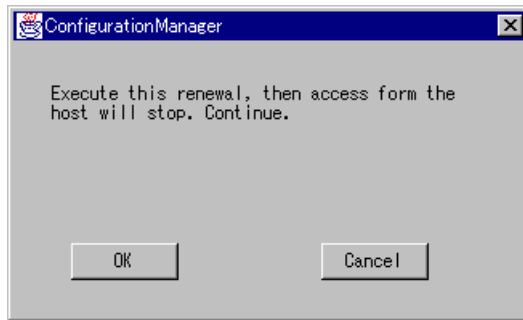
As for the parameters for backup use in the system parameter information, please set **Yes** without fail, as it is necessary to save the set system parameters in the backup FD in the array unit.

2. Click the **Parameters** button, and click the **Constitute** tab.

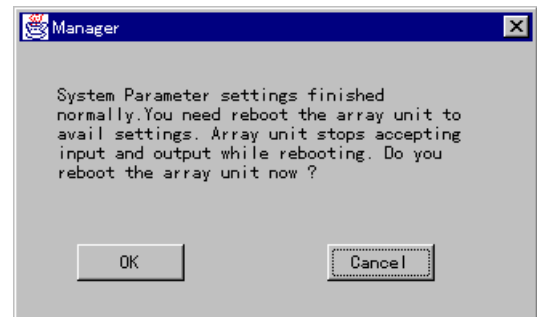


3. Click the **System Parameter** radio button.

4. Click the **File Name** button, and specify the directory and file name of the file that describes the system parameters edited in 1. The specified file name will be shown in the text box.
5. Click the **Import** button.
6. As a confirmation screen for whether to carry out the setting is displayed, click the **OK** button.



7. Now that a confirmation message that the system parameter information from a file with specified name has been set is shown, click the **OK** button.
 - In cases where restart of the array unit not supported
 - In cases where restart of the array unit supported



For the set configuration, please confirm the parameters using the Wizard for setting system parameters.

Note: To validate the set system parameters, restart the array unit. The previous settings stay valid until restarting.

Until restart, commands from the host and part of the functions of the manager cannot be executed.

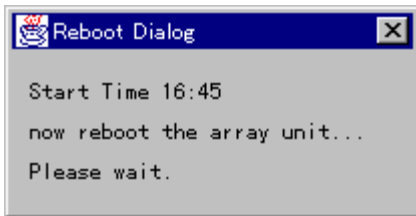
When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

Note: In case where writing onto FD fails, the message : “DMES04EB02 : Backup floppy disk write error.” is shown.

In cases where this message is shown, it is not able to write onto FD, but the setting of Target ID ends normally.

Please check the floppy disk in the array unit. After checking the floppy disk, and confirming the effectiveness of the previous settings, please click the radio **Yes** button in **FD backup**, and click the **OK** button.

8. When restarting an array unit, the time the restarting has begun is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

When the restarting terminates, a message is displayed, so clicks the **OK** button.



When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

3.9.4 Setting the Configuration With a File: RAID/LU Definition

Setting the array unit according to the RAID/LU setting information described in a file.

If the setup of RAID/LU is carried out, all the user data before setting up will be lost as RAID/LU configuration as specified in the file will be set after deleting the current RAID/LU. If the user data is needed, please do the setting after carrying out a backup.

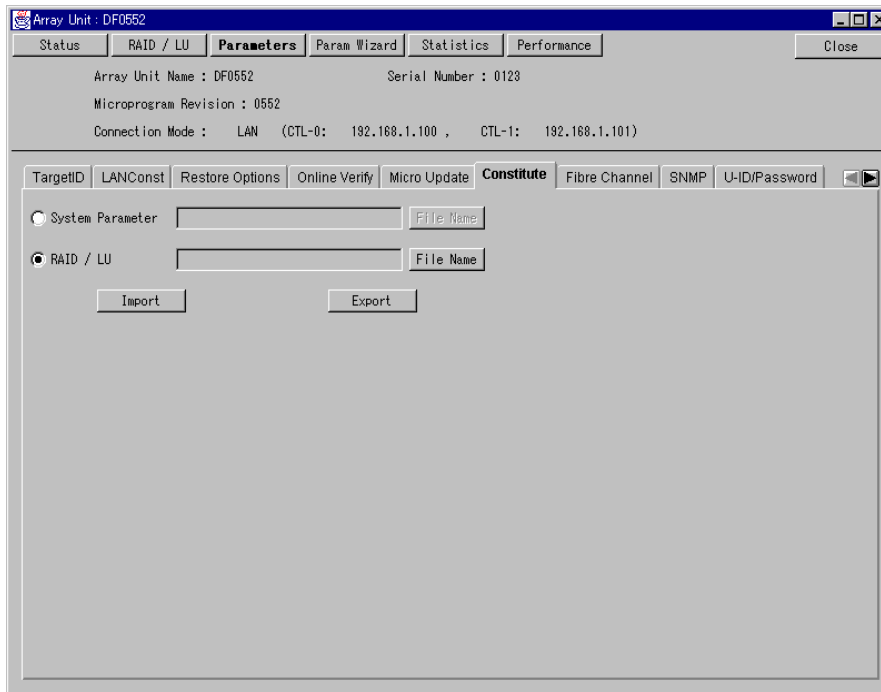
1. Edit the file for setting the RAID/LU to be set in the array unit. The file has a specified format. The format of the file is the same as that of file output by the array unit. Please refer to the following for the format of the file :

– **3.9.2 Outputting configuration information to file : RAID/LU and component status**

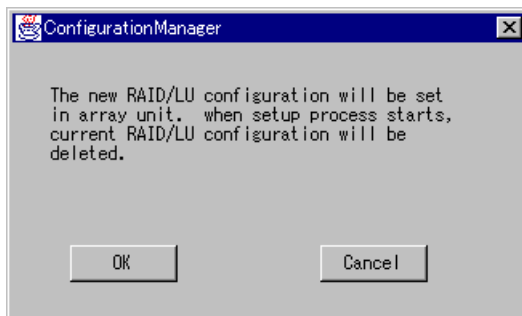
The parameters in the file are the three items of **RAID configuration information**, **LU configuration information**, and **Drive information** in the format of the output file. In the output file, there are items for the status of the constituent parts, but they are ignored while setting up the configuration. The descriptive contents of the parameters are shown below :

- a) **RAID configuration information** : Sets the RAID configuration.
Specifies RAID level, RAID group number and RAID size.
If RAID group is not set, “-” is shown after **Level**, and no other parameters are set.
- b) **LU configuration information** : Sets LU configuration.
Specifies LU number, LU capacity, pre-read capacity, number of controllers in current use, number of controllers in default use, RAID group number and RAID level, and LU status.
In LU status, in cases where formatting is to be executed, specify “Normal”. Formatting cannot be carried out if other status is specified.
In cases where the full capacity of the RAID group is allocated to one LU, specify “All” in **Capacity**.
Even if the number of the controller in current use is specified as “0” or “1”, it will become the same as the number of the controller in default use.
A maximum of 64 LU for DF400 and DF500 and a maximum of 16 LU for DF300, DF350 and DF350F can be created. In cases where LU of less than the maximum LU number are created, specify at the end that “After nn, not define” (nn : the last LU number + 1).
- c) **Drive information** : Sets the configuration of the HDU installed in the array unit to be set.
For HDU not installed, specify “Nothing”.
In the case that a capacity bigger than that of the installed HDU is specified, it is regarded as an error and not set.

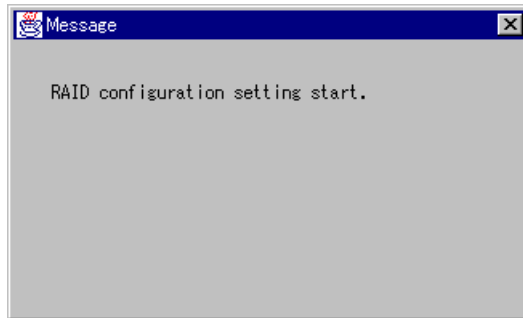
2. Click the **Parameters** button, and click the **Constitute** tab.



3. Click the **RAID/LU** radio button.
4. Click the **File Name** button, and specify the directory and name of the file that describes the RAID definition and LU definition edited in 1. The specified file name will be shown in the text box.
5. Click the button **Import**.
6. As a confirmation screen for whether to carry out the setting is displayed, click the **OK** button.

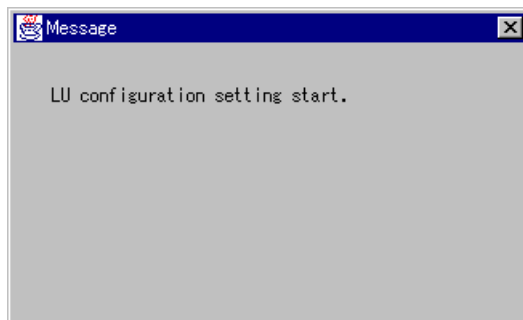


7. A message that the setting of the RAID group has started is shown, and the setting of RAID group is carried out.



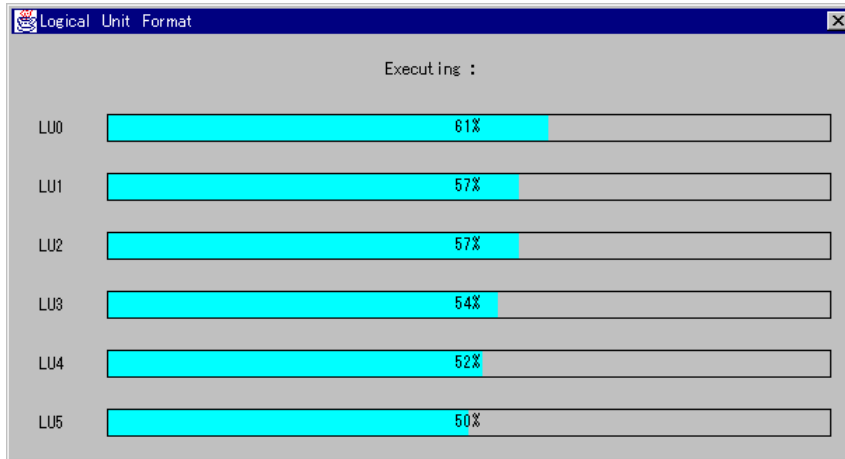
In the case that the setting of the RAID group ends abnormally, an error message will be shown and the processing will be interrupted.

8. If the setting of the RAID group ends normally, a message that the setting of LU has started is shown, and the setting of LU is carried out.



In the case that the setting of the LU ends abnormally, an error message will be shown and the processing will be interrupted.

9. If the setting of the LU ends normally, the formatting of the set LU will begin. The process of formatting execution will be shown.

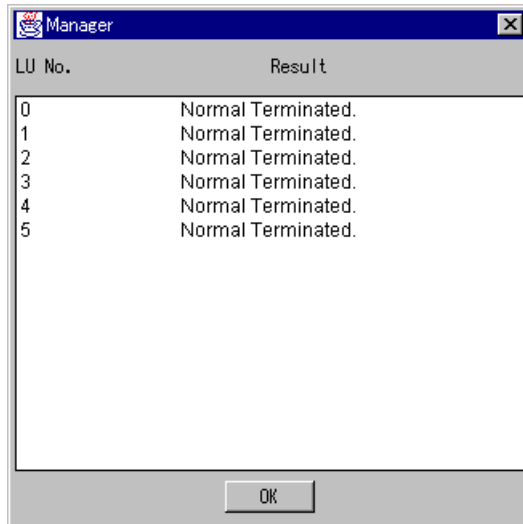


10. Now that a message that the formatting of the LU has ended is shown, click the **OK** button.

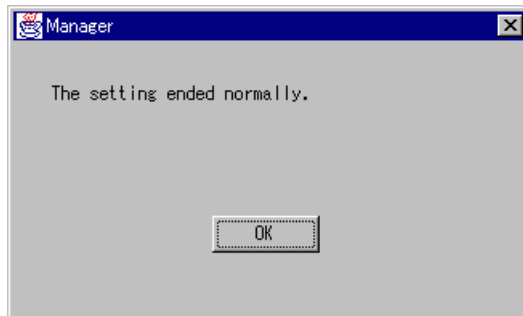


As for the set configuration, please click the **RAID/LU** button, and confirm the RAID and LU configuration displayed on the screen.

11. Now that the result of LU formatting is shown, confirm the content and click the **OK** button.



12. Now a message that the setting of RAID/LU has finished is shown, click the **OK** button.



3.10 Replacing the microprogram

The function downloads and replaces the microprogram in the array unit. When replacing the microprogram, download it and then replace it. When the DF350 is connected, the microprogram can be downloaded.

3.10.1 Microprogram download

Download the microprogram from the FD into the array unit. In the download, the microprogram is only stored in the array unit and the microprogram of the array unit is not replaced.

When the DF350 is connected, do not download the microprogram during execution of an I/O directed by the host. Otherwise, the I/O operation will terminate abnormally.

1. Copy the microprogram from the floppy disk to the hard disk.

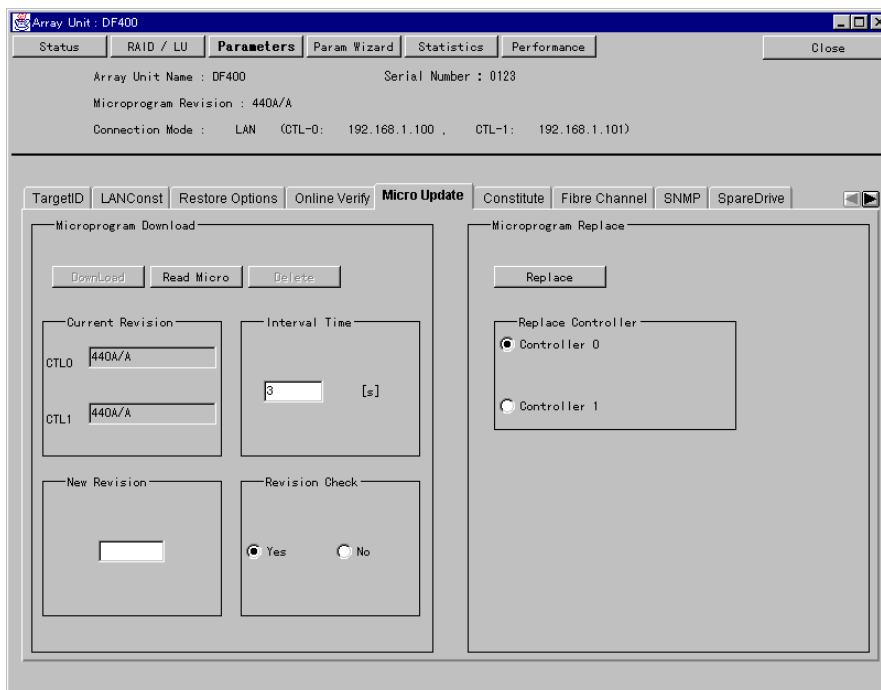
When using Windows, it can store the microprogram from the FD, so that the microprogram is not copied when it is stored from the FD.

When using Solaris, the microprogram is surely copied. As there are multiple floppy disks of the microprogram, each floppy disk is copied to the hard disk using a different directory.

Note: To a directory where the manager is installed, don't copy the microprogram directly to the FD but create a sub-directory and copy it under this sub-directory.

Specify the name of a directory in the hard disk drive to which the microprogram is copied, with one-byte coded alphanumeric.

2. Click **Parameters**, then click **Micro Update** tab.

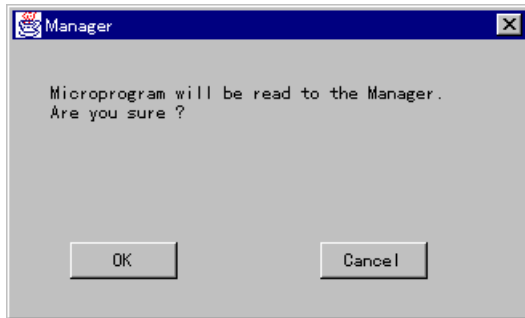


- **Current Revision:** Microprogram revision of each controller of the array unit when the DF400 is connected. Or microprogram revision of the array unit when the DF350 is connected.
- **New Revision:** A microprogram revision stored in the PC or SUN server/workstation in which the manager is installed. When the microprogram is not read, a blank is displayed.
- **Interval Time:** Interval time for download. Specify the time between one second and 60 seconds. In the case of the LAN connection, when the interval time is specified as 3 seconds, the download requires about 9 minutes. The time required for the execution varies with the network status and depending on the I/Os issued by the host. When the interval time is specified as one second longer, the time required for the download is prolonged by 3 minutes. In the case of the RS232C connection, when the interval time is specified as 3 seconds, the download requires about 4 hours. The time required for the execution varies depending on the I/Os issued by the host. When the interval time is specified as one second longer, the time required for the download is prolonged by 40 minutes. The function can be used during execution of the I/O instructed by the host. However, when the download function is executed, the I/O performance of the host is reduced. To restrain the reduction of the performance, specify a longer interval time. It is displayed in halftone when the DF350 is connected.
- **Revision Check:** Instructs the check of the revision of the microprogram to be downloaded. **When the download instruction is specified , whether a hot replacement is applicable to the microprogram is checked. Select Yes.** It is displayed in halftone when the DF350 is connected.

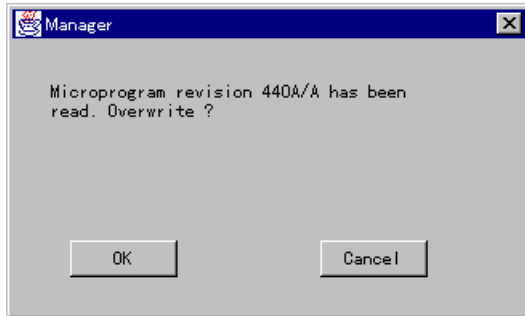
When no microprogram is read, the **DownLoad** and **Delete** buttons are displayed in halftone and cannot be selected.

3. The microprogram is read into the PC or SUN server/workstation in which the manager is installed. Click **Read Micro**. When a revision is displayed in **New Revision**, the microprogram is already read. To download the microprogram that is already read, execute Download.

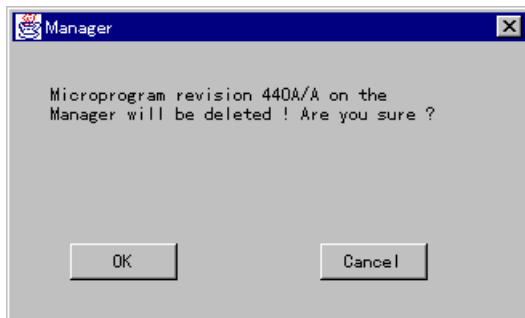
4. When a confirmation message as to whether or not to read the microprogram appears, click **OK**.



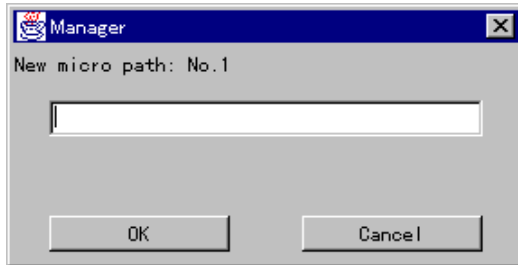
If the microprogram is already read, a confirmation message is displayed. When **OK** is clicked, the microprogram is overwritten. To stop reading the microprogram, click **Cancel**.



To delete the microprogram that is already read in the PC or SUN server/workstation, click **Delete**. When a confirmation message appears, click **OK**.



- When a window for specifying a directory in which the read microprogram exits appears, specify this directory. When **OK** is clicked, reading the microprogram is started.



A path input example is shown below.

When using Windows : a:

`c:\manager\mp0409\disk1`

When using Solaris: `/home/usr/manager/mp0409/disk1`

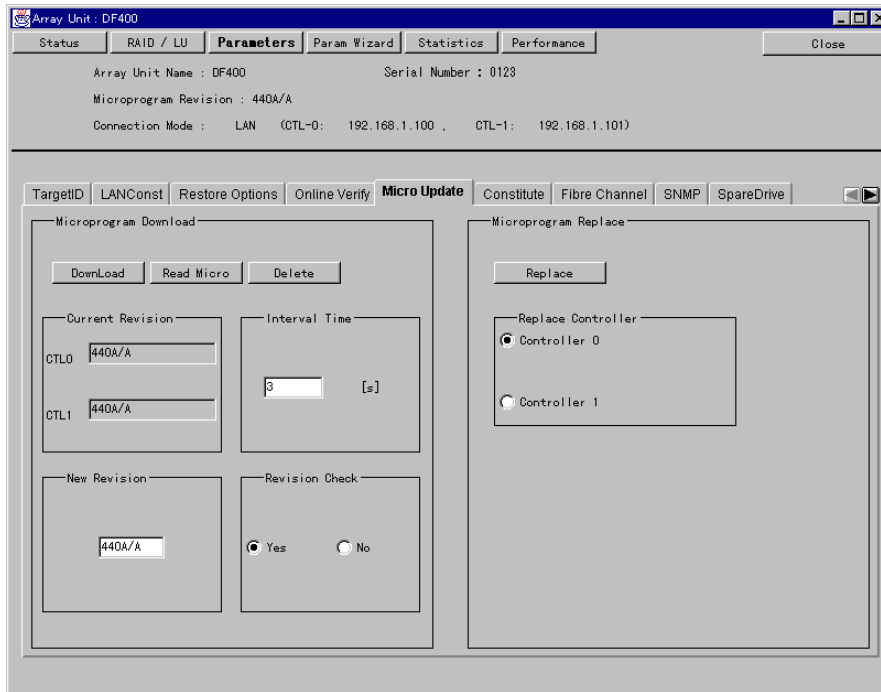
Directory in the hard disk in which the microprogram of the FD is copied.

Multiple floppy disks of the microprogram are supplied. If there is a floppy disk of the microprogram to be read next, the message of 4 reappears. In the message, "No." of the floppy disk to be read is displayed. Read the microprogram according to the display.

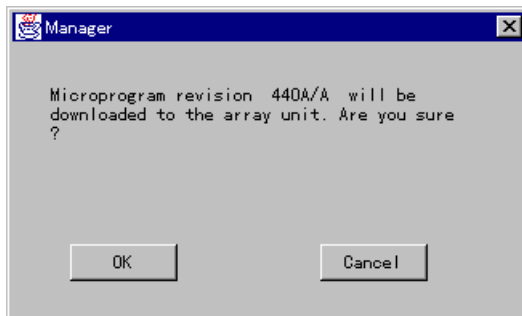
- When a message indicating that all the microprogram has been read appears, click **OK**.



7. The revision of the read microprogram is displayed in the **New Revision** field.

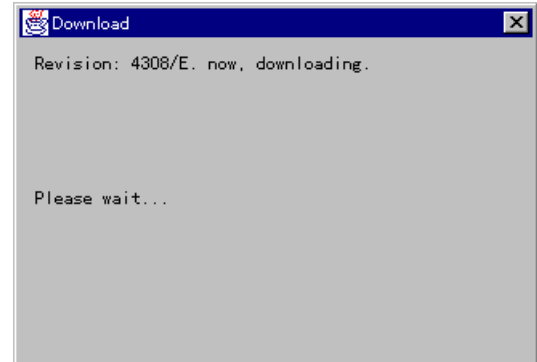
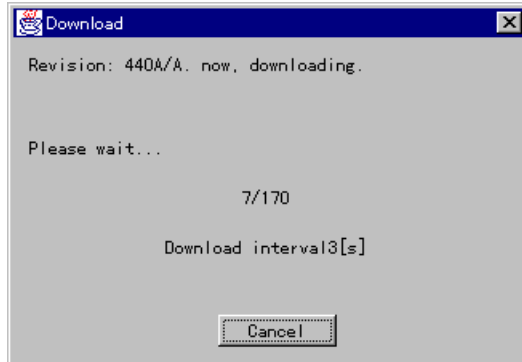


8. When downloading the microprogram, click the **DownLoad** button.
9. When a confirmation message as to whether or not to download the microprogram appears, click **OK**.

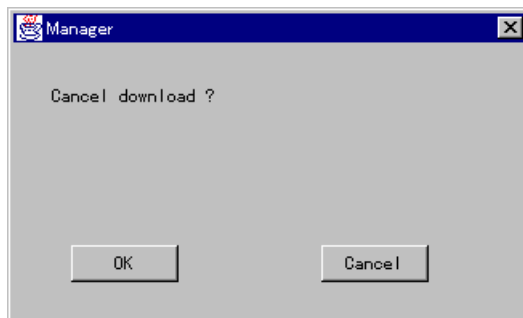


10. The message informing that the download is being executed is displayed. The message shows the revision of the program being downloaded, interval time, and progress.

- When the DF400 or DF500 is connected
- When the DF350 is connected



When the DF400 or DF500 is connected, the download can be aborted. When aborting the download halfway, click the **Cancel** button. The confirmation message is displayed. When the **OK** button is clicked, the download is aborted. When the **Cancel** button is clicked, the download is continued.



11. When the microprogram is normally downloaded, a confirmation message appears. Click **OK**.



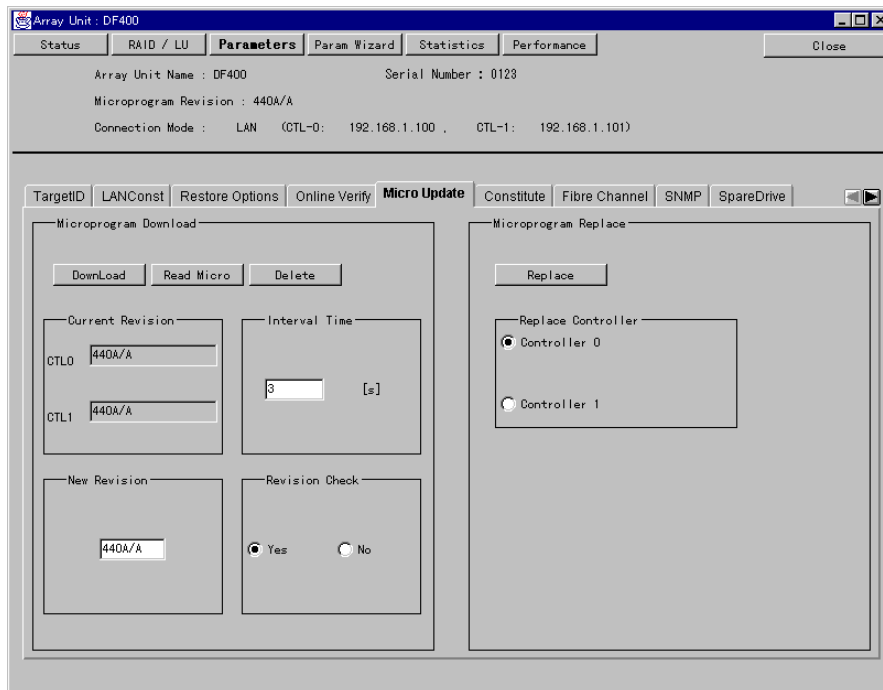
Note: After the download of the microprogram, be sure to restart the array unit or replace the microprogram. If a hot replacement of the controller board is done before the restart of the array unit or the microprogram replacement, the replaced new controller may be blocked. The download may terminate with a DMES05EA03 message when the array unit is heavy host I/Os. In the case, please perform the download operating again.

3.10.2 Replacing the microprogram

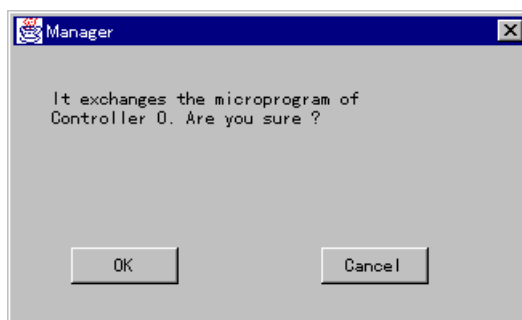
Replace the microprogram of the controller with the microprogram downloaded in the array unit. When replacing the microprogram, be sure to replace those of the both controller 0 and controller 1.

When the DF350 is connected, you cannot select **Replace**.

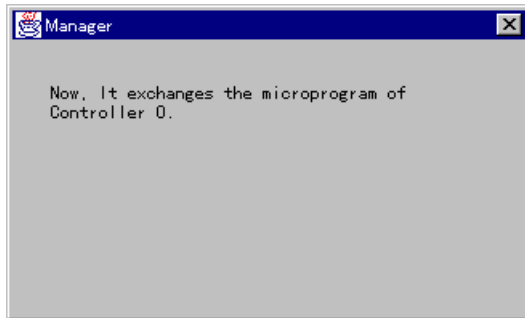
1. Click **Parameters**, then click the **Micro Update** tab.



2. Select the controller whose microprogram is to be replaced and click the **Replace** button.
3. The message confirming whether to replace the microprogram is displayed. The message shows the number of the selected controller. When the **OK** button is clicked, the replacement of the microprogram starts.



4. The message informing that the replacement of the microprogram is being executed is displayed.



5. When the replacement of the microprogram terminates normally, the completion message is displayed. When the **OK** button is clicked, the revision of the replaced microprogram is updated and the "Replacement" window is displayed.



If downloaded microprogram cannot be replaced, a failure message is displayed. To validate the downloaded microprogram, restart the array unit.

6. Replace the microprogram of the other controller according to the procedure from 2.
7. When the replacements for the both controllers terminate normally, the replacement of the microprograms of the array unit is completed.

Note: In the replacement of the microprograms, if the microprogram of only one of the controllers is replaced, the array unit is placed in the state that it is warned. When the microprogram of the other controller is replaced, the array unit is recovered from the above state. When replacing the microprograms, be sure to replace the microprograms of the both controllers continuously.

3.11 Setting and outputting SNMP environmental information file

The SNMP configuration information file is set to the array unit and the SNMP configuration information that is set in the array unit is output to the file.

When connected to the dual system of the DF400, if one of the controllers is blocked, no setting can be made. Before using the function, make sure that the array unit is not in the state in which a warning has been given to it.

When the DF350 is connected, the function can be used in the single system but cannot be used in the dual system.

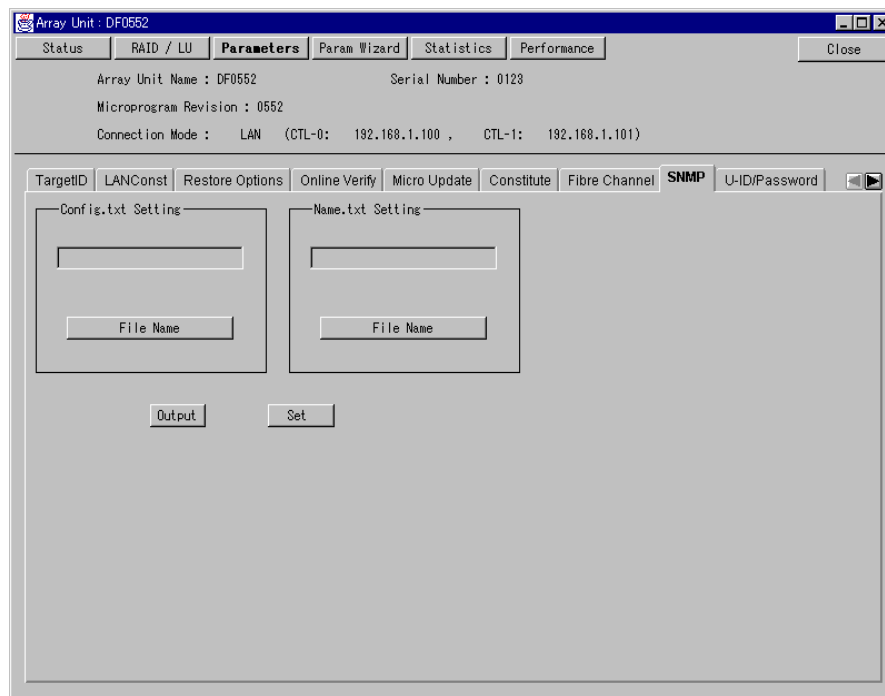
When the DF400 is connected, if the SNMP environmental information file is set, the array unit cannot execute a command issued from the host. Neither can it execute any functions other than the setting wizard function of the manager, function for the SNMP configuration information file setting and outputting, and the error monitoring function. After the setting is completed, restart the array unit, make sure that the array unit has started up, and then connect it to the host and the manager.

The registered SNMP configuration information file is not validated unless the array unit is restarted.

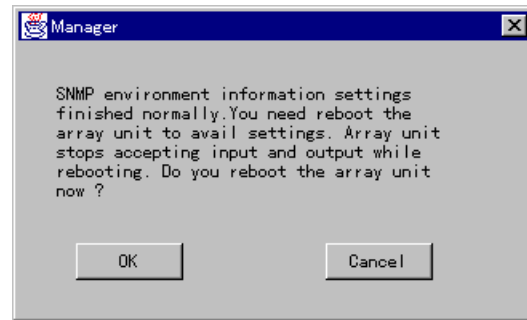
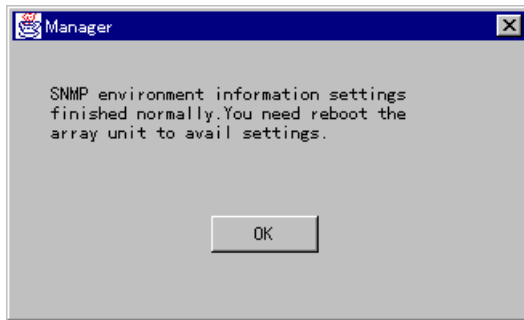
3.11.1 Setting SNMP environmental information file

Set the SNMP environmental information file into the array unit from the FD or hard disk.

1. Clicks the **Parameters** button, and clicks the **SNMP** tab.



2. Specify the paths to the “config.txt” file and “name.txt” file and click **Set**. When you set only one file, specify only the path of the target file.
3. A message indicating completion of setting is displayed. If an array unit supports restarting, a confirmation message indicating a request for restarting is displayed, so clicks the **OK** button when restarting.
 - If an array unit does not support restarting
 - If an array unit supports restarting



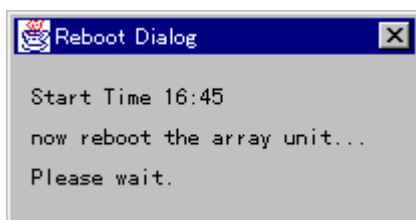
Note: To validate the set SNMP environment information, restart the array unit. The previous settings stay valid until restarting.

When connecting the to DF400, commands from the host cannot be executed until the array unit is restarted. The manager functions cannot be also executed.

When restarting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate restarting.

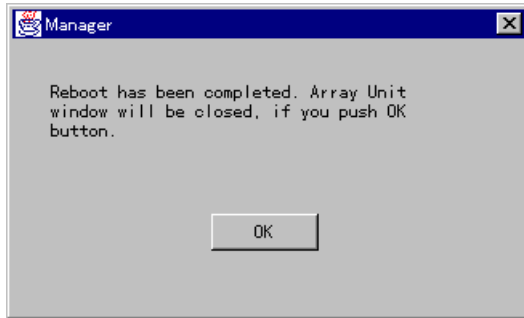
When connecting to the DF350, commands from the host and the manager functions can be executed without the need to restart.

4. When instructing to restart an array unit, the time the restarting has began is displayed. The restarting takes about two to six minutes.



Note: It may take time for an array unit to respond, depending on the condition of the array unit. If it does not still respond after 10 minutes or more pass, check the condition of the array unit.

A message indicating that the restarting has terminated is displayed, so clicks the **OK** button.

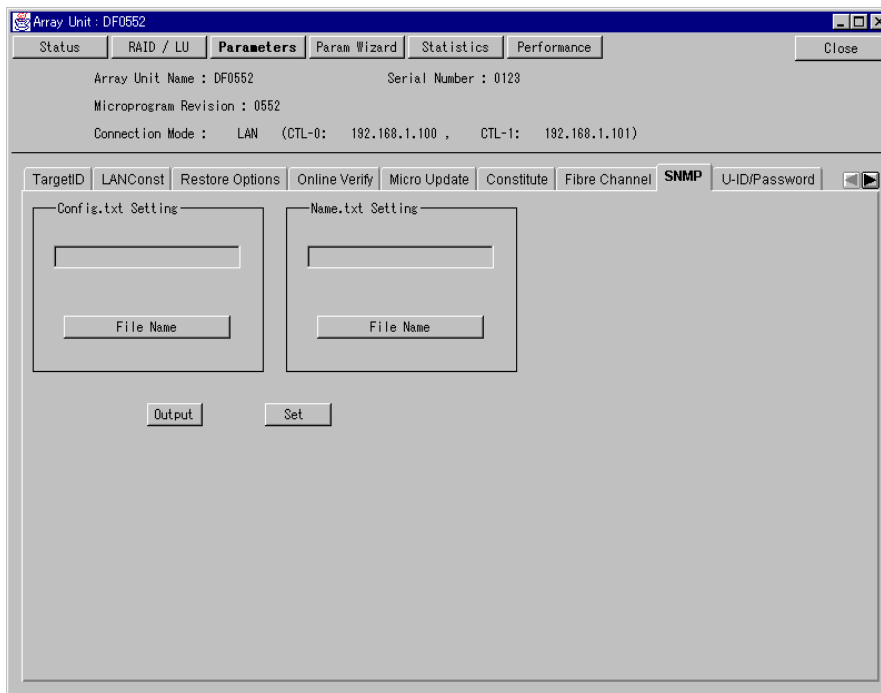


When clicking the **OK** button, the unit window is closed. To perform other operations, select again on the main window an array unit which to operate, and open the unit window.

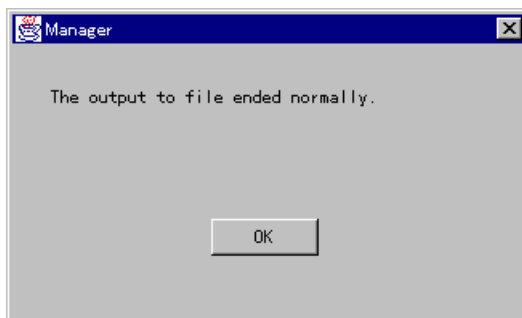
3.11.2 Outputting SNMP environmental information file

Output the SNMP environmental information file from the array unit in the text file format.

1. Clicks the **Parameters** button, and clicks the **SNMP** tab.



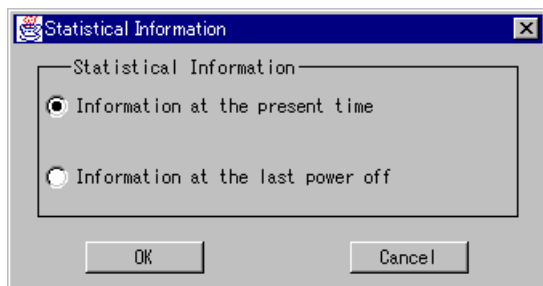
2. Specify the paths of the directory for storing the "config.txt" file and the "name.txt" file and click **Output**. To output only one file, specify only the path of the target file.
Note: Specify the name of a directory in the hard disk drive to which the microprogram is copied and the file name, with one-byte coded alphanumerics.
3. When the file output is normally terminated, the message shown in the following figure is displayed. Then, click **OK**.



3.12 Displaying Statistical Information

You can display the statistical information in the array unit.

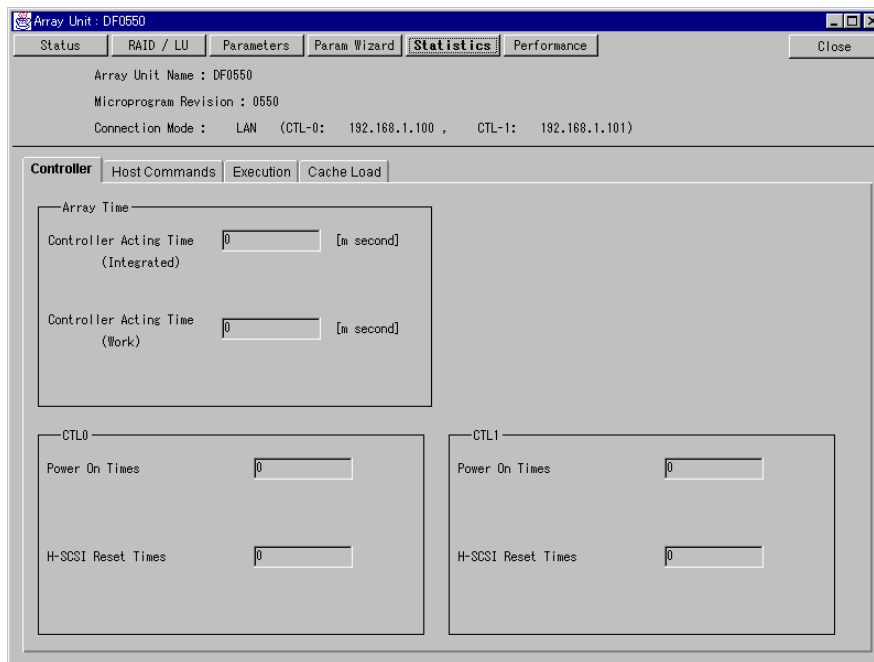
1. Click **Statistics**.



- **Statistical Information:** Statistical information to be displayed
 - **Information at the present time:** Current information
 - **Information at the last power off:** Information when starting up an array unit
2. Specifies statistical information which to display by **Statistical Information**, and clicks the **OK** button.

3.12.1 Displaying the controller use condition

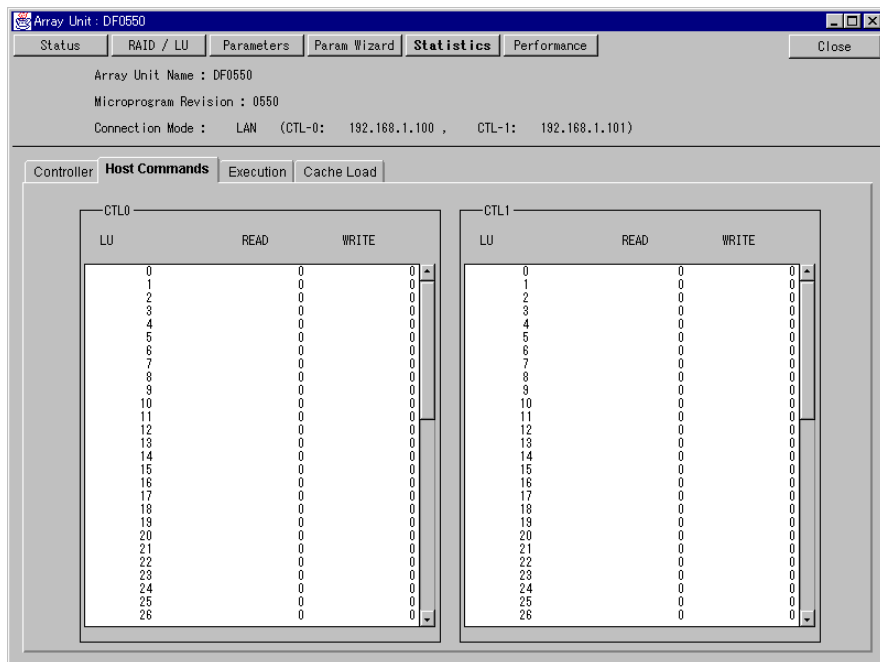
1. Click the **Controller** tab.



- **Controller Acting Time (Integrated):** Integrated acting time of the array unit (minute)
- **Controller Acting Time (Work):** Power ON time of the array unit (PS/ON to PS/OFF) time (ms)
- **Power On Times:** Integrated number of power ON times (at interruption) of the controller
- **H-SCSI Reset Times:** Integrated number of host bus SCSI reset times (total of interruptions and messages) of the controller

3.12.2 Displaying the numbers of host commands received

1. Click the **Host Commands** tab.



- **LU:** Logical unit number
- **READ:** Accumulated number of received read commands in each logical unit
- **WRITE:** Accumulated number of received write commands in each logical unit

3.12.3 Displaying the command execution condition

1. Click the **Execution** tab.

Array Unit : DF0550

Status RAID / LU Parameters Param Wizard **Statistics** Performance Close

Array Unit Name : DF0550
Microprogram Revision : 0550
Connection Mode : LAN (CTL-0: 192.168.1.100 , CTL-1: 192.168.1.101)

Controller Host Commands **Execution** Cache Load

CTL0

LU	Reads Cache Hits	Writes Cache Hits	Sequential Reads	Sequential Writes	Prefetch Stagings	WriteThrough Operation	Reassigned Blocks
0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0

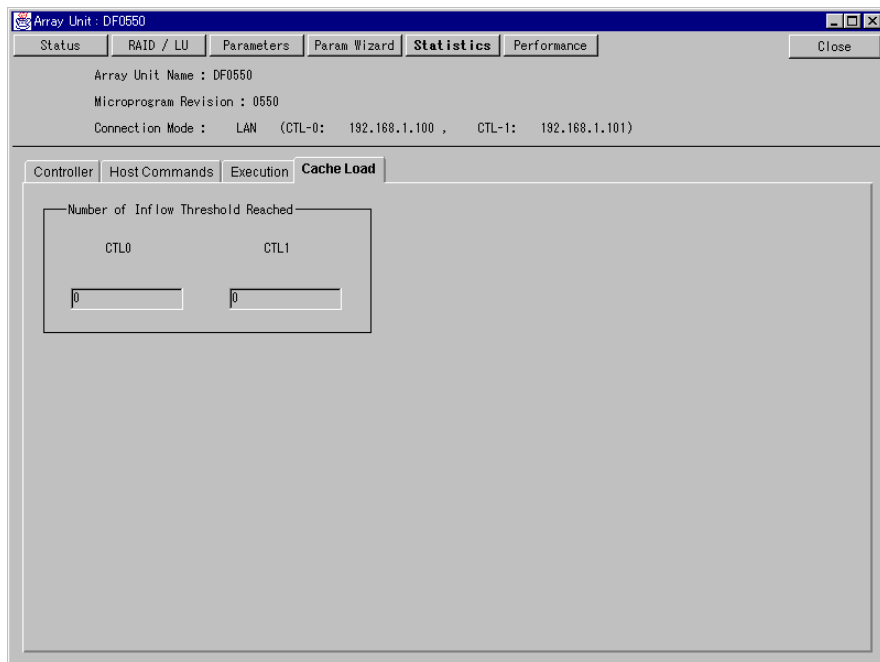
CTL1

LU	Reads Cache Hits	Writes Cache Hits	Sequential Reads	Sequential Writes	Prefetch Stagings	WriteThrough Operation	Reassigned Blocks
0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0

- **LU:** Logical unit number
- **Reads Cache Hits:** Total of READ commands (hitting cache or partially hitting cache)
- **Writes Cache Hits:** Total of WRITE commands (cache read hits)
- **Sequential Reads:** Total of READ commands (recognized as sequential reading)
- **Sequential Writes:** Total of WRITE commands (recognized as sequential writing)
- **Prefetch Strings:** Total of prefetch jobs executed
- **Write Through Operation:** Total of WRITE or WRITE & VERIFY commands (substituted by Write-Through operations)
- **Reassigned Blocks:** Number of re-assigned blocks (Not supported)

3.12.4 Displaying the cache load condition

1. Click the **Cache Load** tab.



- **Number of Inflow Threshold Reached:** Total number of occurrences of inflow limitations.

This equipment manages the amount of data in cache as an inflow limit. When the host tries to write data exceeding this limit, an inflow limitation occurs. In this case, the write request from the host is made to wait until part of write data is transferred to the drive.

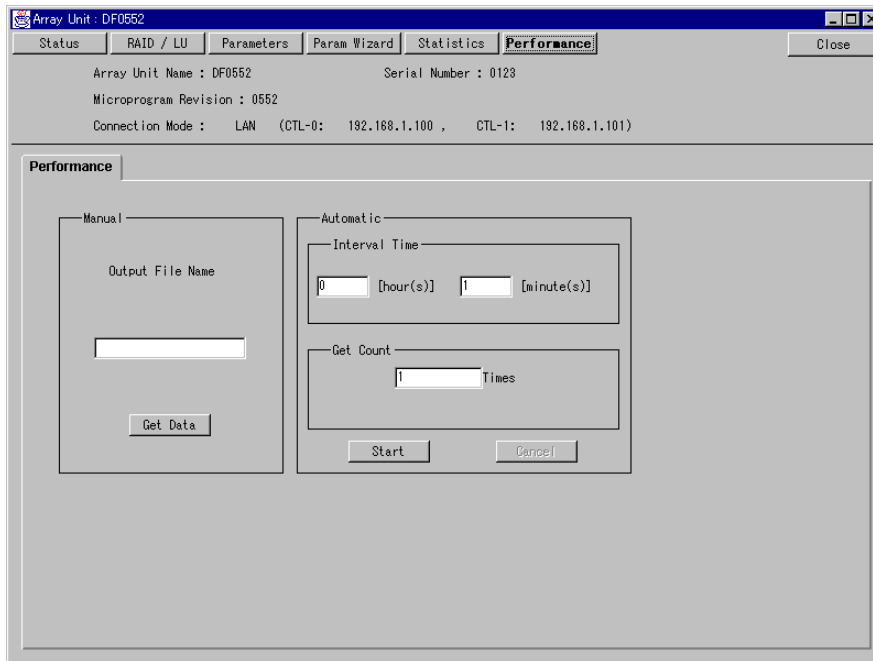
3.13 Acquiring Performance Information

Command operation state is outputted for each logical unit in the array unit. The command operation state consists of three types of data; the number of received commands, the number of cache-hit commands, and the cache hit rate for each Read or Write command.

3.13.1 Outputting performance information manually to text file

The command operation status for each logical unit in the array unit is output to the file when the **Get Data** button is clicked.

1. Click **Performance**.



Note: Specify the file name with alphanumeric.

2. Click **Get Data**.

The file names for getting performance information are displayed in the text box.

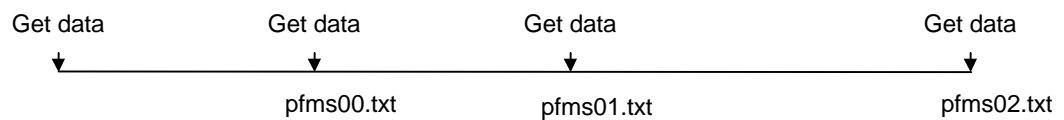
3. Click **Get Data** at a timing from which you want to get information. Files are output with the following file names. The files to be got are output to the directory installing the manager in the text file format.

Single system : pfms\$\$\$.txt (\$\$: serial number from 00 to 99)

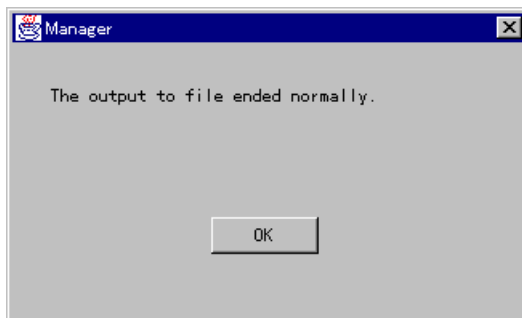
Dual system : pfmd\$\$\$.txt (\$\$: serial number from 00 to 99)

Note: Files are output with the names of pfms00.txt/pfmd00.txt to pfms99.txt/pfmd99.txt. After pfms99.txt/pfmd99.txt, pfms00.txt/pfmd00.txt is overwritten. Transfer necessary information to another directory.

The information is got according to the following timing.



4. After the file get processing is terminated, a confirmation message appears. Then, click **OK**.



5. Refer to the created text file by means of Excel using “SAMPLEPM.xls” on the supplied FD. The text file is created in the manner that it is tabulated in the format shown below when it is opened on Excel by using a delimiter “,”. In the case of signal connection, only information on the CTL0 side is collected.

	CTL0						CTL1					
	Read	Read Hit	Read Hit Rate	Write	Write Hit	Write Hit Rate	Read	Read Hit	Read Hit Rate	Write	Write Hit	Write Hit Rate
LU0												
LU1												
LU2												
LU3												
LU4												
LU5												
LU6												
LU7												
LU8												
LU9												
LU10												
LU11												
LU12												
LU13												
LU14												
LU15												
Total												

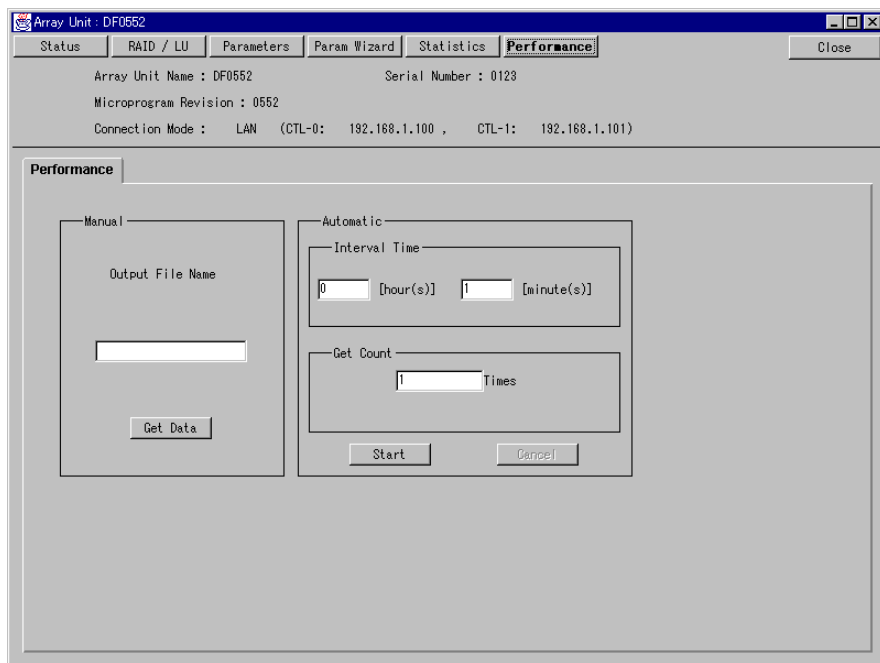
- **CTL0 and CTL1:** Controller number
- **LU0 to LU15:** Logical unit number
- **Total:** Entire controller
- **Read:** Number of received Read commands
- **Read Hit:** Number of cache-hit Read commands to received Read commands
- **Read Hit Rate:** Rate (%) of cache-hit Read commands to received Read commands
- **Write:** Number of received Write commands
- **Write Hit:** Number of cache-hit Write commands to received Write commands
- **Write Hit Rate:** Rate (%) of cache-hit Write commands to received Write commands

Generally, when the subsystem is structured so that the load on each controller and the load on each disk are leveled, its performance is improved. The higher the cache-hit rate is, the higher the performance becomes.

3.13.2 Outputting performance information automatically to text file

Command operation state for each logical unit in the array unit is output at the specified intervals by the specified times.

1. Click **Performance**.



- **Interval Time:** Specifies this item in the range of 1 minute to 23 hours 59 minutes.
- **Get Count:** Specifies this item in the range of 1 to 99.

2. Specify **Interval Time** and **Get Count**, then click **OK**.

During file output, the file name for getting performance information is displayed above the **OK** button.

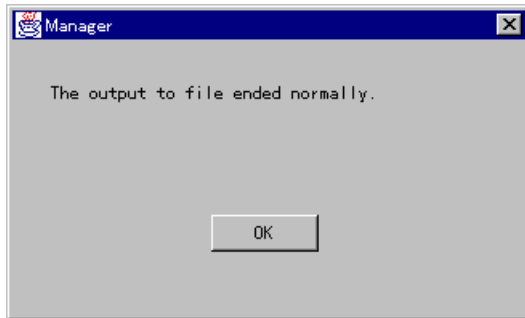
Files are output with the following file names. The files to be got are output to the directory installing the manager in the text file format.

- Single system: pfms\$\$.txt (\$\$: serial number from 00 to 99)
- Dual system: pfmd\$\$.txt (\$\$: serial number from 00 to 99)

Note: Files are output with the names of pfms00.txt/pfmd00.txt to pfms99.txt/pfmd99.txt. After pfms99.txt/pfmd99.txt, pfms00.txt/pfmd00.txt is overwritten. Transfer necessary information to another directory.

To stop the file output halfway, click **Cancel**.

3. When the file get processing is terminated, a confirmation message is displayed. Then, click **OK**.



4. Refer to created text files on Excel by using 'SAMPLEPM.xls' in the supplied FD. Test files are created in the following format when they are opened by ',' on Excel. When the single system is connected, only the information of the controller 0 side is collected. The format to the file to be got is the same as that of the file got manually.

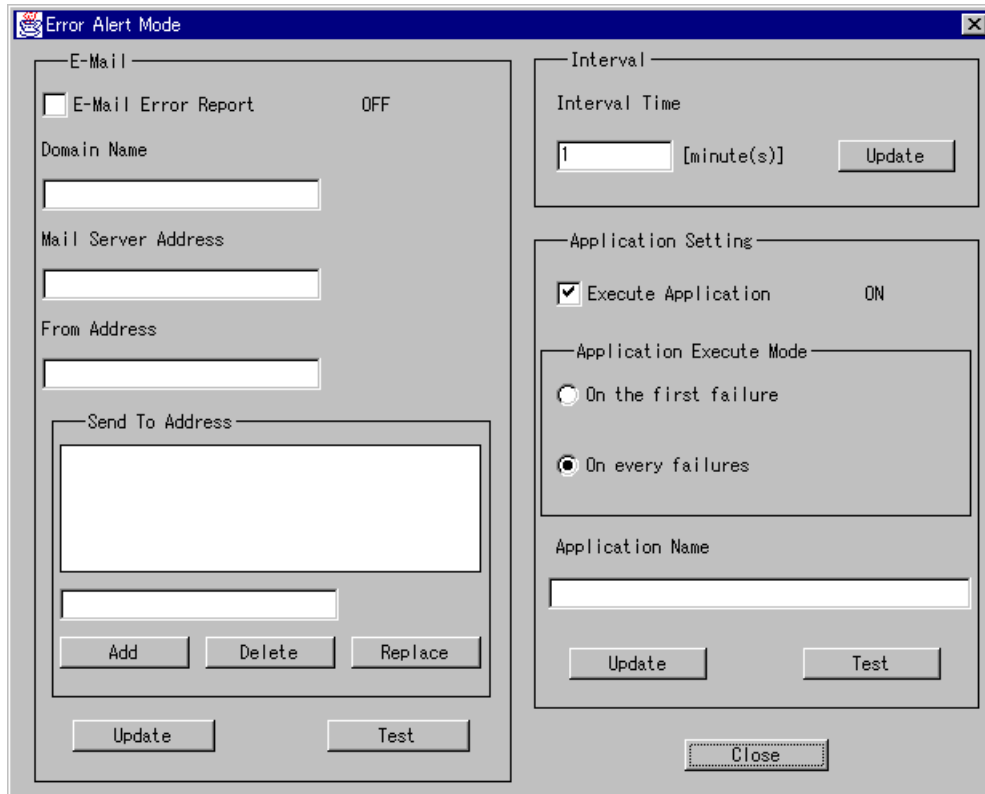
Chapter 4 Error Monitoring

Error monitoring is performed at the interval specified for array unit status monitoring which has been check off in the **Error Alert** check box.

4.1 Setting Error Monitoring Options

During error monitoring, when a failure is detected on the monitored array unit, E-Mail Report or specified one application can be started.

In **Error Alert**, click the **E-Mail Error Report** check box and the **Execute Application** check box to enable them, so that the function is validated.



4.1.1 Interval time

1. Specify the interval time for error monitoring.
Specify **Interval Time** in the range of 1 minute to 720 minutes (12 hours). The interval means the time from an end of all target array unit monitoring till a start of the next monitoring.
2. Click **Update**.
3. Click **Close**.
The setting is validated without rebooting the manager.

4.1.2 E-Mail Report

When an error is detected by error monitoring, reporting the contents of the error is set.

If an error is detected on the array unit while error monitoring is executed, the following error information will be reported by E-Mail.

Usually, the subject is appended before E-Mail is transmitted.

- E-Mail subject

In the case of E-Mail, the failed part can be judged by the subject, so the failed part is appended to the subject as a matter of format. The subject format is shown below. Table 4.1 shows a list of subjects.

Manager/Obstruction (failed part)

Table 4.1 List of E-Mail Subjects

No.	Subject	Meaning
1	Disk	A drive blockade occurred.
2	DC Power	A DC power supply failure occurred.
3	Battery	A battery voltage error occurred.
4	Fan	A fan failure occurred.
5	Controller	A controller blockade occurred. (This occurs only in the dual controller configuration.)
6	AC Power	An AC power supply error occurs.
7	Cache Memory	A cache failure occurred.
8	Cache Backup Circuit	A backup circuit failure occurred.
9	ENC	An enclosure error occurs.
10	Loop	A loop error occurs.
11	Warning	The array unit entered the warning state.
12	Array connection	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.

- E-Mail message text

When using E-Mail, the failed part is reported using a message text in the subject. The format of the message text is shown below. A list of message texts is shown in Table 4.2.

Day, Mon.dd hh:mm:ss yyyy/DF Name/ARRAY message text

Day : Day of the week **hh:mm:ss** : Hours, minutes, and seconds

Mon : Month **yyyy** : Year

dd : Date

Table 4.2 List of E-Mail Message Texts

No.	Message text	Meaning of message
1	ARRAY Drive Detached. ARRAY Detached Drive Position Port No.X Row No.Y.	In the case of DF350, DF400 A drive blockade occurred. (The blocked drive is indicated with a set of a Port No. and a Row No.)
2	ARRAY Drive Detached. ARRAY Detached Drive Position Unit No.X HDU No.Y.	In the case of DF500 A drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and a HDU No.)
3	ARRAY DC Power Supply Failure.	A DC power supply failure occurred.
4	ARRAY Battery Alarm.	A battery voltage error occurred.
5	ARRAY Fan Alarm.	A fan failure occurred.
6	ARRAY CONTROLLER Detached.	A controller blockade occurred. (This occurs only in the dual controller configuration.)
7	ARRAY AC Power Supply Failure.	An AC power supply error occurs.
8	ARRAY Cache Memory Alarm.	A cache failure occurred.
9	ARRAY Cache Backup Circuit Alarm.	A backup circuit failure occurred.
10	ARRAY ENC Alarm.	An enclosure error occurs.
11	ARRAY LoopAlarm.	A loop error occurs.
12	ARRAY Warning.	The array unit entered the warning state.
13	ARRAY Manager Interface error occurred.	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.

1. Specify setting items in E-Mail Report.
 - **E-Mail Error Report:** Specifies whether or not to execute E-Mail Report when an error is detected by error monitoring. When this item is check off, E-Mail Report will be executed. ON/OFF is displayed on the right side depending on whether a check mark exists or not.
 - **Domain Name:** Specifies a domain name. Specify it in 39 or less alphanumeric characters or a code.
 - **Mail Server Address:** Specifies the IP address or host name of the mail server. Specify the host name in 99 or less alphanumeric characters.
 - **From Address:** Specifies the mail address of the E-Mail sender. Specify it in 99 or less alphanumeric characters or a code.
 - **Send To Address:** Specifies the mail address of the E-Mail receiver. Specify it in 99 or less alphanumeric characters or a code.
Up to 20 addresses can be set as receivers.
 - **For addition:** Specify **Send To Address** in the text box above the **Add** button and click **Add**. **Send To Address** added to the **Send To Address** list is displayed.
 - **For deletion:** Click **Send To Address** to be deleted in the **Send To Address** list and click **Delete**. The deleted **Send To Address** disappears from the **Send To Address** list.
 - **For replacement:** Click **Send To Address** to be replaced in the **Send To Address** list, specify **Send To Address** in the text box above the **Add** button, and click **Replace**. The replaced **Send To Address** is displayed in the **Send To Address** list.
2. Click **Update**.
3. For confirming the setting, click **Test**.
When the mail has been normally transmitted, a confirmation message appears. Then, click **OK**.



The following mail is transmitted to the set **Send To Address**. Check the receipt of mail by **Send To Address**. If the mail has not been received, check the setting.

Subject: Manager/Obstruction (test)

message: Day, Mon. dd hh:mm:ss yyyy/DF Name /Test message

Day: Day of the week **hh:mm:ss:** Hours, minutes, and seconds

Mon: Month **yyyy:** Year

dd: Date

4. Click **Close**.
The setting is validated without rebooting the manager.

4.1.3 Executing application

“Execute Application” is set so that another application may be started if an array unit error is detected when error monitoring is executed.

The application to be started make the window active so as to be displayed with the current size and position.

1. Set the setting items for starting an application.
 - **Execute Application:** Specifies whether or not to activate the application when a failure is detected by the error monitoring. The application is activated when the check box is checked by a clicking. ON/OFF is displayed on the right side depending on whether a check mark exists or not.
 - **Application Execute Mode:** Specifies an occasion to activate the application.
 - **On the first failure:** The specified application is activated when the first failure is detected after the error monitoring has been activated. When failures are detected continuously, the application is not activated. To activate the application again when a failure is detected after the application has been activated, terminate the error monitoring once and then restart it.
 - **On every failures:** The specified application is activated when a failure is detected after the error monitoring has been activated. When the same failure is detected while the error monitoring is executed, the application is not activated at the second and subsequent detections of it.

Note: When you select **On every failures**, the specified application is started upon detection of each error. Consequently, multiple specified applications may be started with the result that the PC or SUN server/workstation will result in a hang-up status. Select **On the first failure**, and after occurrence of an error, stop error monitoring and restart it after a recovery from the error.

If an error is caused by starting the specified application during error monitoring, a message is displayed and error monitoring is suspended. When the message is closed, this monitoring will be continued.

- **Application Name:** Specifies a path and a file name of the application to be activated. When the file name is long, enclose it with the quotation marks (" "). When specifying a data file name of the application, if the data file is not in the same directory in which the manager is, specify the full path.

- For Windows

Example 1: "C: \abc\application.exe"

Example 2: "C: \abc\application.exe (option)"

Example 3: "C: \abc\application.exe (option)" "c: \abc\def\application.dat"

Path and file name of the application

Data file name of the application

- For Solaris

Example 1: /home/use/manager/go

Data file name of the application

2. Click **Update**.
3. To check the setting, click **Test**.
Check that the specified application is started.
4. Click **Close**. The setting will be validated without rebooting the manager.

The log information to be output reports the failed part using a message text. The format of message text is shown below. A list of message texts is shown in Table 4.3.

Day, Mon. dd hh:mm:ss yyyy/DF Name/ARRAY message text

Day: Day of the week **hh:mm:ss:** Hours, minutes, and seconds

Mon: Month **yyyy:** Year

dd: Date

Table 4.3 List of Message Texts to Be Output

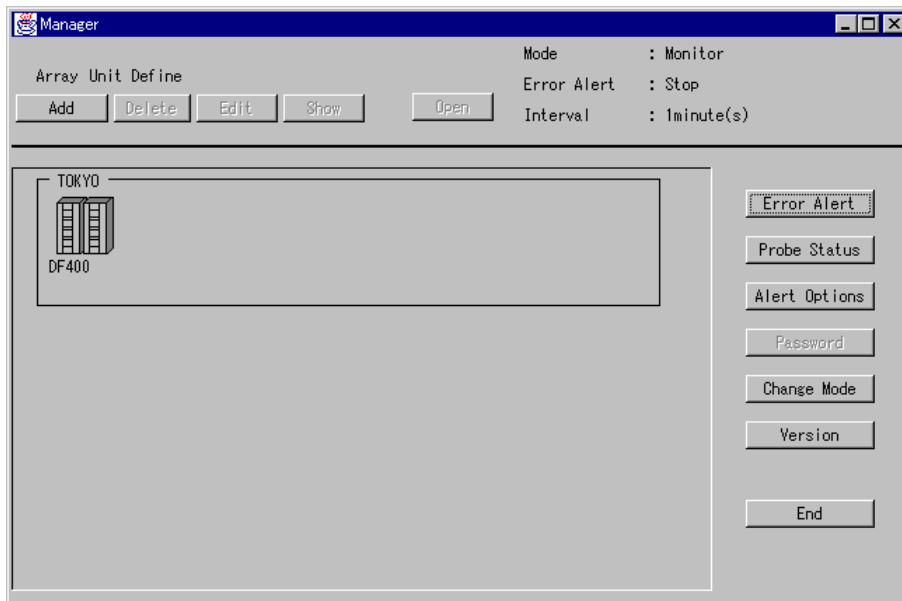
No.	Message text	Meaning of message
1	Alert Started.	The error monitoring is started.
2	ARRAY Drive Detached. ARRAY Detached Drive Position Port No.X Row No.Y.	In the case of DF350, DF400 A drive blockade occurred. (The blocked drive is indicated with a set of a Port No. and a Row No.)
3	ARRAY Drive Detached. ARRAY Detached Drive Position Unit No.X HDU No.Y.	In the case of DF500 A drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and a HDU No.)
4	ARRAY DC Power Supply Failure.	A DC power supply failure occurred.
5	ARRAY Battery Alarm.	A battery voltage error occurred.
6	ARRAY Fan Alarm.	A fan failure occurred.
7	ARRAY CONTROLLER Detached.	A controller blockade occurred. (This occurs only in the dual controller configuration.)
8	ARRAY AC Power Supply Failure.	An AC power supply error occurs.
9	ARRAY Cache Memory Alarm.	A cache failure occurred.
10	ARRAY Cache Backup Circuit Alarm.	A backup circuit failure occurred.
11	ARRAY ENC Alarm.	An enclosure error occurs.
12	ARRAY Loop Alarm.	A loop error occurs.
13	ARRAY Warning.	The array unit entered the warning state.
14	ARRAY Manager Interface error occurred.	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.
15	ARRAY Manager Interface error occurred. Error Code (nnnnn).	When connecting to an LAN, an array unit connection error occurs. nnnnn : Winsoc error code
16	ARRAY Manager Interface error occurred.	When connecting to an RS232C interface, an array unit connection error occurs.
17	Errinf.Txt File Error (xxxx).	A failure occurred in an access to a work file. xxxx : OPEN : File open failure

		xxx: File operation failure
--	--	-----------------------------

4.3 Error Monitoring

Error monitoring is performed about the component status of the array unit including drive, controller, battery, fan, power supply, and cache in the array unit. As error monitoring, polling is performed for the array unit corresponding to the checked-off **Error Alert Flag** in “Array Unit Define”.

1. Click **Error Alert** in the main window.







Monitoring is started for the array unit for which “Error Alert” is specified. After the start of error monitoring, the monitoring status is displayed in the upper right part of the window. The icon with a monitoring result of the array unit is displayed. After error monitoring is performed for all the target array units, monitoring will be started again for these target array units after the lapse of the specified interval time.

The monitoring status is displayed as the following three status in **Error Alert** : in the upper right part of the window.





Monitoring status	Display characters	Character color	Array unit status
Stop	Stop	Black	Error monitoring is not executed.
Monitoring	Monitoring (error not detected)	Blue	Error monitoring is executed and the all the target array units are normal.
	Monitoring (error detected)	Red	Error monitoring is executed and errors are detected in some of the target array units.
Waiting	Waiting (error not detected)	Blue	Error monitoring is at the interval time and all the target array units that were previously monitored are normal.
	Waiting (error detected)	Red	Error monitoring is at the interval time and errors are detected in some of the target array units that were previously monitored.

As a error monitoring result, the status is displayed with the icon color of the array unit in the main window.

a) Array units in the dual system

 Gray	<ul style="list-style-type: none"> • Not monitored
 Green	<ul style="list-style-type: none"> • Normal
 Yellow	<ul style="list-style-type: none"> • An error is detected. • A communication error occurs in a controller.
 Red	<ul style="list-style-type: none"> • A power OFF or a failure of the array unit occurred. • A communication error occurs in both controllers.

b) Array units in the single system

 Gray	<ul style="list-style-type: none">• Not monitored
 Green	<ul style="list-style-type: none">• Normal
 Yellow	<ul style="list-style-type: none">• An error is detected.
 Red	<ul style="list-style-type: none">• A power OFF or a failure of the array unit occurred.• A communication error occurred.

2. To display the detail information of the array unit, stop error monitoring, click an array unit to be displayed, and click **Select**. The contents of display may be different depending on the relationship between **Error Alert** result and “Time” because polling is performed. When the icon is displayed in red, this represents a communication disable status with the array unit and detail information cannot be displayed.

3. Click **Stop**, and **Error Alert** will be stopped. The icon of the array unit continues to display the last error monitoring result.
Click the icon of the array unit and click **Select** to display the unit window. After that, close the unit window, and the icon color will go gray.

Note: If the icon of the array unit is displayed in red as a **Error Alert** result, this represents a connection disable status to the array unit or a information get disable status from the array unit. The causes are the following items.

Cause	Contents of check
Communication line failure	Check the LAN line.
Connected array unit failure	Check the READY status of the array unit.
Too high I/O load from the host	Check the array unit operation status.
Execution of the LU format of the connected array unit, wizard setting of system parameter, or SNMP environment information setting	Check the array unit status or restart the array unit.

Make the above checks. After making sure that connection with the array unit displayed in red has been enabled, start error monitoring.

If the icon of the array unit goes yellow because of controller blockage, the same status as that of the red icon may be provided.

If error monitoring is performed though the iron of the array unit is displayed in red, the icon of the normal array unit may be displayed in red. If the cause corresponds to “Too high I/O load from the host”, continue to execute monitoring.

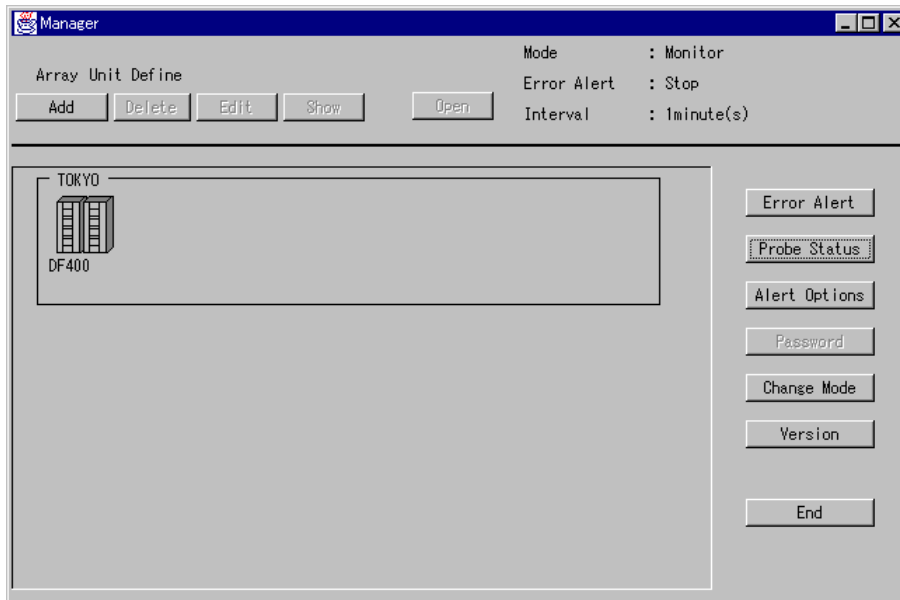
If a drive whose display color is not green in **Unit Status** in the unit window (a drive that is not LU-formatted or an undefined spare drive) is pulled out, no error report will be made but it has no effect on the operation. Insert it once again.

If an error occurs, contact with maintenance personnel.

4.4 Checking Status

Checks the status of such components of an array unit as drives, controllers, batteries, fans, power supply and cache. Checks is done on an array unit for which the check box of the **Error Alert Flag** in “Array Unit Define” is selected.

1. Clicks the **Probe Status** button in the main window.



The status of an array unit for which error monitoring is specified is checked. When checking begins, the condition is displayed on the upper right section of the screen. In addition, the icon of an array unit is displayed with the check result reflected into the icon.

The status check performs functions equivalent to those of error monitoring. When an error is detected in an array unit that has been checked, outputting of a log, sending of an E-Mail, and restarting of a specified application are done in accordance with the settings of the monitor options.

Chapter 5 Automatic Start of Error Monitoring

5.1 Automatic Start of Error Monitoring

Error monitoring can be started when Windows is booted up by specifying an option in the execution file in the manager startup file.


The error monitoring function is the same as that provided by clicking **Error Alert**. The automatic start is available only for Windows.

5.1.1 Automatic Start of Windows

Error monitoring is started when Windows is booted up if the error monitoring is set to “startup”.

1. Open the bat file to boot the manager.
2. Specify an option in the execution file in the bat file.

```
jrew -cp .\Confmng.jar jp.co.hitachi.str.diskarray.DiskArrayManager -check >> exclog
```

Parameter for error monitoring 

3. Prepare a shortcut to the manager startup bat file for the “Startup”.
4. When Windows is rebooted, the manager is started in an error monitoring executing status.

Chapter 6 Detailed Screen Display

6.1 Detailed Screen Display

The detailed display of the array unit is made by specifying options in the execution file in the manager startup file.

The detailed display is available only for Windows.

6.1.1 Detailed screen display on Windows

The detailed display of the array unit is made by specifying options in the bat file.

1. When the manager is start up, the bat file is opened.
2. Specify options in the execution file of the bat file.

There are 3 parameters for screen display.

-unit: Registered name of array unit

-ip: IP address of controller 0 or controller 1 of the registered array unit

-host: Host name of controller 0 or controller 1 of the registered array unit

In the case of RS232C connection, specify “-unit”.

- Example with “-unit” option

```
jrew -cp .\Confmng.jar jp.co.hitachi.str.diskarray.DiskArrayManager -unit DF400 >>
exclog
```

Parameter for screen display ———→
DF name of the array unit to be display ———→

- Example with “-ip” option

```
jrew -cp .\Confmng.jar jp.co.hitachi.str.diskarray.DiskArrayManager -ip 192.168.1.100
>> exclog
```

Parameter for screen display ———→
IP address of the array unit to be display ———→

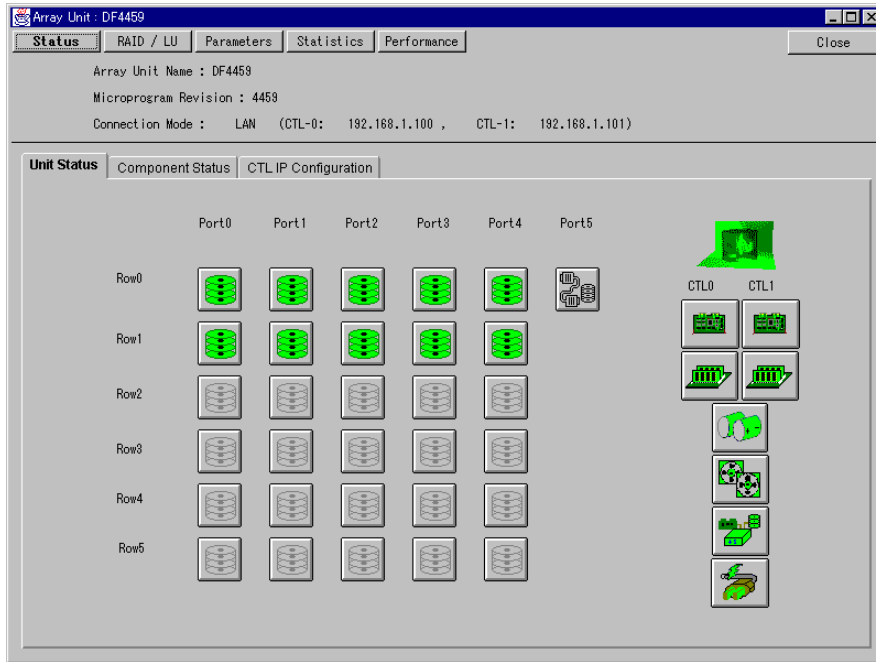
- Example with “-host” option

```
jrew -cp .\Confmng.jar jp.co.hitachi.str.diskarray.DiskArrayManager -host DF400 >>
exclog
```

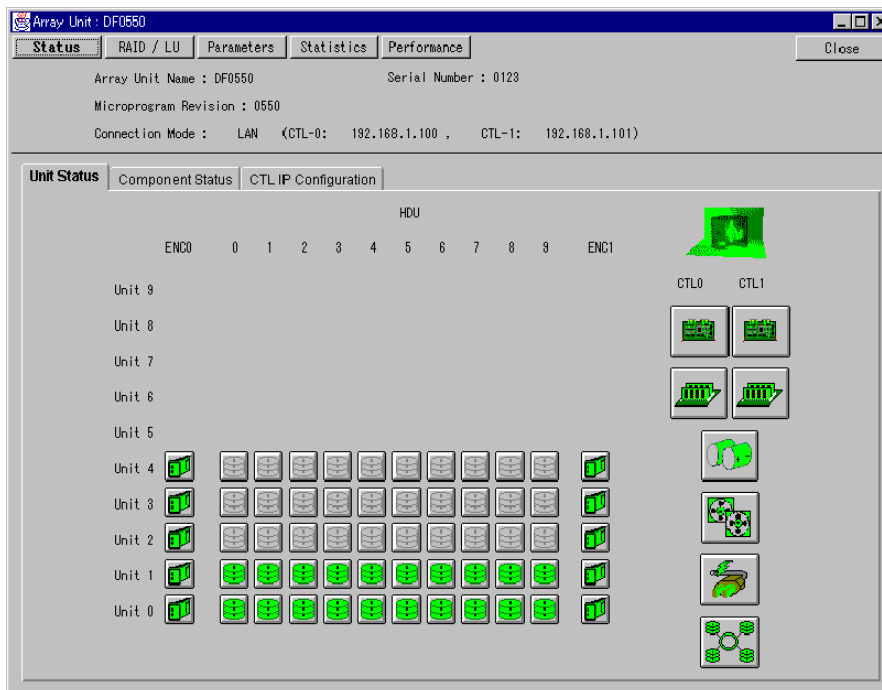
Parameter for screen display ———→
Host name of the array unit to be display ———→

3. The unit window of the array unit specified by option is displayed. The unit window is put into a status provided by logging-in in the monitor mode.

a) For DF350 and DF400



b) For DF500 (CK, and RK model)



c) For DF500 (MK, and RKL model)

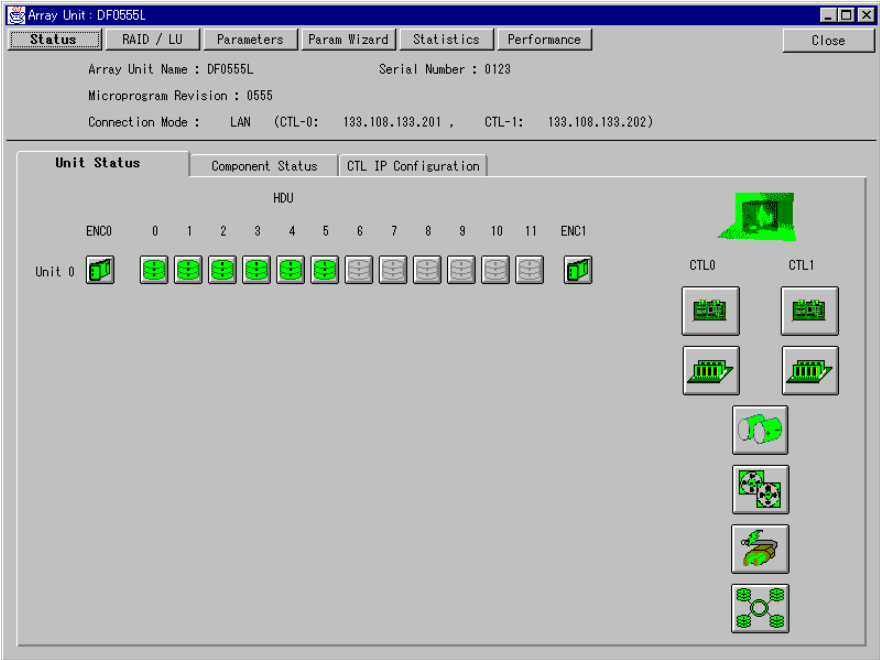
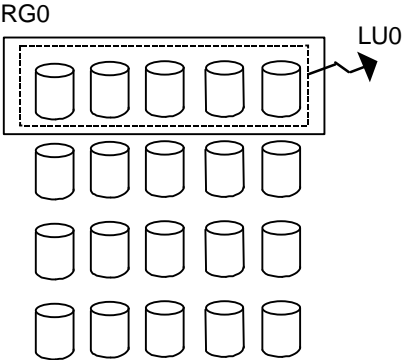
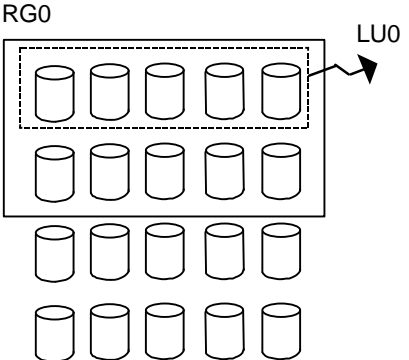
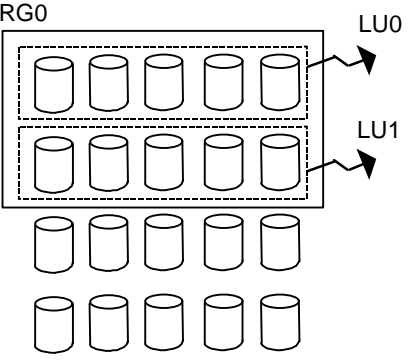


Table 7.1 Operating Procedure for Definition of RAID Group and Logical Units (Continued)

Operating procedure	Defined status
<p>2. Defining LU0</p> <p>Define LU0 for all drives (capacities) in the RAID group 0 defined in step 1. (See "Constituting a logical unit".)</p>	
<p>3. Extending the RAID group by one row.</p> <p>Expand RAID group 0 to Row 1 according to "Expanding a RAID group". (Specify the depth as 2.)</p>	
<p>4. Defining LU1</p> <p>2 Define LU1 for the undefined LU count in RAID group 0 by performing the same operation.</p> <p>Repeat the above steps 3 and 4 to define LU2 and LU3.</p>	

Disk Array management program
(for GUI)

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