



**Hitachi Freedom Storage™
Thunder 9200™
Resource Manager 9200
User's Guide**

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Document Revision Level

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Document Revision Level

The following source documents were used to produce this 5800/9200 user guide:

Disk Array management program (for GUI) User's Guide, Eighth edition.

Disk Array management program (for CLI) User's Guide, Eighth edition.

Preface

The *Hitachi Freedom Storage™ Thunder 9200™ Resource Manager 9200 User's Guide* describes the operations required to execute the configuration setting and display, information display, and error monitoring of the Hitachi disk array unit subsystems (5700E, 5800, and 9200) using the Resource Manager 9200 program.

This manual is divided into two parts:

- Part 1: Graphical User Interface (GUI)
- Part 2: Command Line Interface (CLI)

Notes on Use:

- This manual is intended for users with a background in data processing and who understand direct-access storage device subsystems and their basic functions. Specific examples of appropriate users include: system administrators - responsible for operation of systems including array units, system engineers - for construction of systems including array units, and customer support engineers - for maintenance of array units.
- The user needs to be familiar with the Hitachi Freedom Storage™ Thunder 9200™ array subsystem.
- 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”, and “Windows NT Version 4.0” are abbreviated to “Windows” in the manual.
- This manual quotes screens that appear when the Resource Manager 9200 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, Solaris, and IRIX, displays on some screens differ from those on corresponding screens shown in this manual.
- Resource Manager 9200 supercedes and replaces the "SOMMET" function.

For further information on Hitachi Data Systems products and services, please contact your Hitachi Data Systems account team, or visit the Hitachi Data Systems worldwide web site at <http://www.hds.com>. For specific information on the supported host systems and platforms for the 9200, please refer to the user documentation for the product, or contact the vendor's customer support service.

Note 1: The term “9200” refers to the Hitachi Thunder 9200™ subsystem, unless otherwise noted. Please refer to the *Hitachi Thunder 9200™ User and Reference Guide* (MK-90DF504) for further information on the 9200 disk array subsystem.

Note 2: Throughout this manual, the term "**Disk Array Management Program (DAMP)**" refers to the **Resource Manager 9200** program.

Note 3: The use of Resource Manager 9200 and all other Hitachi Data Systems products is governed by the terms of your license agreement(s) with Hitachi Data Systems.

Note 4: For information on password protection, please refer to the *Hitachi Thunder 9200™ Password Protection User's Guide* (MK-90DF528).

Safety Precautions

Note the following when using Resource Manager 9200:

- Only administrators, system engineers, and field engineers who are familiar with Hitachi Data Systems disk array units are allowed to run Resource Manager 9200 function.
- Make certain you read and fully understand this guide before you operate the Resource Manager 9200 function.
- Carefully follow instructions included with the "CAUTION" label.



Failure to follow these instructions can result in serious system damage and/or the loss of system data.

Cautions to Observe While Starting Your Operation

- While operating Resource Manager 9200, the contents of array unit errors may be displayed as error messages. Read the User's Manual or Maintenance Manual to look up the appropriate action to be taken and handle the error accordingly.
- When performing operations in this manual that are preceded by a CAUTION label, read the instructions before starting the operation and follow them carefully during operation.

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PART 1:

Graphical User Interface (GUI)

Chapter 1 Resource Manager 9200 (GUI)

This Resource Manager 9200 is used to reference status and set up the configuration of an array unit. This chapter includes the following:

- Notes on Using Resource Manager 9200
- Operating Environments
- Connecting
- Installing
- Updating
- Uninstalling

Note: The term "Manager" used throughout this manual refers to "Resource Manager 9200".

1.1 Notes on Using Resource Manager 9200

When using Resource Manager 9200, consider the following:



- When using Resource Manager 9200 on "RS232C connection", the "ERROR INF" (a function to specify an error information transfer mode to the RS232C port) must be set to "OFF" (suspension of the 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 cause Resource Manager 9200 to fail to connect to the array unit or functions of Resource Manager 9200 to end abnormally.
- Regarding the functions to be executed by Resource Manager 9200, some are available and others are not available while the array unit is online with a host. For details, see chapter 2.
When high I/O load exists, functions that are available while online might cause a command time-out in the host or a recovering fault in Resource Manager 9200. It is recommended that these functions be executed while offline.
- At least one logical unit must be configured in the array unit, to make all of the Resource Manager 9200 functions available. If no logical unit is defined in the array unit, some functions cannot be executed.
- Resource Manager 9200 can control up to 1,024 array units. Configurations (setting of RAID groups, logical units, etc.) can be done on one array unit at a time. Error Alert monitoring must be stopped to configure array units.
- When the PC enters the suspension state (low power mode) while the Resource Manager 9200 is running, Resource Manager 9200 may not operate correctly after the PC is released from the suspension state.

When you operate Resource Manager 9200, disable power management by Windows so that the PC will not enter the suspension state.

- Resource Manager 9200 may hang up in the following cases.
 - 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 Resource Manager 9200 hangs up, terminate it forcibly and check the array unit status and the connection status of RS232C or LAN. Then, boot up Resource Manager 9200 once again.

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

1.2 Operating Environments

Resource Manager 9200 is operated by connecting to the array unit via a LAN or RS232C. When an array unit is connected to a LAN, a host (personal computer, SUN server/workstation, SGI server/workstation), in which Resource Manager 9200 is installed, must be connected with the network 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, 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.)
 - Ethernet 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.)
 - Ethernet 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.)
 - Ethernet Network adapter
 - Monitor (Resolution 800×600 , $1,024 \times 768$ or more is recommended.)

- JRE
 - Windows/IRIX : JRE1.1.8
 - Solaris: JRE1.1.8_10 (OS patch is mandatory for Solaris 2.6 or 2.7)

- RS232C connection
 - Serial port
 - baud rate: 9600
 - data bit: 8
 - parity: none
 - 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 directly to a host, a 10BaseT/100BaseT (100BaseT for 9200 only) twisted pair crossover cable is used.
 - When an array unit is connected to a host via a hub, a 10BaseT/100BaseT (100BaseT for 9200 only) twisted pair cable is used.

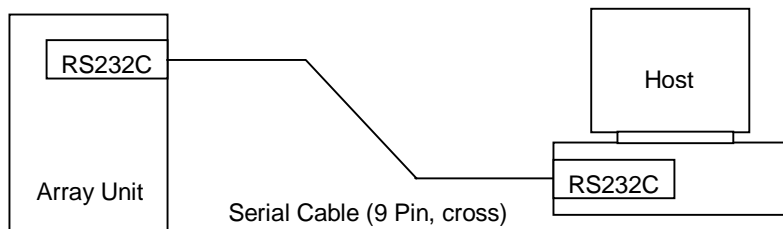
1.3 Connecting

This section provides examples of connections between a host in which Resource Manager 9200 has been installed and an array unit. These connections include:

- RS232C Connection
- LAN With a Hub
- LAN Without a Hub

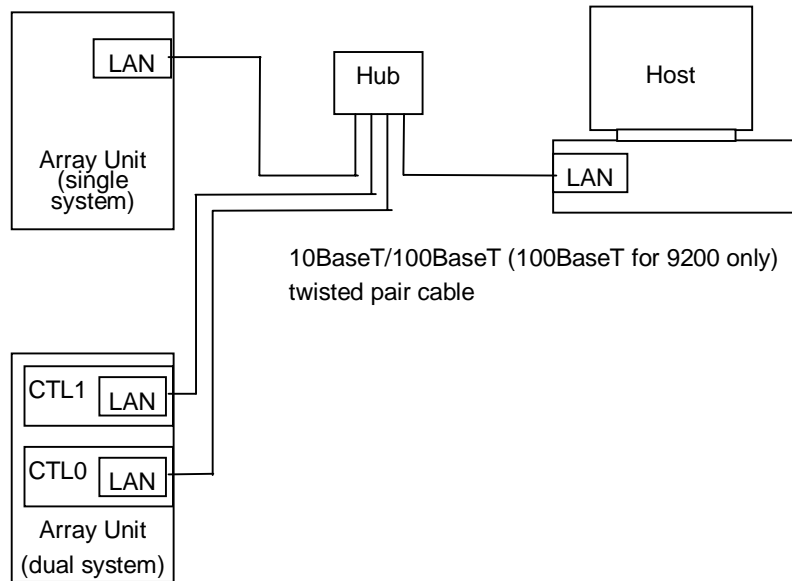
1.3.1 RS232C Connection

The following diagram is an example of a connection between a host in which Resource Manager 9200 is installed and an array unit.



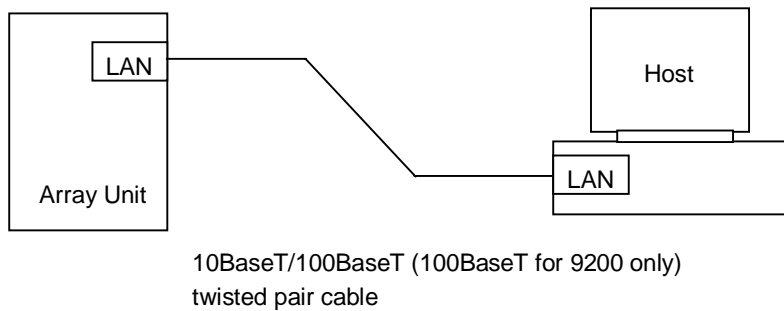
Note: If an array unit is configured from a dual system and a machine is equipped with two RS232C ports, both controller 0 and controller 1 are connected through an RS232C interface.

1.3.2 LAN With a Hub



Note: If an array unit is already connected with a LAN, a host is connected to the same network as the array unit.

1.3.3 LAN Without a Hub



1.4 Installing

The procedures for installing and uninstalling Resource Manager 9200 are described below. To use Resource Manager 9200, Java Runtime Environment 1.1.8 must be installed on a host and in normal operation. Before installing JRE1.1.8, ensure that it is in normal operation. If JRE1.1.8 is not installed, install JRE1.1.8 or JRE1.1.8_10.

This section provides instructions for installing Resource Manager 9200 to the following systems:

- Windows
- Solaris
- IRIX

1.4.1 Windows

1. Start the PC, then boot up Windows.
2. If JRE1.1.8 is not yet installed, install JRE1.1.8 contained in the provided CD-R.
3. Execute setup.exe in the GUI directory of the provided CD-R.
4. When executing the startmgr.bat (a batch file used to start Resource Manager 9200), Resource Manager 9200 starts.

Note: When starting Resource Manager 9200 from a directory other than the directory in which Resource Manager 9200 has been installed, edit the CMDF_PATH environment variable of the startmgr.bat file. Set the install directory of Resource Manager 9200 in the CMDF_PATH environment variable.

Example : If Resource Manager 9200 has been installed in C:\manage,
set CMDF_PATH=C:\manage
jrew -cp .\Confmng.jar jp.co.hitachi.str.diskarray.DiskArrayManager >>exclog

1.4.2 Solaris

1. Start 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, install JRE1.1.8_10 contained in the provided CD-R. When installing JRE1.1.8_10, OS patches need to be applied; apply 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. Create a new directory for installing Resource Manager 9200, and copy the ArrayManage-S340-GUI.tar file in the provided CD-R into the created directory in the hard disk drive.
4. The ArrayManage-S340-GUI.tar is the Tar format of a file. Extract the file by referring to the command below.
Example : tar xvf ArrayManage-S340-GUI.tar
5. Change scripts in the startmgr (a shell script used to start the manager) in the supplied file as follows:
“DEFAULT_JAVAHOME=/usr/java” has been defined in the startmgr as specification of a path to JRE.
Set up a path to JRE in the DEFAULT_JAVAHOME variable to set 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. Log in again.
7. After logging in again, execute the startmgr (a shell script to start the Resource Manager 9200).

Note: When starting Resource Manager 9200 from a directory other than the one in which Resource Manager 9200 has been installed, edit the CMDF_PATH environment variable of the startmgr in the supplied file before logging in again at Step 6. Set up the install directory of Resource Manager 9200 in the CMDF_PATH environment variable.

Example : If the Resource Manager 9200 has been installed in /usr/manage,
CMDF_PATH environment variable
CMDF_PATH=/usr/manage
export CMDF_PATH

1.4.3 IRIX

1. Start a SGI server/workstation.
2. Create a new directory for installing Resource Manager 9200, and copy the ArrayManage-I340-GUI.tar file in the provided CD-R into the created directory in the hard disk drive.
3. The ArrayManage-I340-GUI.tar is the Tar format of a file. Extract the file by referring to the command below.

Example : `tar xvf ArrayManage-I340-GUI.tar`

4. Change scripts in the startmgr (a shell script used to start Resource Manager 9200) in the supplied file as follows:

“DEFAULT_JAVAHOME=/usr/java” has been described in the startmgr as specification of a path to JRE.

Set up a path to JRE in the DEFAULT_JAVAHOME variable to set 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. Log in again.
6. After logging in again, execute the startmgr (a shell script to start Resource Manager 9200).

Note: When starting Resource Manager 9200 from a directory other than the one in which Resource Manager 9200 has been installed, edit the CMDF_PATH environment variable of the startmgr in the supplied file before logging in again at Step 6. Set up the install directory of Resource Manager 9200 in the CMDF_PATH environment variable.

Example : If the Resource Manager 9200 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 the 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 Updating

This section provides instructions for updating Resource Manager 9200 on the following systems:

- Windows
- Solaris
- IRIX

Note: When you update, be sure to terminate Resource Manager 9200 before starting operations.

1.5.1 Windows

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

The updated Resource Manager 9200 can be run without restarting Windows.

1.5.2 Solaris

1. Copy the ArrayManage-S340-GUI.tar file in the provided CD-R to the hard disk.
2. The ArrayManage-S340-GUI.tar is the Tar format of a file. Extract the file by referring to the command below.

Example : tar xvf ArrayManage-S340-GUI.tar

The updated Resource Manager 9200 can be run without restarting Solaris.

1.5.3 IRIX

1. Copy the ArrayManage-I340-GUI.tar file in the provided CD-R to the hard disk.
2. The ArrayManage-I340-GUI.tar is the Tar format of a file. Extract the file by referring to the command below.

Example : tar xvf ArrayManage-I340-GUI.tar

The updated Resource Manager 9200 can be run without restarting IRIX.

1.6 Uninstalling

This section provides instructions for uninstalling Resource Manager 9200 on the following systems:

- Windows
- Solaris and IRIX

1.6.1 Windows

1. Delete Resource Manager 9200 using the Add and Delete Application icon on the Control Panel.
2. Delete the directory used for Resource Manager 9200 on the hard disk drive.

1.6.2 Solaris and IRIX

1. Delete the directory used for Resource Manager 9200 on the hard disk drive.

Chapter 2 Functions (GUI)

The following table lists all functions of Resource Manager 9200. Functions that can be used vary, depending on the current Resource Manager 9200 mode. The availability of functions varies, depending on the action mode (monitor mode or management mode). The mode can be changed in the startup screen prior to connecting to the array unit. By default, it is in Monitor mode.

Some functions are not available while the array unit is online to the host. For example, for security reasons a RAID Group cannot be deleted while the array unit is online. For the RS232C connection, do not operate while online except for item 12: **Error monitoring**; otherwise, your connection may time out.

Table 2.1 Resource Manager 9200 Functions

No.	Category	Name of function	Outline of function	Remarks	Operation	Mode	
						Monitor	Management
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 Resource Manager 9200 Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Operation	Mode	
						Monitor	Management
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.	See the Software Users Guide of your array unit for details on rules for RAID Groups.	○	×	○
		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 Resource Manager 9200 Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Operation	Mode	
						Monitor	Management
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 highest 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 overwrites any user data on disks.	×/○ 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 Resource Manager 9200 Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Operation	Mode	
						Monitor	Management
5	System parameter setting	Setting wizard	Sets a system parameter in the wizard format. There are three types of wizard formats: standard setup, full setup, and RTC setup.	<p>To make the setting valid, restart the array unit.</p> <p>See Note 4.</p> <p>I/O requests from the host cannot be executed while the array unit is restarted. The Resource Manager 9200 cannot be used while the array unit is restarted.</p> <p>The entry values for the RTC are validated before they are set.</p>	x	x	○

Table 2.1 Resource Manager 9200 Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Operation	Mode	
						Monitor	Management
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 requested by Hitachi personnel.	×	×	○
		Online verify setting	Whether or not to execute the online verify function and an interval for it.	Note that changing this setting may result in lower performance.	×	×	○
		Setting and display of the Fibre Channel information	Sets and displays port addresses, topology, and security information, etc.	To make the setting valid, restart the array unit. See Note 4.	×	×	○

Table 2.1 Resource Manager 9200 Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Operation	Mode	
						Monitor	Management
7	Configuration information file	Import/Export system parameters and RAID/LU configuration information to/from a file.	Exports system parameters and RAID/LU configuration information to a separate file. Imports and sets system parameters and RAID/LU configuration information using files as input.	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, user data stored in the disk drive will be overwritten.	○	○	○
8	Microprogram replacement	Microprogram download and updating	Downloads and updates the microprogram of the array unit.	To activate the downloaded microprogram, restart the array unit. When 5700E has been executed, I/O cannot be executed from the host.	×/○ See Note 2.	×	○
9	Setting and listing SNMP environment information.	Setting SNMP environment information and store in file.	Sets the SNMP environmental information and stores the values in a file.	To make the setting valid, restart the array unit. See Note 4. I/O requests from the host cannot be executed while the array unit is restarted. Resource Manager 9200 cannot be used while the array unit is restarted.	×/○ See Note 3.	×	○

Table 2.1 Resource Manager 9200 Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Operation	Mode	
						Monitor	Management
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 online status.

Note 2: For the 5800 and the 9200 array units with dual controllers, commands can be used while online.

Note 3: For 5700E array units, this function can be used while online.

Note 4: When restarting the array unit from Resource Manager 9200, the unit window will be closed. To open the unit window again, select the array unit and click Open. An instruction to restart may also be issued to a 5800 (with a dual controller configuration, and both controllers operating) with flash code B15 or later.

Chapter 3 Operations (GUI)

The Resource Manager 9200 Graphical User Interface (GUI) can be used to display the status of array units, set up the configuration of array units, monitor array units for errors, etc.

The operations in this chapter can be used for Windows, Solaris, and IRIX.

3.1 Basic Operations

The basic operations describe in this section include:

- Starting
- Password Setting
- Changing the Action Mode
- Registering an Array Unit
- Version Display
- Terminating

3.1.1 Starting

1. Execute the batch file or shell script for starting Resource Manager 9200.
 - 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 from the same directory where Resource Manager 9200 program is installed.

2. The Resource Manager 9200 is started in the monitor mode and the main window appears.



Under Windows, the DOS prompt window is also displayed.

Close this window; it is not needed for Resource Manager 9200 operations. When you specify “Minimize icon” or “Exit program”, in the batch file property, “Minimize icon” or “Exit program” will automatically be executed.

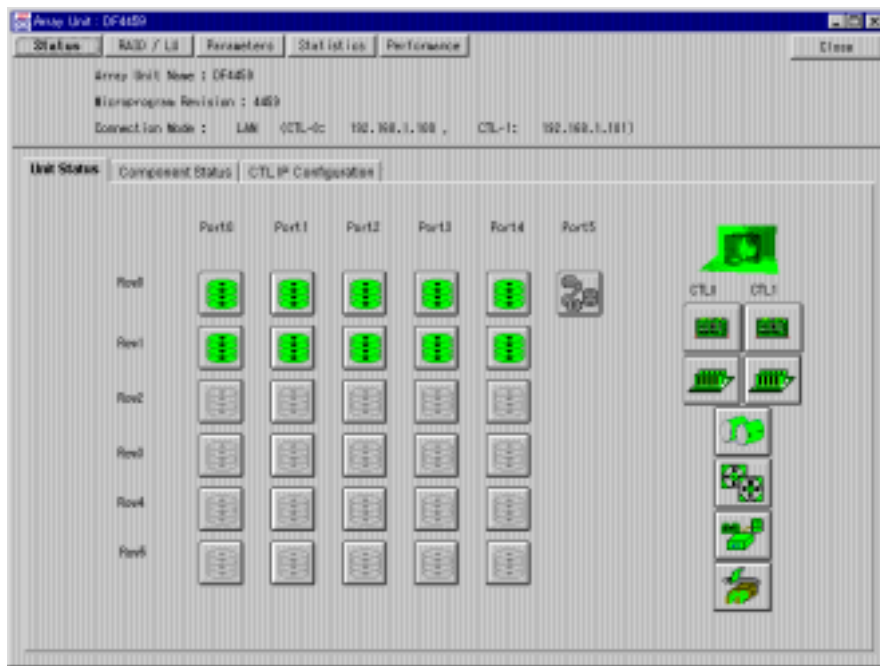
In the main window, Resource Manager 9200 action mode and the error monitoring status are displayed and the following functions are performed. See the page pertaining to the explanation of each function.

- 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

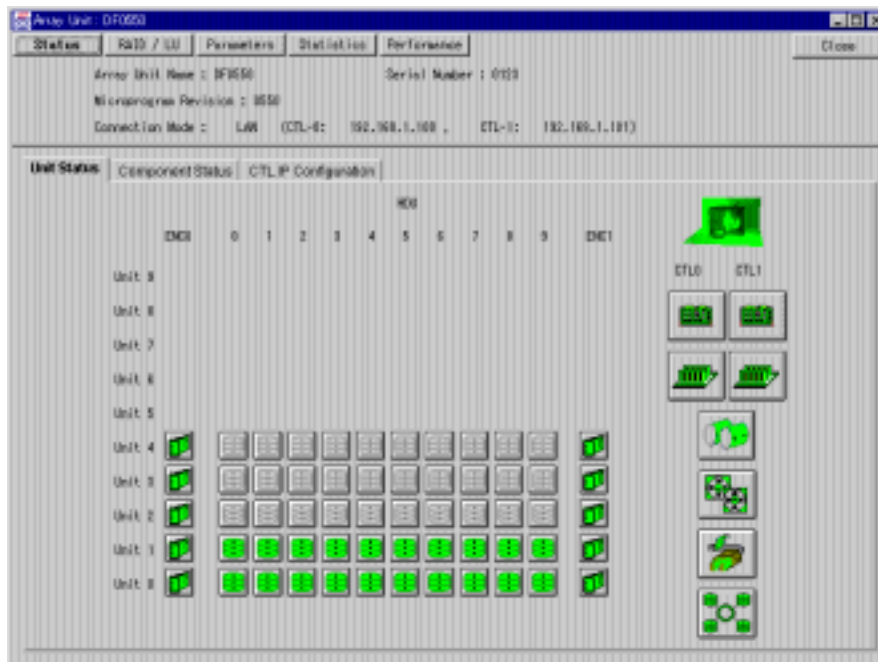
To change the action mode, execute **Change Mode**.

Note: The first time Resource Manager 9200 is started, the **Change Mode** button is displayed in halftone. Click **Password** to register the workstation password, and the **Change Mode** button will be enabled. This password is stored on the workstation and is the same, regardless of the array unit to which Resource Manager 9200 is connected.

3. Click the icon of the array unit in the main window and click **Open**. The unit window of the array unit you clicked will appear.
 - a) For 5700E and 5800:



b) For 9200:



In the unit window, the registered array unit name, serial number, microprogram revision, and connection information are displayed and the following functions are performed. For an explanation of 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

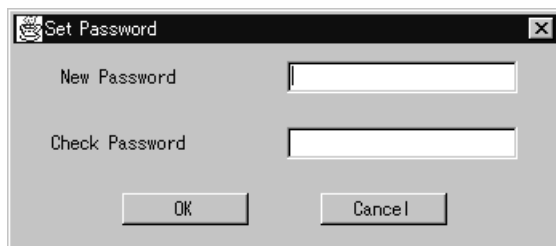
When using the Resource Manager 9200 in the management mode, a password must first be set. This password is stored on the workstation and is the same regardless of the array unit to which Resource Manager 9200 is connected. Additional password security is provided with the user ID and password stored on each array unit (see section 3.2).

Note: For information on password protection, refer to the *Hitachi Thunder 9200™ Password Protection User's Guide* (MK-90DF528).

3.1.2.1 Registration of a Password

To register a password:

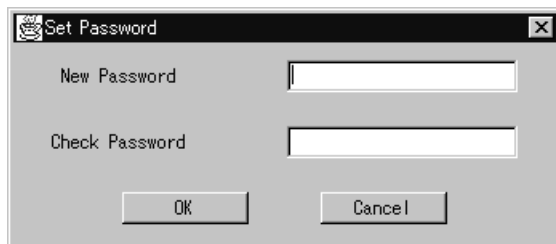
1. Click **Password** in the main window.
2. Input **New Password** and **Check Password**. Click **OK**.
Specify a password of up to 12 alphanumeric characters.



3.1.2.2 Changing the Password

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



3.1.2.3 Deleting the Password

To delete the password, Resource Manager 9200 must be uninstalled and reinstalled.

1. Delete the directory where Resource Manager 9200 is installed.

Note: To save the information of the registered array unit, back up the “utlprm.inf” file in the directory where Resource Manager 9200 is installed.

2. Create a directory with the same path and the same name as those of the directory deleted in 1.
3. Install Resource Manager 9200.

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

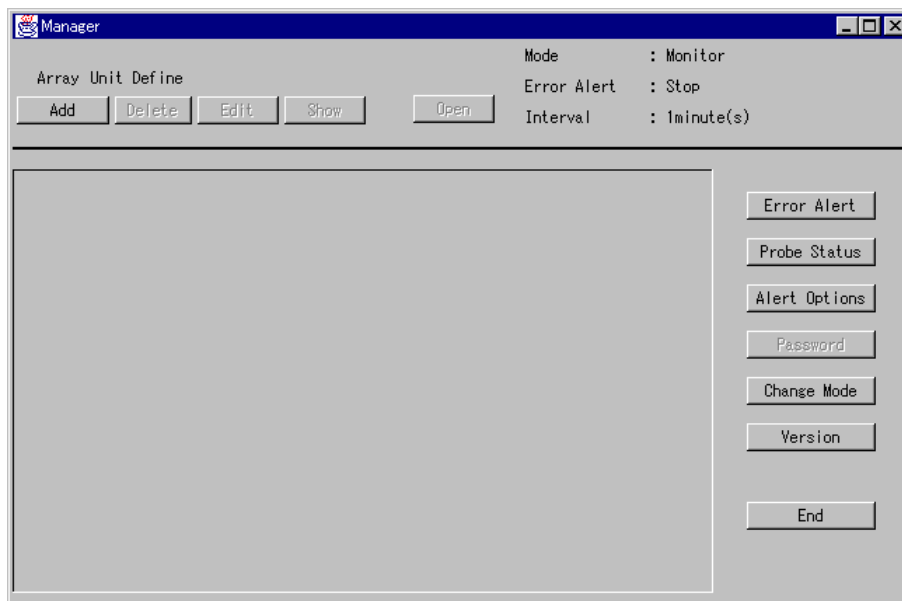
Resource Manager 9200 is provided with two action modes: monitor mode and management mode. In the monitor mode, both array unit configuration and status are displayed. In the management mode, the array unit configuration can be set in addition to the monitor mode functions.

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

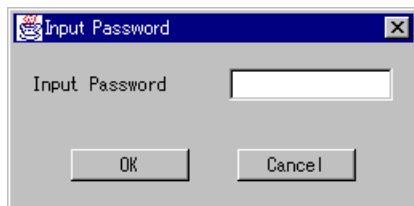
3.1.3.1 Changing from the Monitor Mode to the Management Mode

Resource Manager starts up in Monitor Mode. To change the action mode from the monitor mode to the management mode, follow this procedure:

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



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

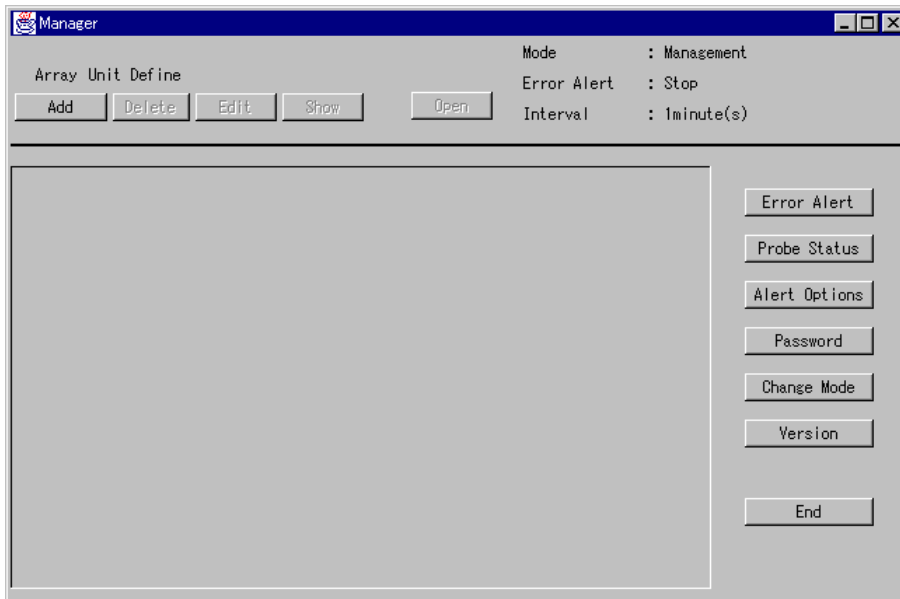


3. **Management** is displayed in **Mode:** in the upper right part of the main window and Resource Manager 9200 will operate in the management mode.

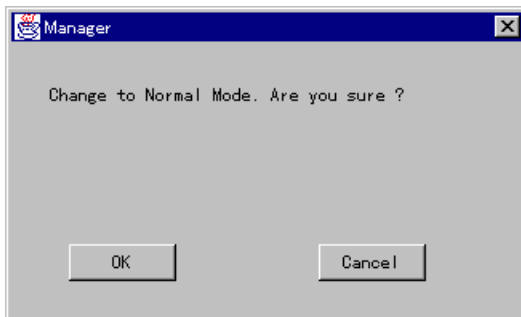
3.1.3.2 Change from the Management Mode to the Monitor Mode

To change the action mode from the management mode to the monitor mode:

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



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



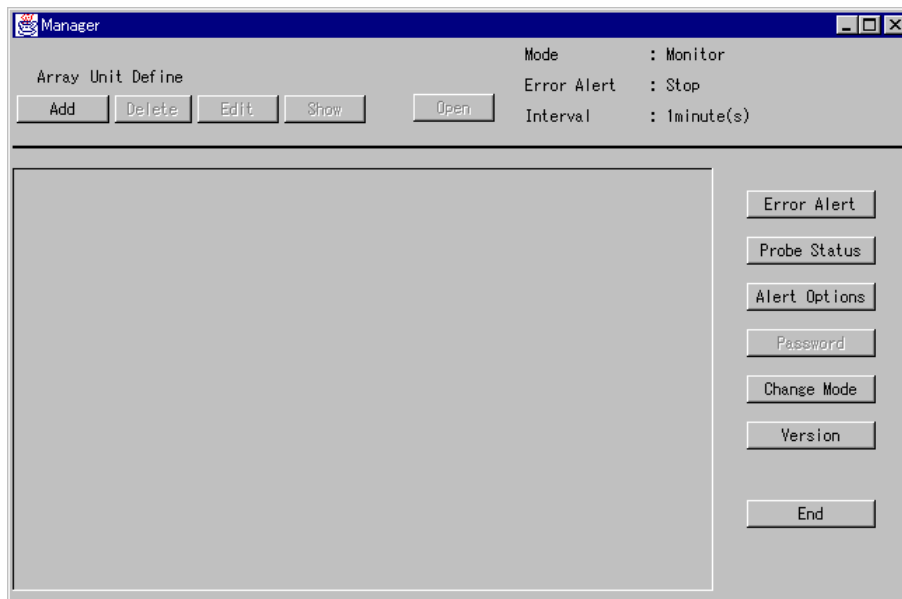
3. **Monitor** is displayed in **Mode:** in the upper right part of the main window and Resource Manager 9200 will operate in the monitor mode.

3.1.4 Registering an Array Unit

To connect to an array unit from Resource Manager 9200, register the array unit to be connected. The array unit must be connected to the workstation via the LAN or a serial port. It is not possible to register an array unit without a connection to the array unit.

3.1.4.1 New Registration

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



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

The screenshot shows a Windows-style dialog box titled "Array Unit Regist". It has a standard title bar with a close button. The dialog is organized into two main columns. The left column contains: "Array Unit Name" (a text input field), "Array Unit Type" (a dropdown menu currently showing "DF400 Dual"), and "Controller 0" (a group of three text input fields for "IP Address", "Host Name", and "Device Name"). The right column contains: "Group Name" (a text input field), "Connection Mode" (a dropdown menu currently showing "LAN"), and "Controller 1" (a group of three text input fields for "IP Address", "Host Name", and "Device Name"). At the bottom left, there is a checkbox labeled "Error Alert" which is checked. At the bottom center, there are two buttons: "OK" and "Cancel".

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

Group Name is used to group array units for administrative purposes. It is not necessary to enter a group name.

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 available for the connection to each controller.

Check the **Error Alert** check box when the array unit is to be monitored. Do not check this box if an RS-232C connection is used.

- **Array Unit Name:** Registered name of array unit. Specify up to 16 alphanumeric characters or characters (-, _) except numbers.
- **Group Name:** Group name when array units are controlled as a group. Specify 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:** For the 9200, select DF500 single for units with one controller or DF500 dual for units with two controllers.
- **Connection Mode:** Select either LAN or RS232C.
- **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 : In 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 : In 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

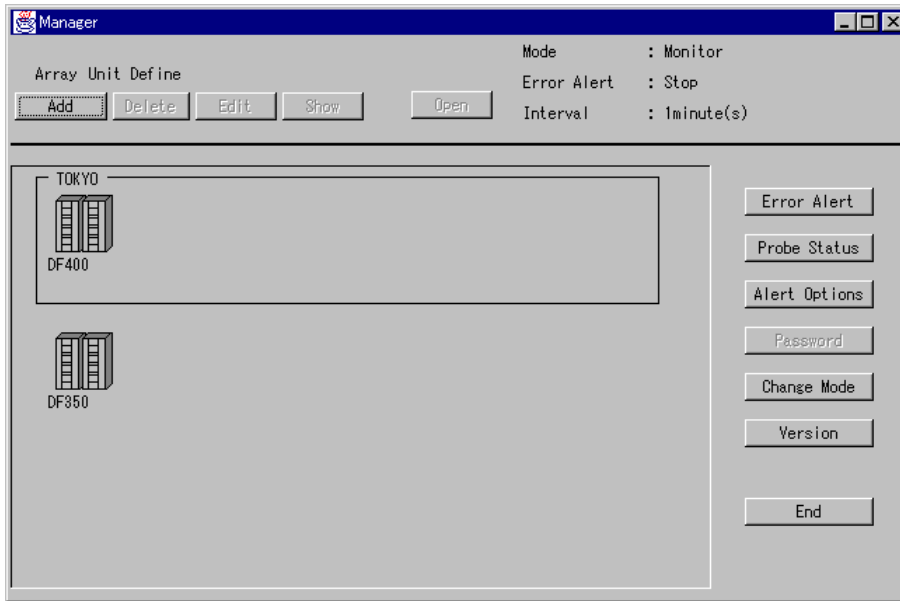
Note: For array units with dual controllers connected to the LAN, only one controller has be be connected. Specify **Controller 0 IP Address/Host Name/Device Name** and **Controller 1 IP Address/ Host Name/Device Name** for the connected controller side only.

When registering the array unit in the dual system, verify that you have selected the correct controller for the connection before specifying **Controller 0 IP Address/Host Name/Device Name** and **Controller 1 IP Address/Host Name/Device Name**. If you specify the wrong controller, depending on the specified contents, the controller configuration can be set to the opposite controller side.

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



4. The main window is updated and then displayed.



When you enter a **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

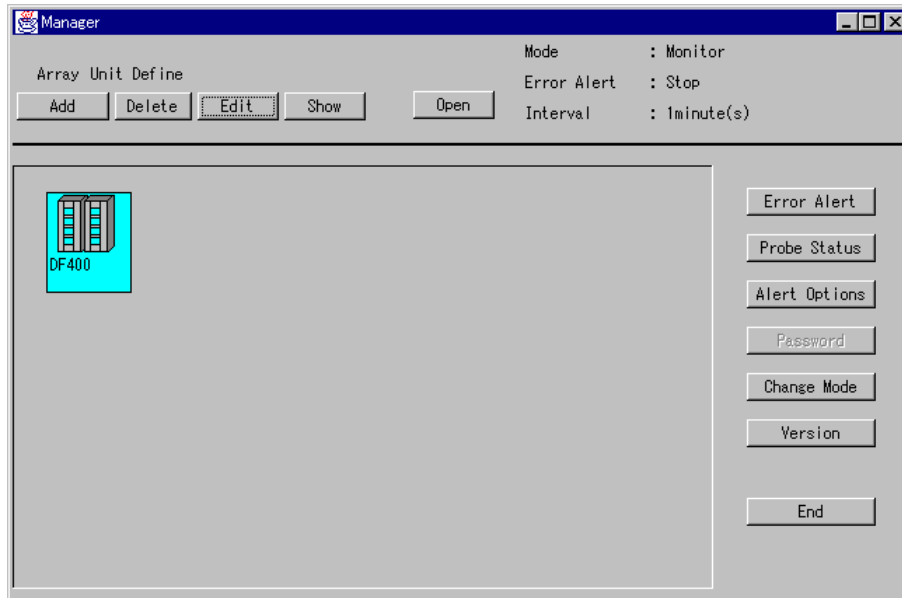


Array unit icons are displayed in the order they were registered.

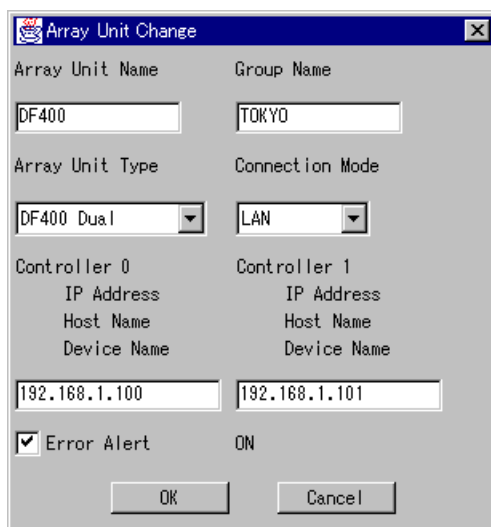
3.1.4.2 Changing the Registration Contents

Change the registration contents of the array unit which are registered in Resource Manager 9200.

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



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

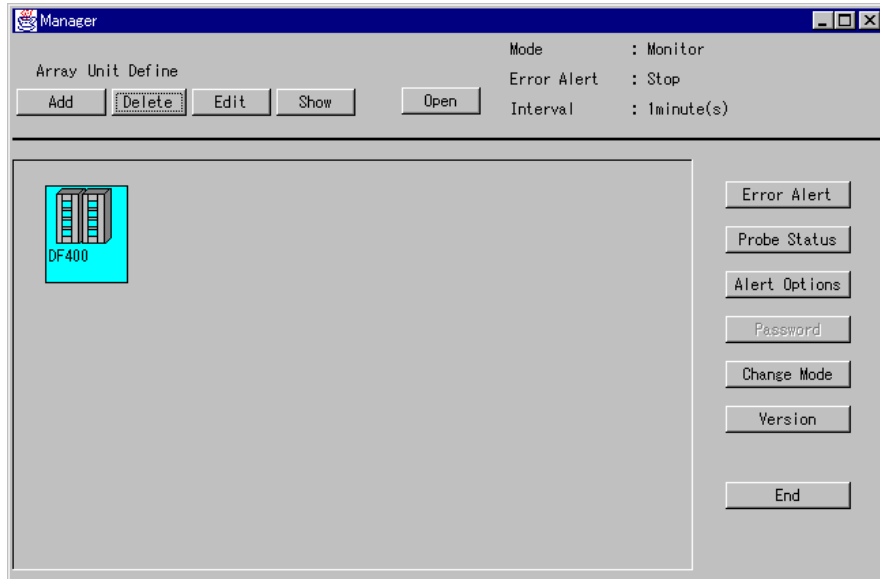


3. When a registration change completion message appears, click **OK**.
4. The main window is updated and then displayed.

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 selected array unit is displayed in a light blue frame.

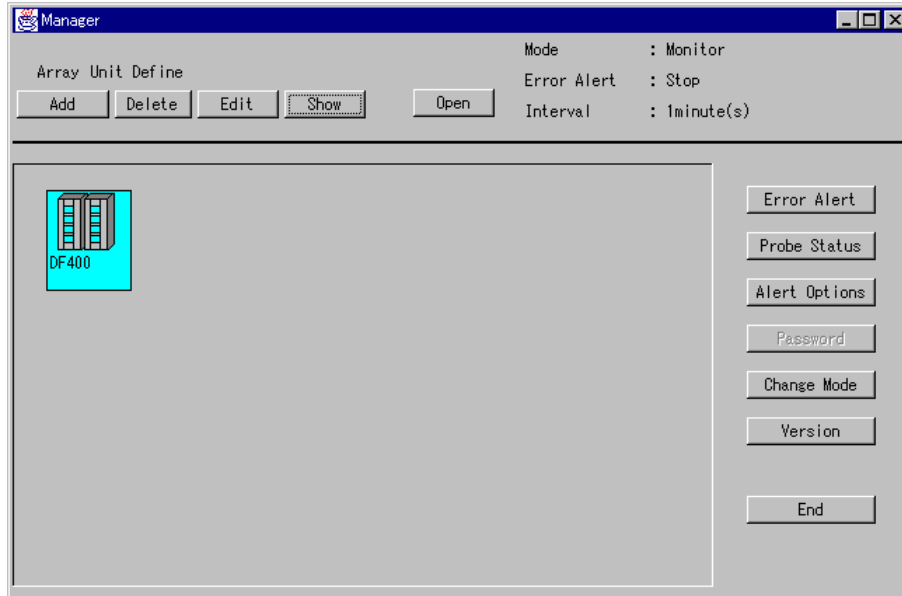


2. When a message confirming whether the registration should be deleted or not is displayed, click **OK**.
3. The main window is updated and then displayed.

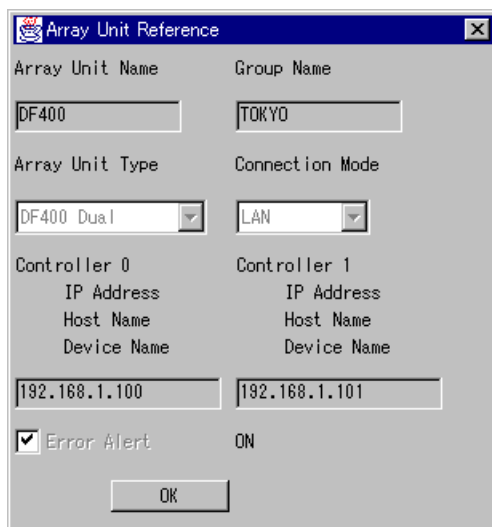
3.1.4.4 Displaying the Registration Contents

Display the registration contents of an array unit which is registered in the Resource Manager 9200.

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.



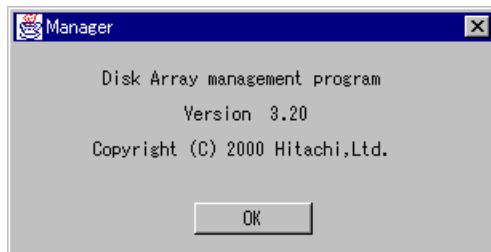
3.1.5 Version Display

Display the version of Resource Manager 9200.

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



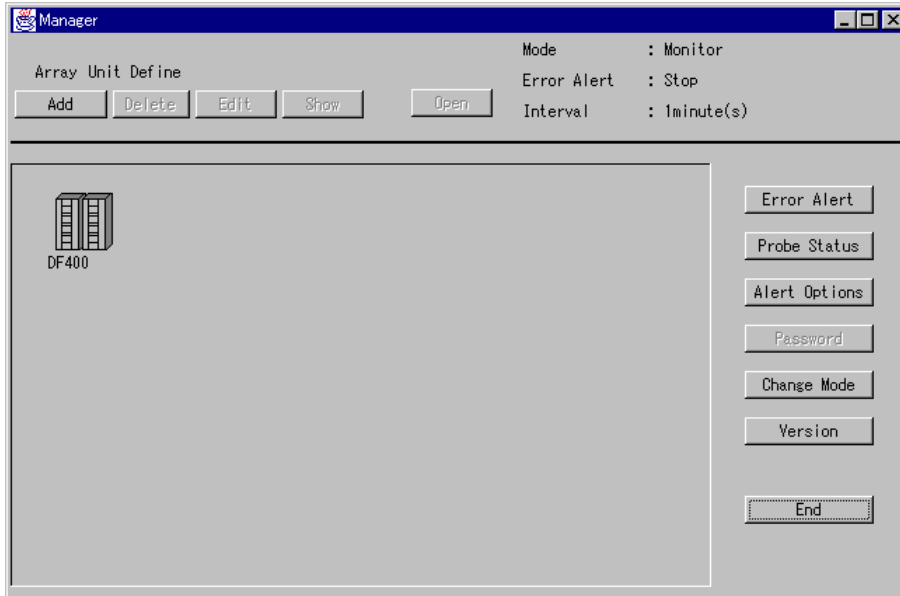
2. The version of Resource Manager 9200 is displayed.



3.1.6 Terminating

Terminate Resource Manager 9200. When the unit window is open, close it and terminate Resource Manager 9200.

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

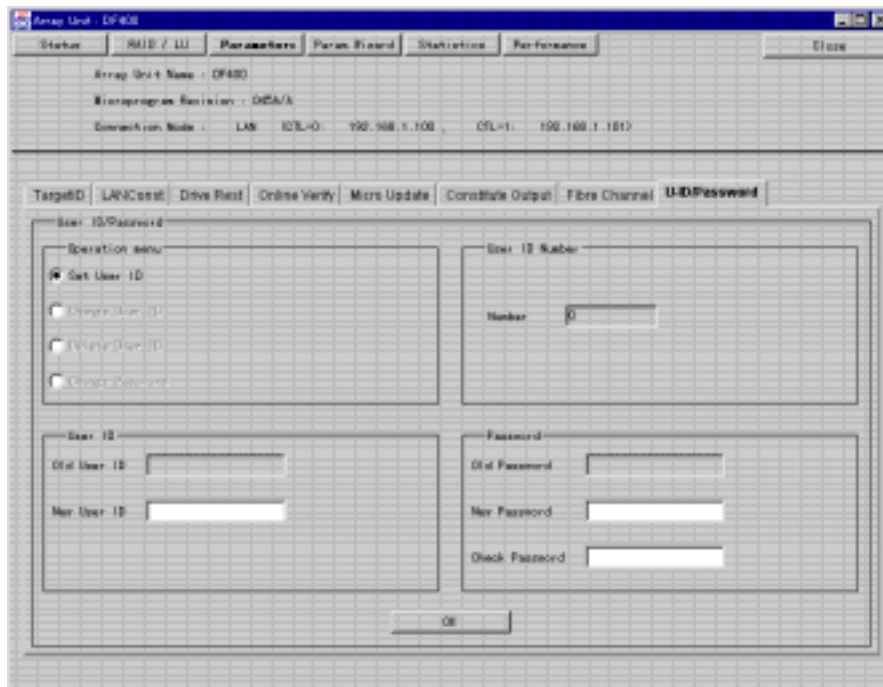


2. Resource Manager 9200 is terminated and the main window is closed.

3.2 Array Unit Management by User ID

Every user will need a User ID and password before entering the Management Mode.

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

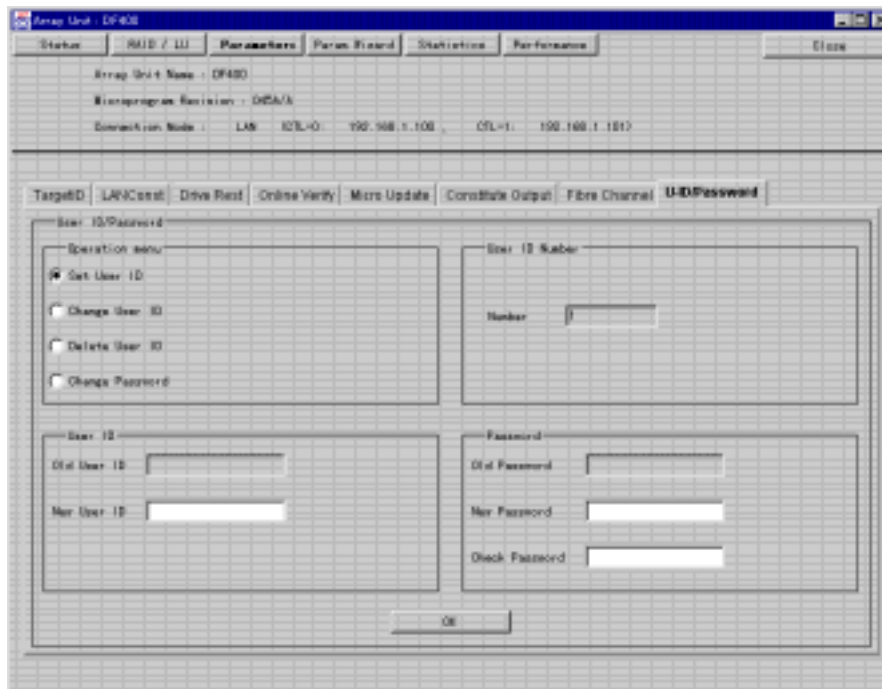


Management of operators by user ID is required when operating Resource Manager 9200 in management mode. When operating Resource Manager 9200 in monitor mode, no user ID is required.

3.2.1 Setting User ID

Set a user ID in an array unit.

1. Click the **Parameters** button, then click the **U-ID/Password** tab.

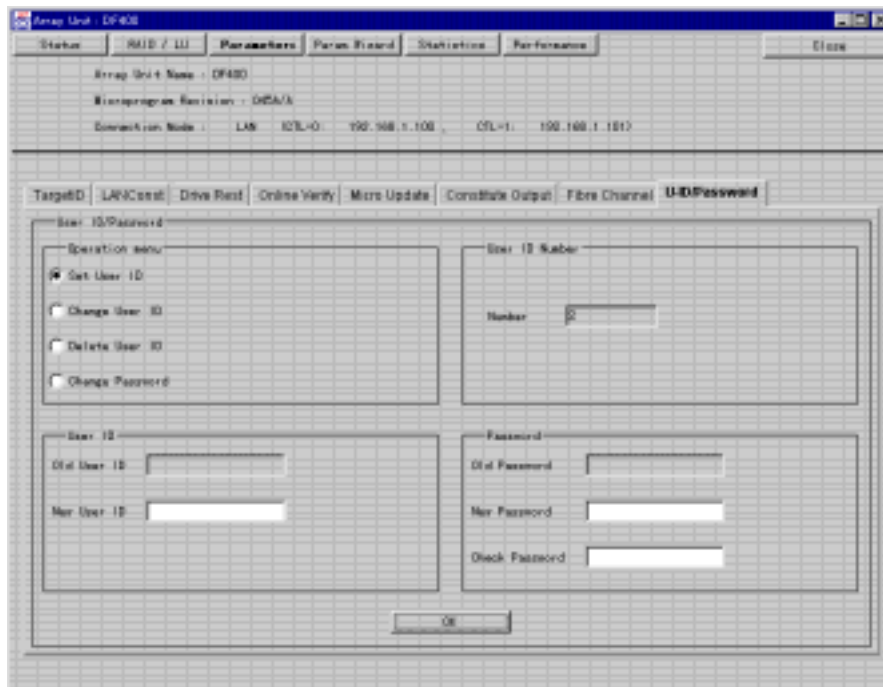


2. From the **Operation menu**, click the **Set User ID** option button. Make entries for the **New User ID**, **New Password**, and **Check Password** fields.
 - **New User ID:** Specify a user ID to be registered.
Valid entries are alphanumerics and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.
 - **New Password:** Specify the password of a user ID to be registered.
Valid entries are alphanumerics and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.
 - **Check Password:** Specify the same password again.
3. Next, click the **OK** button.

4. A message appears, verifying that the registration is complete. Click the **OK** button again to close the screen.



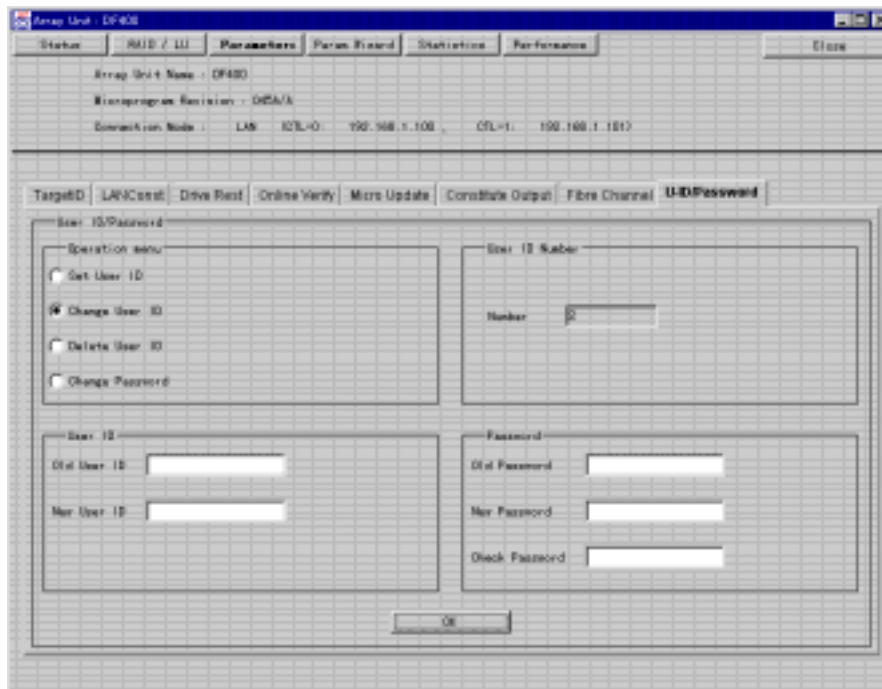
5. The number of user IDs registered is updated and displayed.



3.2.2 Changing User ID

To change an existing user ID, registered in an array unit:

1. Click the **Parameters** button, then click the **U-ID/Password** tab.

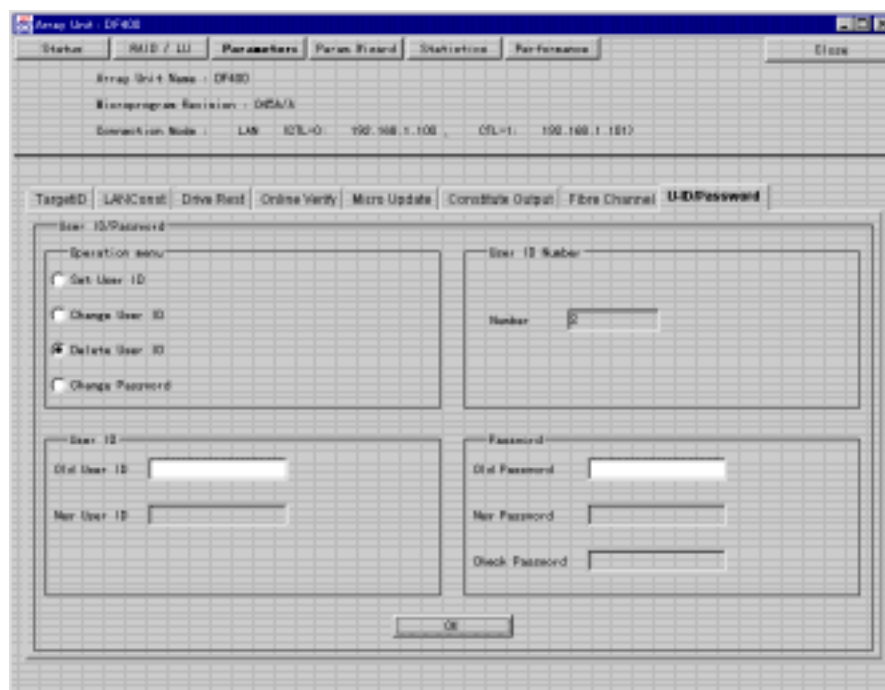


2. From the **Operation menu**, click the **Change User ID** option button. Make entries for the **Old User ID**, **Old Password**, **New User ID**, **New Password**, and **Check Password** fields for their respective data, and then click the **OK** button.
 - **Old User ID:** Specify the user ID to change.
 - **New User ID:** Specify the new user ID to register.
Valid entries are alphanumeric and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.
 - **Old Password:** Specify the password of the user ID to change.
 - **New Password:** Specify the password of the new user ID to register.
Valid entries are alphanumeric and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.
 - **Check Password:** Specify the same password again.
3. A message appears, verifying that the changes have been made. Click the **OK** button.

3.2.3 Deleting User ID

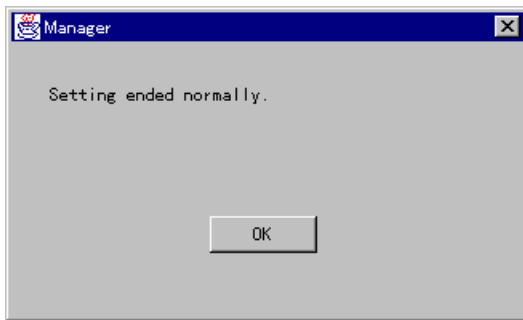
Deletes a user ID registered in an array unit.

1. Click the **Parameters** button, then click the **U-ID/Password** tab.

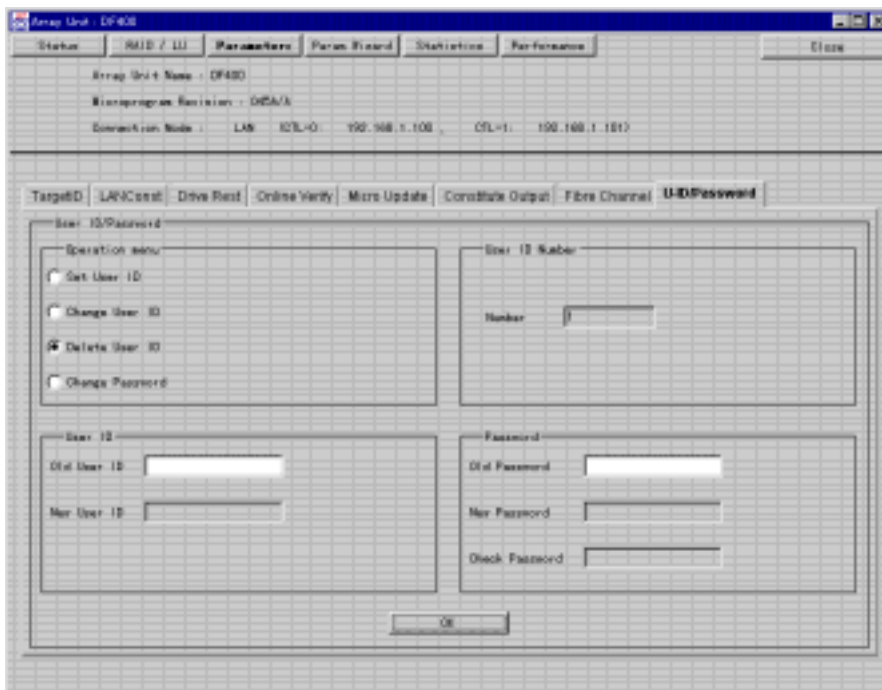


2. From the **Operation menu**, click the **Delete User ID** option button. Enter the **Old User ID** and **Old Password** for the user ID to be deleted.
 - **Old User ID:** Specify the user ID to be deleted.
 - **Old Password:** Specify the password of the user ID to be deleted.
3. Click the **OK** button.

4. A message appears, verifying that the deletes are complete. Click the **OK** button.



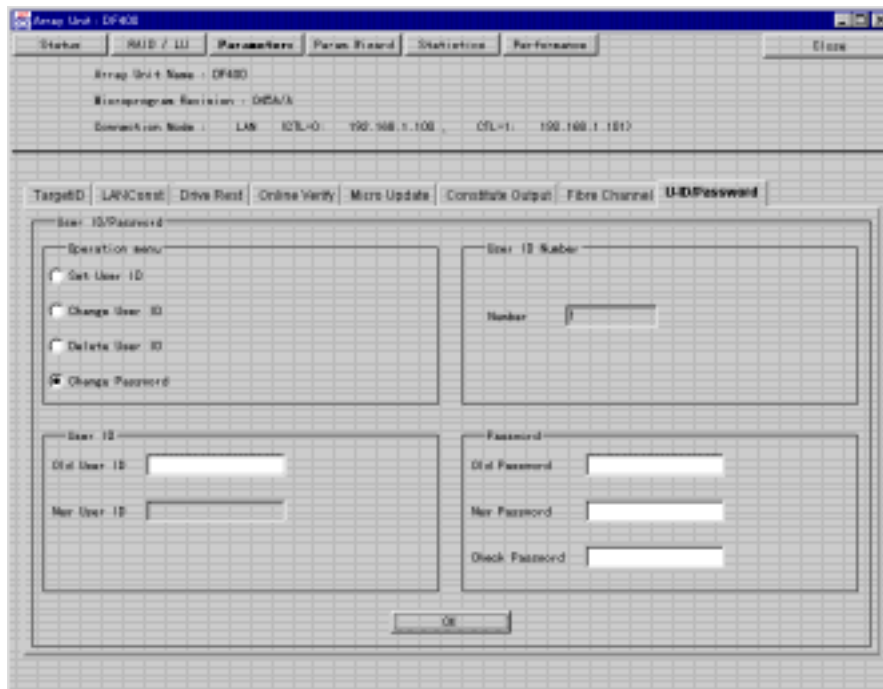
5. The number of user IDs registered is updated and displayed.



3.2.4 Changing Password

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

1. Click the **Parameters** button, then click the **U-ID/Password** tab.

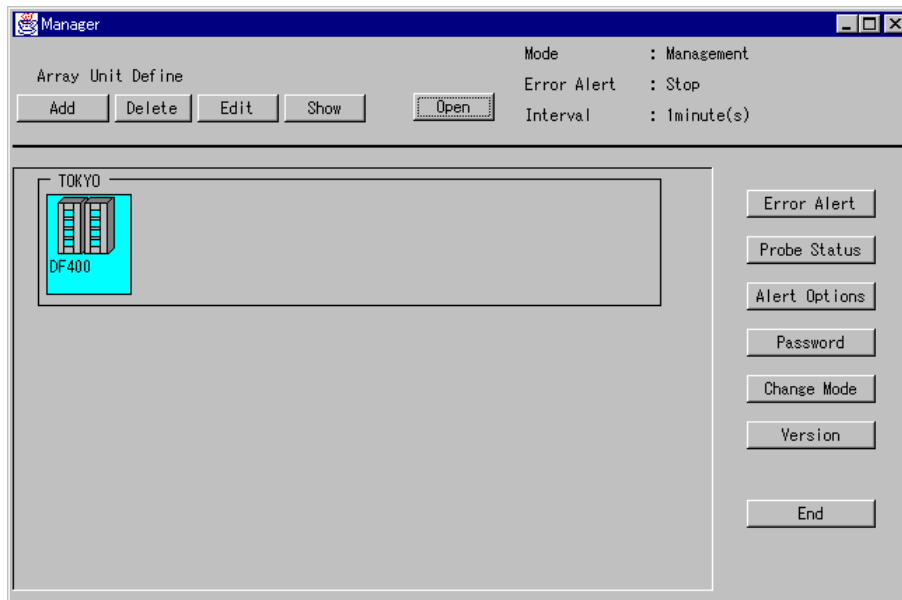


2. From the **Operation menu**, click the **Change Password** option button. Enter the **Old User ID**, **Old Password**, **New Password**, and **Check Password**.
 - **Old User ID:** Specify the user ID to change.
 - **Old Password:** Specify the password of the user ID to change.
 - **New Password:** Specify the new password.
Valid entries are one-byte coded alphanumeric and special symbols “- (minus)” and “_ (underline)” of 4 to 12 characters long.
 - **Check Password:** Specify the same password.
3. Click the **OK** button.
4. A message appears, verifying that the changes are complete. Click the **OK** button.

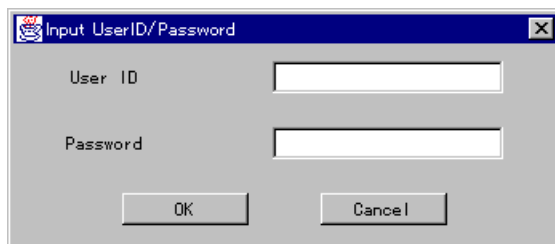
3.2.5 Logging into an Array Unit

To log into an array unit in which a user ID has been already registered:

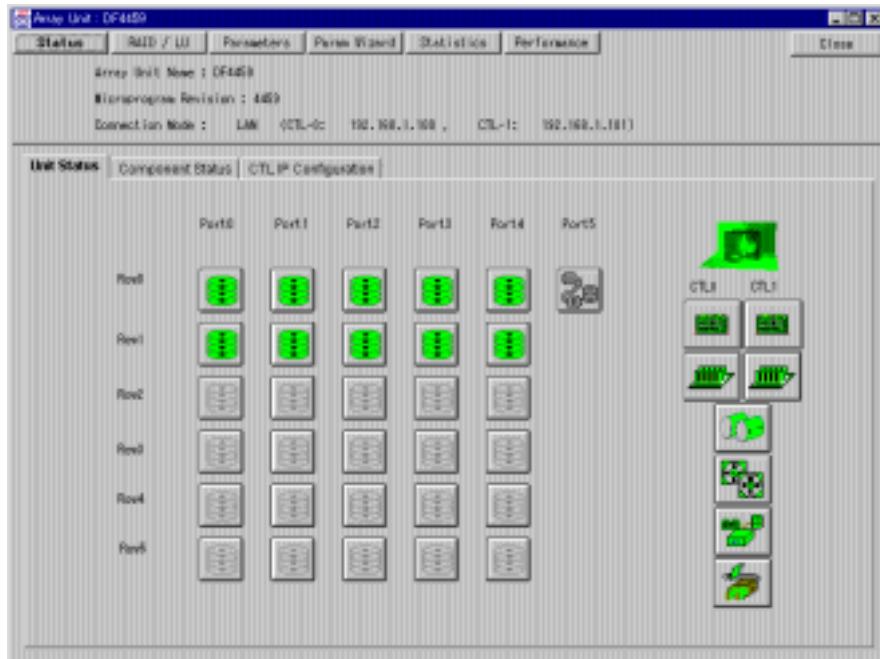
1. Set the mode of operation to management mode.
2. Click the icon of the array unit to connect to on the main window, then click the **Open** button.



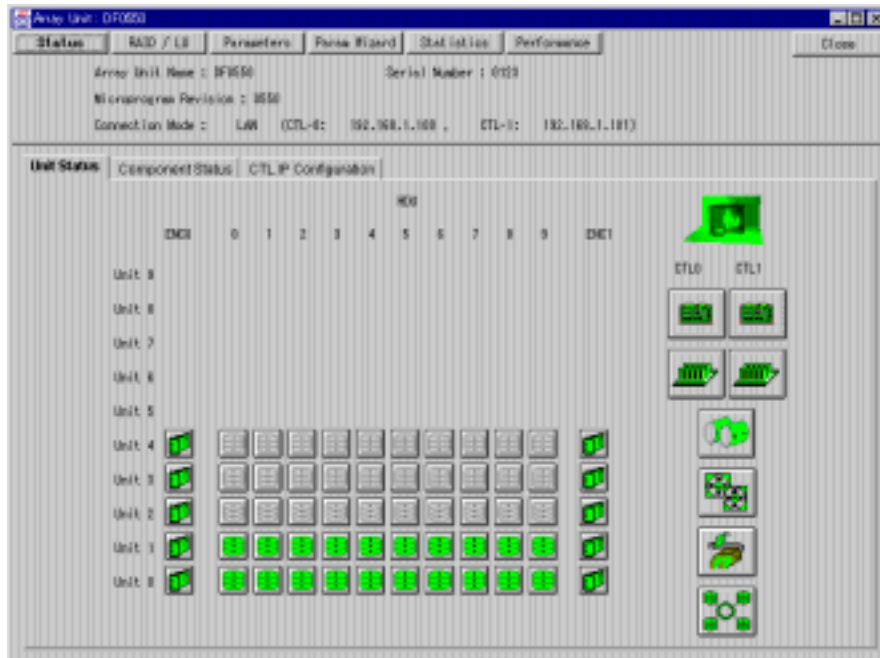
3. Enter a registered user ID and password, then click the **OK** button.



4. After a successful login with the registered user ID, the unit window is displayed.
 - a) For 5700E and 5800:



- b) For 9200:



3.2.6 Logging into Array Unit Forcibly

A user can forcibly log into an array unit in which another user is already logged in; this user will be logged out of the array unit.

When clicking the icon of an array unit to which a user has already logged in, a message indicates that a user has already logged in. The message indicates the user ID and connection information.



A user is already logged into the same array unit. Use the `-discon` option when starting Resource Manager 9200. See the following for details.

1. Terminate Resource Manager 9200, and restart it by appending the “-discon” option to the end of the startup command.

- a) For Windows, edit the file of `startmgr.bat` (a batch file used to start Resource Manager 9200) and add the “-discon” option.

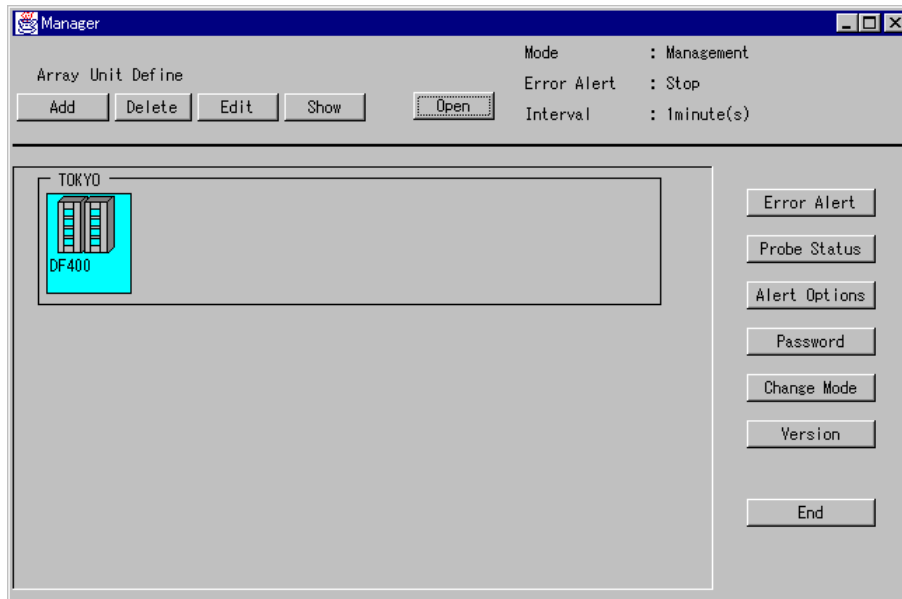
Example : `jrew -cp .\CONFMNG.JAR
jp.co.hitachi.str.diskarray.DiskArrayResourceManager -discon`

- b) With Solaris and IRIX, it is started with the “-discon” option appended on the command line when starting Resource Manager 9200.

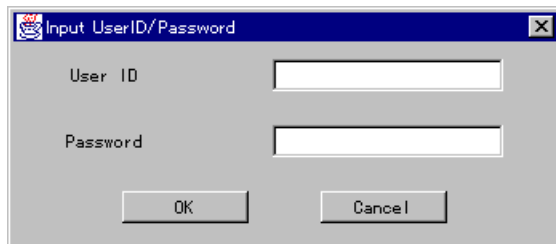
Example : `./ startmgr -discon`

2. Restart Resource Manager 9200, and set the mode of operation to management mode.

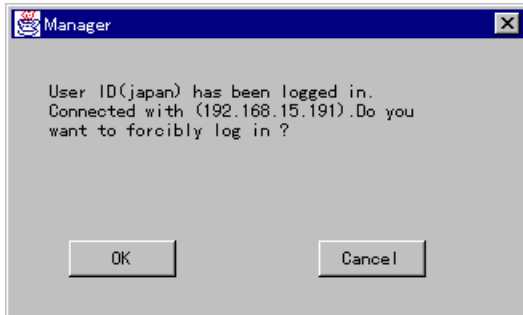
3. Click the icon of an array unit to be connected on the main window, then click the **Open** button.



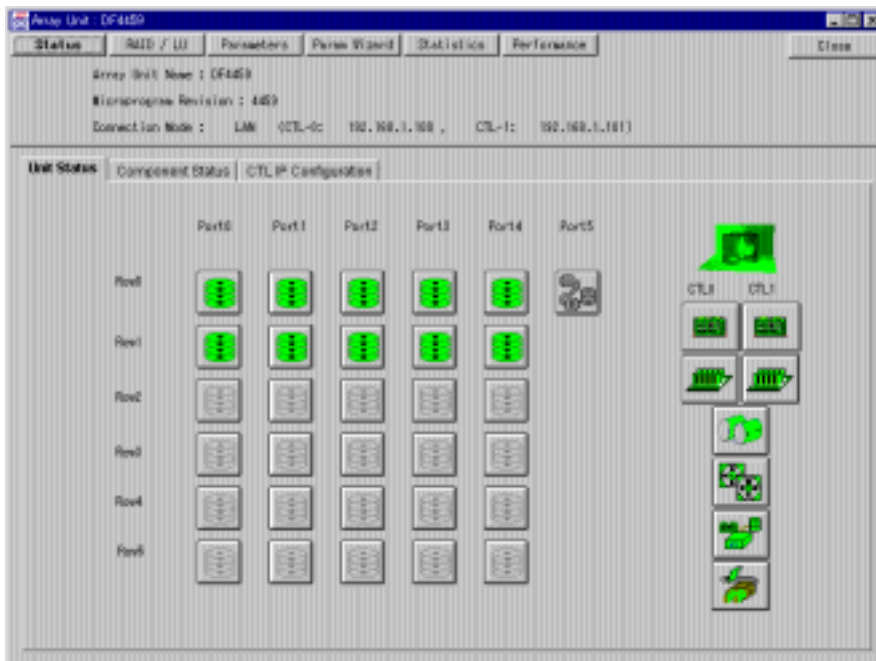
4. Enter a registered user ID and its password, then click the **OK** button.



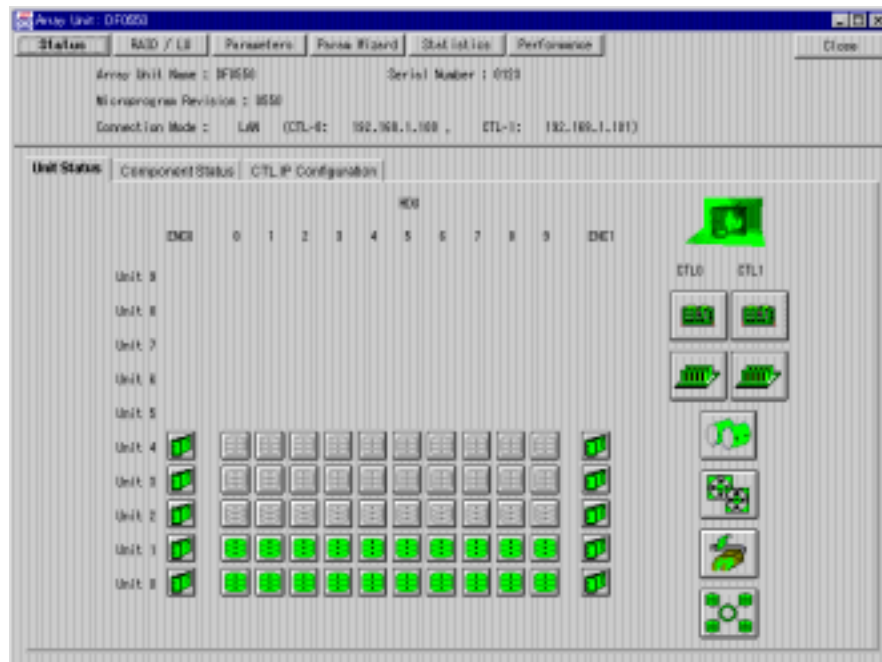
5. A user ID with which a user has logged in and its IP-Address are displayed. If you want to log forcibly, click the **OK** button. **Caution:** This will log out the other user without warning.



6. Logging in with an entered user ID is done, and the unit window is displayed.
- a) For 5800:



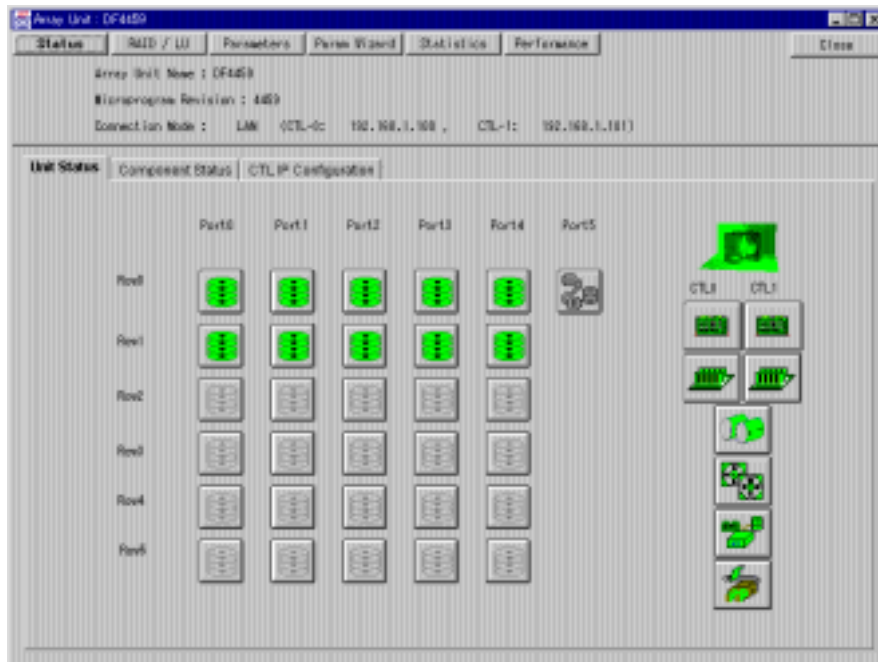
b) For 9200:



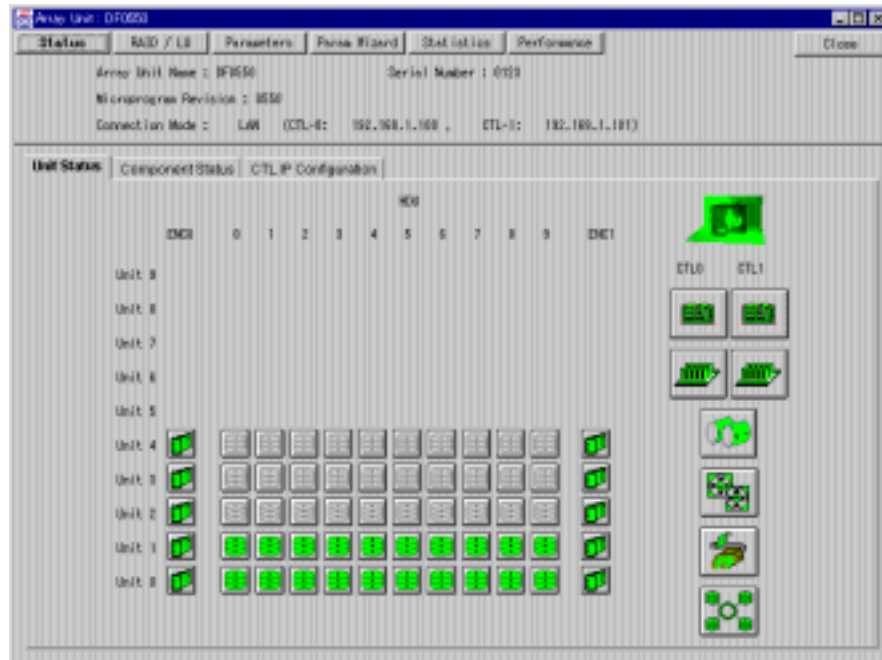
3.2.7 Logging Out from Array Unit

To log out from an array unit and close the operation Mode window:

1. Click the **Close** button on the unit window .
 - a) For 5800:



b) For 9200:



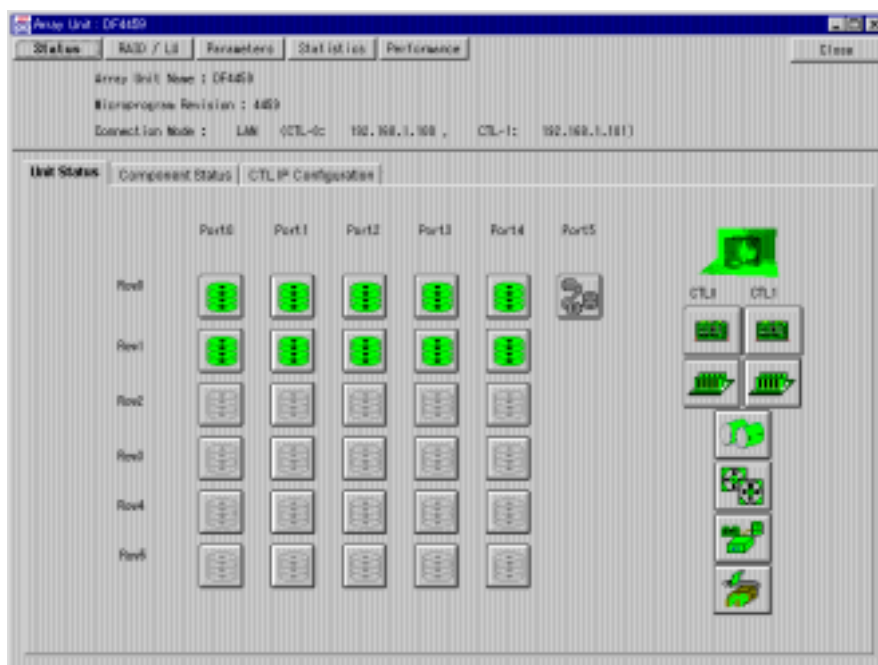
2. Logging out is done, and the unit window is closed.

3.3 Displaying the Array Unit Configuration

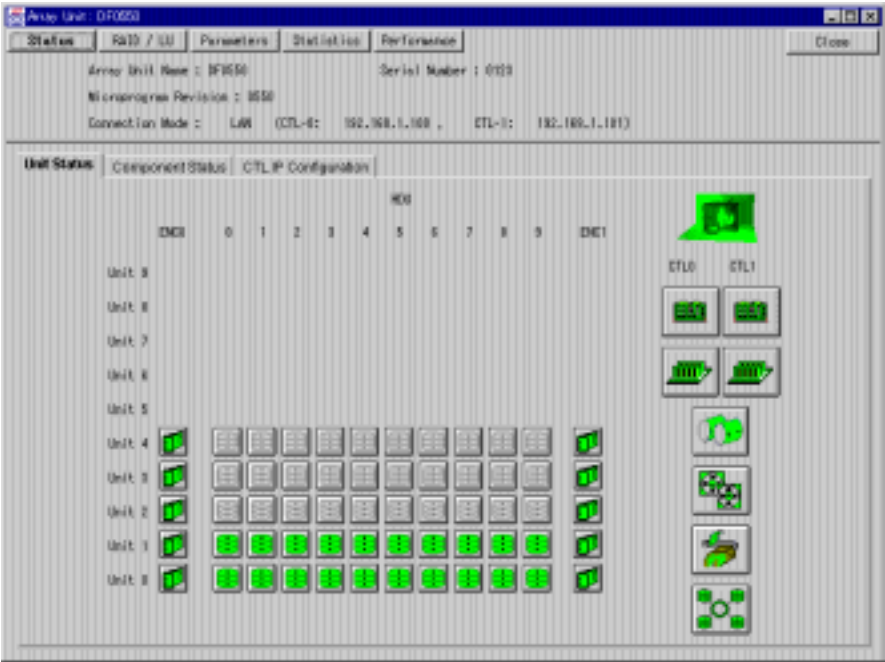
3.3.1 Displaying the Array Unit Components by Icons

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

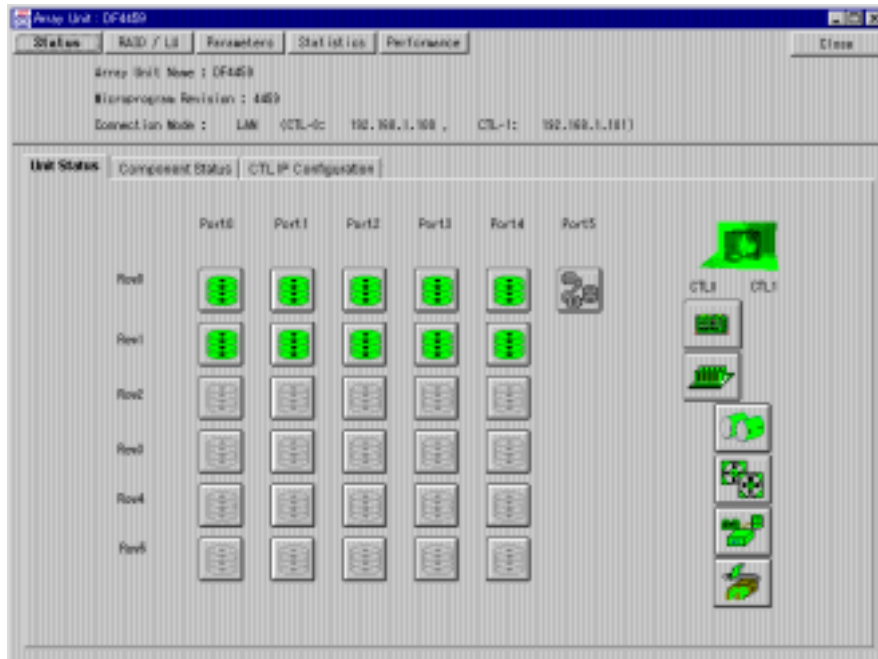
1. Click **Status**, then click the **Unit Status** tab.
The array unit component status is displayed.
To update the component display, click the **Status** button once.
- Display when both controllers are connected in the dual system
 - a) For 5700E and 5800:



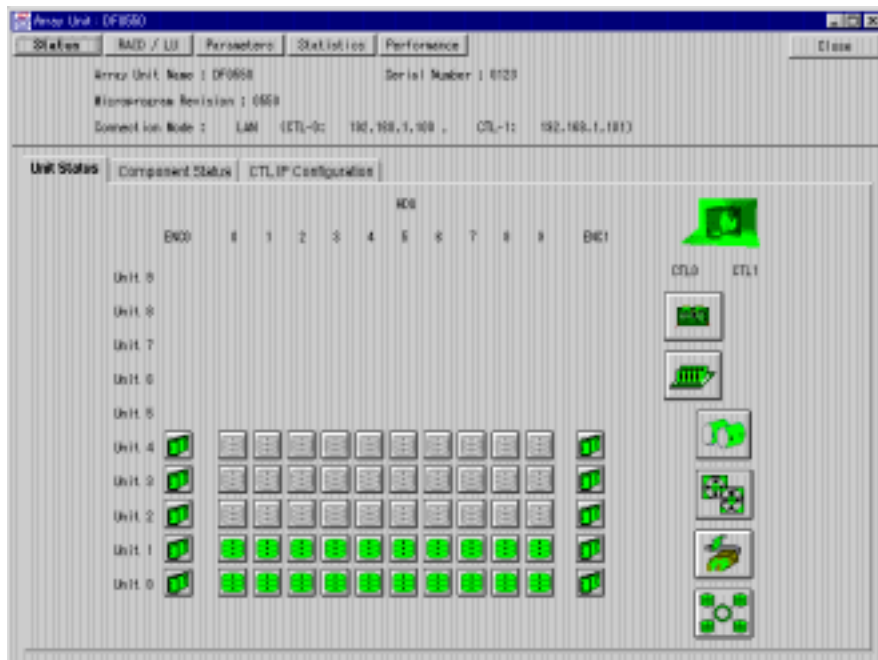
b) For 9200:



- Display when one controller only is connected in the dual system
 - a) For 5700E and 5800:

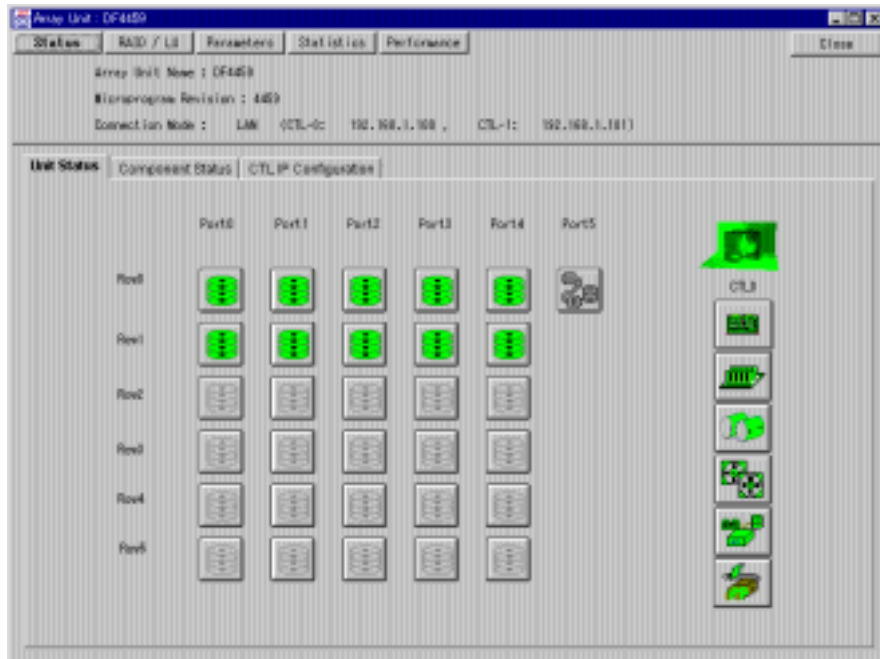


- b) For 9200:

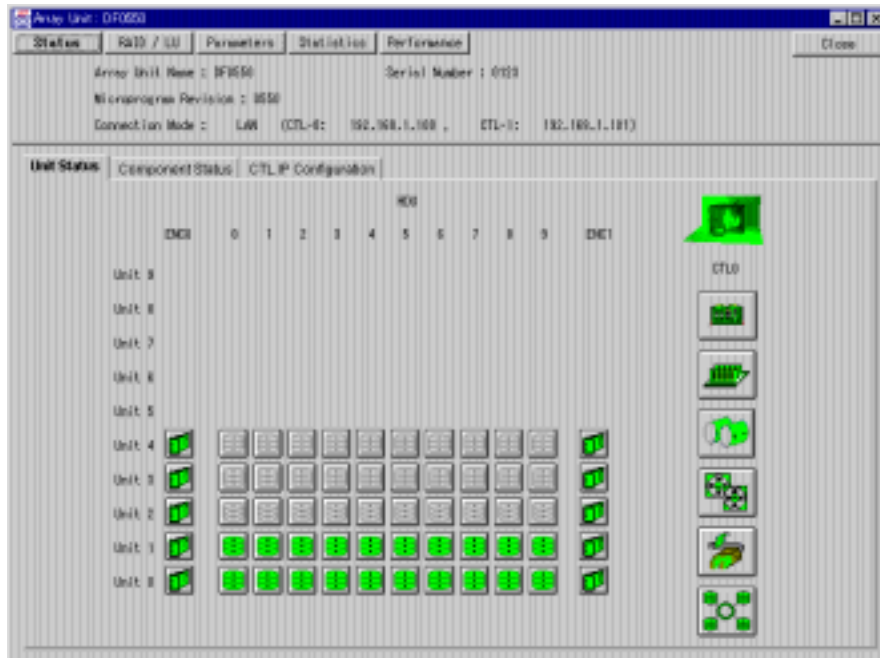


Information on the controller and cache of the connected controller side only is displayed.

- Display when a single system with single controller is connected
 - For 5700E and 5800:





- For 9200:










The color of the icon of each component represents the status. 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 for 5800 or 0307/J or later for 5700E 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

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

2. When you click an icon, detailed information of the component part indicated by the icon is displayed.

The following information is displayed by clicking the icon of data drives and spare drives.

a) Data drive and spare drive

- For 5700E and 5800:



- For 9200:



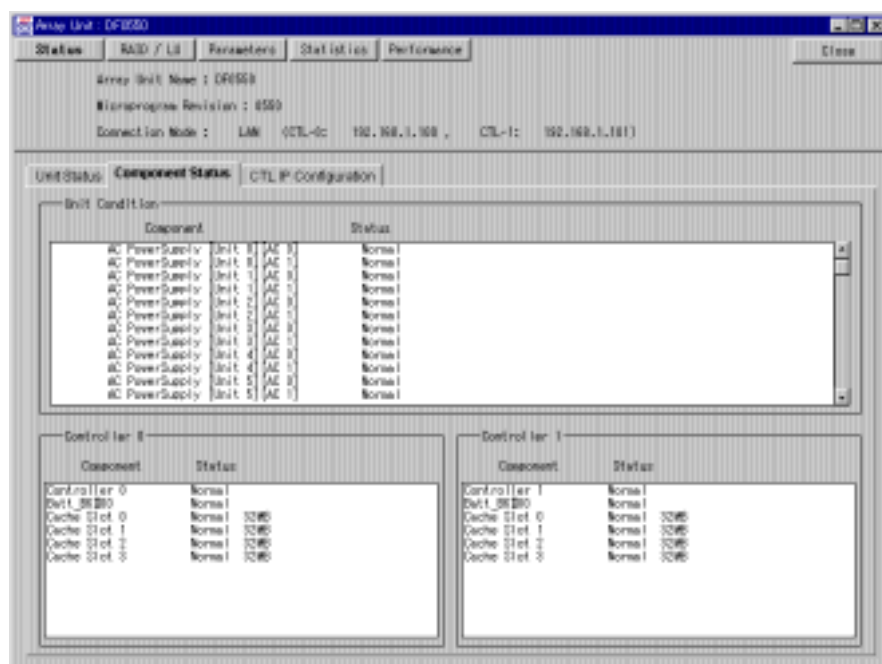
- **Vendor ID:** Vendor ID of drive
 - **Product ID:** Product ID of drive
 - **Revision:** Firmware revision of drive
 - **Drive Type:** Drive using form
 - Data:** Data drive
 - Spare:** Spare drive
 - **Position:** Array unit mounting position
 - Port No. and row No. for 5700E and 5800
 - Unit No. and HDU No. for 9200
 - **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 5700E and 5800
 - PortX RowY:** Position of a corresponding data drive when using spare disk drives.
For 9200
 - 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.

3.3.2 Displaying the Array Unit Component List

To 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 divided into two divided sections: 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.

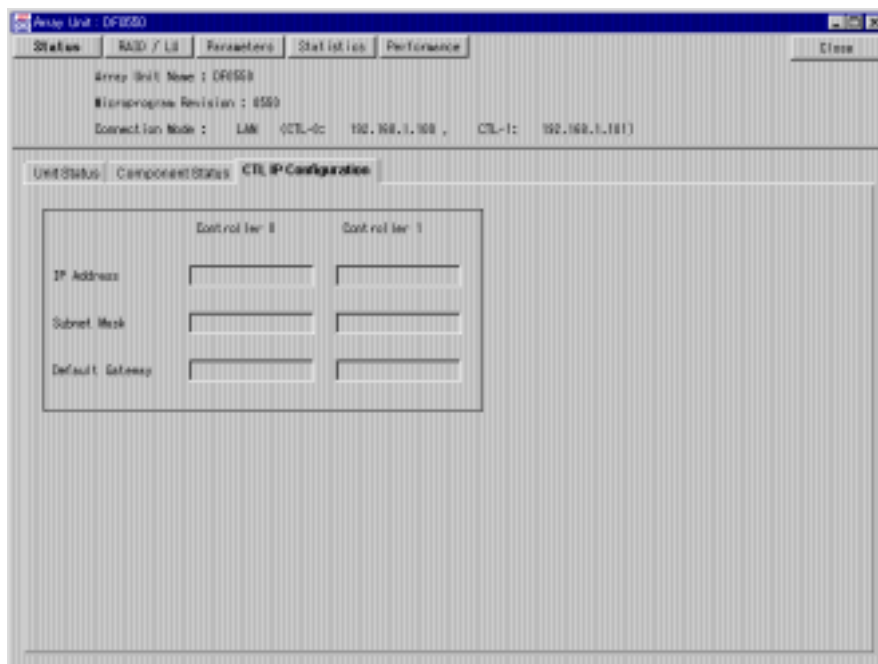
When the array unit is connected to the single system, the controller 1 side is not displayed. When a single controller is connected in the dual system, only the connected controller side is displayed.

3.3.3 Displaying the Array Unit LAN Configuration Information

To 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.



3.4 Definition of RAID/LU

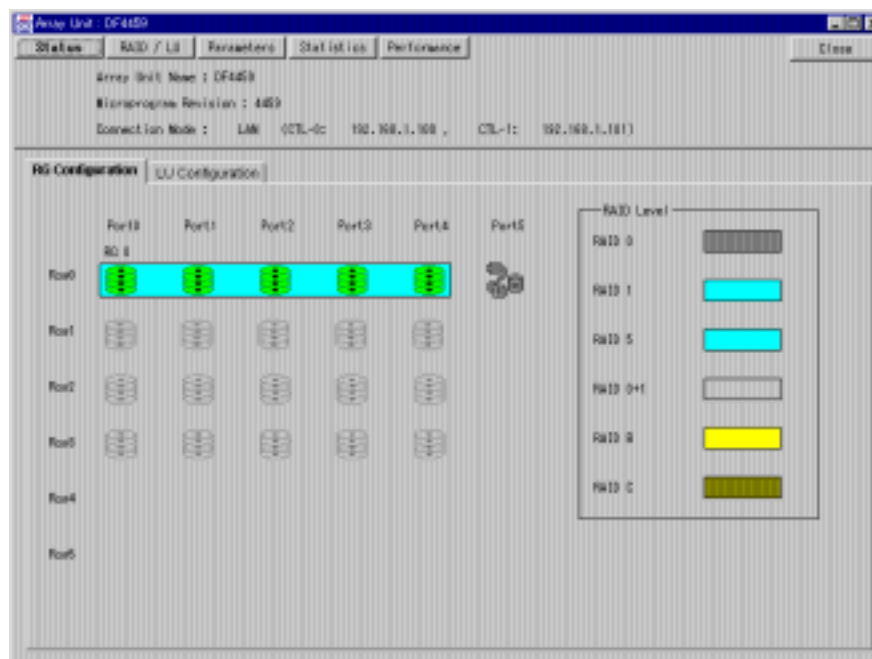
Creating, expanding and deleting the RAID group, and creating, expanding, and deleting etc. the logical unit are done from this window.

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

- Displaying the **RAID group definition**

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

a) For 5700E and 5800:



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. Defined RAID group Nos. are displayed at the upper left side of the object of the top disk drive in individual groups.

b) For 9200:



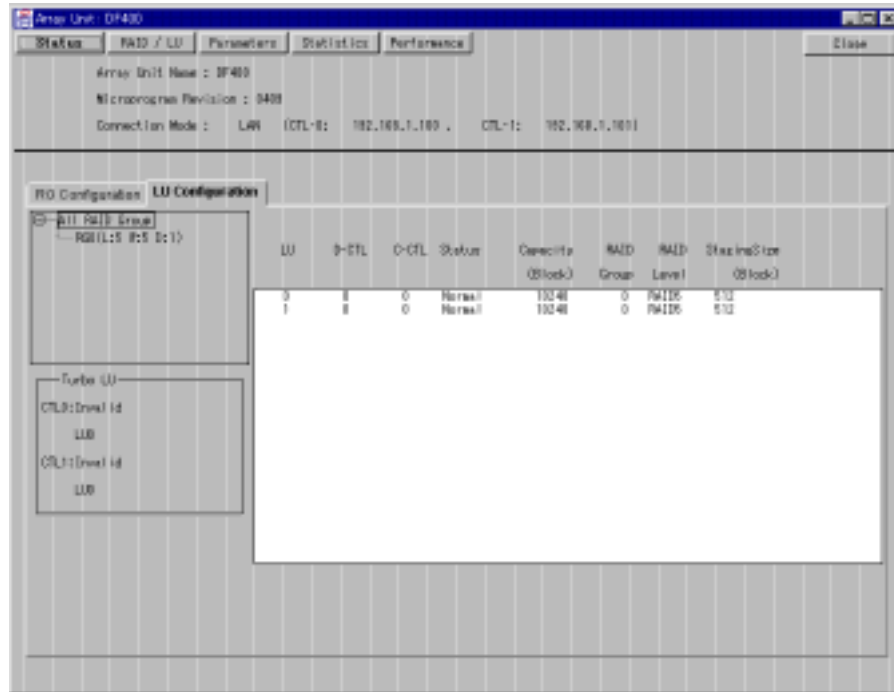
The drive mounting status of an array unit is displayed with the unit No. and HDU No.. Defined RAID groups are classified by RAID level and defined RAID group numbers are displayed with the left side of the first drive of the respective groups.

If a created RAID group spans between units (RAID group 1 in the figure above), the group is displayed with the outline box on the right side of the Unit0, HDU9 frame and the left side of the Unit1, both deleted.

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.



In the logical unit displays, select the contents to be displayed by selecting from the list of available RAID groups in the left 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 LU by default or definition.
- **C-CTL:** Controller No. in charge of the LU currently (may be different from D-CTL after an LU ownership change or modification through Resource Manager 9200 before reboot).
- **Status:** Logical unit status
- **Capacity:** Capacity in which the logical unit is defined (Unit : Block = 512 Bytes)
- **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 = 512 Bytes)

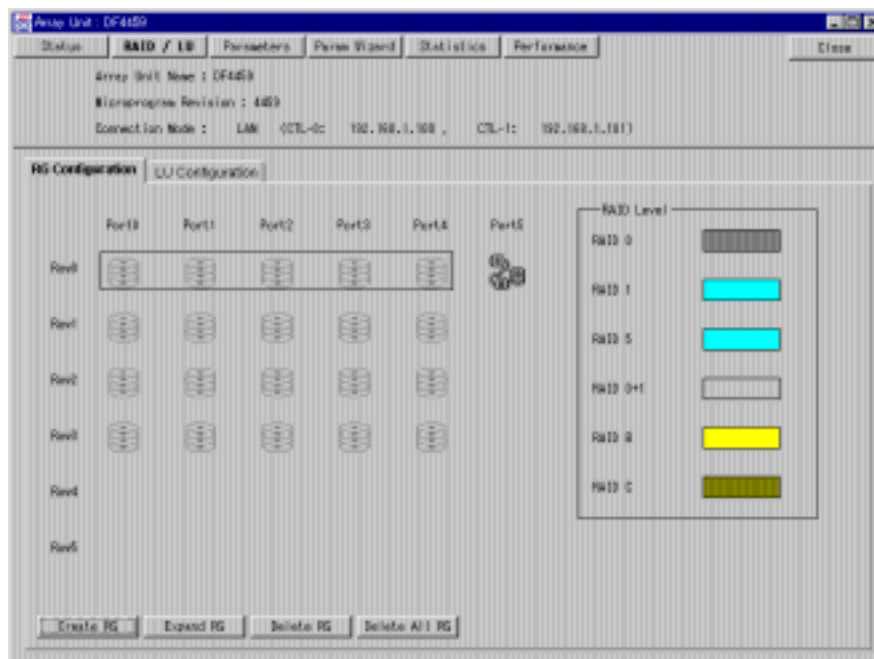
In the lower left part of the screen, the Turbo LU assignment information is displayed.

3.4.1 Creating a RAID Group

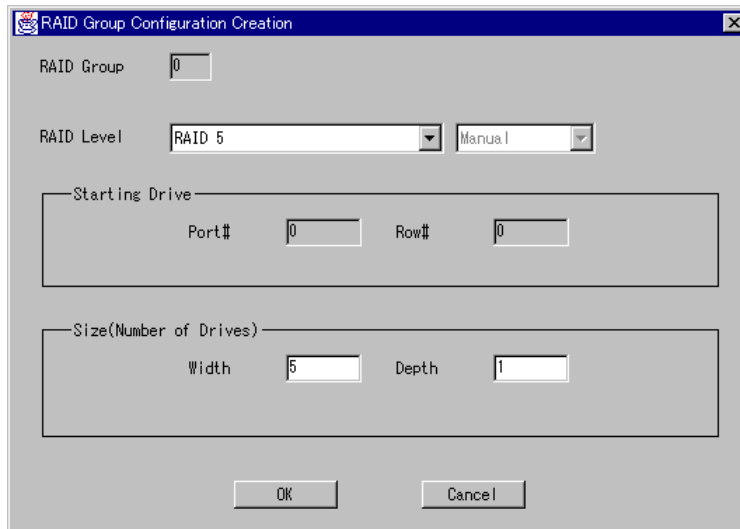
To create a new RAID group, read the following:

3.4.1.1 5700E and 5800

1. Click **RAID/LU** in the unit window, then click the **RG Configuration** tab.
2. Enclose all HDD to create a RAID group with a rectangle by dragging and click **Create RG**. The minimum and maximum number of HDUs in a RAID group depends on the RAID level.



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



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

- RAID Group:** A text box containing the value "0".
- RAID Level:** A dropdown menu currently showing "RAID 5".
- Manual:** A dropdown menu currently showing "Manual".
- Starting Drive:** A section containing two text boxes: "Port#" with the value "0" and "Row#" with the value "0".
- Size(Number of Drives):** A section containing two text boxes: "Width" with the value "5" and "Depth" with the value "1".
- Buttons:** "OK" and "Cancel" buttons at the bottom.

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

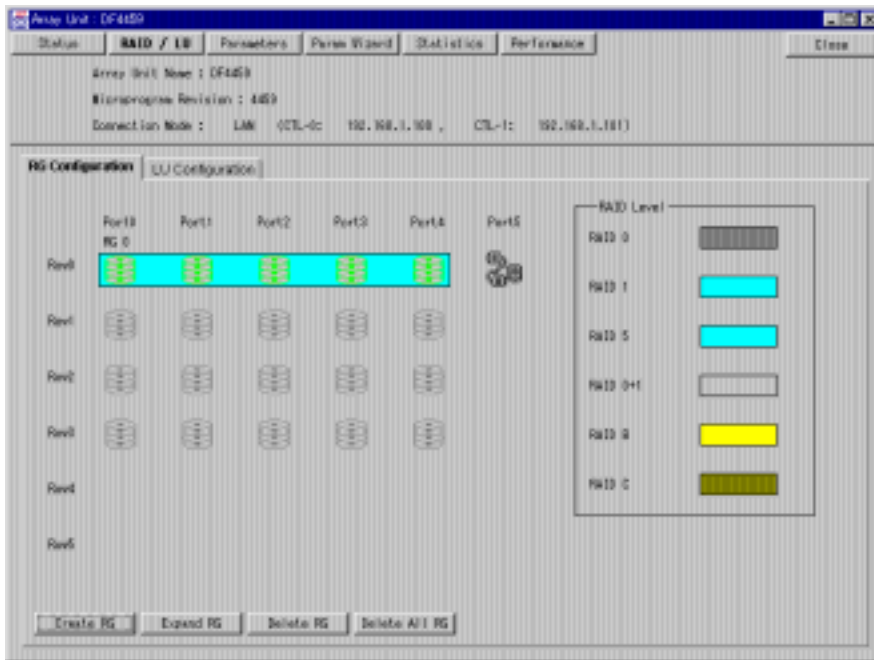
4. When a confirmation window of the RAID setting appears, click **OK**.



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

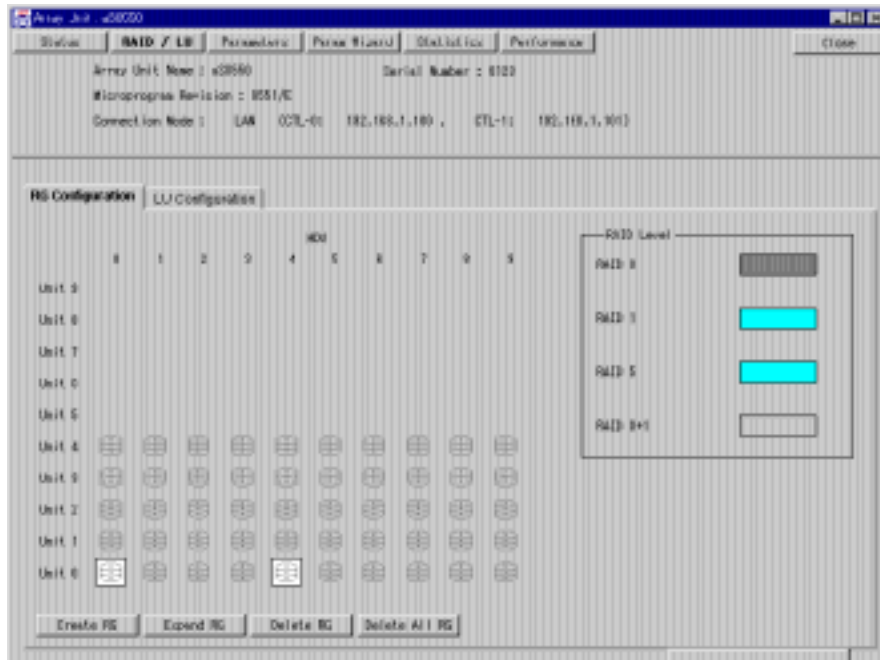
- Text:** "RAID group will be created. Are you sure ?"
- Buttons:** "OK" and "Cancel" buttons at the bottom.

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

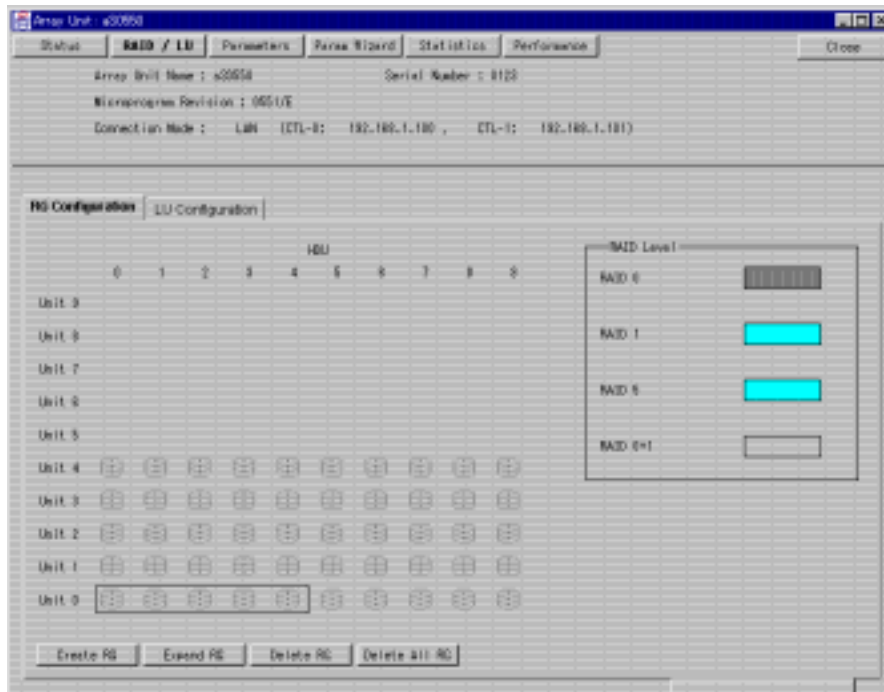


3.4.1.2 9200

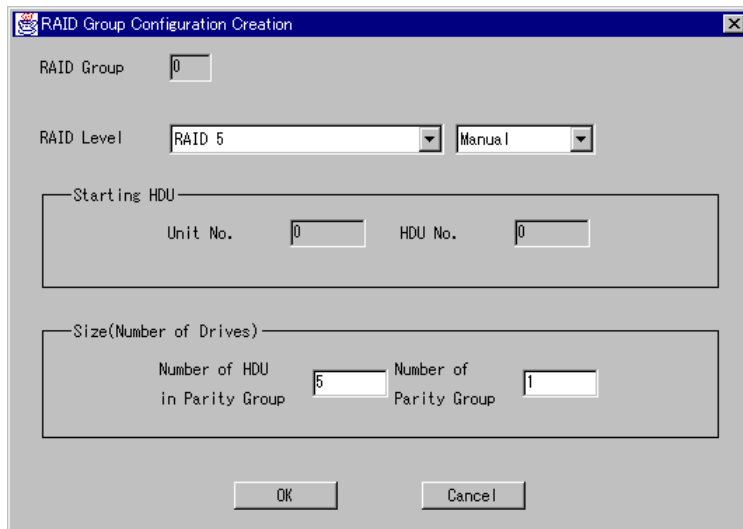
1. Click **RAID/LU** in the unit window, then click the **RG Configuration** tab.
2. Click the top HDU for the RAID group to be created. The HDU that is clicked is highlighted. Drag the pointer to the last HDU in the RAID Group.



3. Click the **Create RG** button.



4. Select the desired RAID level and click **OK**.

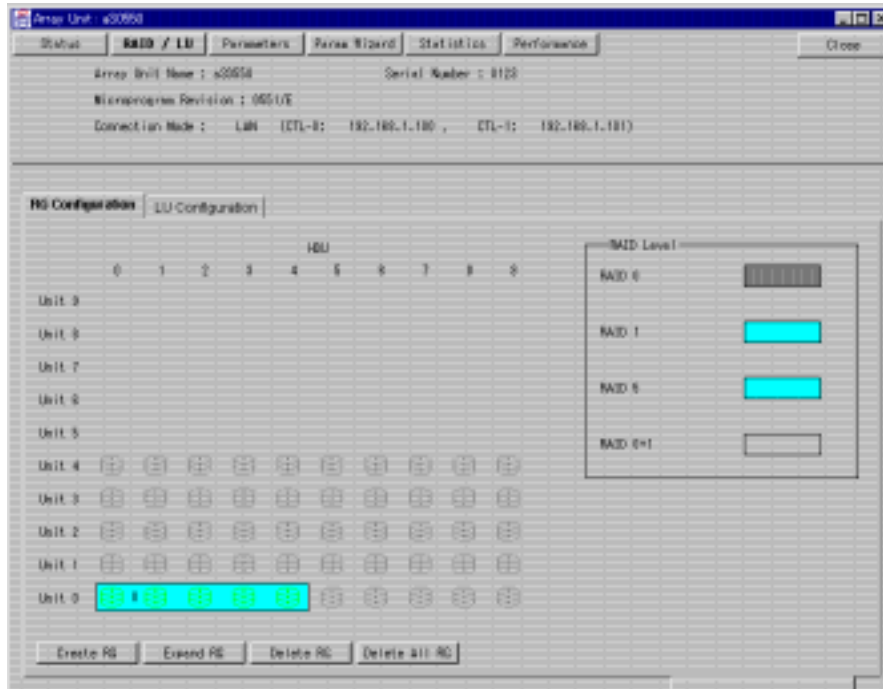


In the **RAID Group**, RAID group No. is set automatically in sequential order. In **Starting HDU** and **Size(Number of Drives)**, the system inserts the information from the click and drag operation.

The RAID level specifies RAID level 0, 1, 0+1, or 5, and in the drop-down menu next to it, possible HDU combinations for the specified level. If you select **Manual** as configuration specification, the size is automatically set so as to match with the specified level. If you specify a size optionally, please see table 7.1 for recommended combinations.

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

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



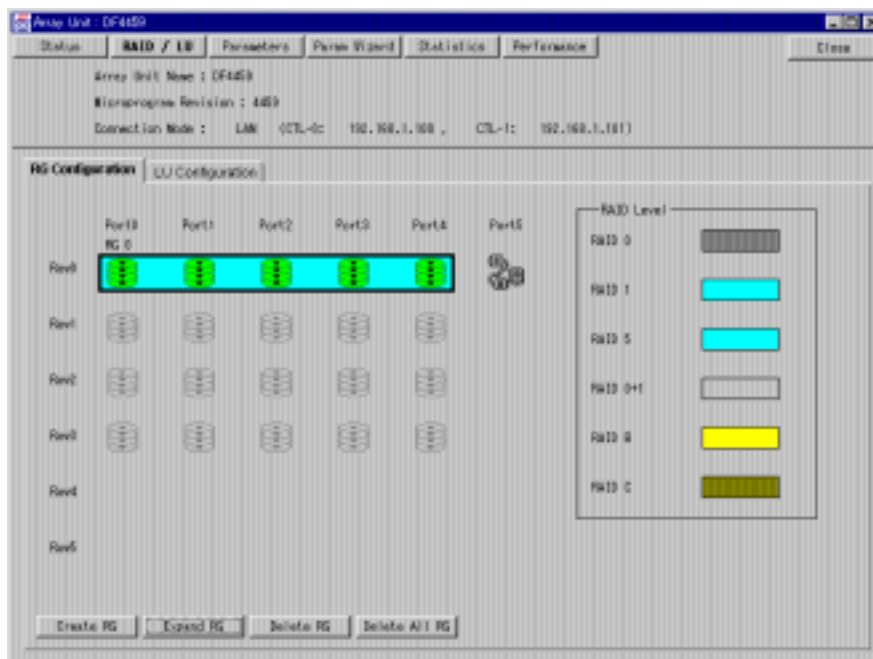
3.4.2 Expanding a RAID Group

To expand a set RAID group, read the following:

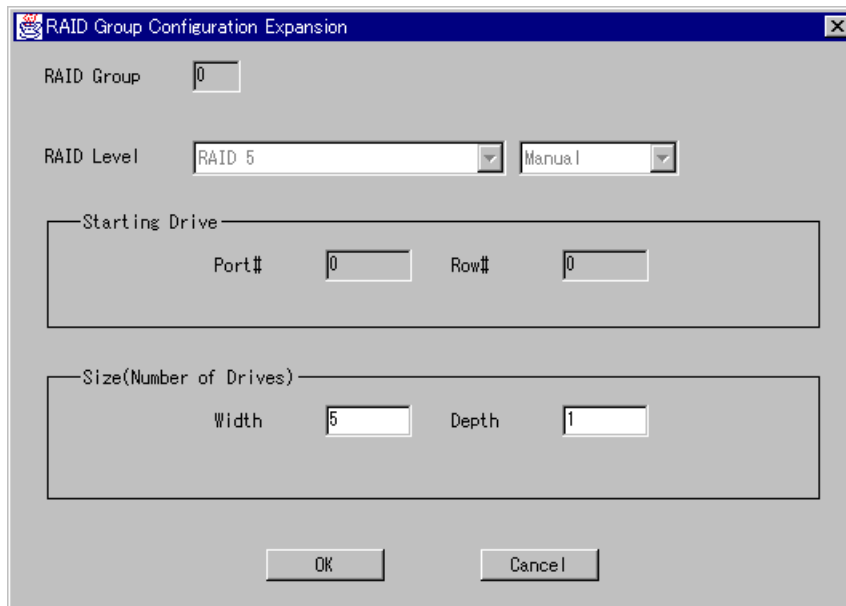
3.4.2.1 5700E and 5800

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 selected RAID group is highlighted.



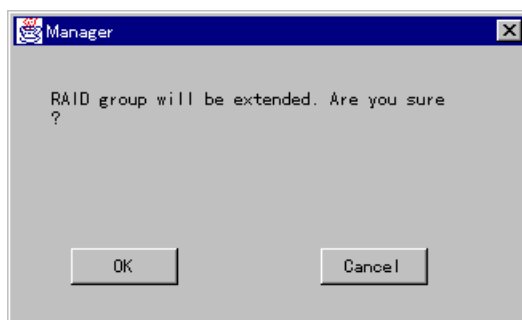
3. Specify the width and depth after expansion, then click **OK**.



The image shows a Windows-style dialog box titled "RAID Group Configuration Expansion". It contains several input fields and buttons. At the top, there is a "RAID Group" field with the value "0". Below it is a "RAID Level" section with a dropdown menu showing "RAID 5" and a "Manual" checkbox. The "Starting Drive" section contains "Port#" and "Row#" fields, both with the value "0". The "Size(Number of Drives)" section contains "Width" and "Depth" fields, with values "5" and "1" respectively. At the bottom are "OK" and "Cancel" buttons.

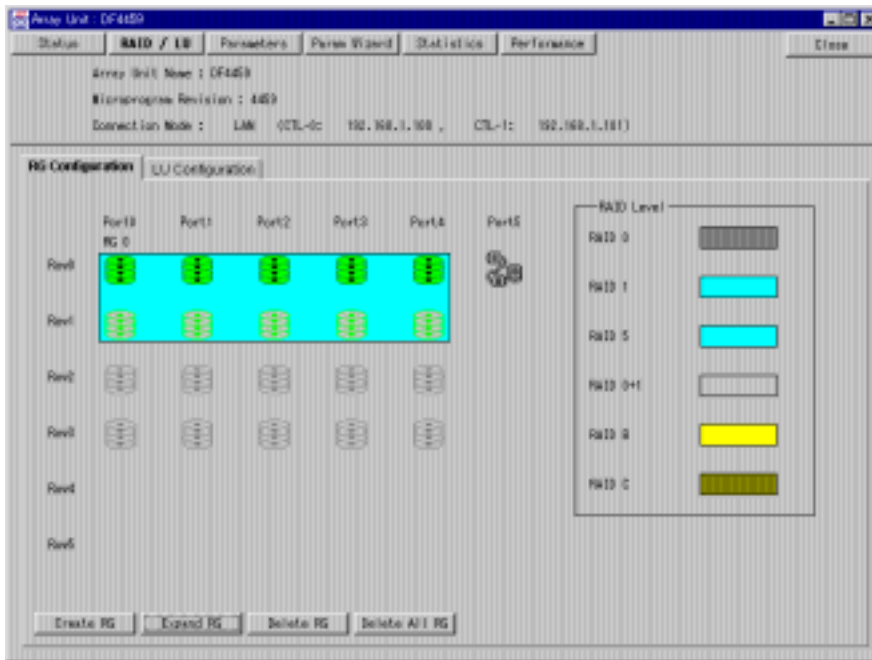
In **RAID Group**, the RAID group No. to be expanded is displayed. In **RAID Level**, the RAID level of RAID group to be expanded is displayed. In **Starting Drive**, the position of the RAID group to be expanded is displayed.

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



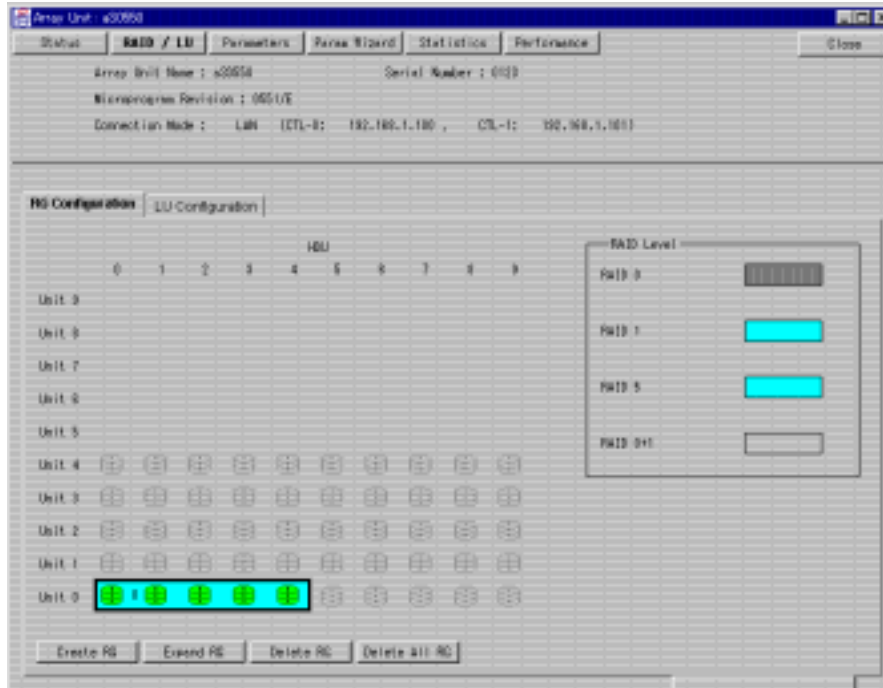
The image shows a small Windows-style dialog box titled "Manager". It contains a single line of text: "RAID group will be extended. Are you sure?". At the bottom are "OK" and "Cancel" buttons.

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

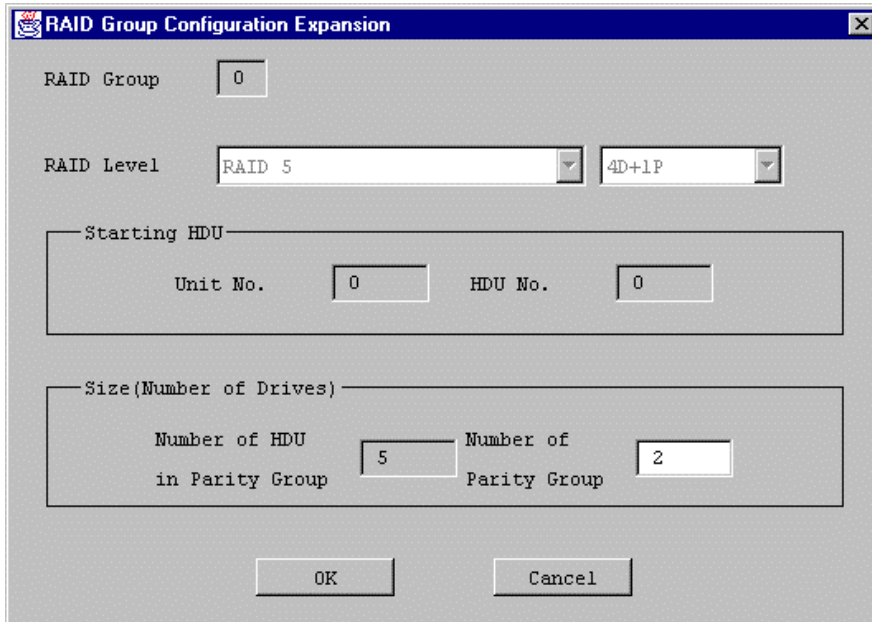


3.4.2.2 9200

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 selected RAID group is highlighted.



3. A RAID Group is expanded in increments of size equal to a parity group. The number of drives in a parity group cannot be changed. Specify the number of parity groups after expansion, and then click the **OK** button.



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

- RAID Group:** A text box containing the value "0".
- RAID Level:** Two dropdown menus. The first is set to "RAID 5" and the second is set to "4D+1P".
- Starting HDU:** A section containing two text boxes: "Unit No." with the value "0" and "HDU No." with the value "0".
- Size (Number of Drives):** A section containing two text boxes: "Number of HDU in Parity Group" with the value "5" and "Number of Parity Group" with the value "2".
- Buttons:** "OK" and "Cancel" buttons at the bottom.

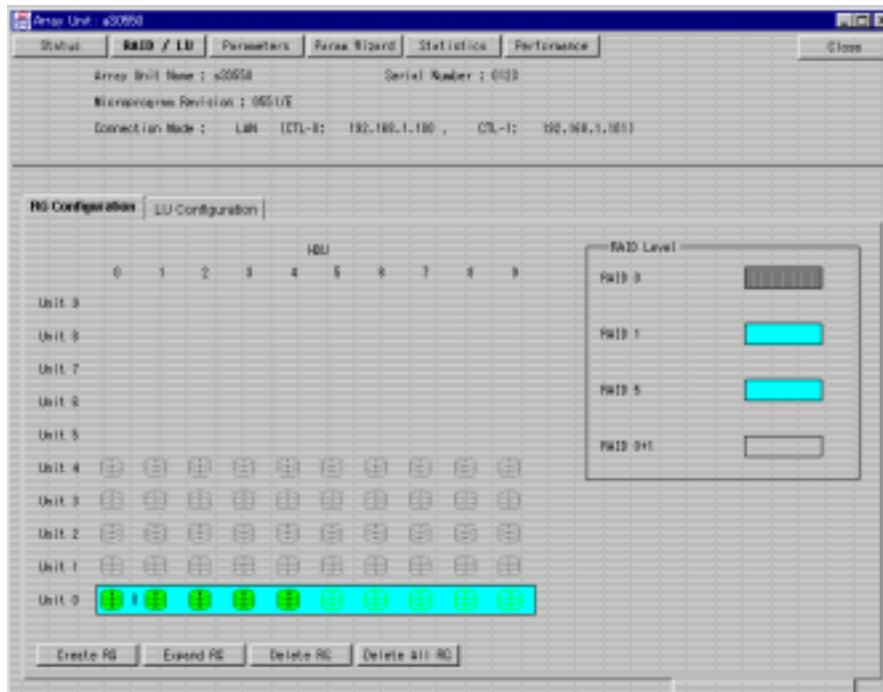
4. When a confirmation window of RAID expansion appears, click **OK**.



The dialog box is 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.

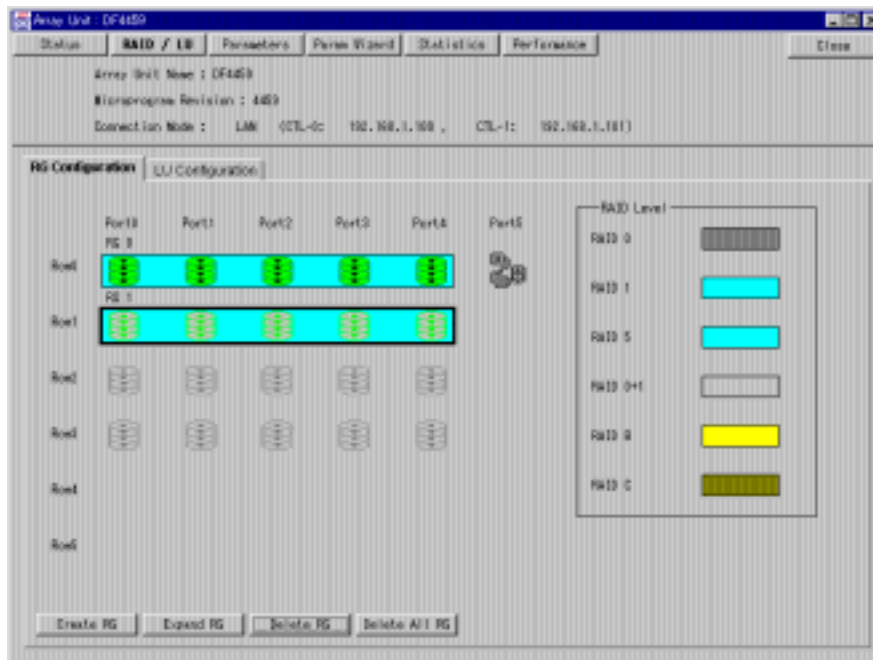
5. The expanded RAID group is updated and then the window is displayed.



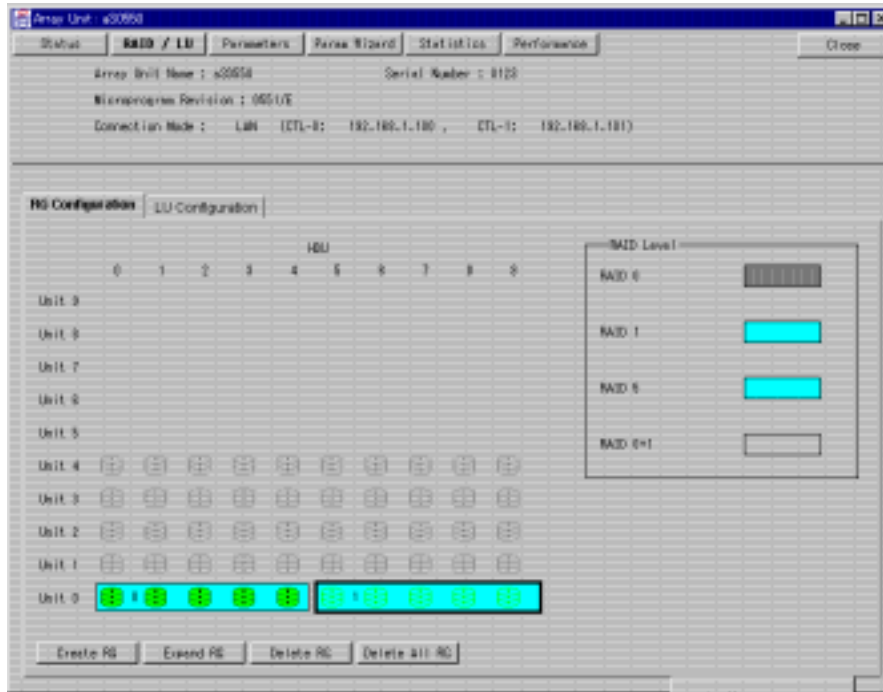
3.4.3 Deleting a Specified RAID Group

To 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 5700E and 5800:



b) For 9200:

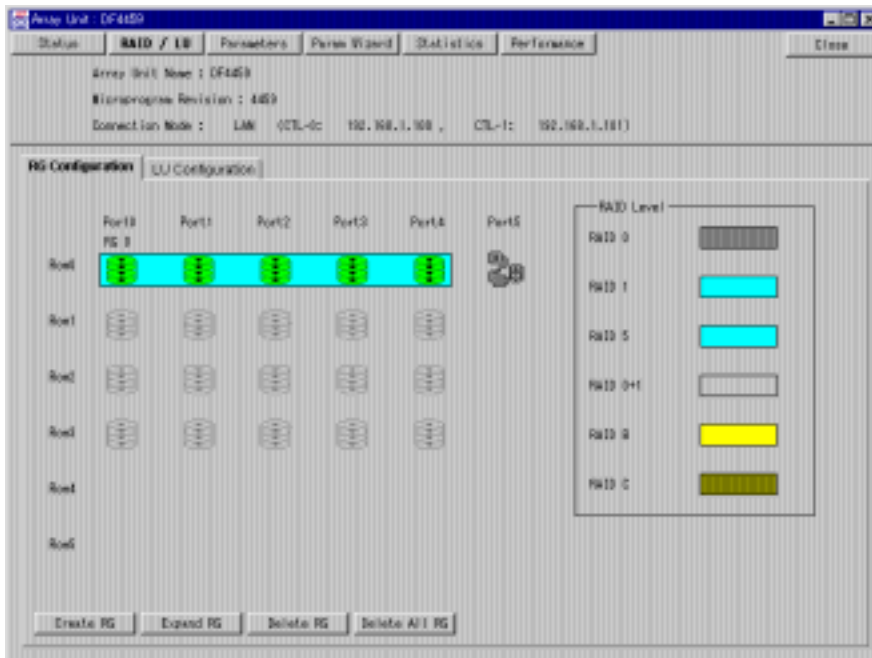


3. When a confirmation message appears, click **OK**.

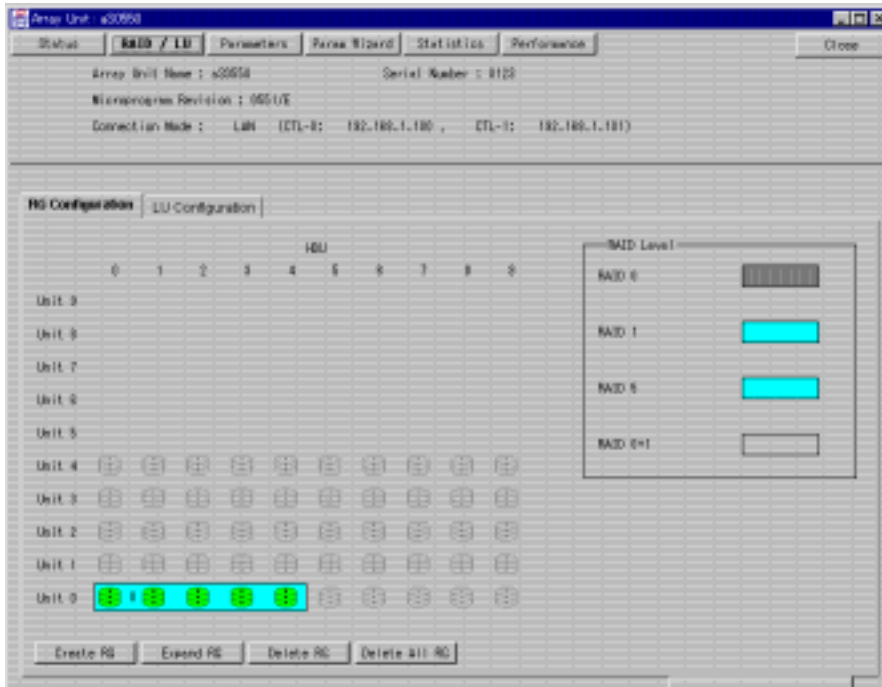


Note: If an LU is defined in the specified RAID group, this RAID group cannot be deleted. To delete the specified RAID group, first delete all the LUs in the specified RAID group.

4. The deleted RAID group is updated and then the window is displayed.
 - a) For 5700E and 5800:



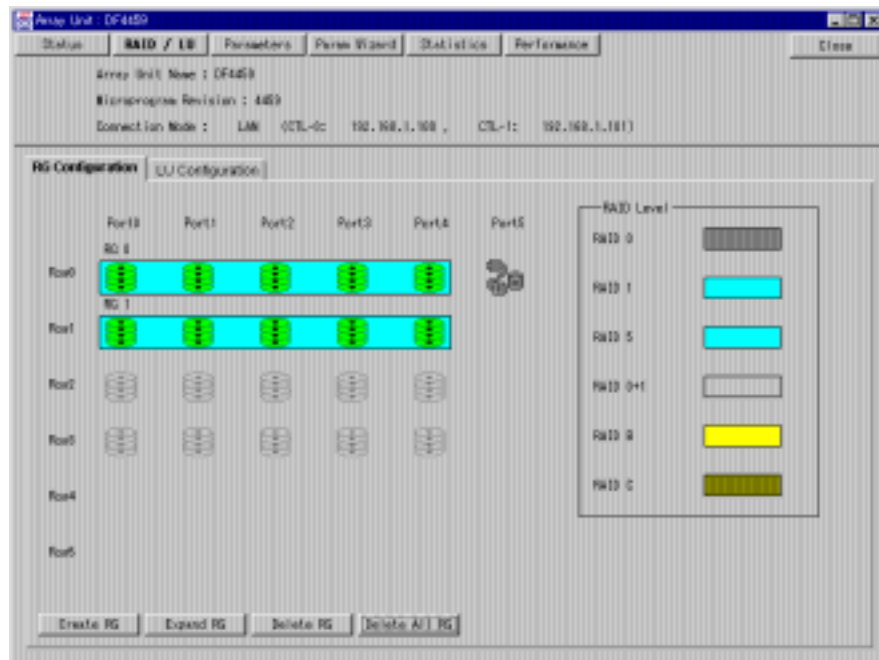
- b) For 9200:



3.4.4 Deleting All RAID Groups

To 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 5700E and 5800:



Array Unit: a30050

Status **RAID / LU** Parameters Array Wizard Statistics Performance

Close

Array Unit Name : a30050 Serial Number : 8120

Microprogram Revision : 0051/E

Connection Mode : LBN (CTL-0: 192.168.1.180 , CTL-1: 192.168.1.181)

RAID Configuration LU Configuration

RAID Level

RAID 0

RAID 1

RAID 5

RAID 6+1

Unit 0 1 2 3 4 5 6 7 8 9

Unit 0

Unit 9

Unit 7

Unit 6

Unit 5

Unit 4

Unit 3

Unit 2

Unit 1

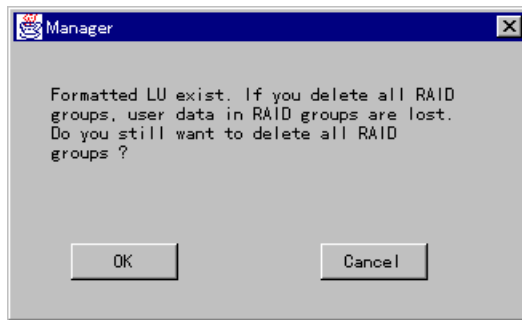
Unit 0

Create RS Expand RS Delete RS Delete All RS

a) When there is no formatted LU in the RAID group



- b) When there are any formatted LUs in the RAID group:



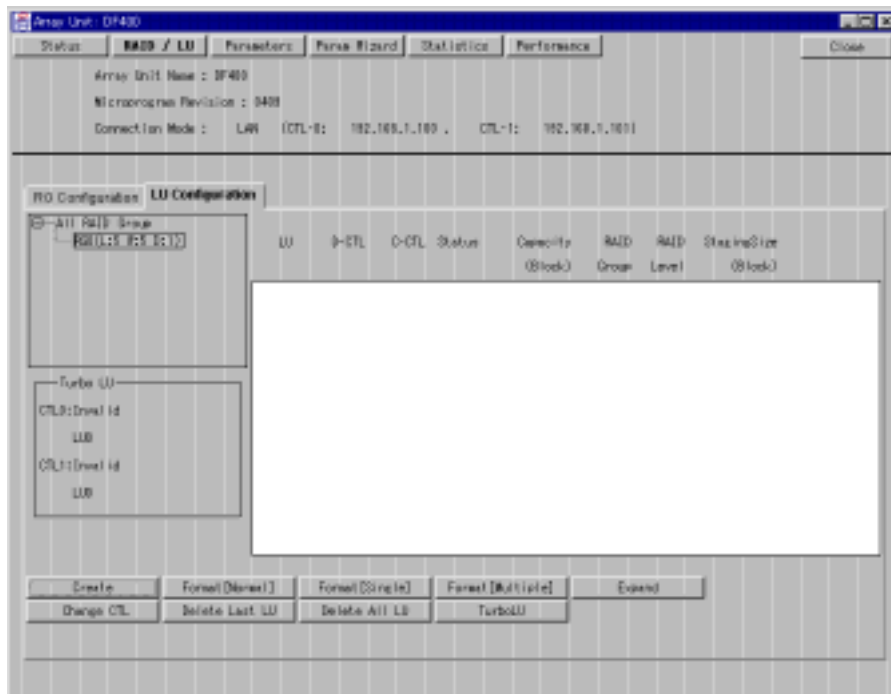
Note: All the user data in the LU will be destroyed by deleting the RAID group.

4. The deleted RAID group is updated and the window is displayed. The Array Unit Configuration contains no RG and LU.

3.4.5 Constituting a Logical Unit

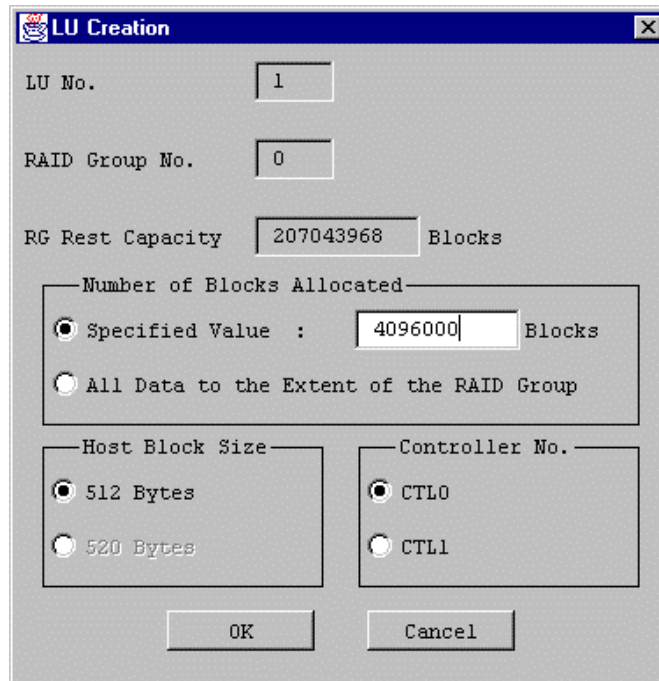
To create an LU in a RAID Group:

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. Enter **Number of Block** and select a controller in charge in **Controller No.**.

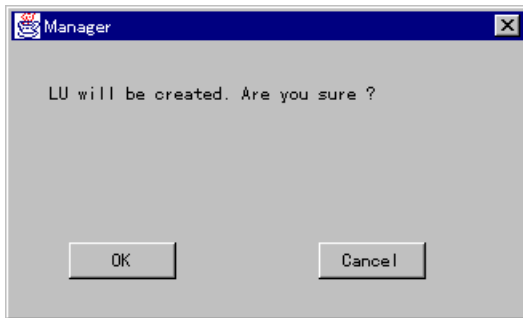
The image shows a 'LU Creation' dialog box with a blue title bar. It contains several input fields and radio button options. The 'LU No.' field has the value '1'. The 'RAID Group No.' field has the value '0'. The 'RG Rest Capacity' field shows '207043968' followed by the text 'Blocks'. Below this is a section titled 'Number of Blocks Allocated' containing two radio button options: 'Specified Value' (selected) with a text field containing '4096000' and the word 'Blocks', and 'All Data to the Extent of the RAID Group'. Below this is another section with two sub-sections: 'Host Block Size' with radio buttons for '512 Bytes' (selected) and '520 Bytes', and 'Controller No.' with radio buttons for 'CTL0' (selected) and 'CTL1'. At the bottom are 'OK' and 'Cancel' buttons.

A sequential number is assigned to the new LU. If the 9200 is connected, the remaining capacity in the RAID Group is displayed.

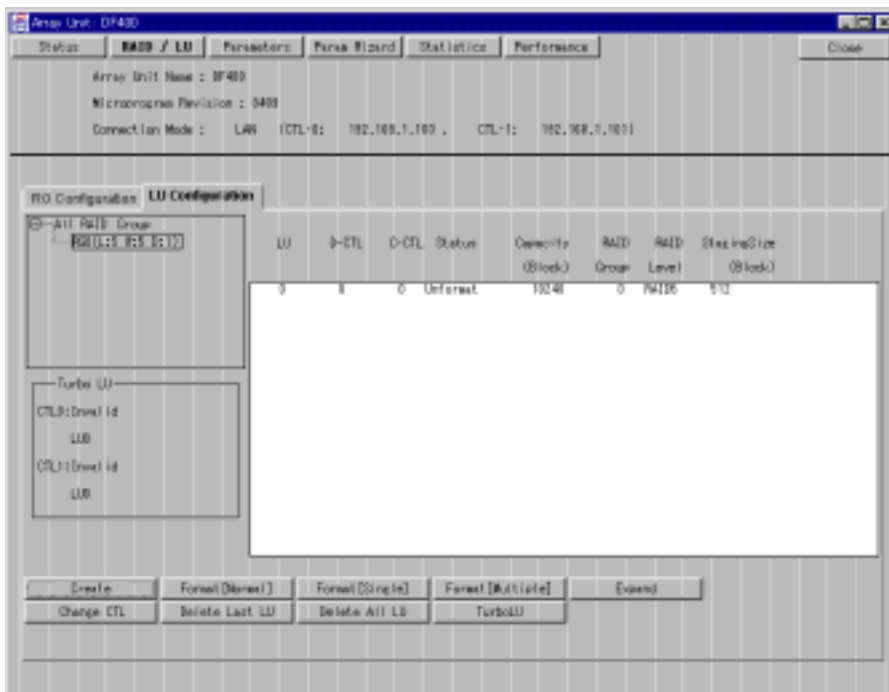
- Specifying the **Number of Blocks Allocated**:
 - a) Click the **Specified Value** option button and enter the allocation (number of blocks in 512 Bytes) in an integer number for the desired LU size.
 - b) To allocate all the remaining amount of the corresponding RAID group, click the **All Data to the Extent of the RAID Group** option button.
- Specifying the **Controller No.**
 - a) Click the option button of **CTL0** or **CTL1** to select the controller in charge of the LU. This is necessary for a dual system connection. It is not displayed for a single system connection.

Note: When a dual active mode is selected in the dual system, a controller in charge of an LU must be specified. All LUs in a RAID Group should be controlled by the same controller.

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.

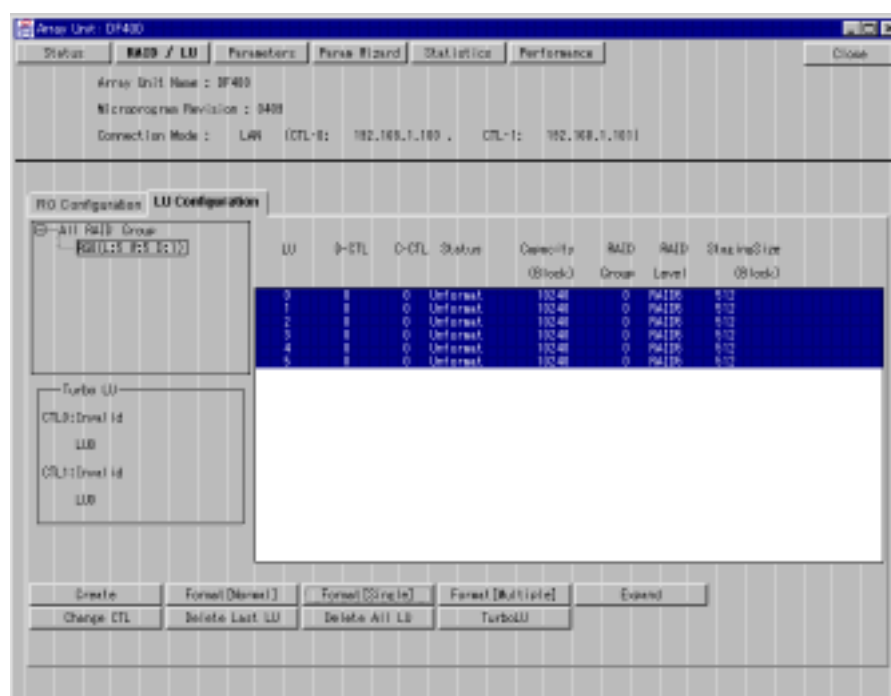


Controller No. at LU creation specifies the default controller in charge of an LU. After LU creation, **C-CTL** is the same as the default controller current in charge of an LU. However, when LU switching is performed, **C-CTL** is not the same.

3.4.6 Formatting a Logical Unit

To 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 (%).

Formatting multiple LUs from different RAID groups reduces the time required 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.

While formatting more than one LU, a host command might terminate 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)**.

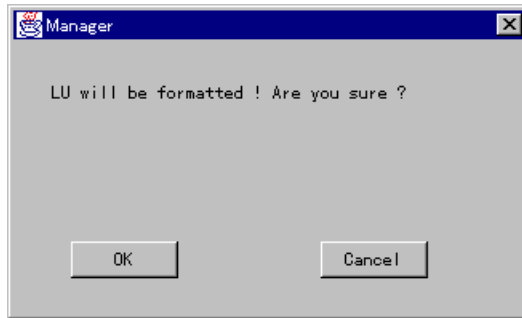
Formatting mode varies depending the controller configuration and connection from Resource Manager 9200 to the array unit. See the following table.

No.	LU formatting mode	Resource Manager 9200 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 Resource Manager 9200 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 Resource Manager 9200 is selected. Format (Multiple) is selected and only an LU currently controlled by the controller connected with the Resource Manager 9200 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 Resource Manager 9200 is selected. Two or more LUs are selected in Format (Multiple) .

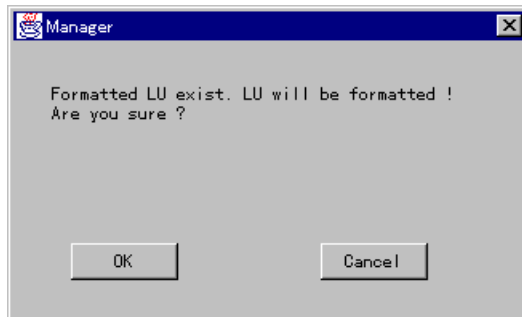
Note: The formatting may be interrupted if a host is rebooting, or is doing an I/O path switching. It is therefore best to format LUs when no host activity occurs.

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.

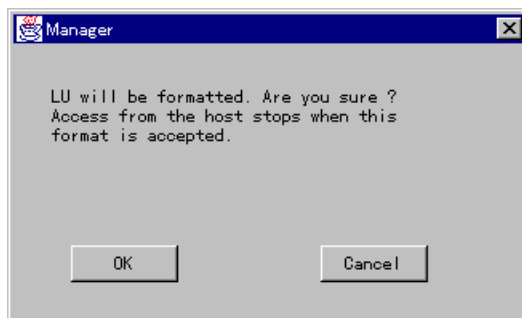
a) When no formatted LU exists



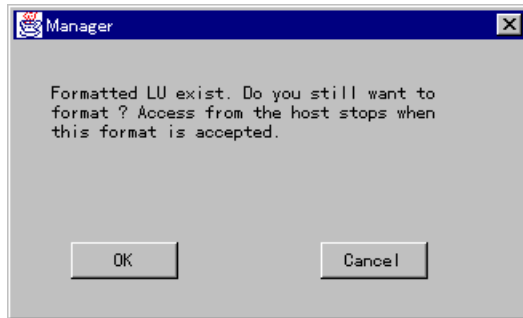
b) When one or more formatted LUs exist



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



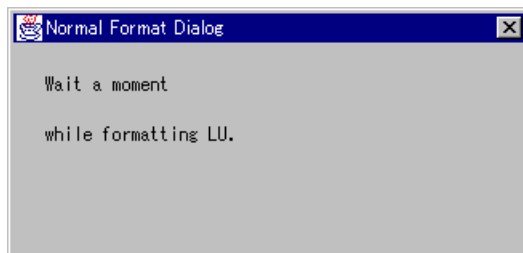
- d) When two or more LUs are specified in **Format (Multiple)** and one or more formatted LUs exist:



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**.

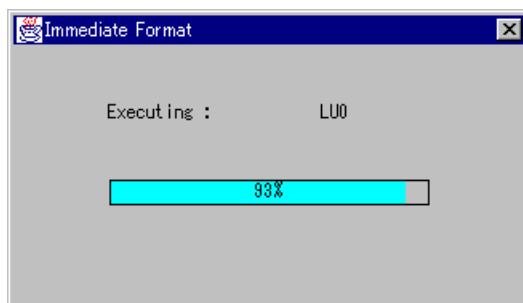
3. When formatting starts, a message is displayed indicating that formatting is in progress.
- a) When **Format (Normal)** is specified:

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



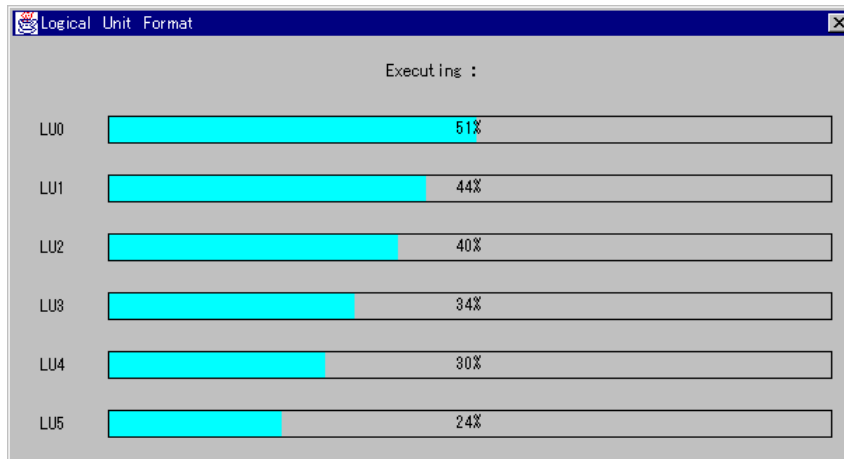
- b) When **Format (Single)** is specified:

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.



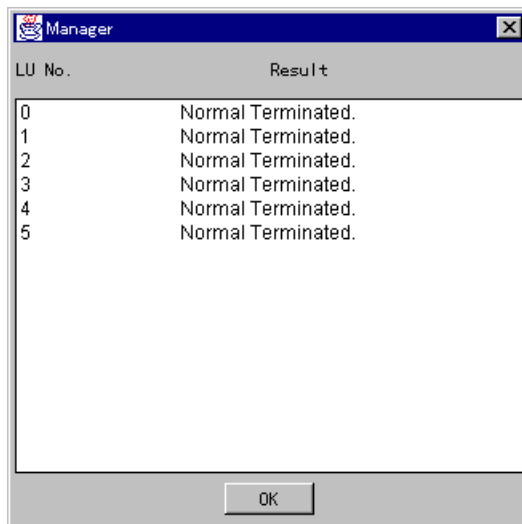
- c) When **Format (Multiple)** is specified:

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.



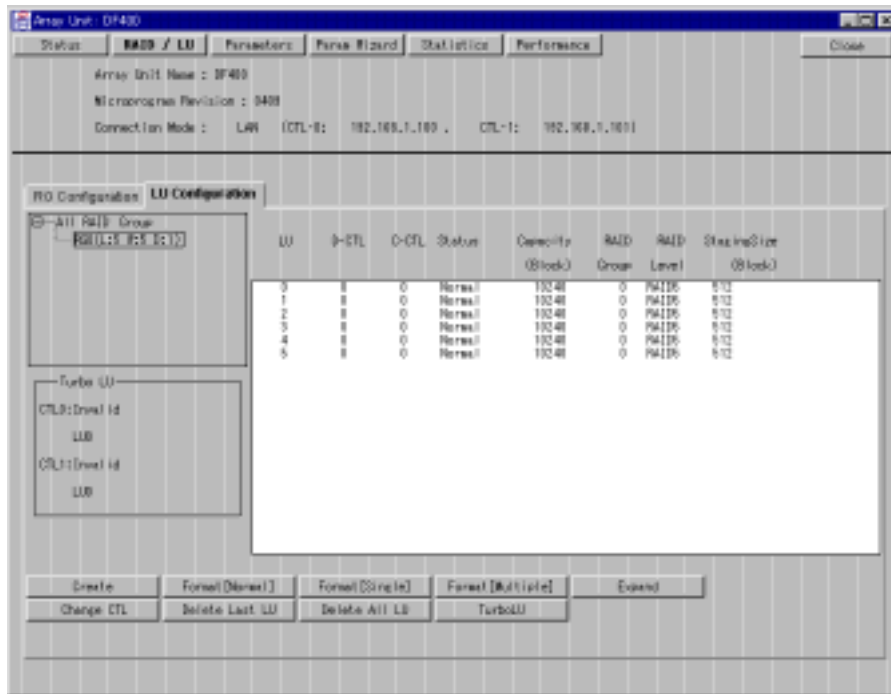
When multiple LUs are specified, up to 6 LUs are formatted in the order starting with the smallest LU number and the progress of the formatting is displayed. After one LU is formatted, the next LU is formatted and the progress of the formatting is displayed.

4. When a message is displayed, indicating that the specified LU has been formatted, click **OK**.
5. 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.



3.4.6.1 Error Conditions During LU Formatting

If an LU format operation fails, follow the procedure provided in Table 3.1.

Table 3.1 Interpretation of “Logical Unit Format Results” Window

No.	Result of LU formatting	“Result” column	
1	Succeeded	Normal Terminated	
2	Failed (xx-xxxx)	Abnormal end	# CHK CONDITION
	<div style="display: flex; justify-content: space-around;"> <div>Sense key</div> <div>Sense code</div> </div> Failure of a FORMAT UNIT command		* 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.

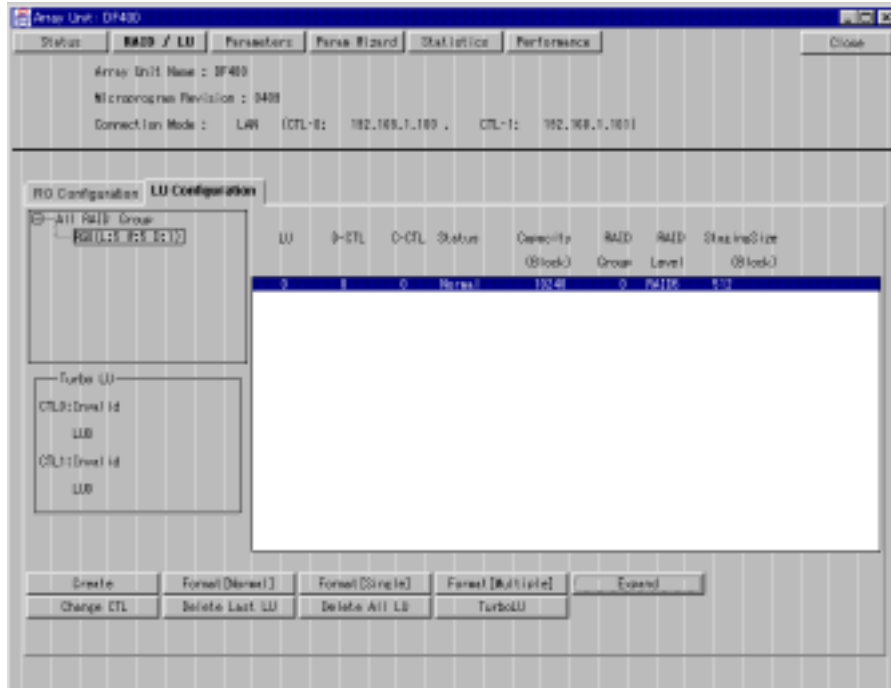
When “Abnormal end” is displayed in the “Result” column, a sense key and a sense code are displayed.

- 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 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 Resource Manager 9200 and array unit) which disables the progress state indication window to be displayed. The LU formatting is continued nevertheless.

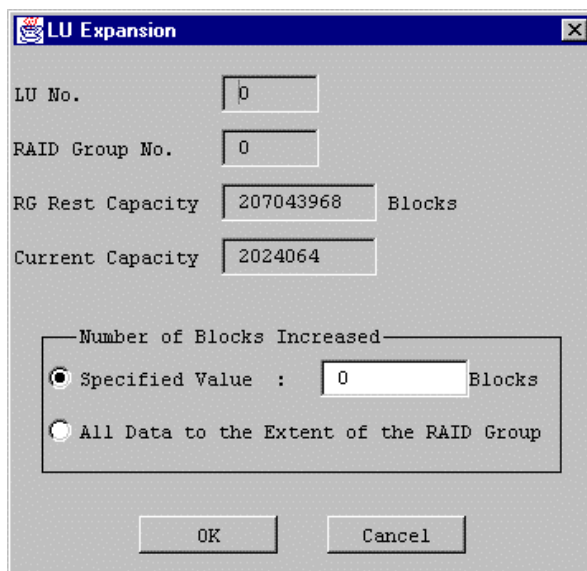
3.4.7 Expanding a Logical Unit

The last LU in a RAID group can be expanded. **Caution:** Existing data in the LU will be destroyed.

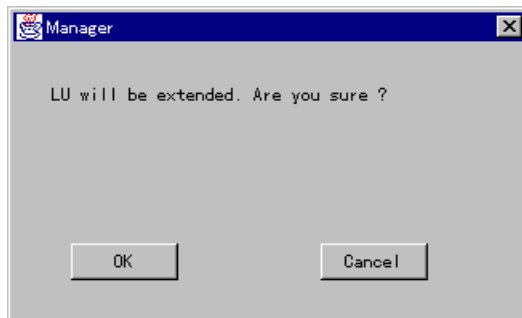
1. Click **RAID/LU** in the unit window, then click the **LU Configuration** tab.



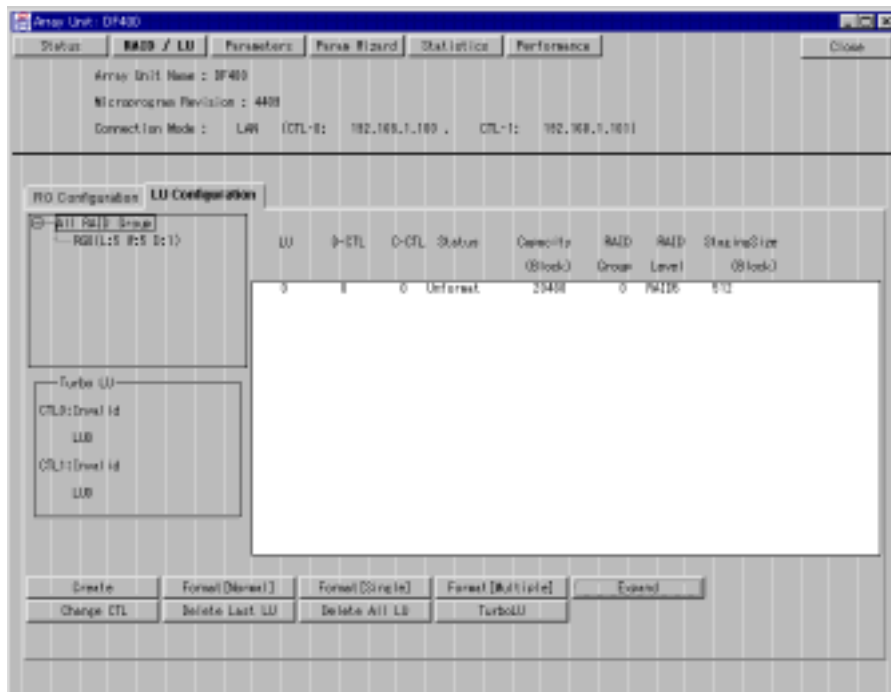
2. Click the last LU in the RAID group, then click **Expand**.



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 integer 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**.



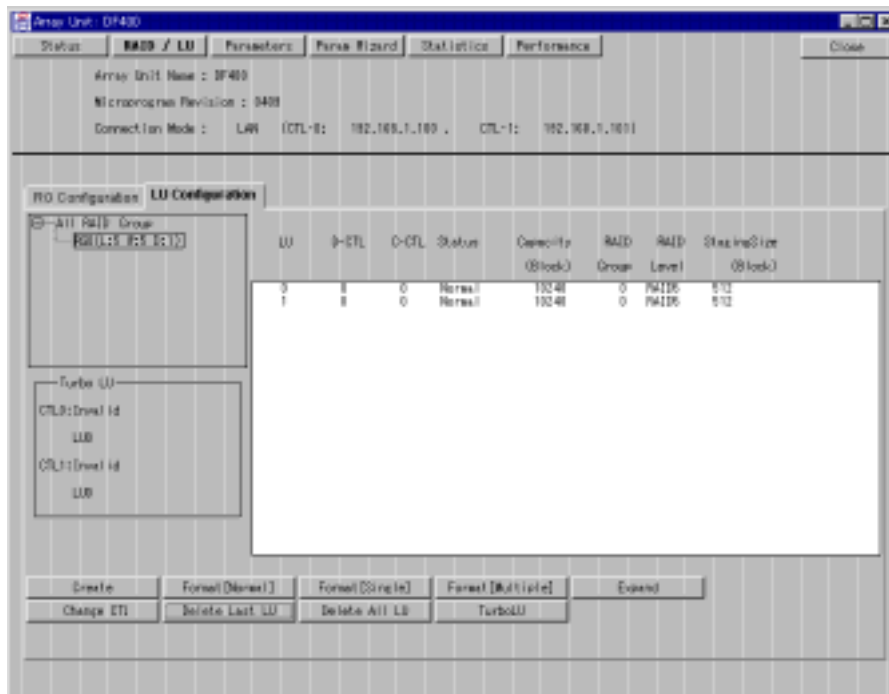
6. The expanded LU information is updated and the window is displayed. The expanded LU will have to be formatted. Existing data will be destroyed.



3.4.8 Deleting the Last Logical Unit

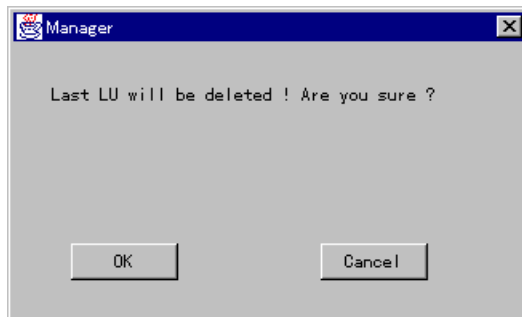
To delete the last LU, read the following:

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

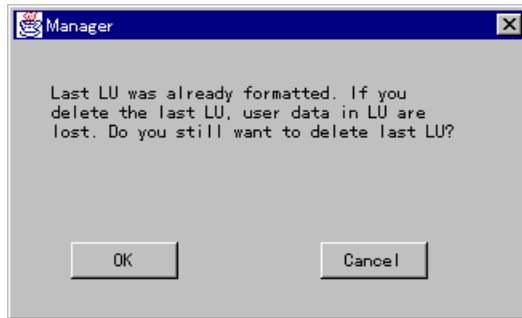


2. Click **Delete Last LU**.

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

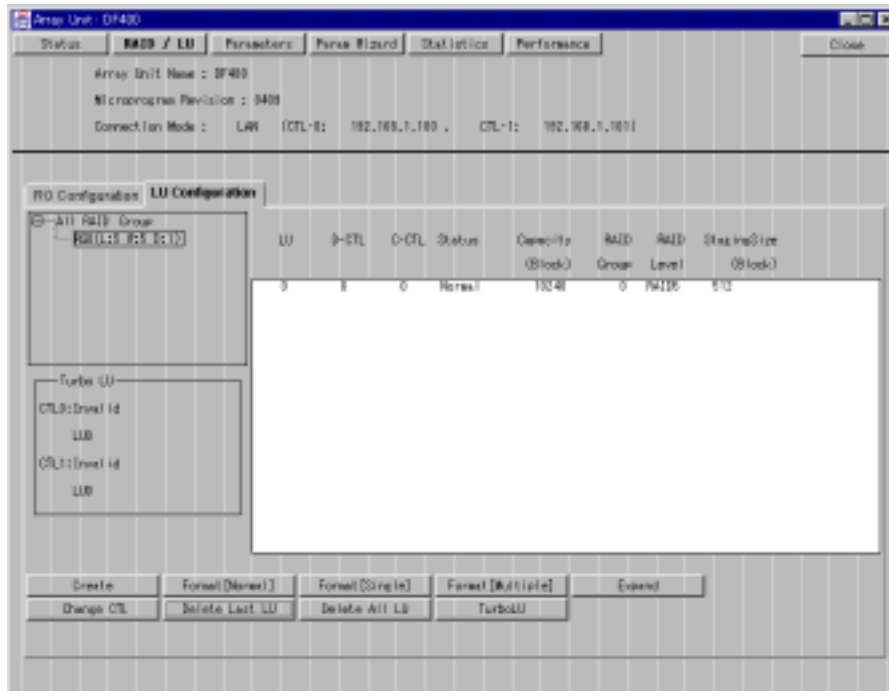


- b) When any formatted LU exists:



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

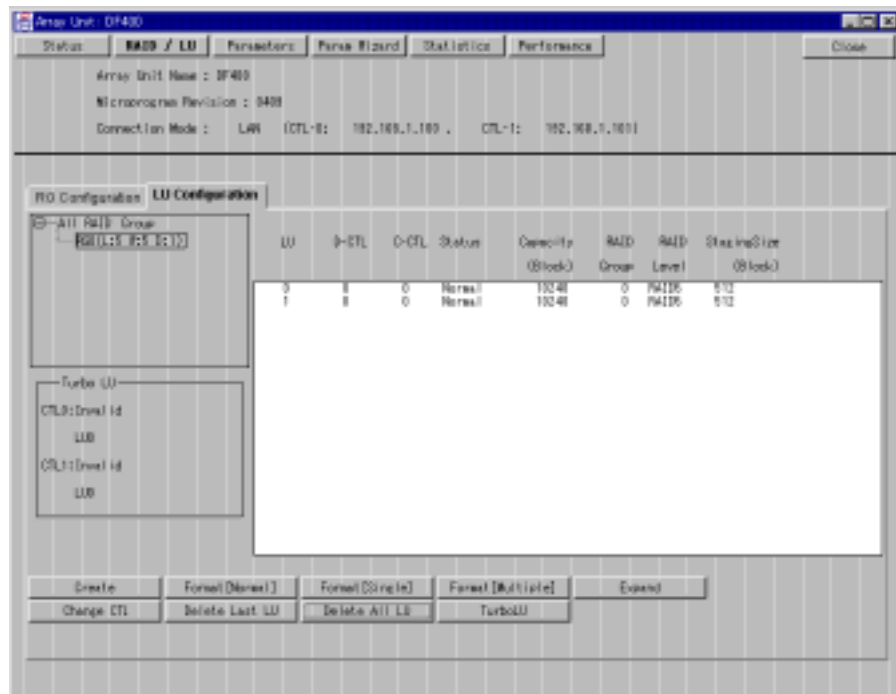
4. The LU information in which the last LU has been deleted is updated and the window is displayed.



3.4.9 Deleting All Logical Units

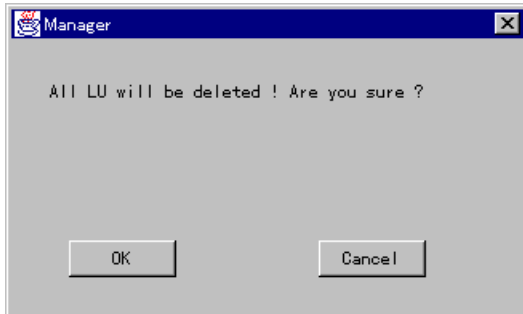
To delete all logical units, read the following:

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

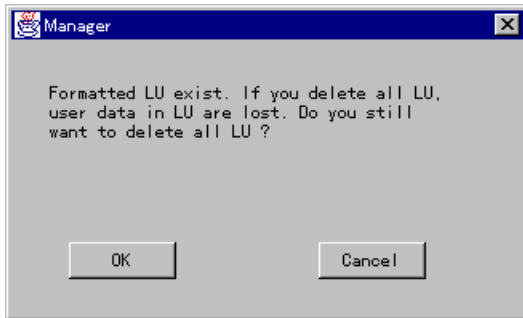


2. Click **Delete All LU**.

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

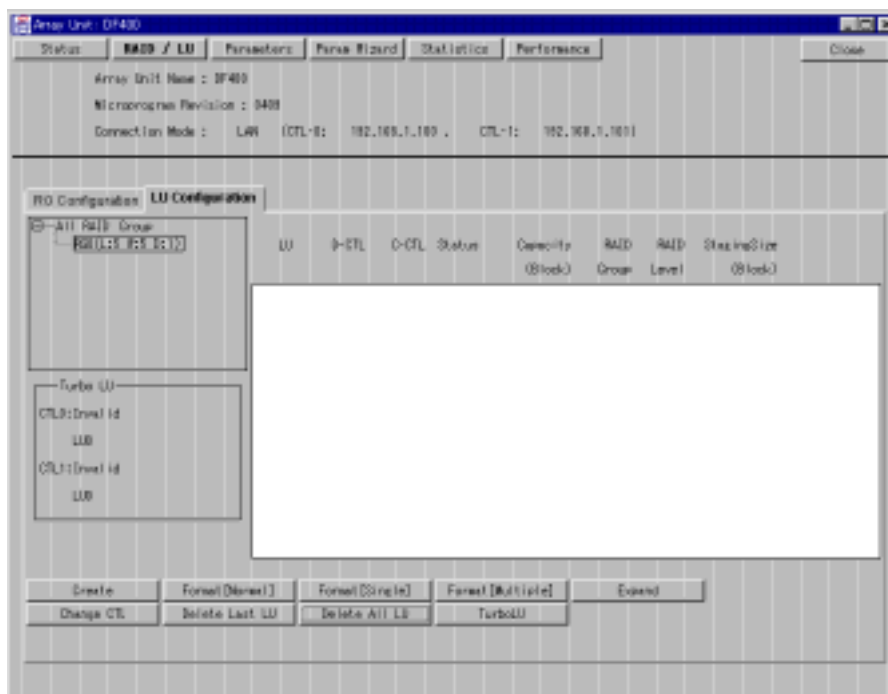


- b) When any formatted LU exists:



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

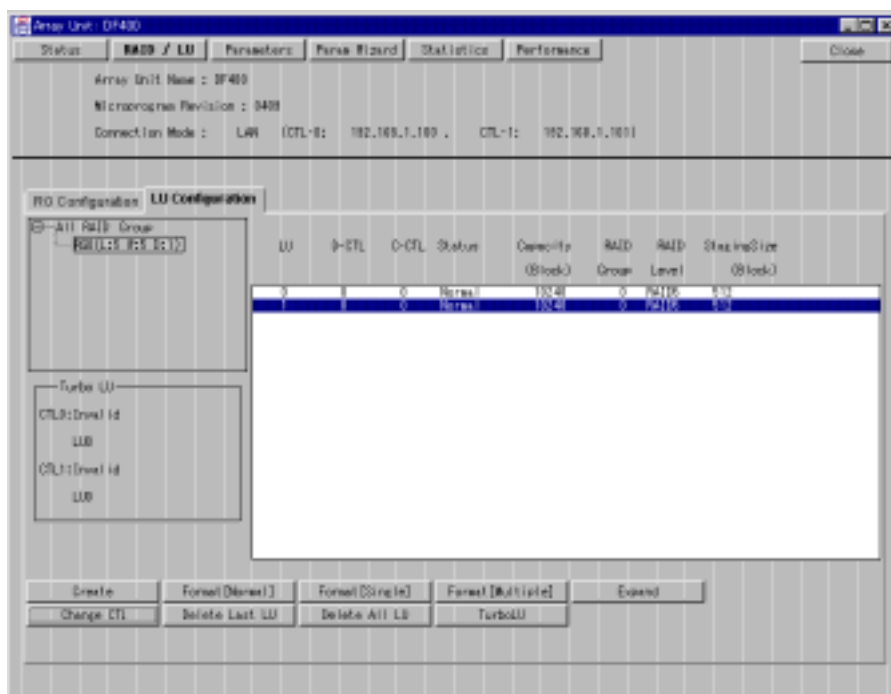
- The LU information in which all the LUs have been deleted is updated and the window is displayed.



3.4.10 Changing the Default Controller in Charge of an LU

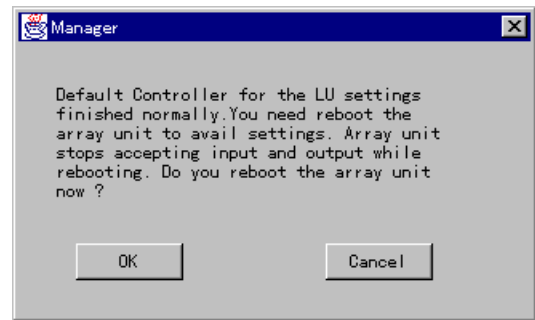
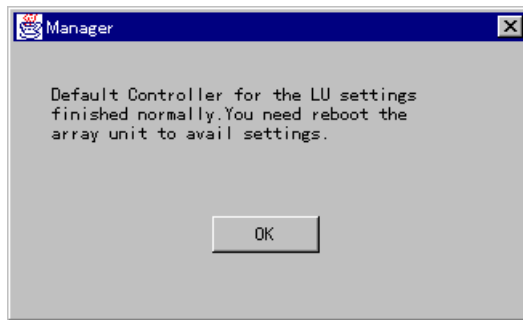
The LU ownership can be changed from one controller to the other. **Caution:** This requires a reboot of the array unit.

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



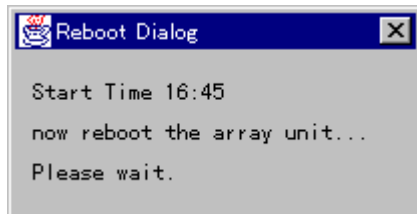
2. Select the LU for which you want to switch the default controller in charge and the click **Change CTL**.

3. A message indicating that the default controller to which an LU is connected has been changed. If an array unit supports rebooting, a confirmation message indicating a request for rebooting is displayed. Click the **OK** button to reboot.
 - If an array unit does not support rebooting (5800):
 - If an array unit supports rebooting (9200):



Note: To validate the set-up default controller of an LU, reboot the array unit. The previous setting stays valid until rebooting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

- a) When you choose to reboot the array unit, the time the reboot began is displayed. Rebooting takes approximately two to six minutes.

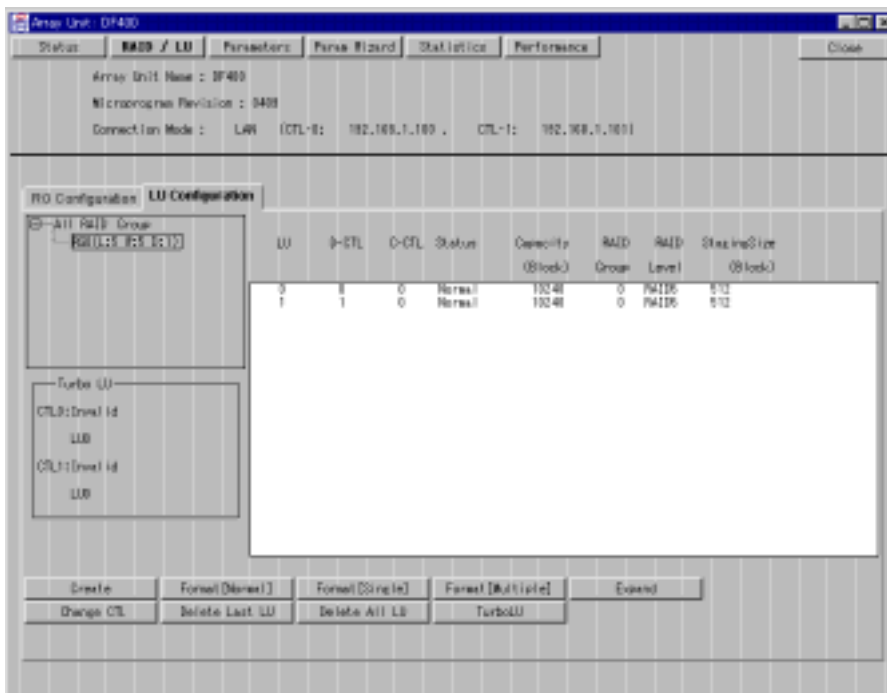


Note: It may take up to six minutes for an array unit to respond, depending on the configuration of the array unit.

- b) A message appears, stating that the reboot has terminated. Click the OK button; the unit window closes. To perform other operations on the main window, select an array unit from the main window and open the selected unit.



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

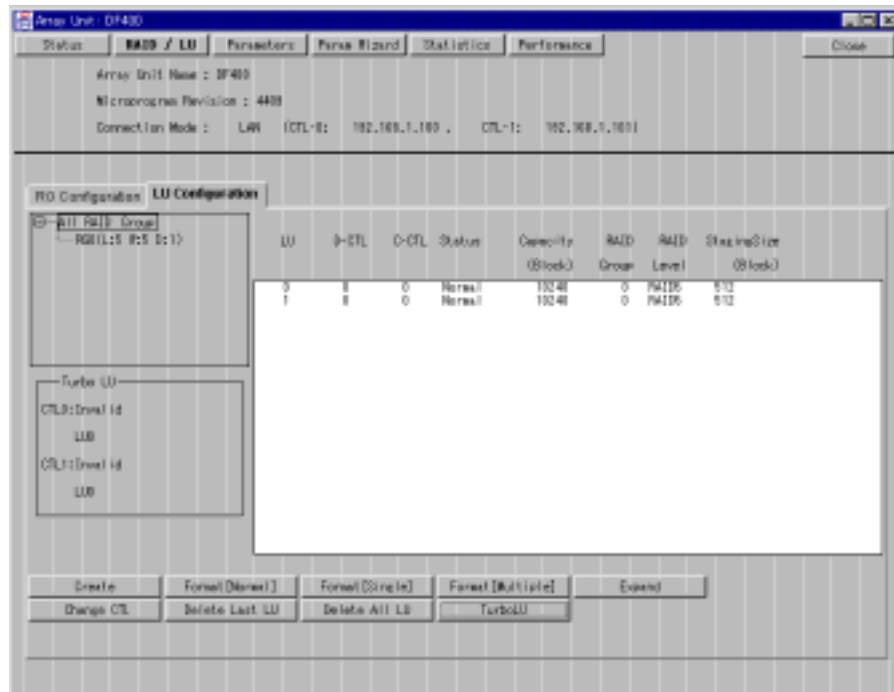


Note: Switching the default controller owning the LU changes the default controller currently displayed. When the switching is executed twice, the specified controller is changed to the original default controller controlling the LU.

3.4.11 Setting Turbo LU

This function sets an LU to be resident in the cache. Optional software must be installed to enable this function. Setting this requires a reboot of the array unit.

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**.

The screenshot shows a window titled "Turbo LU" with a close button in the top right corner. The window is divided into two main sections: "Current Configuration" and "Reserved Configuration".

Current Configuration:

- Controller 0:**
 - Turbo LU Assignment: Disable
 - TurboLU: 0
 - Turbo LU Status: Invalid
- Controller 1:**
 - Turbo LU Assignment: Disable
 - TurboLU: 0
 - Turbo LU Status: Invalid

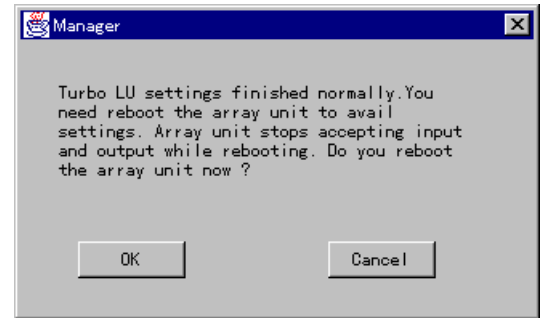
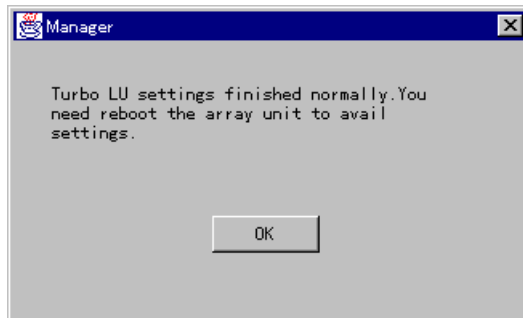
Reserved Configuration:

- Controller 0:**
 - Turbo LU Assignment: Radio buttons for ON (unselected) and OFF (selected).
 - TurboLU: 0
- Controller 1:**
 - Turbo LU Assignment: Radio buttons for ON (unselected) and OFF (selected).
 - TurboLU: 0

Buttons for "OK" and "Cancel" are located in the top right corner of the window.

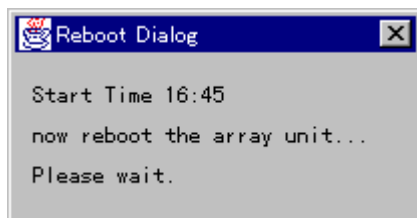
- **Current Configuration:** Indicates the currently set configuration.
 - **Turbo LU Assignment:** Setting status of whether to validate or invalidate the Turbo LU function.
 - Enable:** Valid
 - Disable:** Invalid
 - **Turbo LU:** Turbo LU number
 - **Turbo LU Status:** Status of the Turbo LU.
This 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 rebooting, a confirmation message indicating a request for rebooting is displayed. Click the **OK** button to reboot.
- If an array unit does not support rebooting:
 - If an array unit supports rebooting:



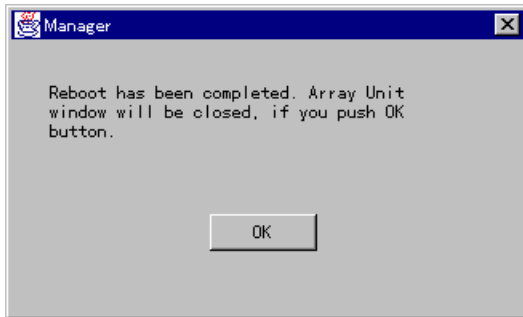
Note: To validate the set-up default controller of an LU, reboot the array unit. The previous setting stays valid until rebooting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

- a) When you choose to reboot the array unit, the time the reboot began is displayed. Rebooting takes approximately two to six minutes.



Note: It may take time for an array unit to respond, depending on the configuration of the array unit.

- b) A message appears, stating that the reboot has terminated. Click the **OK** button; the unit window closes. To perform other operations on the main window, select an array unit from the main window and open the selected unit.



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 using Parameter Wizard

Set the system parameters of the array unit in the wizard format. **Caution:** This requires rebooting the array unit.

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 Resource Manager 9200 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 Resource Manager 9200.

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	DF 400		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	DF 400		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	○	○	×	×
	SGI 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	DF 400		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	×	×	×	○
	SGI 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	×	×	×	○
	SGI 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	DF 400		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 5700E or 5800 connection, and screen displayed by each selection is shown in Table 3.4 for 9200 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 5700E, 5800 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 9200 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

For the **Standard Setup**, the window with a heading **System Parameter** is displayed. For 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 5800: 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 5800: 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 5800: DF400-00C0 (default value) For the 9200: DF500-00C0 (default value)	

d) When the array unit is used in the Microsoft Windows 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 9200: Reset/LIP Mode (Signal) Reset/LIP Mode (Process) LIP Port All Reset Mode	10

e) When the host uses the Veritas 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 5800: DF400-C000 (default value) For the 9200: DF500-C000 (default value)	

f) When the host uses Sun OS Solaris 2.5.1 (August, 1997 or later) (5800):

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 5800)

When the port type is normal:

No.	Setting item	Set value	No. of windows displayed
1	Option 2	SGI 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	SGI mode	

- j) When the array unit is used in the Port ID taking over mode (in the fibre channel connection of 5800):

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 9200 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 9200, the screen for connection with 5800 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 5700E or 5800, click the button **All Port**, and specify the host connection mode in the array unit.

For 9200, 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.

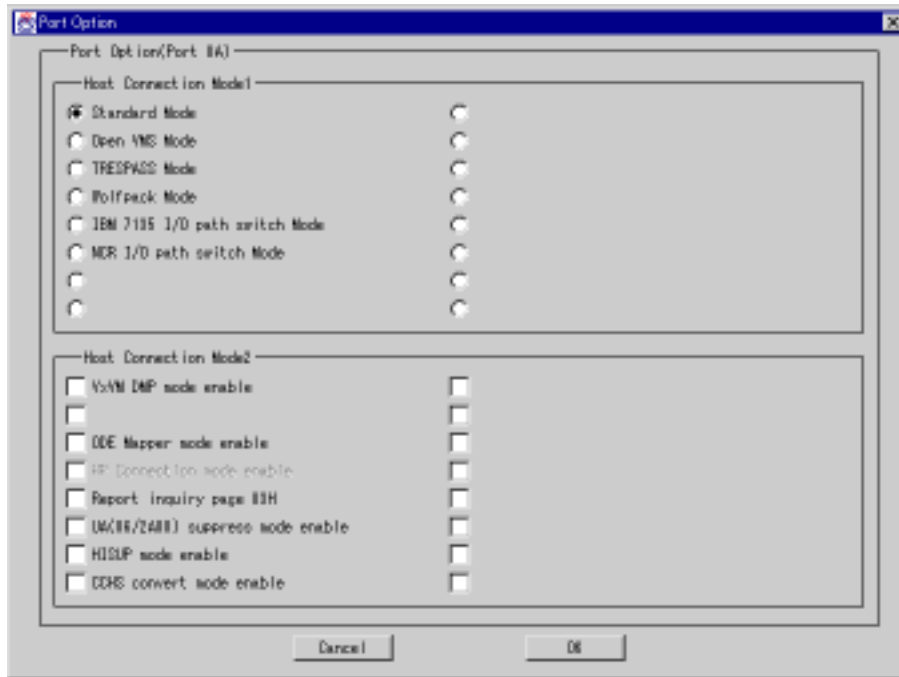
Note 1: When the 5700E or the 5800 is connected, to change to **SCSI ID/Port ID Take-over Mode**, do so when the Target ID's of controller 0 and controller 1 are set to be the same. It cannot be changed when the settings of the Target ID's are different.

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, change to **SCSI ID/Port ID Take-over Mode**.

When the 9200 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, 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

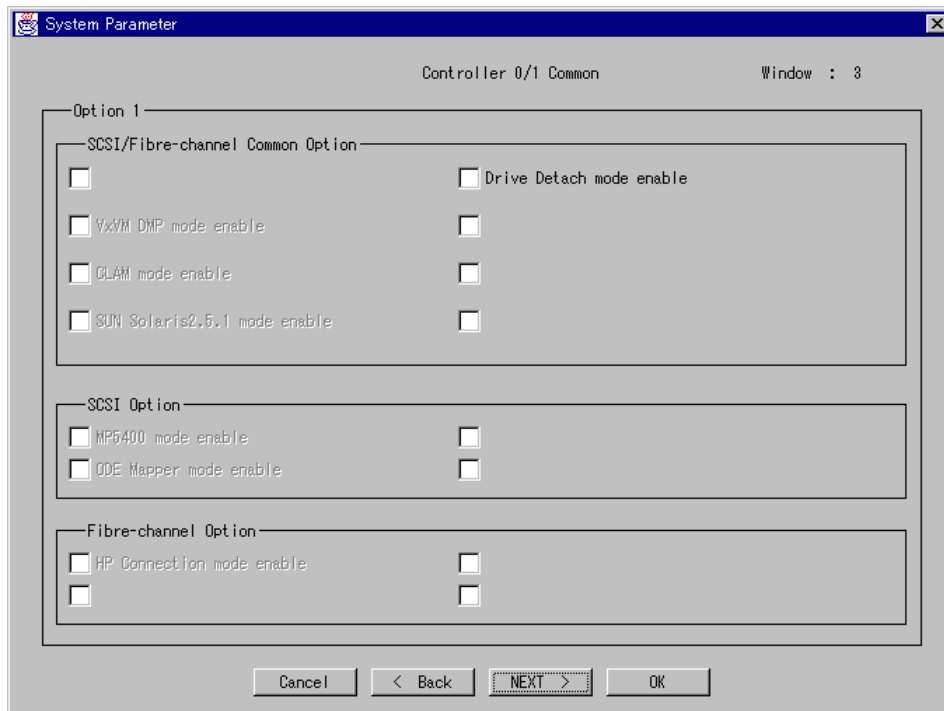
Note 3: In **Host Connection Mode 1**, if the following change is carried out, please delete the **Vendor ID** and **Product ID** in **INQUIRY Information** under “Window : 8”.

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

The screenshot shows a 'System Parameter' dialog box with a title bar containing a close button. The main area is titled 'Controller 0/1 Common' and 'Window : 2'. A section titled 'Drive Capacity' contains a table with 7 rows (Row0 to Row5). Each row has a text input field with '18', a unit label 'GB', and an empty text input field. Below the table are four buttons: 'Cancel', '< Back', 'NEXT >', and 'OK'.

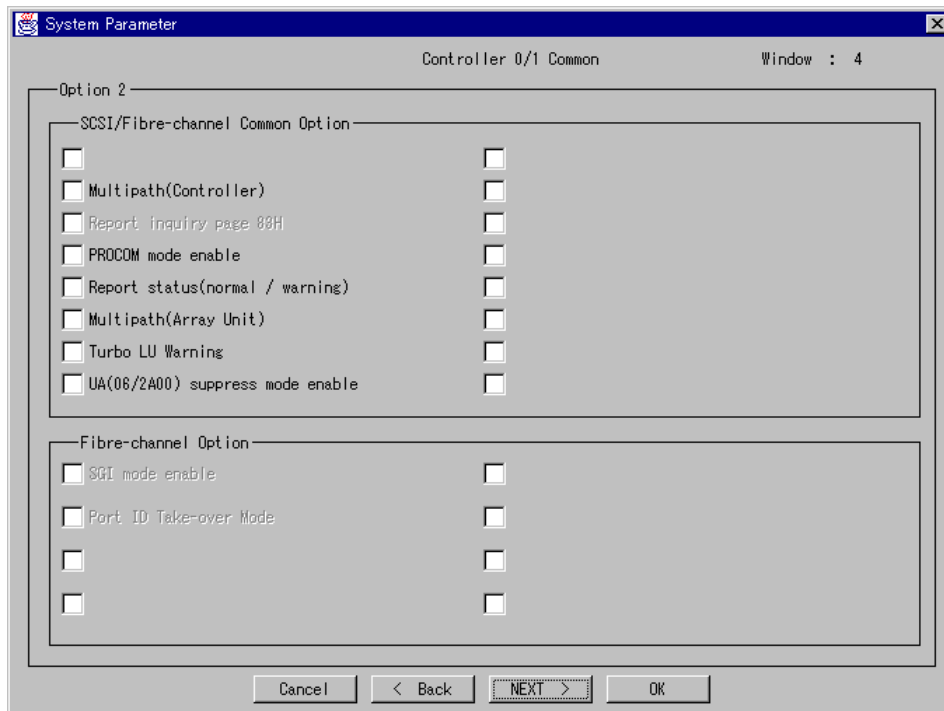
Row	Capacity	Unit	
Row0	18	GB	
Row1	18		
Row2	18		
Row3	18		
Row4	18		
Row5	18		

- **Drive Capacity:** Selects the capacity of the installed drive in units of row. Row0 cannot be set (5800 only).



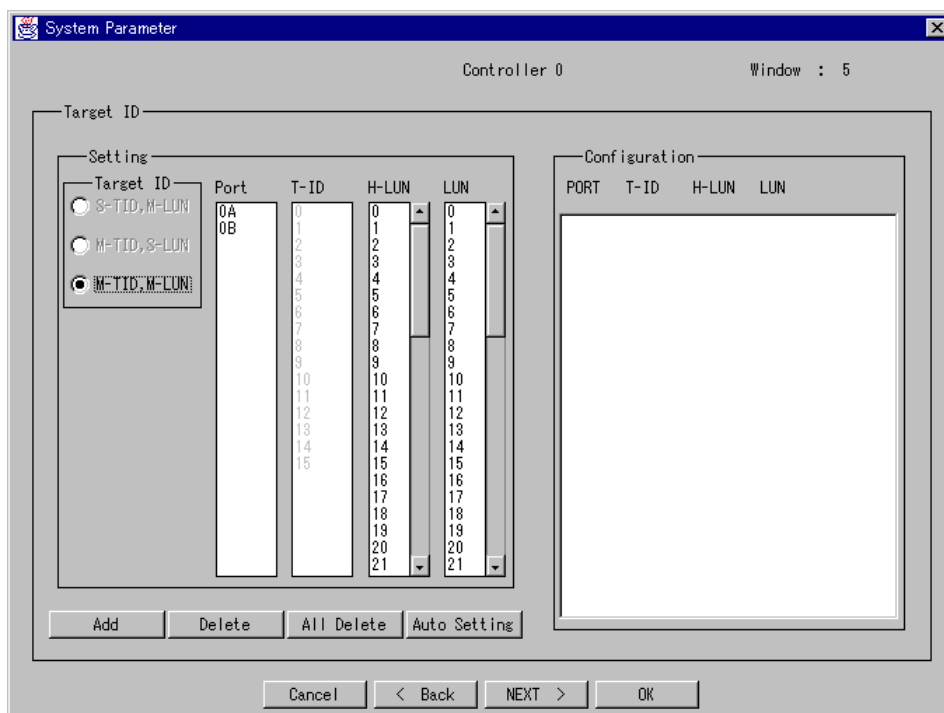
- **Option 1:** Sets the optional functions 1 of the array unit. Two or more optional functions can be selected.
- **SCSI/Fibre-channel Common Option:** Options which can be used by the SCSI and Fibre Channel interface array units. Set the optional function(s) according to the configuration of the array 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 array unit is connected via fibre channel, 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 array unit is connected via SCSI, 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. 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 5800 connection, if **System Startup Attribute** is set at **SCSI ID/Port ID Take-over Mode**, 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 9200 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 Resource Manager 9200 runs with IRIX, all LUNs may not be displayed by scrolling. If LUNs are not displayed up to 63, operate with the arrowdown (▼) key.

When the LUN mapping is used for the controller 0, the LUN mapping shall be also used for the controller 1. Otherwise, all logical units 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 a 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 5800 fibre version, **T-ID** is displayed in gray and input 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**.

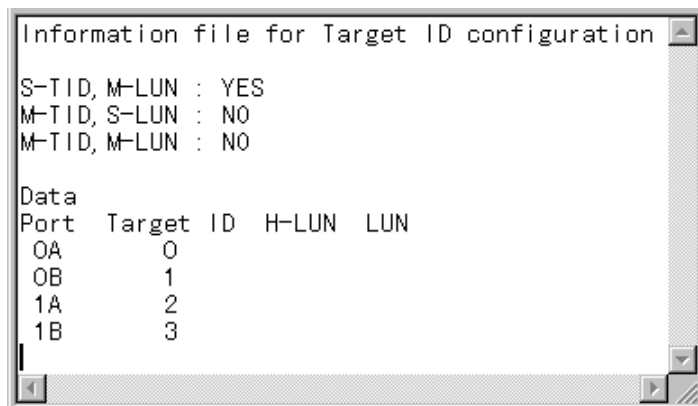
The deleted contents disappear from the **Configuration** display.

d) **Auto setting (read configuration from file)**

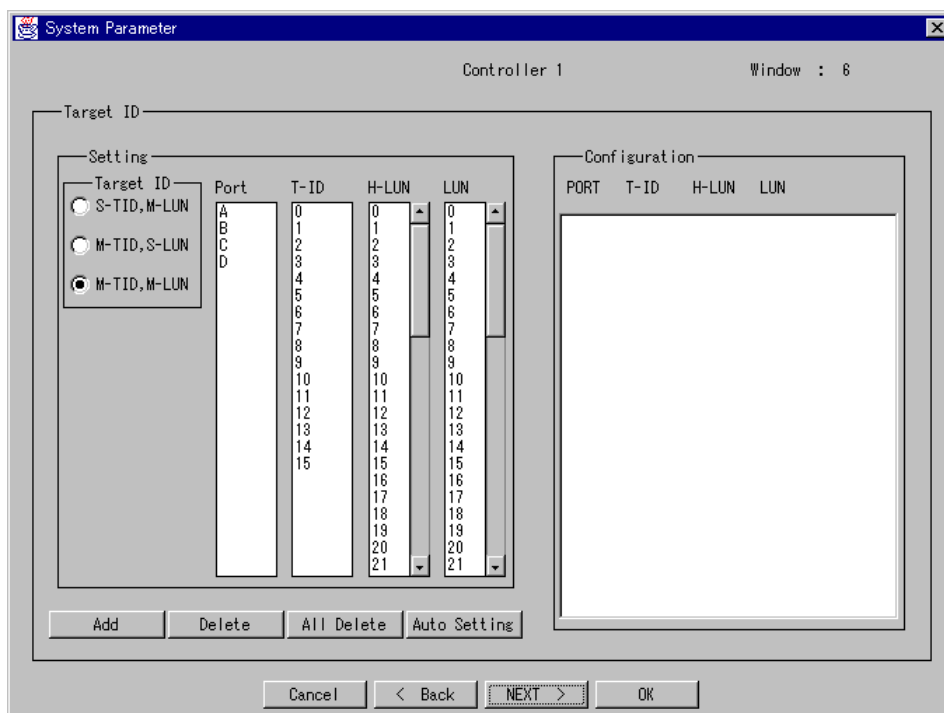
Click **Auto Setting**.

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.



Note: When Resource Manager 9200 is connected to the 5800 array unit with the Fibre Channel connection, set **T-ID** to ‘--’.



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

Note: For the 5800 connection, if **System Startup Attribute** is set at **SCSI ID/Port ID Taking-over Mode**, 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.

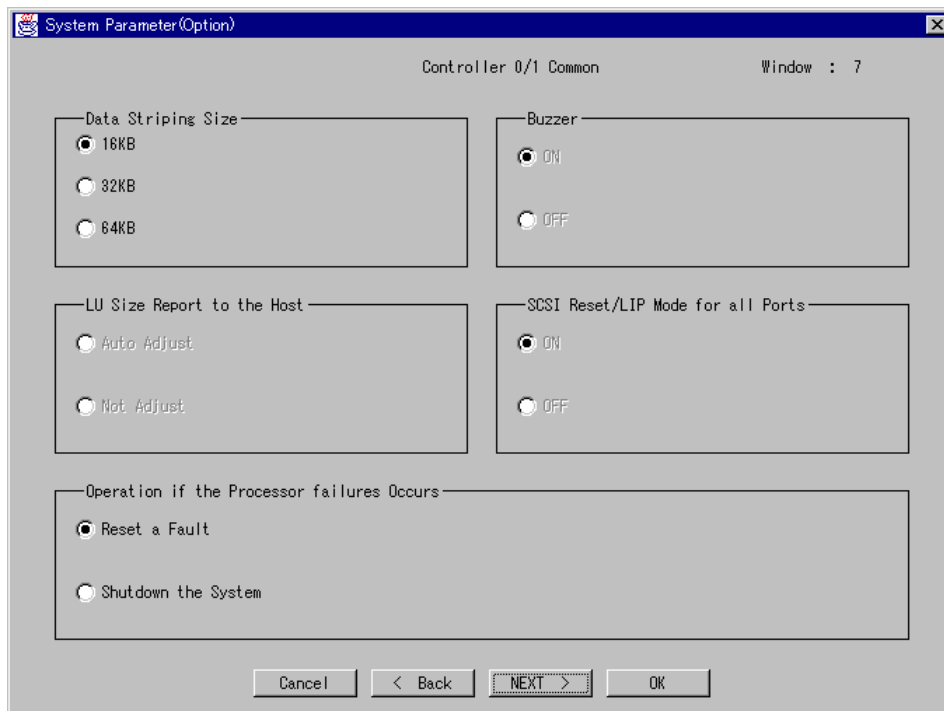
For the 9200 connection, if **System Startup Attribute** is set at **SCSI ID/Port ID Taking-over Mode**, the setting of controller 0 automatically sets the Target ID for controller 1, and screen display is not shown.

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 Resource Manager 9200 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. When the LU is already defined, it cannot be changed. To change, 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.

System Parameter(Optional) Controller 0/1 Common Window : 8

INQUIRY Information

Command Queuing

☒ ON

☐ OFF

ANSI Version

☐ SCSI-2

☐ SCSI-3

Vendor ID

Product ID

ROM Microprogram Version

RAM Microprogram Version

Web Title

Web Title

Cache Mode

☒ All OFF

☐ Random mode

☐ Sequential mode

☐ Random & Sequential mode

Host Connection Mode

☐ Link Separation

Cancel < Back NEXT > OK

- **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 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 rest 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.)

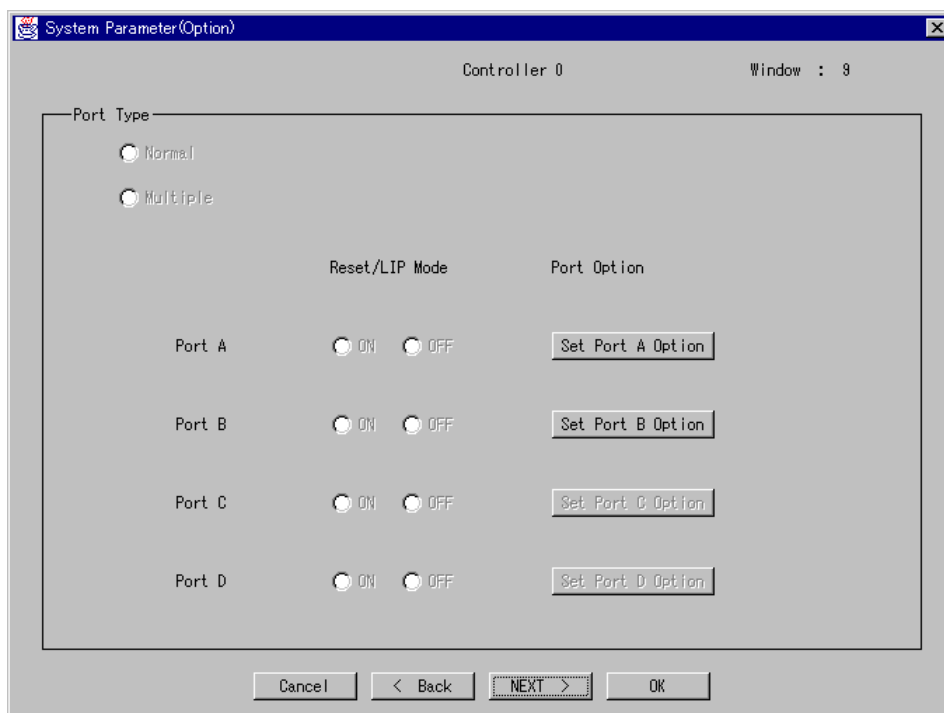
IBM 7135 I/O path switch Mode: 7135021000000000

NCR I/O path switch Mode: INF-01-00 △△△△△△△

5800 (SCSI version): other modes : DF400 △△△△△△△△△△

5800 (Fibre version): other modes : DF400F △△△△△△△△△△

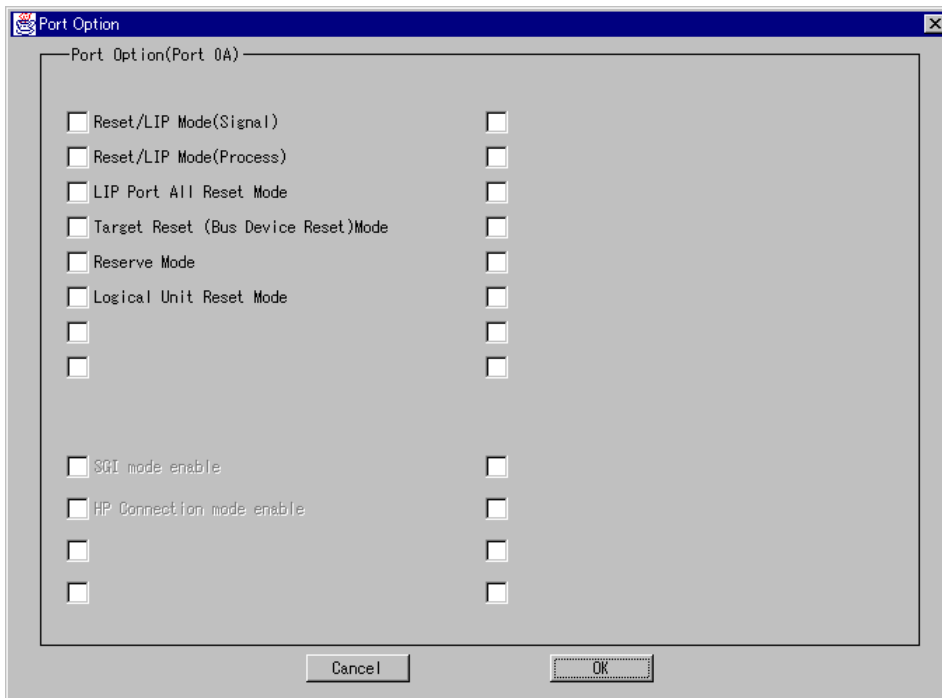
9200: other modes : DF500 △△△△△
 - **ROM Microprogram Version:** Specifies a microprogram version of a ROM reported by inquiry command.
 - **RAM Microprogram Version:** Specifies a microprogram version of a RAM reported by inquiry command.



- **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.

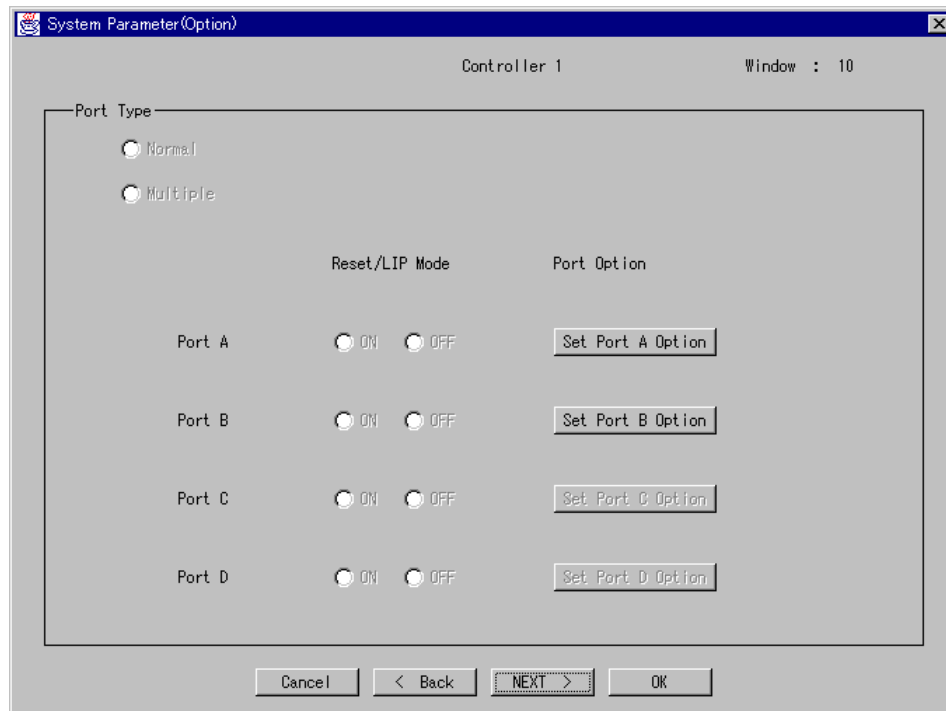
Reserve Mode: The mode to reserve LU in a dual system.

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.

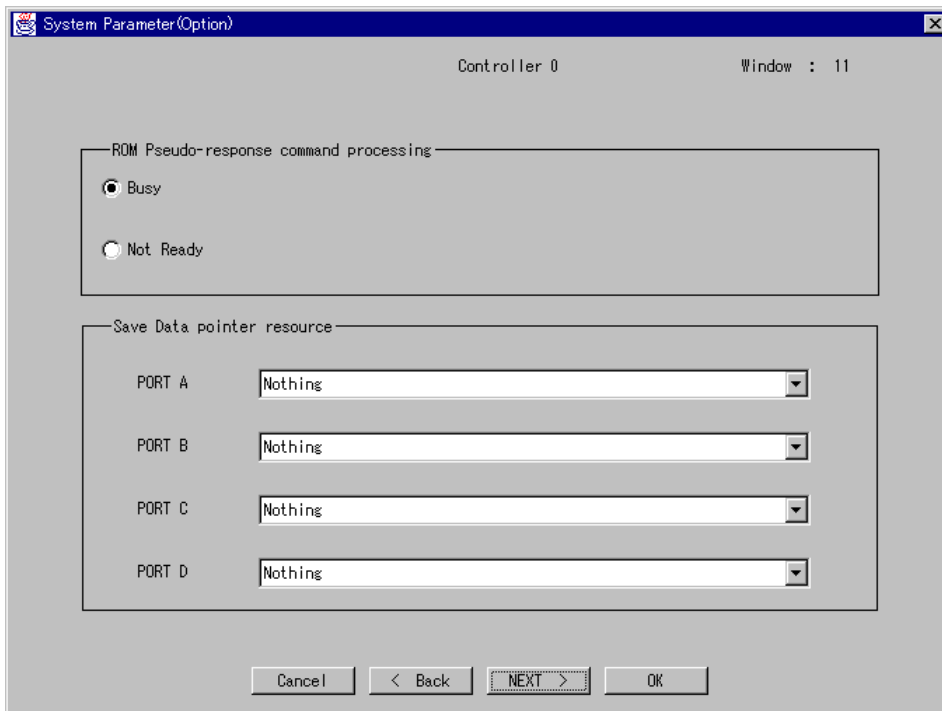
Third Party Process Logout Mode: Other mode to transmit Third Party Process Logout to other ports.

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

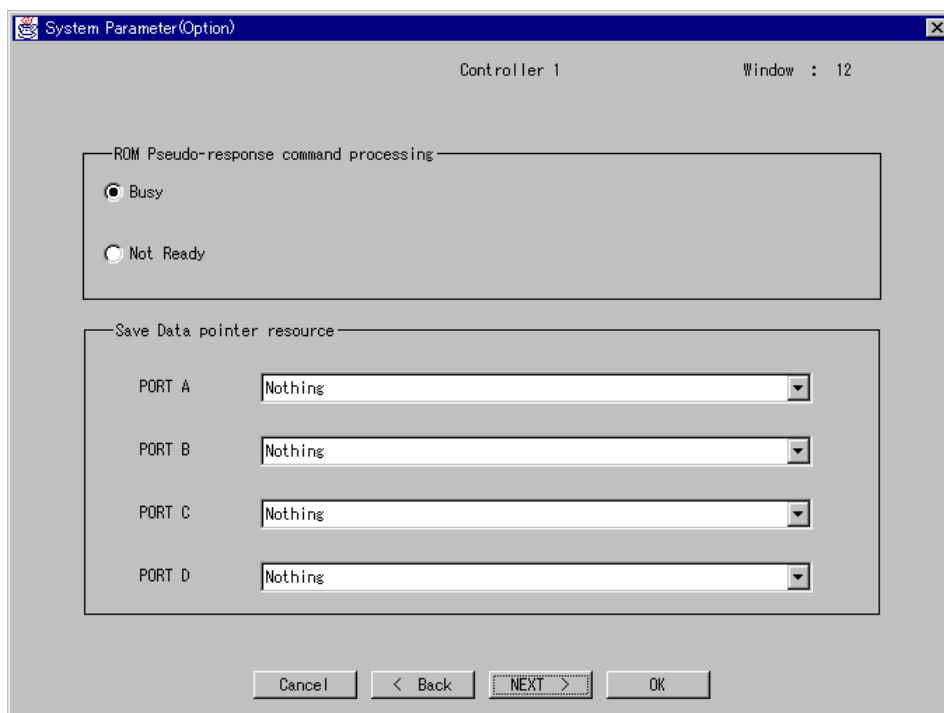
Port Option can be multiply set, but depending on the setting, it may not function properly. If it is to be set, please refer to the appended manual of the array unit and set only the applicable parameters.



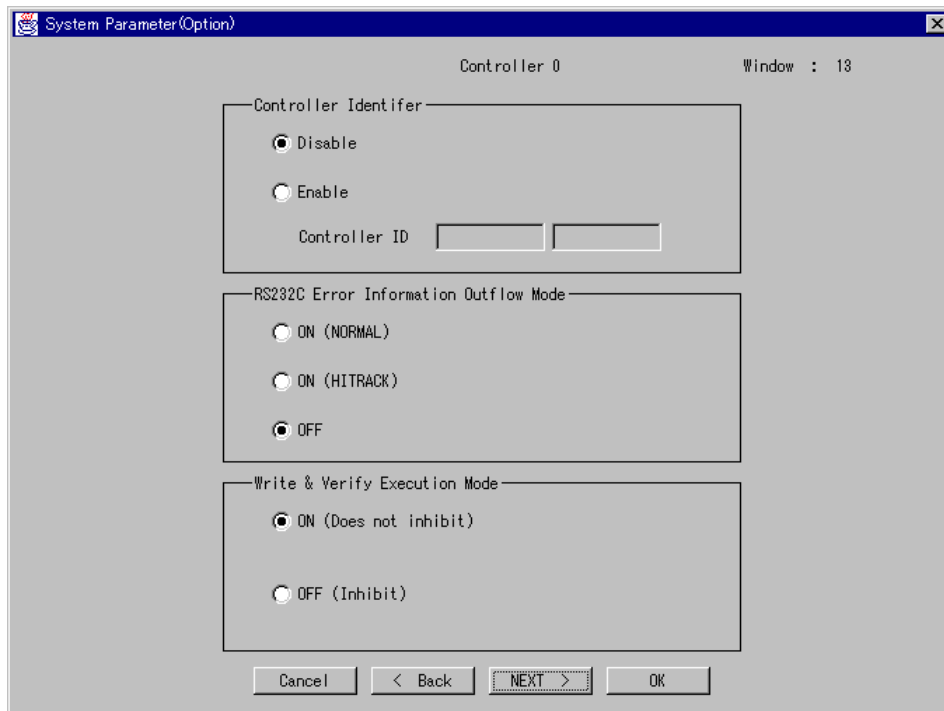
- Port Type:** Sets the multiport expansion function of controller 1. **Normal** and **Multiple** enable the setting of controller 0. If set, do so on the screen of controller 0. The setting of other procedures is the same as that for the controller 0.



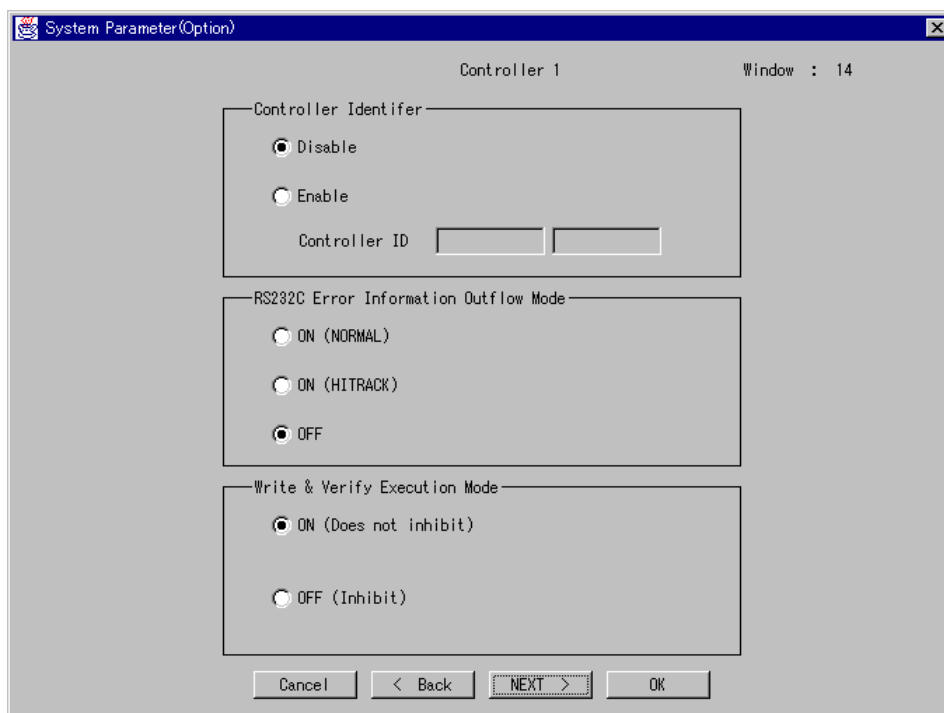
- **ROM Pseudo-response command processing:** Sets the mode of response to the host during a period from powering on to the time when the controller 0 becomes ready.
 - **Busy:** Responds “BUSY”.
 - **Not Ready:** Responds “Not Ready”.
- **Save Data pointer resource:** Sets a Save Data Pointer report 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.



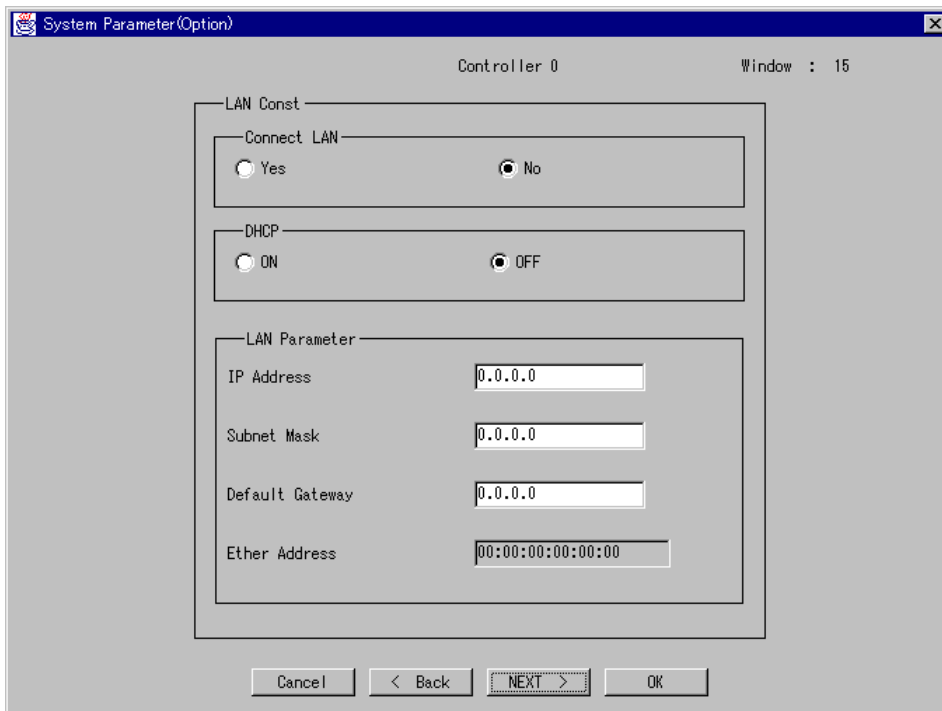
- **ROM Pseudo-response command processing:** Sets the mode of the response to the host during a period from powering on to the time when the controller 1 becomes ready.
The setting procedure is the same as that for the controller 0.
- **Save Data pointer resource:** Sets a Save Data Pointer report request 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):** Does 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:** Enables DHCP operation. The array unit will request an IP address from a DHCP server.
 - 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.

System Parameter(Optional)

Controller 1 Window : 16

LAN Const

Connect LAN

☐ Yes ☒ No

DHCP

☐ ON ☒ OFF

LAN Parameter

IP Address 0.0.0.0

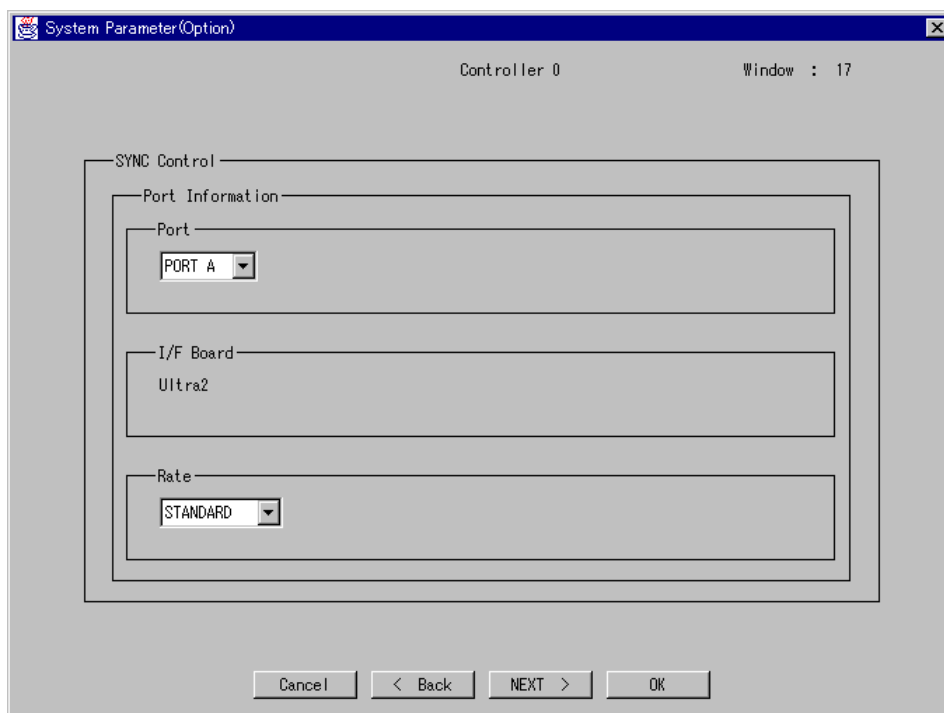
Subnet Mask 0.0.0.0

Default Gateway 0.0.0.0

Ether Address 00:00:00:00:00:00

Cancel < Back NEXT > OK

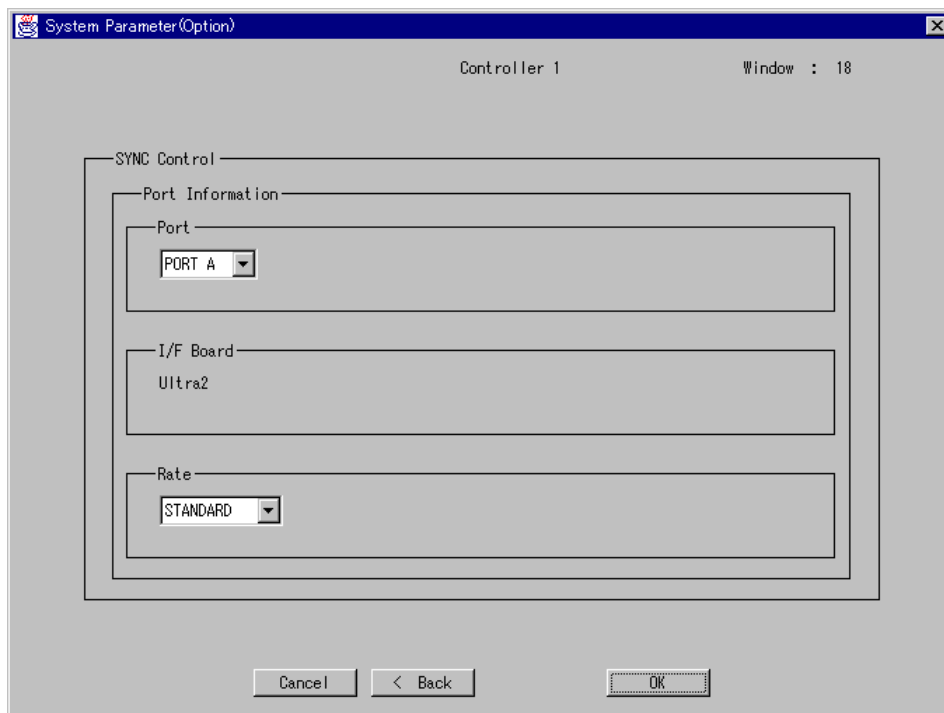
- **LAN Const:** Sets the LAN configuration information of the controller 1. The setting procedure is the same as that for the controller 0.



- **SYNC Control:** Sets the SCSI transfer rate of the controller 0. (For array units with SCSI Interfaces only.)
 - **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.
 - ASYN:** 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.



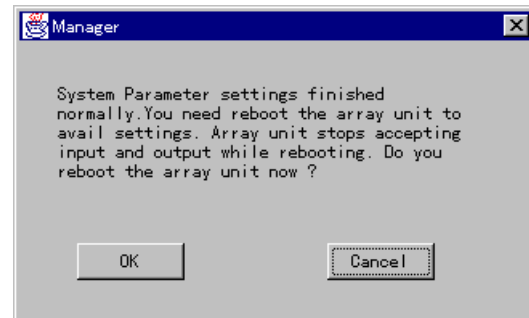
- **SYNC Control:** Sets the SCSI transfer rate of the controller 1. Setting procedure is the same as that for the controller 0.

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 appears, confirming that the settings are completed. If an array unit supports rebooting, a confirmation message indicating a request for rebooting is displayed. Click the **OK** button to reboot.
- If an array unit does not support rebooting:
 - If an array unit supports rebooting:

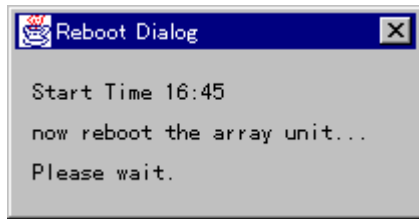


Note 1: To validate the set system parameters, reboot the array unit. The previous settings stay valid until the system is rebooted. Commands from the host and part of Resource Manager 9200 functions cannot be executed until the array unit is restarted. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

Note 2: 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 a reboot, reboot an array unit. After the array unit reboots, modify registered information on the main window, and then open the unit window again.

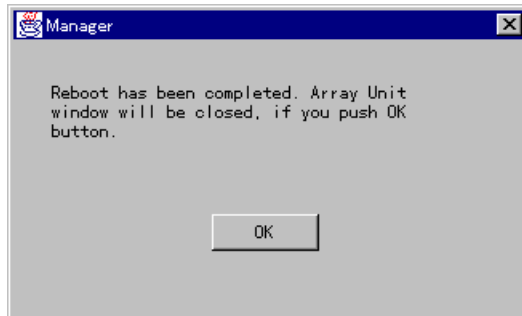
Note 3: When failing to write onto the FD drive, the message "DMES04EB02 : Backup floppy disk write error." is displayed. When this message is displayed, writing onto the FD is not yet completed normally, but the setting of a target ID has terminated normally. Check the FD drive in the array unit. After 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.

6. When you choose to reboot the array unit, the time the reboot began is displayed. Rebooting takes approximately two to six minutes.



Note: It may take time for an array unit to respond, depending on the configuration of the array unit.

A message appears, stating that the reboot has terminated. Click the **OK** button.



The unit window closes. To perform other operations on the main window, select an array unit from the main window and open the selected unit.

3.5.2 Setting RTC

This section explains how to set the RTC of the array unit. This requires a reboot.

When the array unit is connected to the dual system, a setting cannot be performed if the controller on one side is blocked. Make sure that the array unit does not have 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.

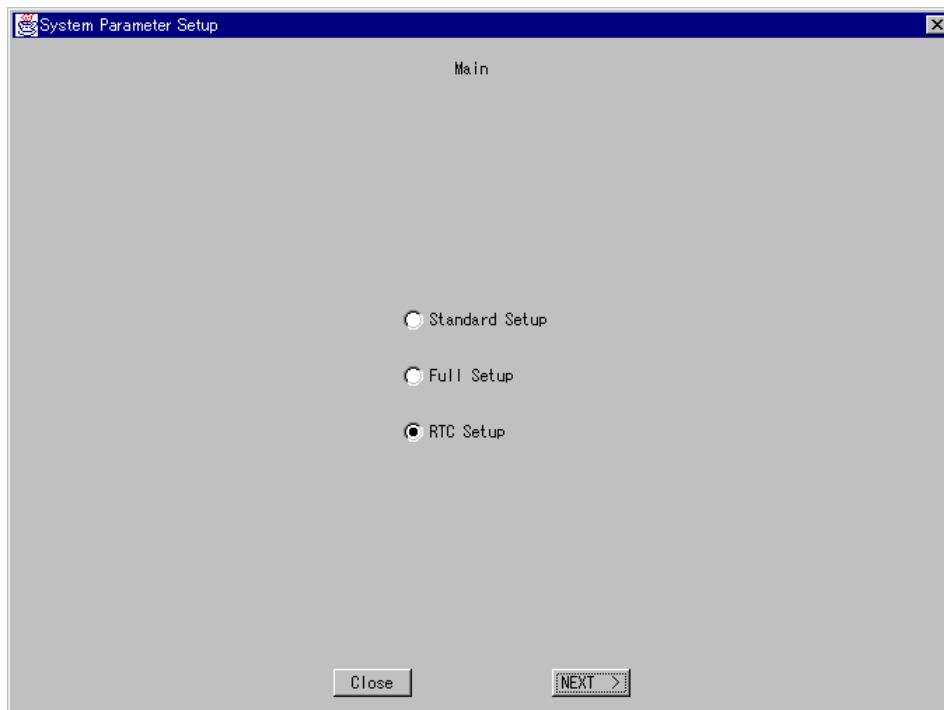
When the RTC is set, the array unit cannot execute commands from the host. The Resource Manager 9200 cannot execute functions other than the system parameter setting wizard, SNMP configuration information file setting and outputting, and error monitoring (LAN connection).

After the setting is completed, restart the array unit. Make sure that the array unit has started, then connect it to the host and Resource Manager 9200.

1. Click **Param Wizard**.

The **Param Wizard** button can be clicked regardless of the 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**.

System Parameter (RTC Set)

Controller 0/1 Common

☒ Manual Setting

☐ Auto Setting

Internal Time

Date 1999 / 11 / 30

Time 0 : 0 : 0

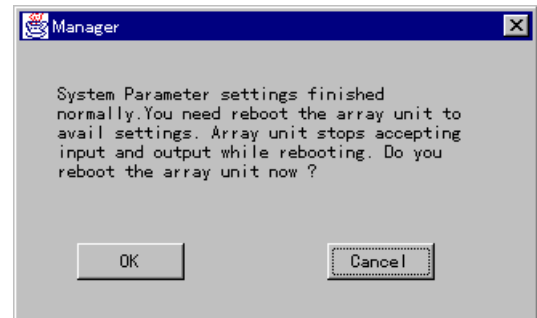
Cancel < Back OK

- **Manual Setting:** Sets the date and time to be set.
- **Auto Setting:** Sets the time of the PC or SUN server/workstation executing the Resource Manager 9200.

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



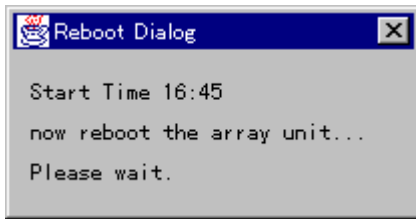
5. A message appears, confirming that the settings are completed. If an array unit supports rebooting, a confirmation message indicating a request for rebooting is displayed. Click the **OK** button to reboot.
- If an array unit does not support rebooting:
 - If an array unit supports rebooting:



Note 1: To validate the set system parameter (RTC), reboot the array unit. The previous settings stay valid until rebooting. Commands from the host and part of Resource Manager 9200 functions cannot be executed until the array unit is restarted. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

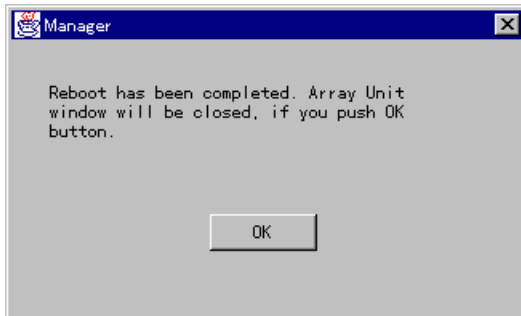
Note 2: When failing to write onto the FD drive, the message “DMES04EB02 : Backup floppy disk write error.” is displayed. When this message is displayed, writing onto the FD has not yet completed normally, but the setting of a target ID has terminated normally. Check the FD drive in the array unit. After 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.

6. When you choose to reboot the array unit, the time the reboot began is displayed. Rebooting takes approximately two to six minutes.



Note: It may take time for an array unit to respond, depending on the configuration of the array unit.

A message appears, stating that the reboot has terminated.



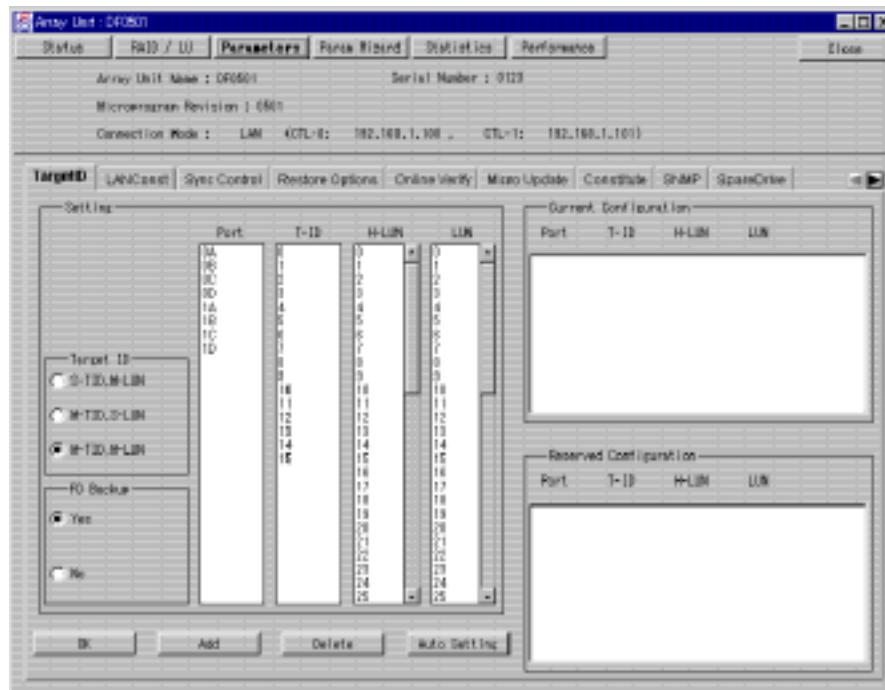
Click the **OK** button; the unit window closes. To perform other operations on the main window, select an array unit from the main window and open the selected unit.

3.6 Setting and Displaying System Parameters

3.6.1 Target ID

Map the LU to a port, target ID and host ID.

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



The condition currently set is displayed in **Current Configuration**. After changing or setting parameters, the contents are displayed in **Reserved Configuration**.

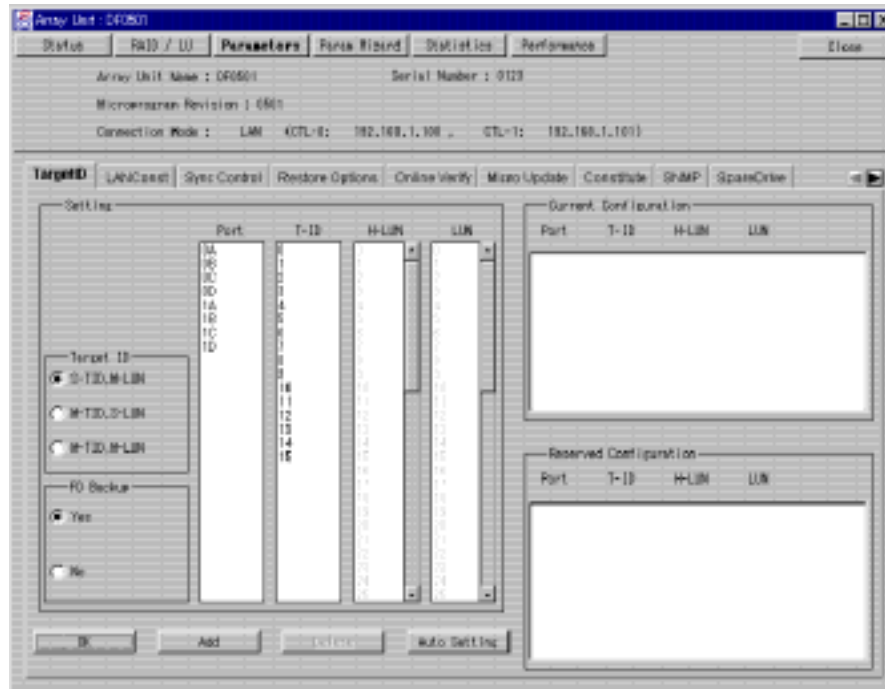
- **Target ID:** Specifies configuration types of the target ID and the LUN.
 - **S-TID, M-LUN:** Sets a target ID of the port and makes the LUN which shared by the ports can be used by the host with an identical LUN.
 - **M-TID, S-LUN:** Sets a port and a target ID for the LUN and makes the LUN can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



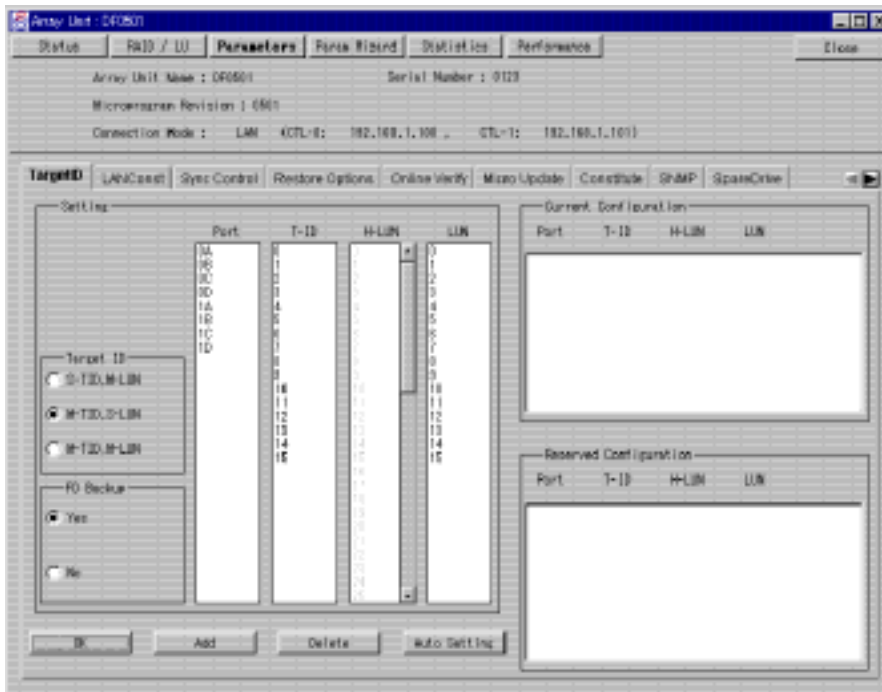
Click the **S-TID, M-LUN** option button in **Target ID**.

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 5800 array unit, the options are displayed in halftone and cannot be selected.

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



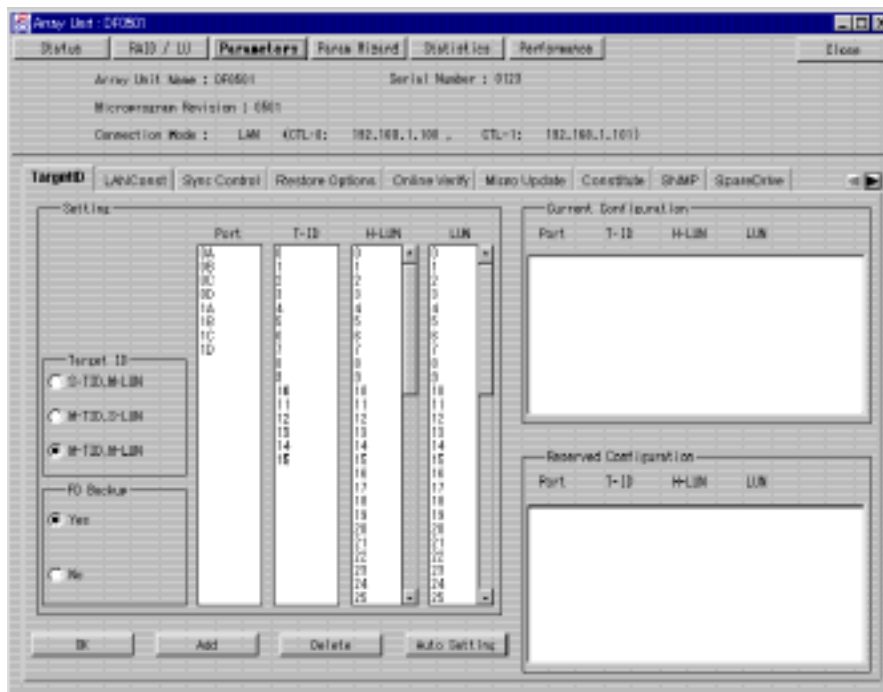
Click the **M-TID, S-LUN** option button in the **Target ID**.

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 5800 array unit, the options are displayed in half-tone and cannot be selected.

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



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

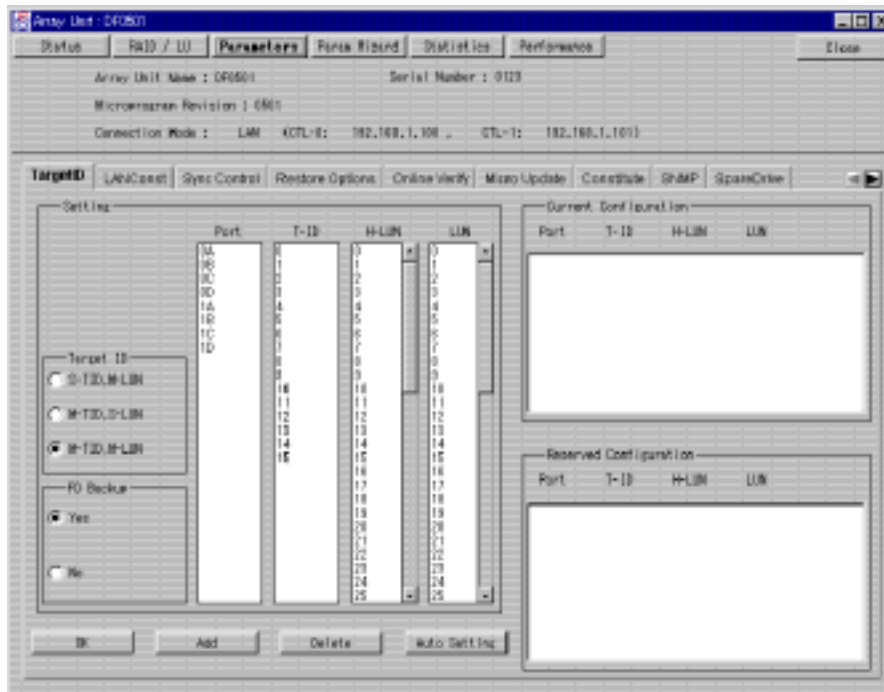
Select one **LUN** to be added, select **Port**, **T-ID**, and **H-LUN** in the mapping configuration, and click **Add**. The added contents are displayed in **Reserved Configuration**. Multiple **Port**, **T-ID**, and **H-LUN** can be selected.

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 5800 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 (read configuration from a file)



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**.

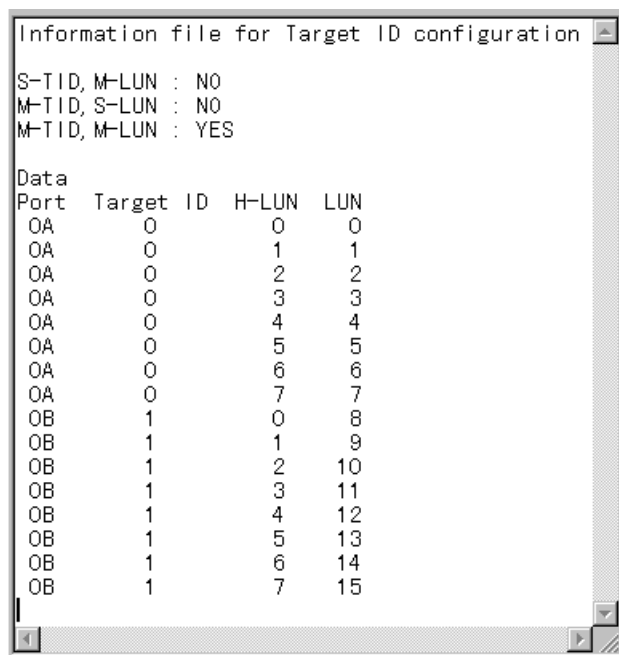
When **Auto setting** is set, all configurations that have been set are invalidated and changed to that of the target ID configuration file.

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**. Enter spaces between the items. If the tabulating function is used, the spaces are regarded as input errors and the inputs are ignored.

Example 1 M-TID, M-LUN Mode



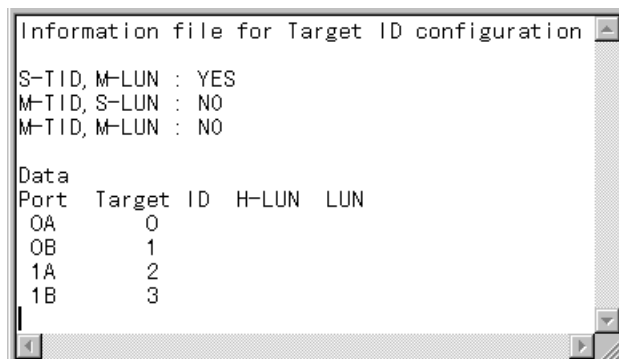
Information file for Target ID configuration

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

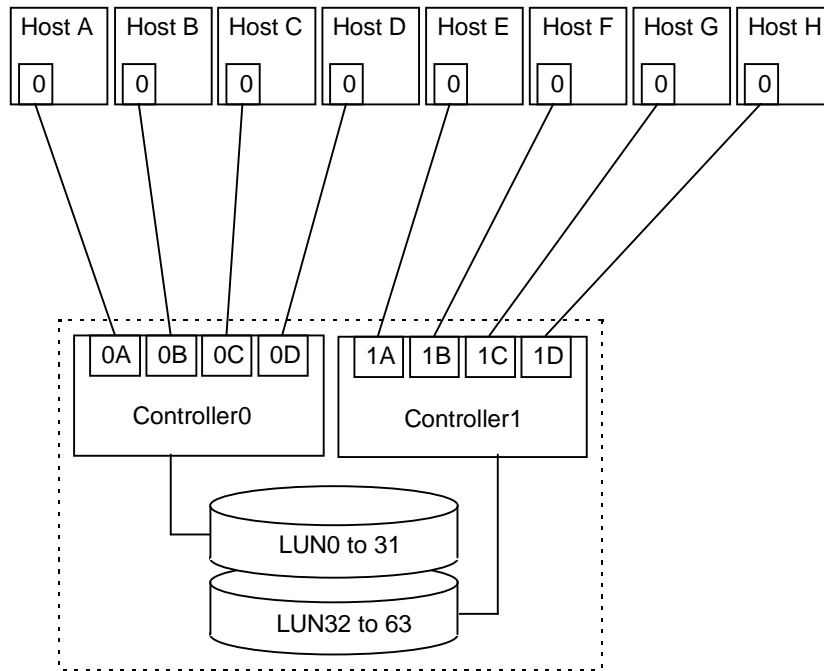
Data

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

Note: When the Resource Manager 9200 is connected to the 5800 array unit with the Fibre Channel connection, set the **T-ID** to ‘--’.

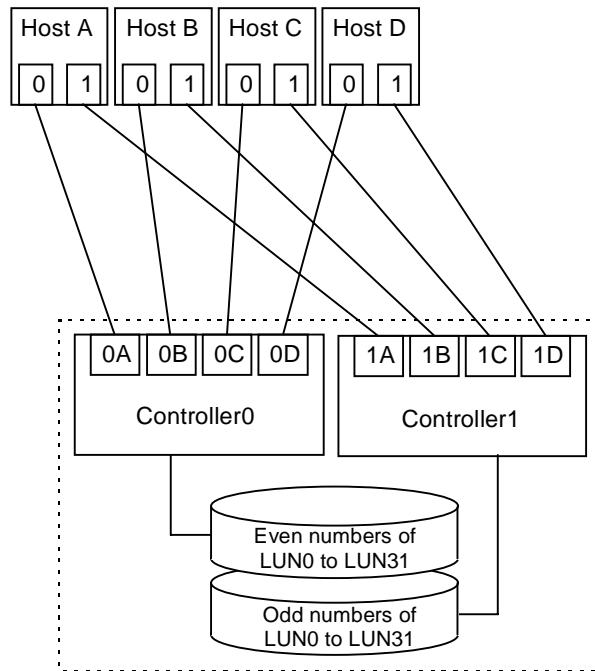
Two types of sample files are provided for automatic setting. The sample file configuration is shown below.

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



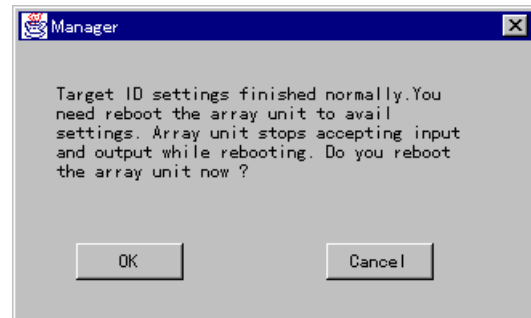
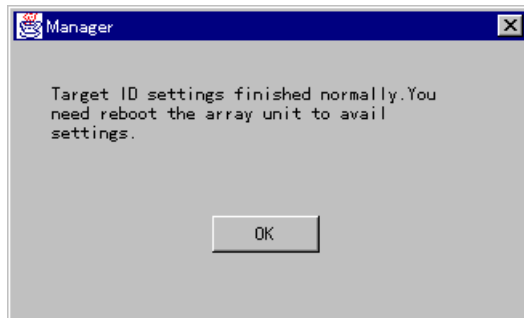
Host	Port	Target ID	H-LUN	LUN
A	0A	0	0 to 7	0 to 7
B	0B	1	0 to 7	8 to 15
C	0C	2	0 to 7	16 to 23
D	0D	3	0 to 7	24 to 31
E	1A	0	0 to 7	32 to 39
F	1B	1	0 to 7	40 to 47
G	1C	2	0 to 7	48 to 55
H	1D	3	0 to 7	56 to 63

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

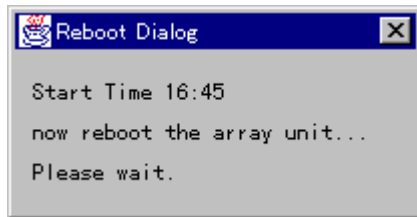
3. Click **OK**.
4. A message appears, confirming that the settings are completed. If an array unit supports rebooting, a confirmation message indicating a request for rebooting is displayed. Click the **OK** button to reboot.
 - If an array unit does not support rebooting:
 - If an array unit supports rebooting:



Note 1: To validate the set Target ID, reboot the array unit. The previous settings stay valid until the system is rebooted. The previous settings stay valid until rebooting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

Note 2: 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 you choose to reboot the array unit, the time the reboot began is displayed. Rebooting takes approximately two to six minutes.



Note: It may take time for an array unit to respond, depending on the donfiguration of the array unit.

A message appears, stating that the reboot has terminated.

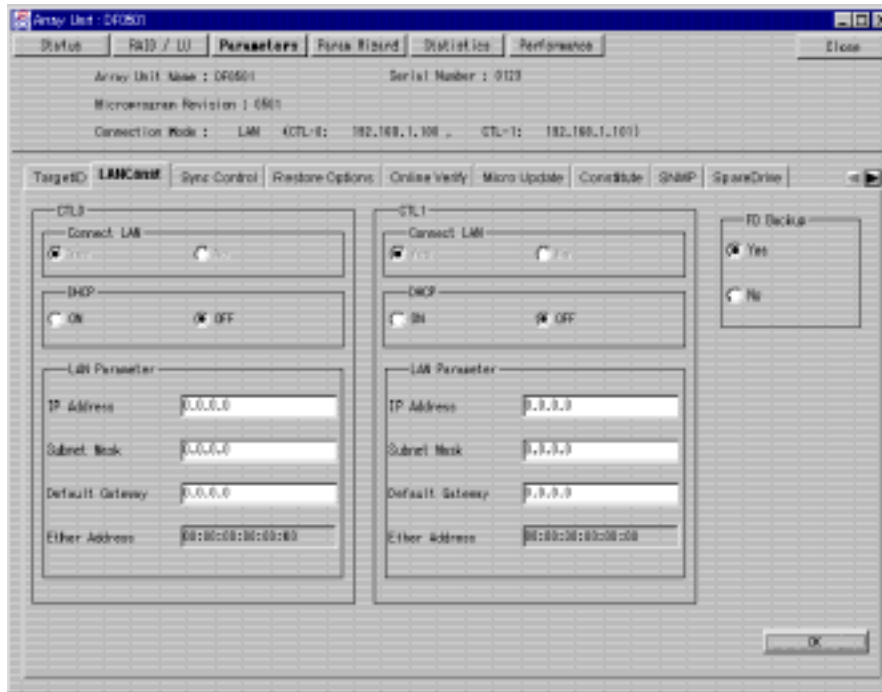


Click the **OK** button; the unit window closes. To perform other operations on the main window, select an array unit from the main window and open the selected unit.

3.6.2 LAN Configuration

This section explains how the LAN configuration information of the array unit is set.

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



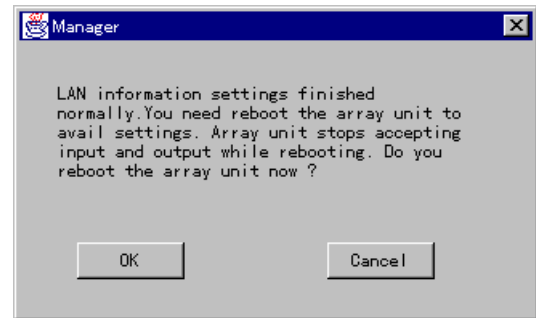
- **Connect LAN:** Specifies whether the LAN function is to be valid or invalid.
- **DHCP:** Specifies whether the DHCP mode is to be enabled or disabled.
- **LAN Parameter:** Specifies IP Address, Subnet Mask, or Default Gateway which is a piece of the LAN information. Ether Address is displayed for reference 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 **ON** is selected in **DHCP**, the **LAN Parameter** is displayed in halftone and cannot be selected.

Note 2: When the 5700 and 5700E are connected, **Connect LAN** and **DHCP** are displayed in halftone and cannot be selected.

Note 3: For 9200, **Connect LAN** is displayed in halftone and cannot be selected. The **Connect LAN** setting is always **Yes**.

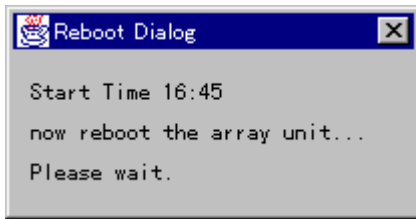
2. After setting items, click **OK**.
3. A message appears, confirming that the settings are complete. If an array unit supports rebooting, a confirmation message indicating a request for rebooting is displayed. Click the **OK** button to reboot.
 - If an array unit does not support rebooting:
 - If an array unit supports rebooting:



Note 1: To validate the set LAN configuration information, reboot the array unit. The previous settings stay valid until rebooting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

Note 2: 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 you choose to reboot the array unit, the time the reboot began is displayed. Rebooting takes approximately two to six minutes.



Note: It may take time for an array unit to respond, depending on the configuration of the array unit.

A message appears, stating that the reboot has terminated.

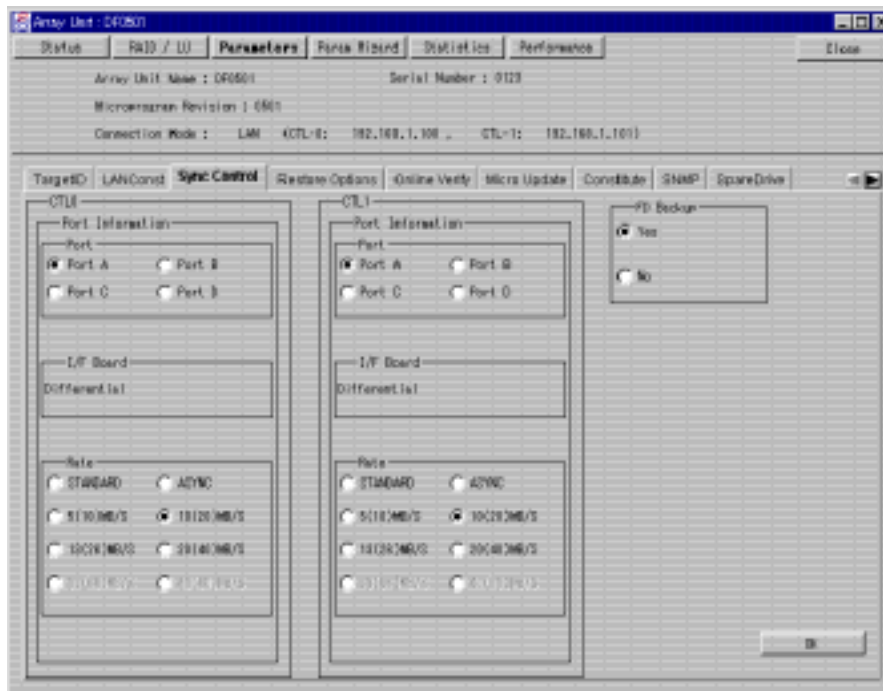


Click the **OK** button; the unit window closes. To perform other operations on the main window, select an array unit from the main window and open the selected unit.

3.6.3 Setting SCSI Transfer Rate

This section explains how the transfer rate for each port of the array unit is set.

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



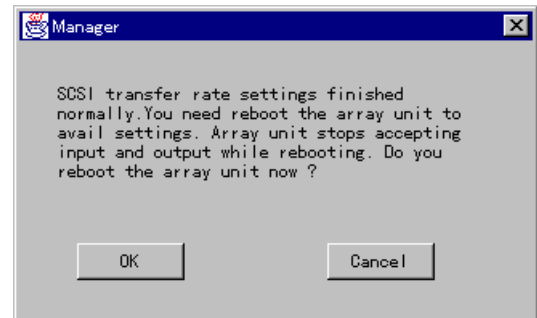
- **Port:** Selects the port number to be set.
- **I/F Board:** The IF board type installed is displayed.
 - **None:** Not installed
 - **Single:** Single type
 - **Differential:** Differential type
 - **Ultra2:** Ultra2 type

- **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 Mbyte/s for wide SCSI.
 - **13(26) MB/S:** Sets the maximum transfer rate to 13 M byte/s for narrow SCSI and 26 Mbyte/s for wide SCSI.
 - **20(40) MB/S:** Sets the maximum transfer rate to 20 M byte/s for narrow SCSI and 40 Mbyte/s for wide SCSI.
 - **33(66) MB/S:** Sets the maximum transfer rate to 33 M byte/s for narrow SCSI and 66 Mbyte/s for wide SCSI.
 - **40(80) MB/S:** Sets the maximum transfer rate to 40 M byte/s for narrow SCSI and 80 Mbyte/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.

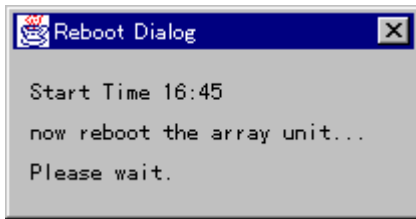
2. After setting the items, click **OK**.
3. A message appears, confirming that the settings are completed. If an array unit supports rebooting, a confirmation message indicating a request for rebooting is displayed. Click the **OK** button to reboot.
 - If an array unit does not support rebooting:
 - If an array unit supports rebooting:



Note 1: To validate the set transfer rate, reboot the array unit. The previous settings stay valid until rebooting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

Note 2: 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 you choose to reboot the array unit, the time the reboot began is displayed. Rebooting takes approximately two to six minutes.



Note: It may take time for an array unit to respond, depending on the configuration of the array unit.

A message appears, stating that the reboot has terminated.

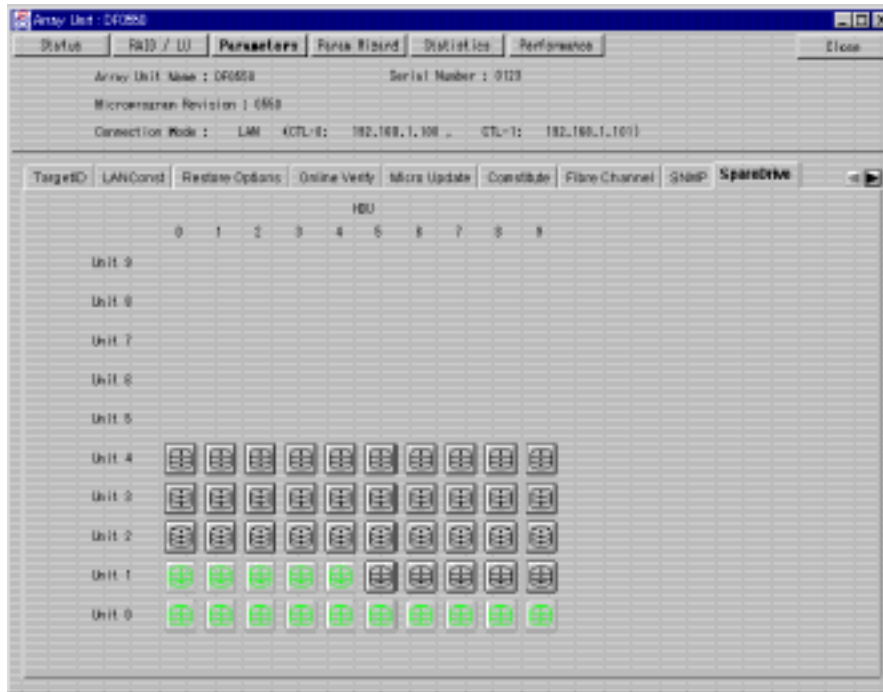


Click the **OK** button; the unit window closes. To perform other operations on the main window, select an array unit from the main window and open the selected unit.

3.6.4 Spare Disk Setup

The following procedure sets up and cancels the spare disk (9200 only).

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



Data disk



Spare disk

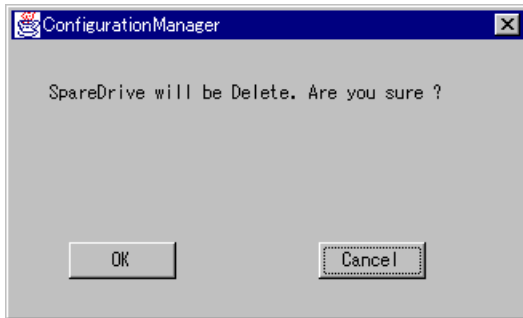
2. To set up the spare disk, click the icon of the HDU to be set up as a spare disk. HDUs that can be set to a spare disk drive are data disk drives for which a RAID group is not yet defined. HDUs 0 and 1 in Unit 0 cannot be used as spare drives.

To cancel the spare disk setup, click the icon of the HDU to be canceled.

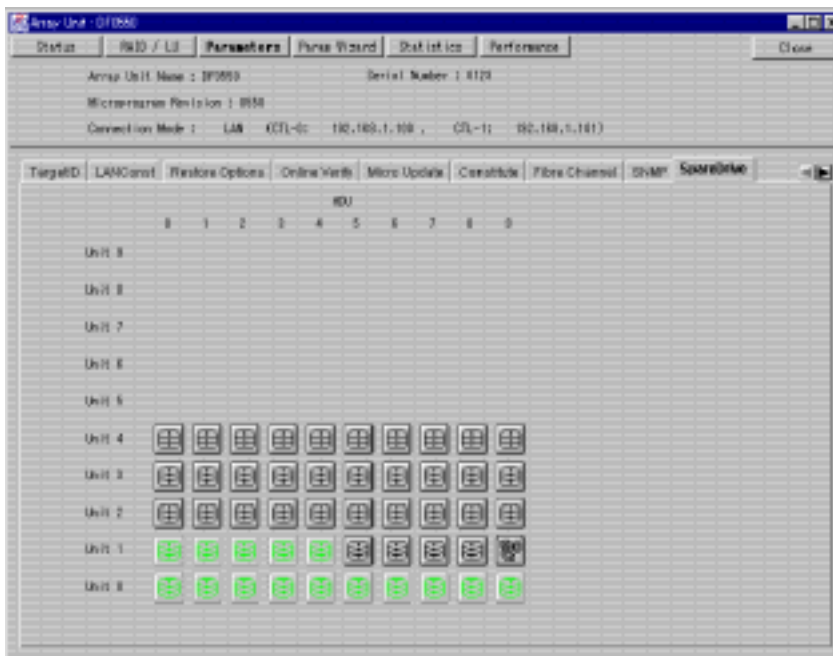
3. The confirmation message for spare disk setup or canceled is displayed.
 - a) When a spare disk is set up:



- b) When a spare disk is canceled:



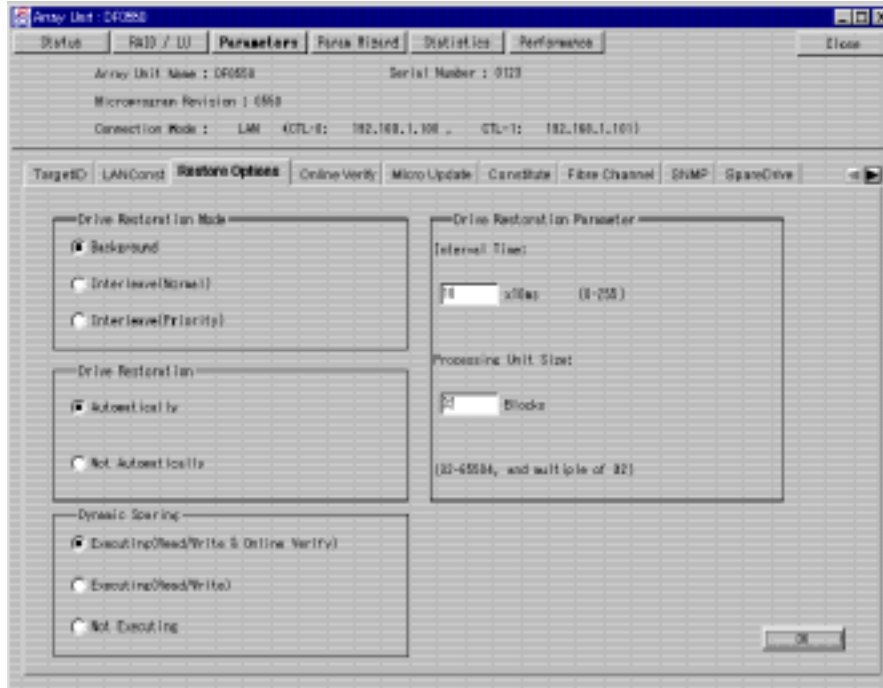
4. The icon of the HDU which is set up or canceled is updated and displayed.



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 Sparing**.
 - **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**; Resource Manager 9200 does not support 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.

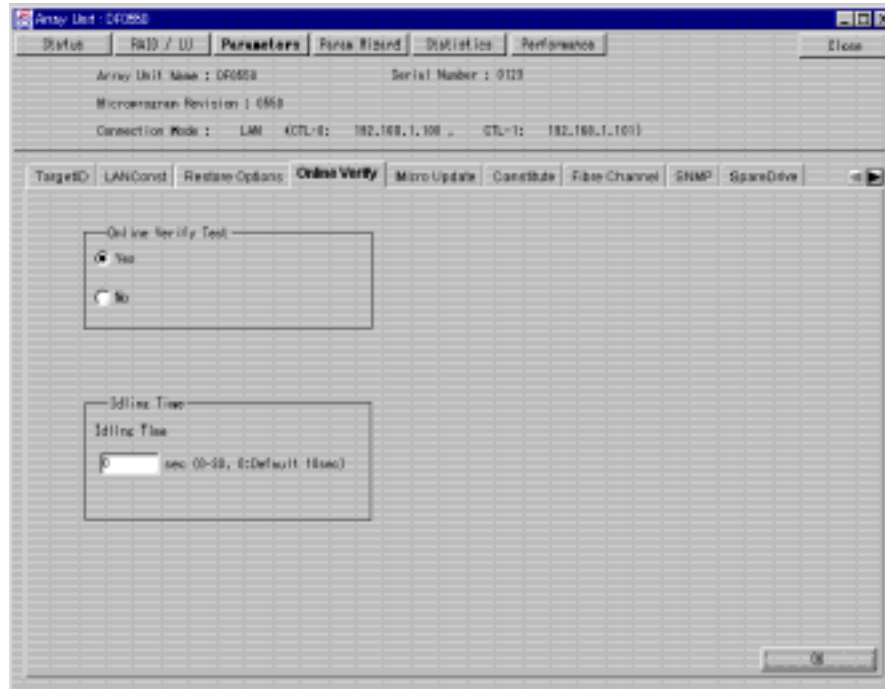
Specify a multiplication factor 32 to 65,504 in a unit of 512 bytes in a step of 32.

- **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.



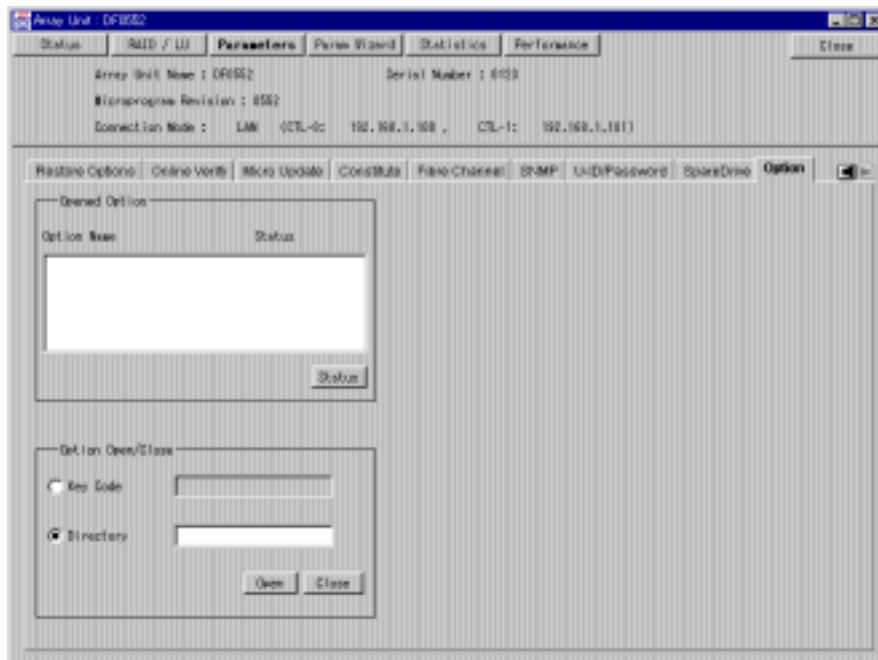
2. Select whether or not to execute **Online Verify** and specify **Idling Time**.
 - **Online Verify Test:** Specifies whether or not to execute **Online Verify**.
 - **Yes:** Execute
 - **No:** Not execute
 - **Idling Time:** Specifies an interval from the end of an I/O operation instructed by the host to the start of the online verify. If "0" is specified, the time is set to 10 [seconds], and 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 the Fee-Basis Option

3.7.1 Opening the Fee-Basis Option

The following procedure opens the key of the fee-basis option for 9200.

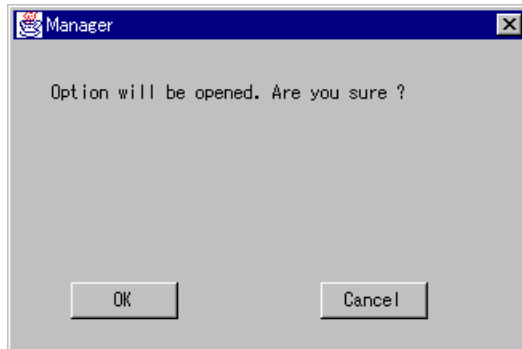
1. Click **Parameters**, then click the **Option** tab.



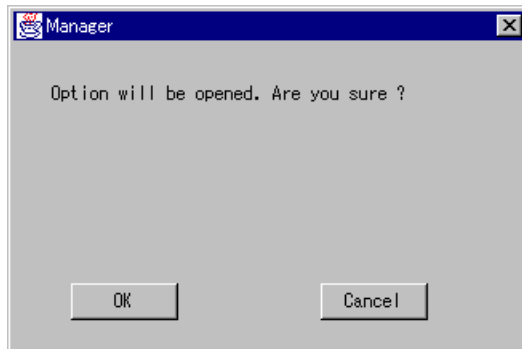
2. Specify whether you are opening the fee-basis option using the FD with the fee-basis option, or if you are using the key code. Then set up the directory path or key code and click the **Open** button.

When you open the option using the FD, click the **Directory** radio button and then set up the path for the FD. When you open the option using the key code, click the **Key Code** radio button and then enter 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.

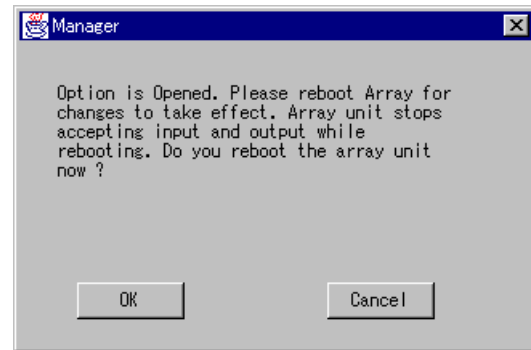
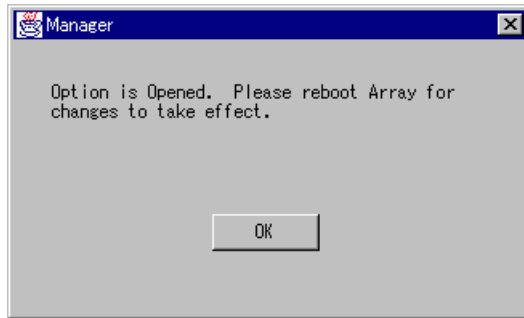


4. A screen confirming that the fee-basis option has been opened appears. Depending on the option, an array unit needs to be rebooted in order to set the opening effective. If an array unit supports rebooting, a message confirming a reboot request will be displayed. Click the **OK** button when restarting.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



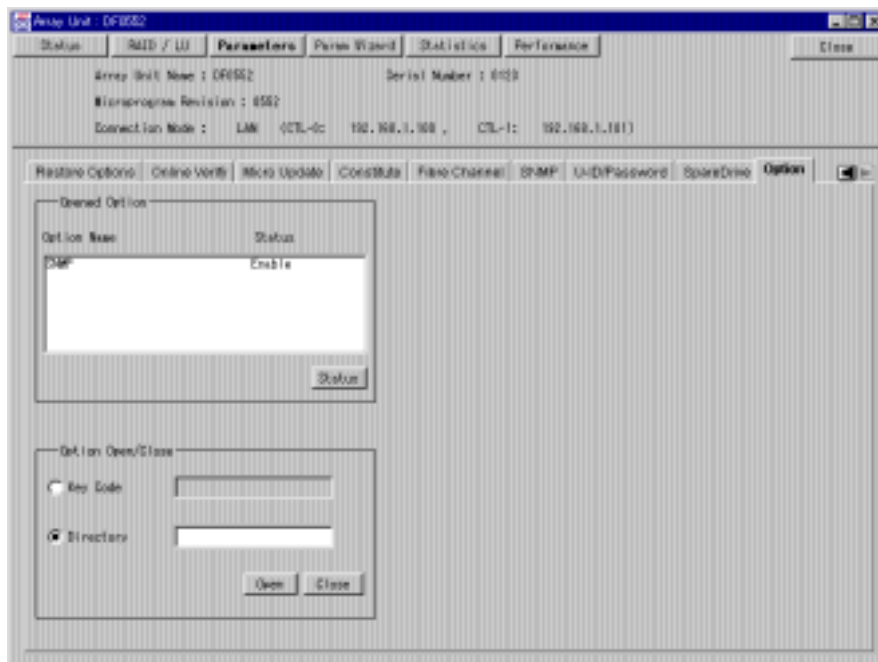
b) Option for which the opening is set effective by rebooting an array unit:

- If an array unit does not support rebooting:
- If an array unit supports rebooting:

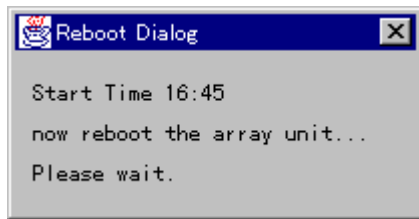


Note: To set effective the opening of the option that you have operated, reboot the array unit. The feature is not yet closed until rebooting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

5. After an array unit is rebooted, the unlocked fee-basis option can be displayed.



When you choose to reboot the array unit, the time the reboot began is displayed. Rebooting takes approximately two to six minutes.



Note: It may take time for an array unit to respond, depending on the configuration of the array unit.

A message appears, stating that the reboot has terminated.

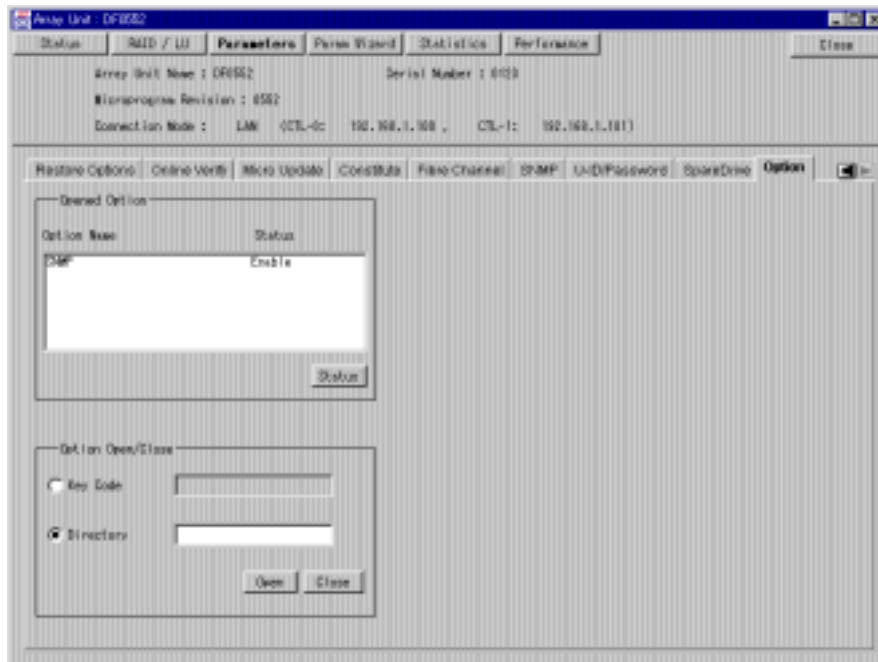


Click the **OK** button; the unit window closes. To perform other operations on the main window, select an array unit from the main window and open the selected unit.

3.7.2 Closing the Fee-Basis Option

The following procedure closes the key of the fee-basis option for 9200.

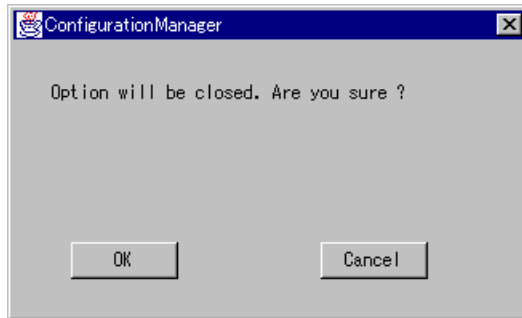
1. Click **Parameters**, then click the **Option** tab.



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 set up 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 set up the path for the FD. When you close the option using the key code, click the **Key Code** radio button and then set up 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.



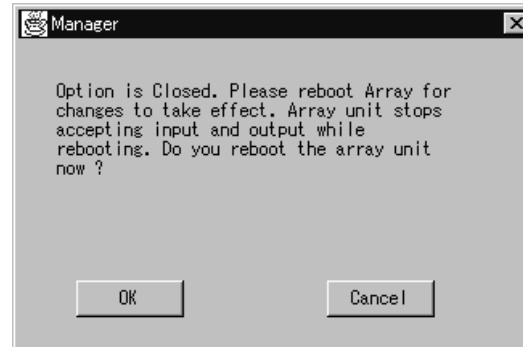
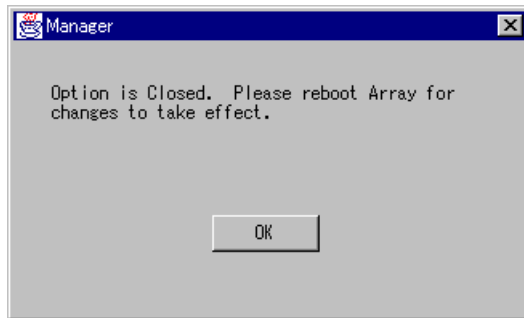
4. A screen confirming that the fee-basis option has been closed appears. Depending on the option, an array unit needs to be rebooted in order to set the closing effective. If an array unit supports rebooting, a message confirming a reboot request will be displayed. Click the **OK** button when rebooting.

- a) Option that does not require that the array unit be rebooted in order to close the option:



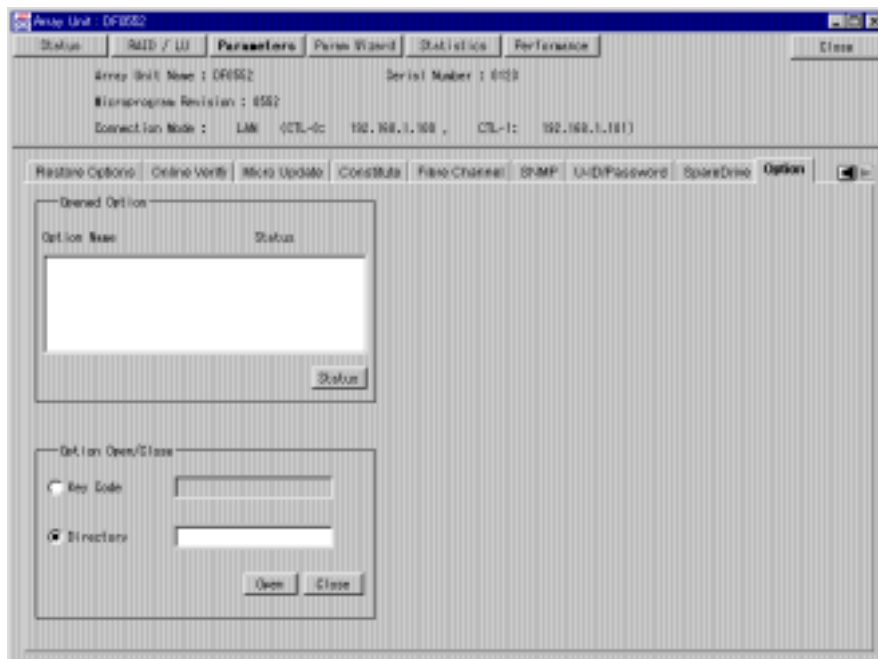
b) Option for which the disk array must be rebooted to set the option:

- If an array unit does not support rebooting:
- If an array unit supports rebooting:

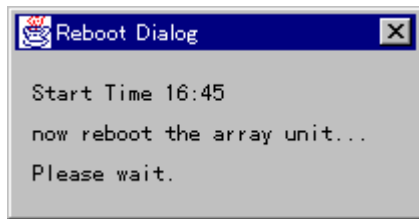


Note: To set effective the closing of the option that you have operated, reboot the array unit. The feature is not yet opened until rebooted. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

5. After an array unit is rebooted, the locked fee-basis option is not displayed anymore.



When you choose to reboot the array unit, the time the reboot began is displayed. Rebooting takes approximately two to six minutes.



Note: It may take time for an array unit to respond, depending on the configuration of the array unit.

A message appears, stating that the reboot has terminated.

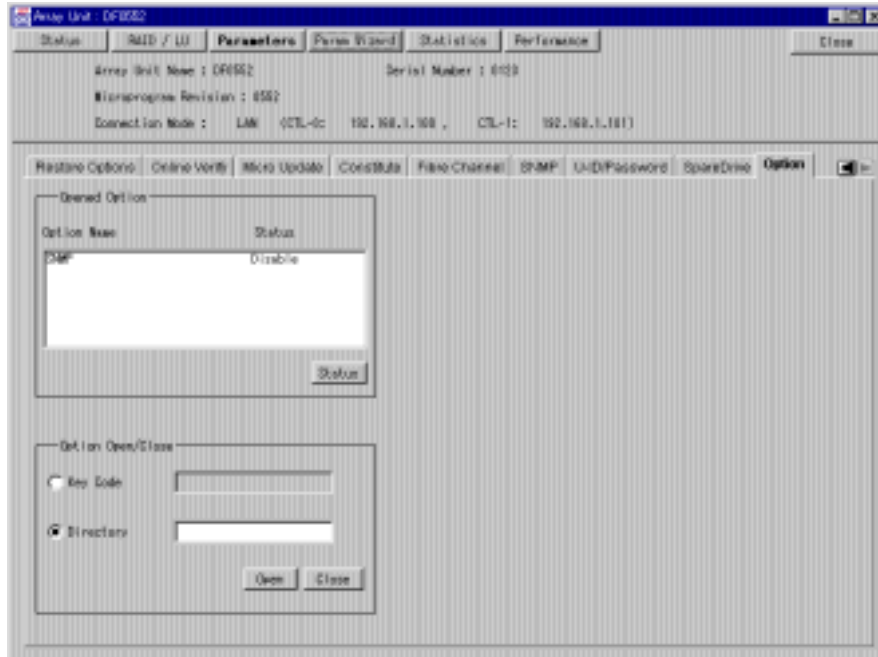


Click the **OK** button; the unit window closes. To perform other operations on the main window, select an array unit from the main window and open the selected unit.

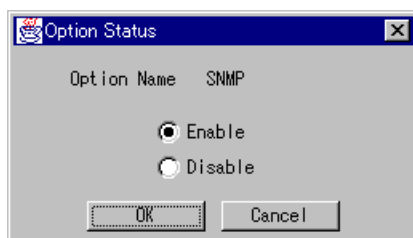
3.7.3 Setting up Priced Optional Features

After the key of a 9200 priced optional feature has been released, this section explains how to enable or disable the priced optional feature.

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

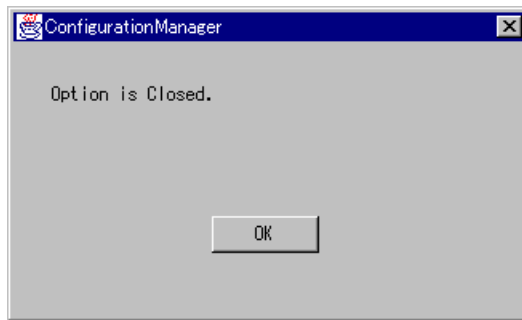


2. Select the fee-basis option to be set up and then click the **Status** button.
3. Select Enable/Disable and then click the **OK** button.



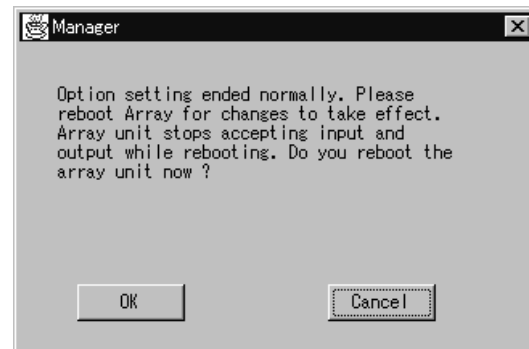
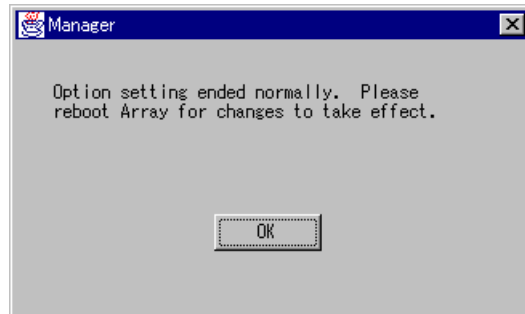
4. A screen appears, confirming that the fee-basis option has been set. Depending on the option, an array unit needs to be rebooted in order to set the setup effective. If an array unit supports rebooting, a message confirming a reboot request will be displayed. Click the **OK** button to reboot.

a) Option that does not require that the array unit be rebooted to set the setup effective:



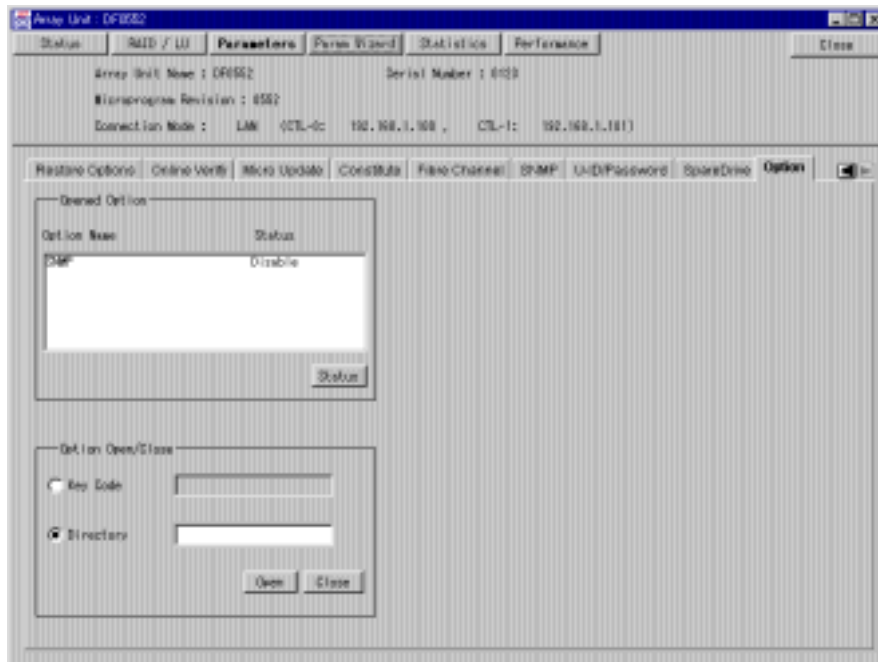
b) Option for which the setup is set effective by rebooting an array unit:

- If an array unit does not support rebooting:
- If an array unit supports rebooting:

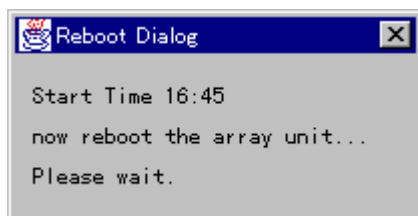


Note: To set effective the setup of the option that you have operated, reboot the array unit. The setup is not reflected until the reboot is finished. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

5. When not rebooting an array unit, a screen appears with the updated set-up fee-basis option.

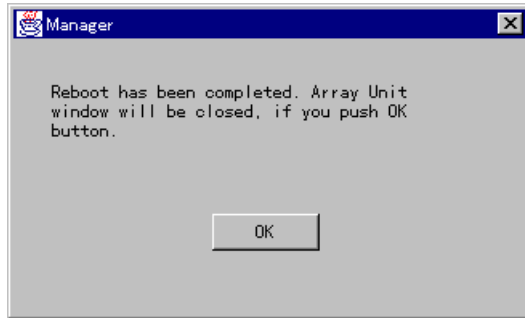


When you choose to reboot the array unit, the time the reboot began is displayed. Rebooting takes approximately two to six minutes.



Note: It may take time for an array unit to respond, depending on the configuration of the array unit.

A message appears, stating that the reboot has terminated.

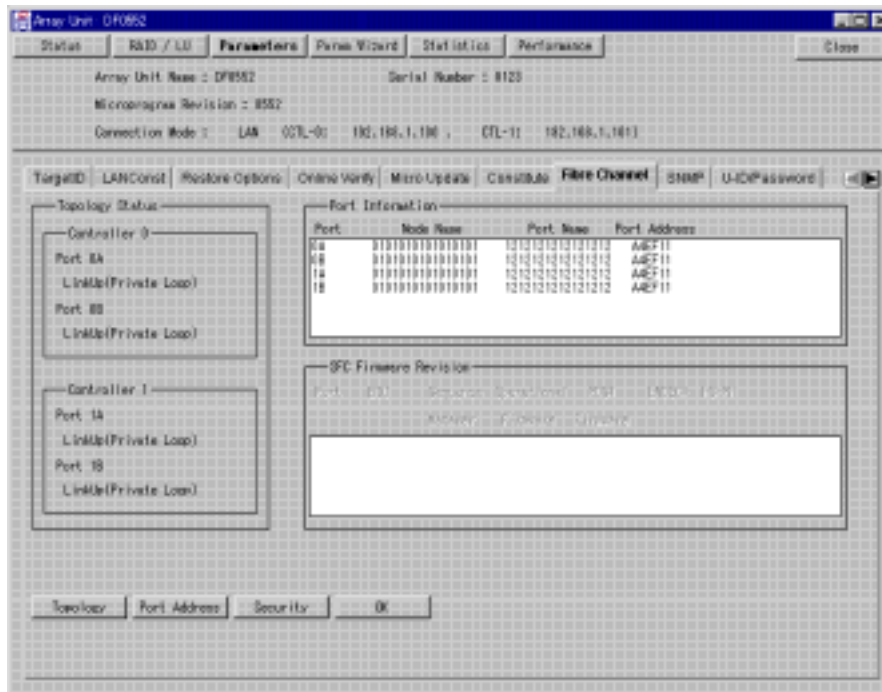


Click the **OK** button; the unit window closes. To perform other operations on the main window, select an array unit from the main window and open the selected unit.

3.8 Setting Fibre Channel Information

This section explains how 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 9200 connection.

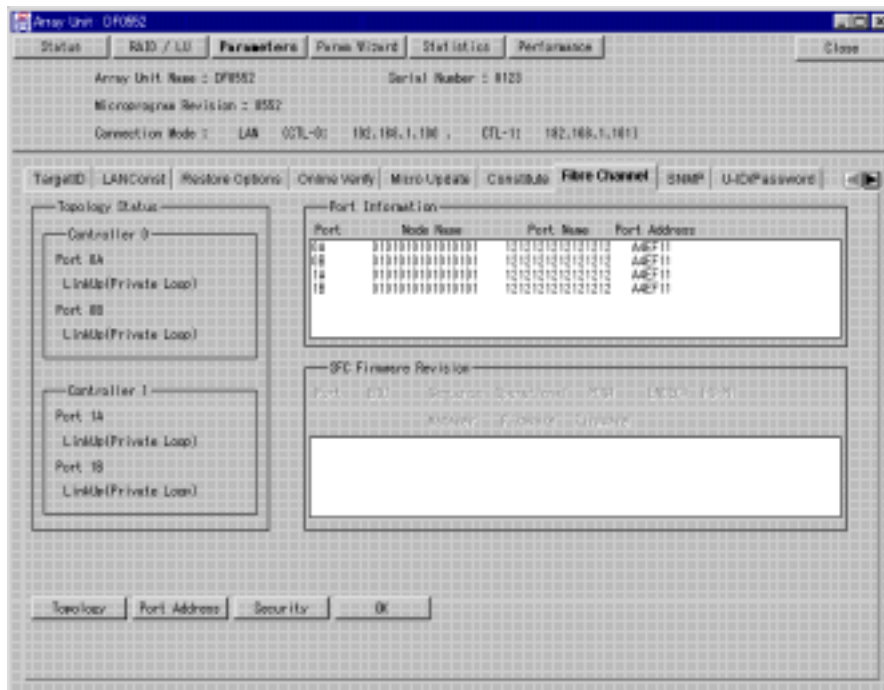
- **Topology Status:** Indicate the topology status.
 - **LinkUp (Private Loop):** Arbitrated Loop not connected with Fibre Channel switch.
 - **LinkUp (Public Loop):** Arbitrated Loop connected with Fibre Channel switch.
 - **LinkUp (N_Port connection):** Connect Point to Point with host.
 - **LinkUp (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 information is revised, 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

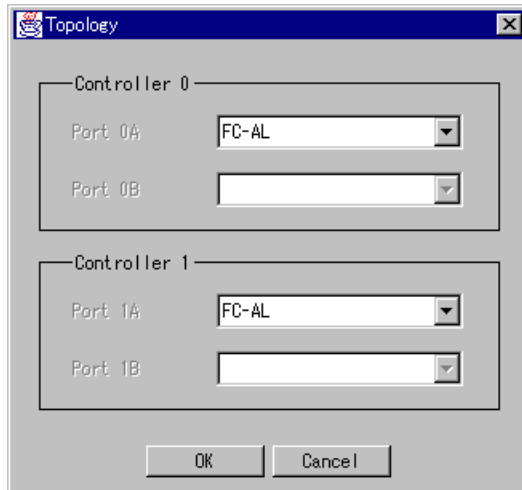
The following procedure sets up the topology. The topology is set up on a controller basis (5700E and 5800) or on a port basis (9200).

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



2. Click the **Topology** button.

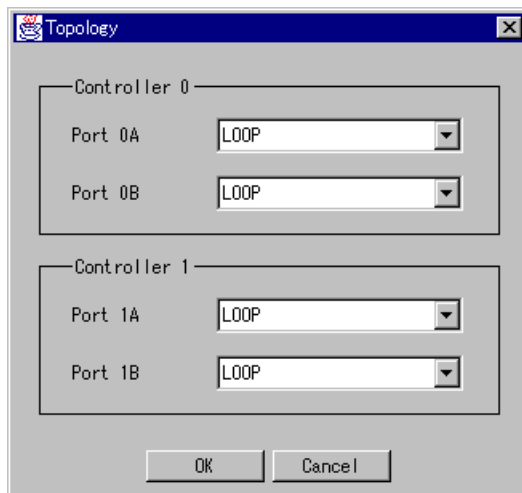
3. Select the topology to be set up, then click the **OK** button.
 - a) For the 5700E and 5800:



Specify the topology on a controller basis.

- FC_AL
- Fabric Point-to - Point

- b) For the 9200:



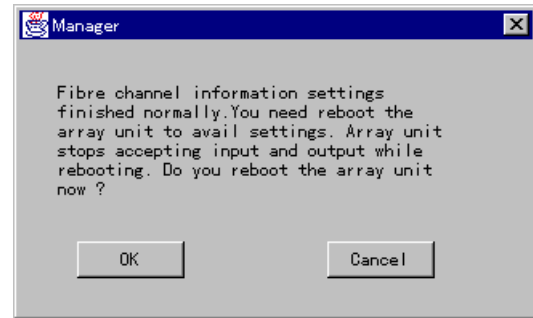
Specify the topology on a port basis.

- Loop
- Point -to -Point

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

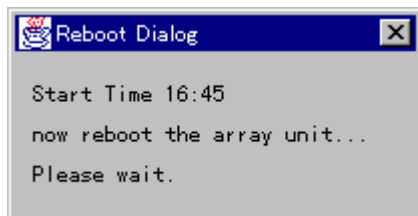
5. A message indicating completion of setting is displayed. If an array unit supports restarting, a confirmation message indicating a request for restarting is displayed. Click the **OK** button when restarting.

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



Note: The new settings do not become effective until the array unit is rebooted. The previous settings stay valid until restarting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

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 configuration of the array unit.

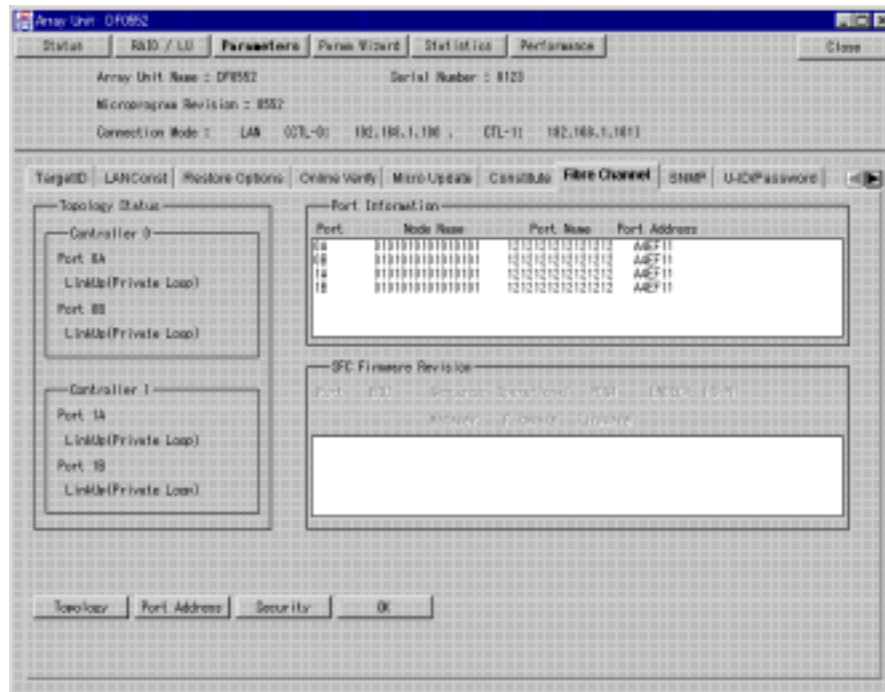
A message indicating that the restarting has terminated is displayed. Click the **OK** button.

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 the Port Address

Set the port address of the Fibre Port.

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

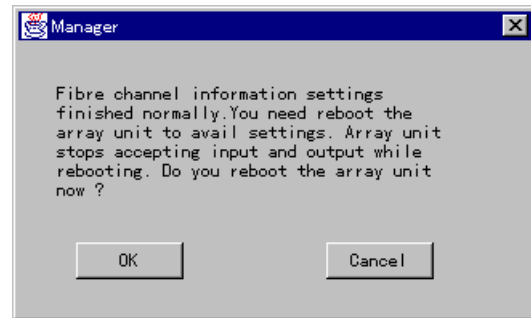


2. Click the port to be set in the **Port Information** box, then click **Port Address**.
3. When **Port Address** window appears, specify a value to be set in the **Port Address** text box and click **OK**.



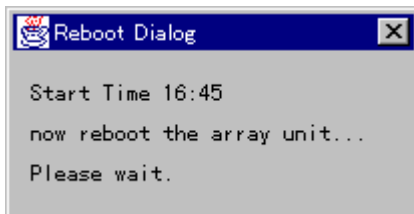
Specify **Port Address** in a hexadecimal 6-digit number.

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. Click the **OK** button when restarting.
 - If an array unit does not support restarting
 - If an array unit supports restarting



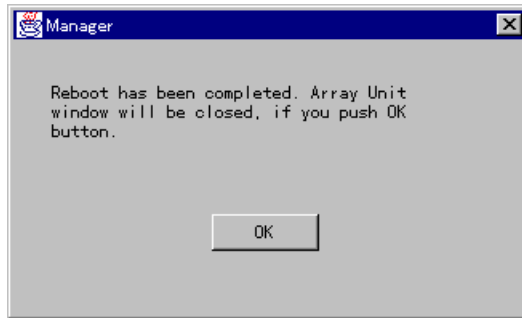
Note: The new settings do not become effective until the array unit is rebooted. The previous settings stay valid until restarting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

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 configuration of the array unit.

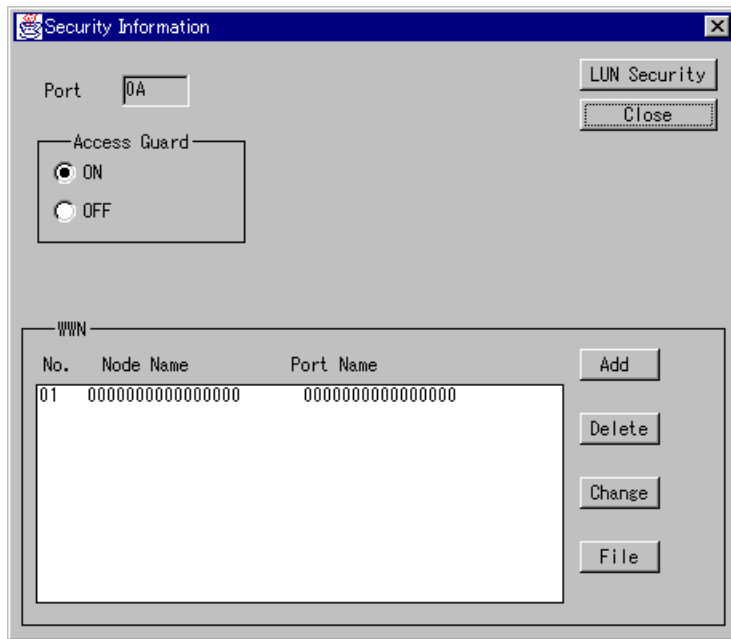
A message indicating that the restarting has terminated is displayed. Click the **OK** button.



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.

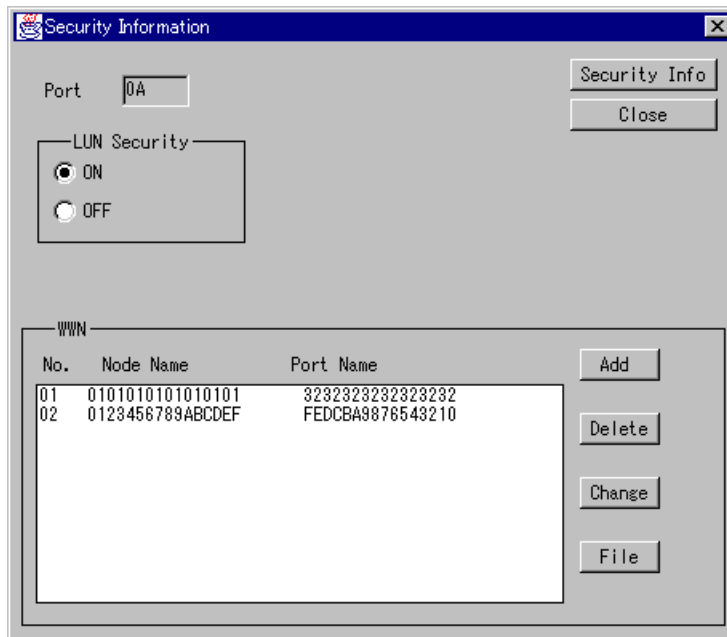
7. When not instructing to restart an array unit, the **Fibre Channel Page** is updated with the set contents reflected into the screen.

3. The **Security Information** window is displayed.
- For 5700E and 5800:



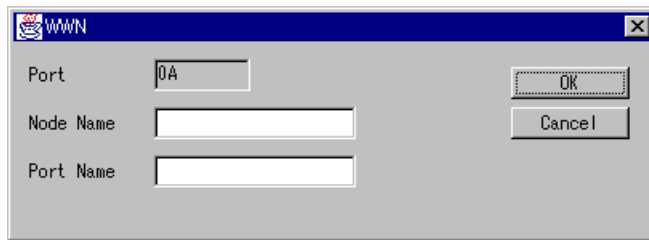
- **Access Guard:** Specifies whether or not to permit access from the WWN of another port registered in WWN. The access permission is applied to all WWNs that are registered.
 - **ON:** Permits access.
 - **OFF:** Not permit access.
- **WWN:** When using the port security and LUN security, the WWN of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

- For 9200:



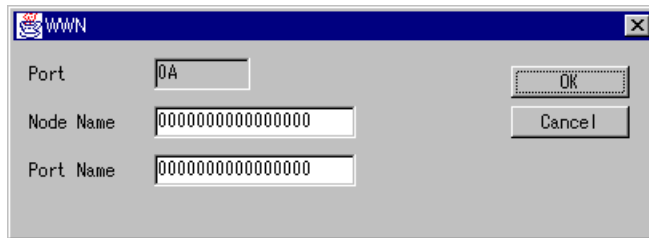
- **LUN Security:** Specify whether the LUN security is to be used or not.
 - **ON:** Permits the LUN security.
 - **OFF:** Inhibits the LUN security.
- **WWN:** When using the port security and LUN security, set up the host WWN. Specify **Node Name** and **Port Name** using a 16-digit hexadecimal

- 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**.

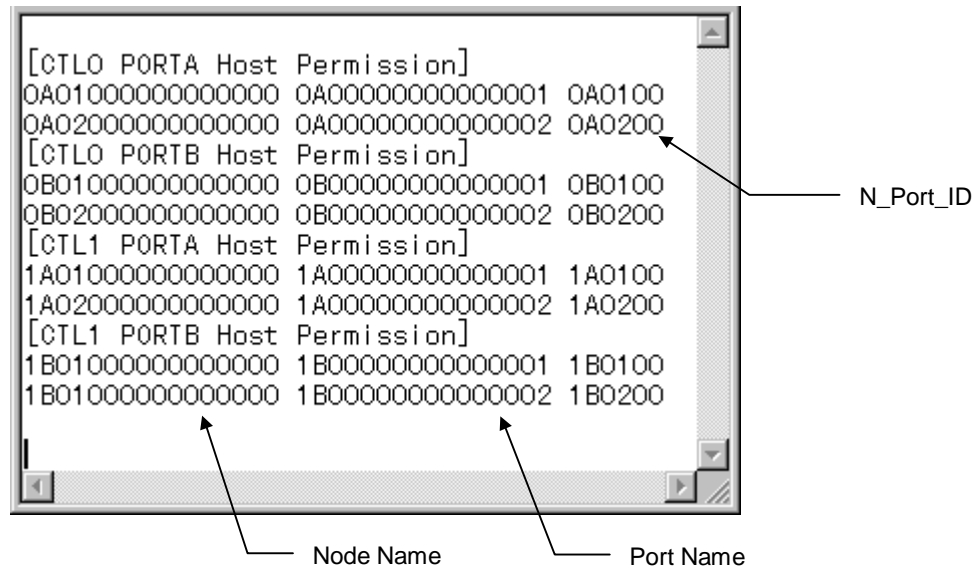
The screenshot shows the same "WWN" dialog box. The "Port" field still contains "0A". The "Node Name" field now contains a long string of zeros: "0000000000000000". The "Port Name" field also contains a long string of zeros: "0000000000000000". The "OK" and "Cancel" buttons are still present.

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**.

- 5800 microprogram revision : x458 or earlier
- 5800 microprogram revision : x459 or later

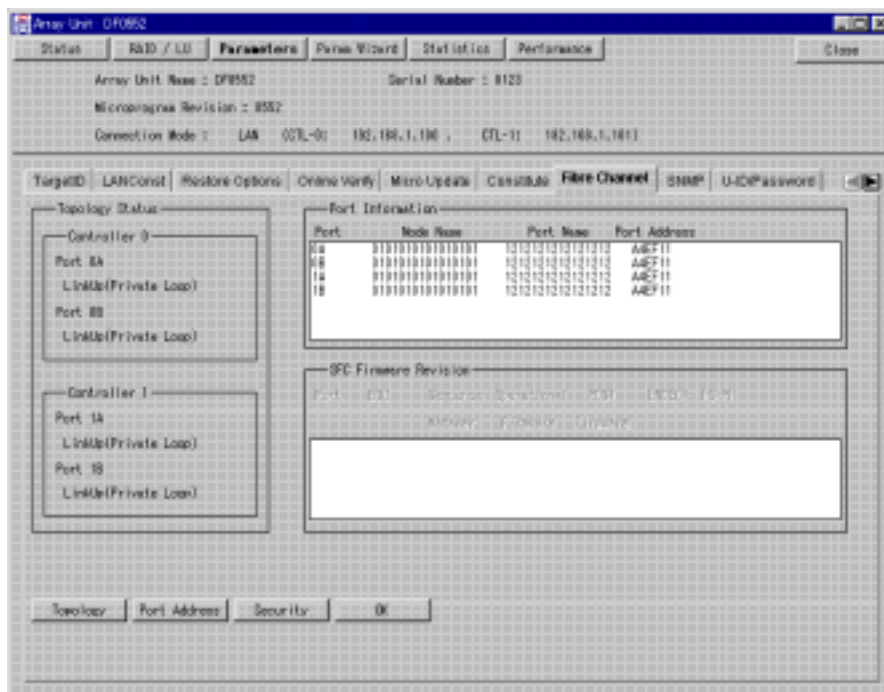


- For 5800 microprogram revision : x459 or later, the setting is reflected as it is.
- For 5800 microprogram revision : x458 or earlier, restart the array unit to validate the setting.

3.8.4 Setting LUN security

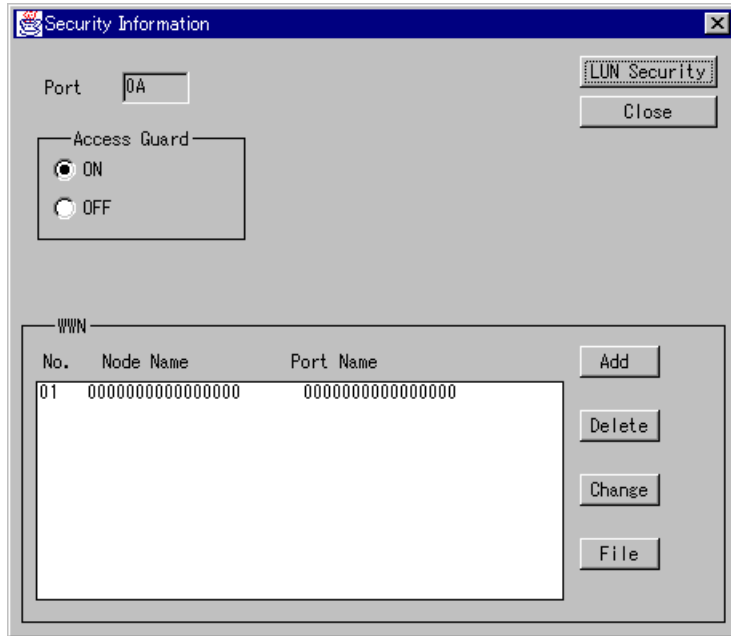
The LUN security function specifies the host port for which access is permitted to the specified LUN. Optional LUN security software is required for this function to work.

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

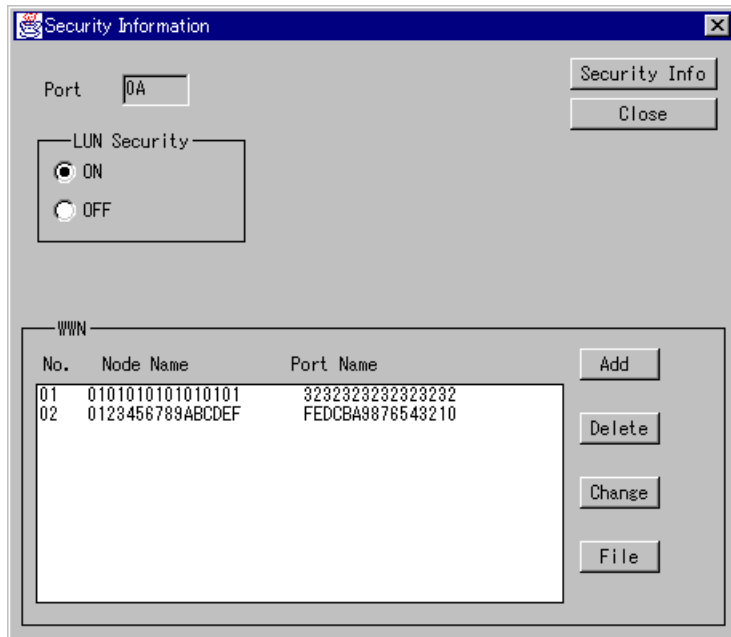


2. Click the port to be set in the **Port Information** box, then click **Security**.

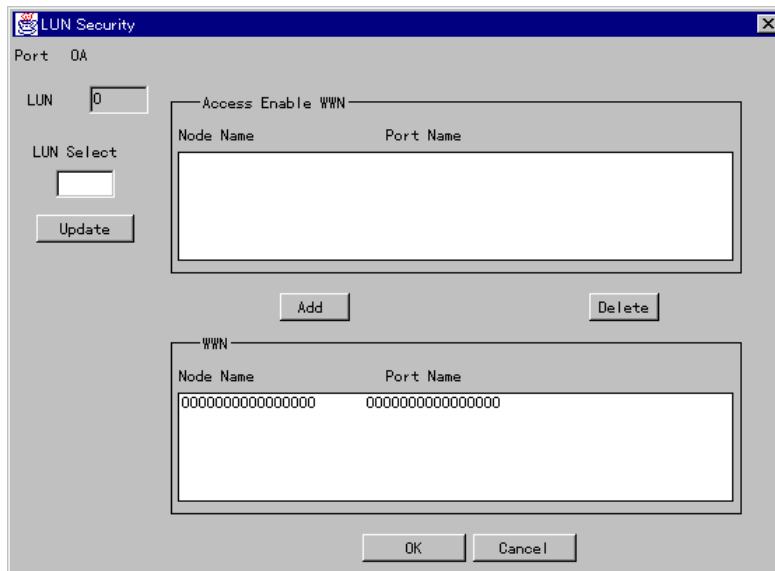
3. When the **Security Information** window appears, click **LUN Security**.
 - a) 5700E and 5800:



- b) 9200 (click **Security Info**):



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

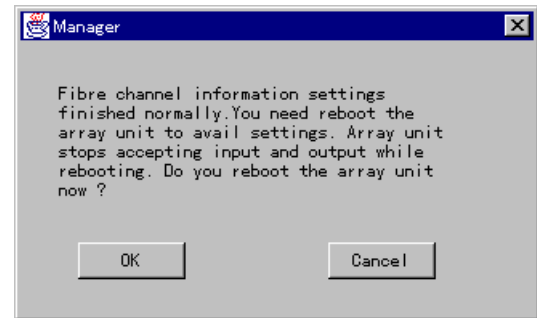


LUN Security is disabled while in HP connection mode.

5. Enter into the **LUN Select** text box an LU No. to set, then click the **Update** button. The LU No. to be set is displayed in the **LUN** field, and host WWN information in the **WWN** box 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 set up the security for all LUs, specify **ALL** for **LUN Select**.
6. Click the **OK** button, click the **Close** button on the **Security Information** screen, and then click **OK** button on the **Fibre Channel Page** screen.

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

- 5800 microprogram revision : x458 or earlier
- 5800 microprogram revision : x459 or later



- For 5800 microprogram revision : x459 or later, the setting is reflected as it is.
- For 5800 microprogram revision : x458 or earlier, restart the array unit to validate the setting.

3.9 Outputting Configuration Information to File

List and save the configuration information of the array unit in a text file or set configuration using a text file.

The configuration information can be listed in three text files. They are the status of the system parameters, RAID/LU configuration, and the constituent parts of the array unit.

The configuration which can be set using a file are the system parameters and RAID/LU configuration. The status of the constituent parts of the array unit cannot be set.

The configuration information is handled in two separate text files for the system parameters and for RAID/LU.

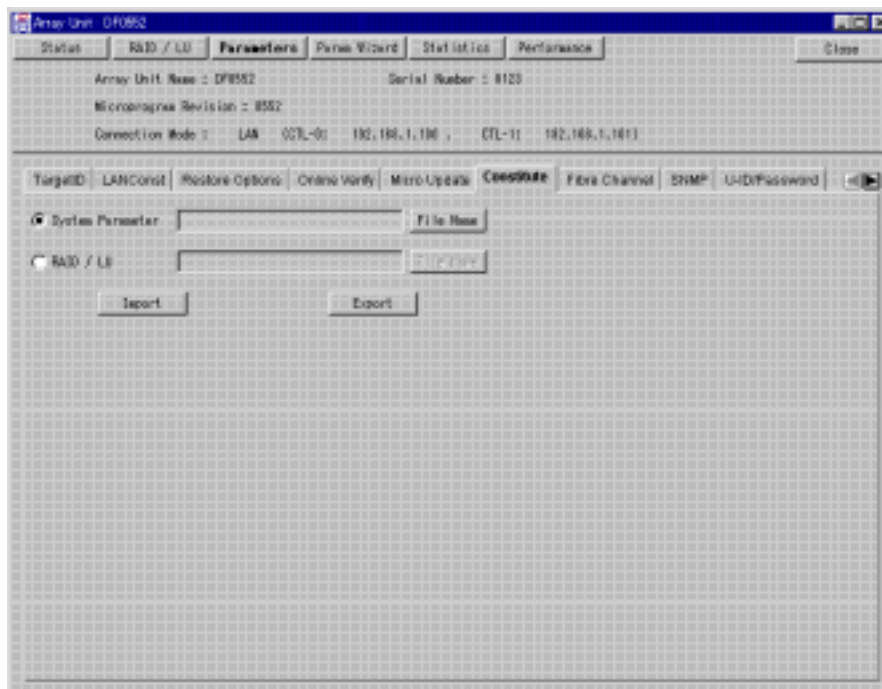
The duplication of configuration between array units can be carried out, by outputting a text file of the configuration from an array unit, and then by using the output text file to set another array unit.

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 of Resource Manager 9200.

3.9.1 File Output of Configuration : System Parameters

Output in text form to a specified file 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.
3. Click the **File Name** button, and specify the directory and file name to save 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

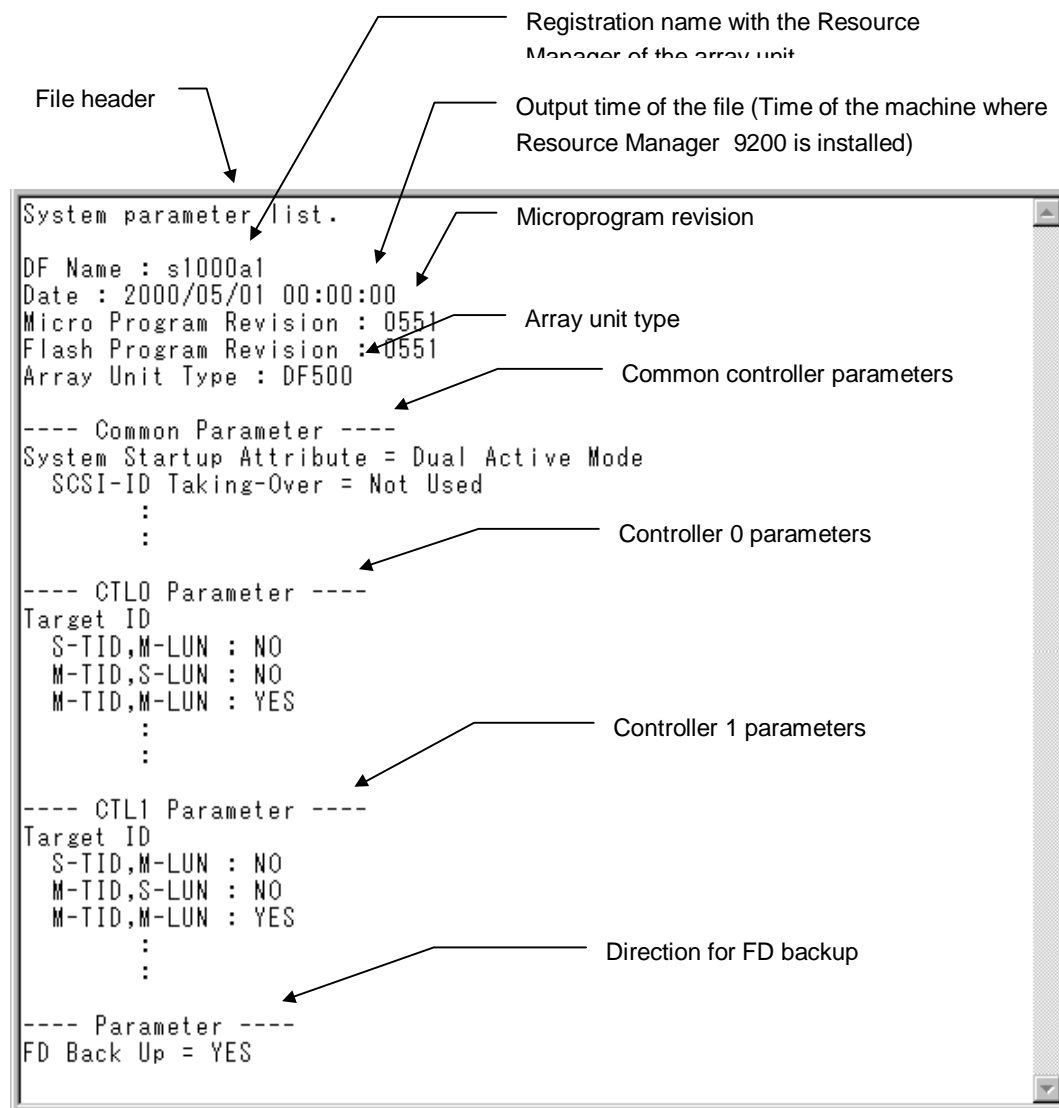


Figure 3.1 Outline of the Format of the System Parameter Output File

a) Common Controller Parameters

The common system parameters of the array unit are output. An output example of the system parameters of 5800 is shown below.

```
---- 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 the following table.

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 saved 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
0B      --        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
ROM Pseudo-response command processing = ---
Save Data pointer response
  Port A = ---
  Port B = ---
Controller Identifier = Disable
RS232C Error Information Outflow Mode = ON (NORMAL)
Write & Verify Execution Mode = ON
LAN Const
  DHCP = OFF
  IP Address = 192.168.1.100
  Subnet Mask = 255.255.255.0
  Default Gateway = 192.168.1.3
  Ether Address = 00:00:87:00:DF:01
SCSI transfer rate
  Port A = ---
  Port B = ---
```

Figure 3.3 System Parameters: Output Example of Controller 0 Parameters

The parameters of controller 0 are the items shown in the following table.

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 saved 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
1A      --      2      2
1B      --      3      3
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
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 = 192.168.1.101
Subnet Mask = 255.255.255.0
Default Gateway = 192.168.1.3
Ether Address = 00:00:87:70:3F:00
SCSI transfer rate
Port A = ---
Port B = ---
```

Figure 3.4 System Parameters: Output Example of the Parameters of Controller 1

The parameters of controller 1 are the items shown in the following table.

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 saved 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”.

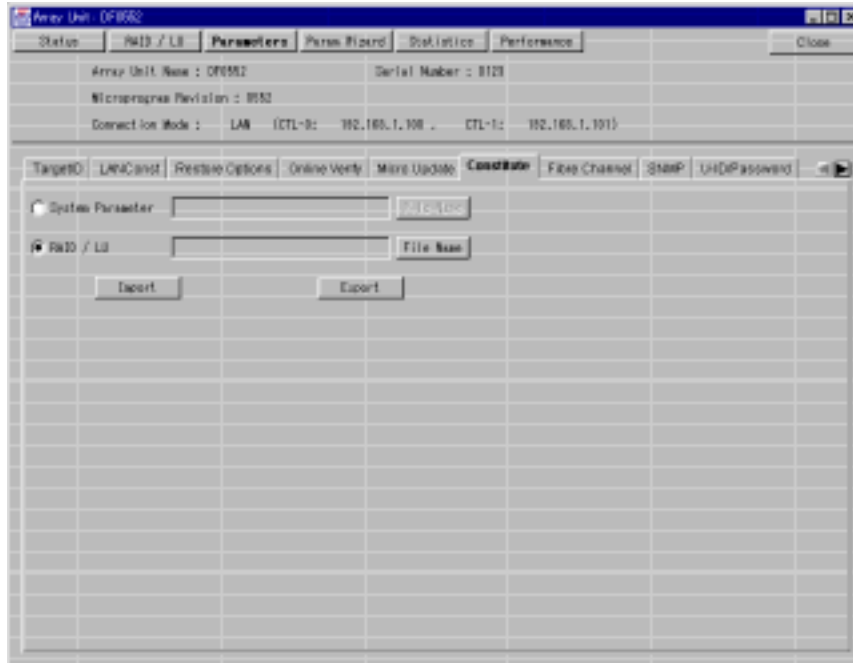


Figure 3.5 Output Example for FD Backup Specification

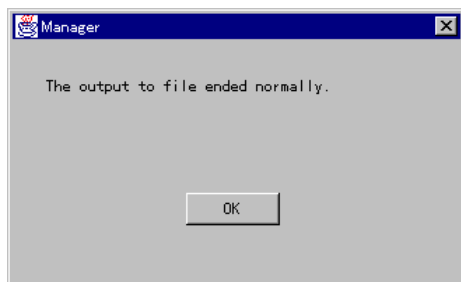
3.9.2 Outputting Configuration Information to File: RAID/LU and Component Status

The RAID/LU definition information already set in an array unit is saved 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 save 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.



RAID Group and LU 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 9200.

- 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

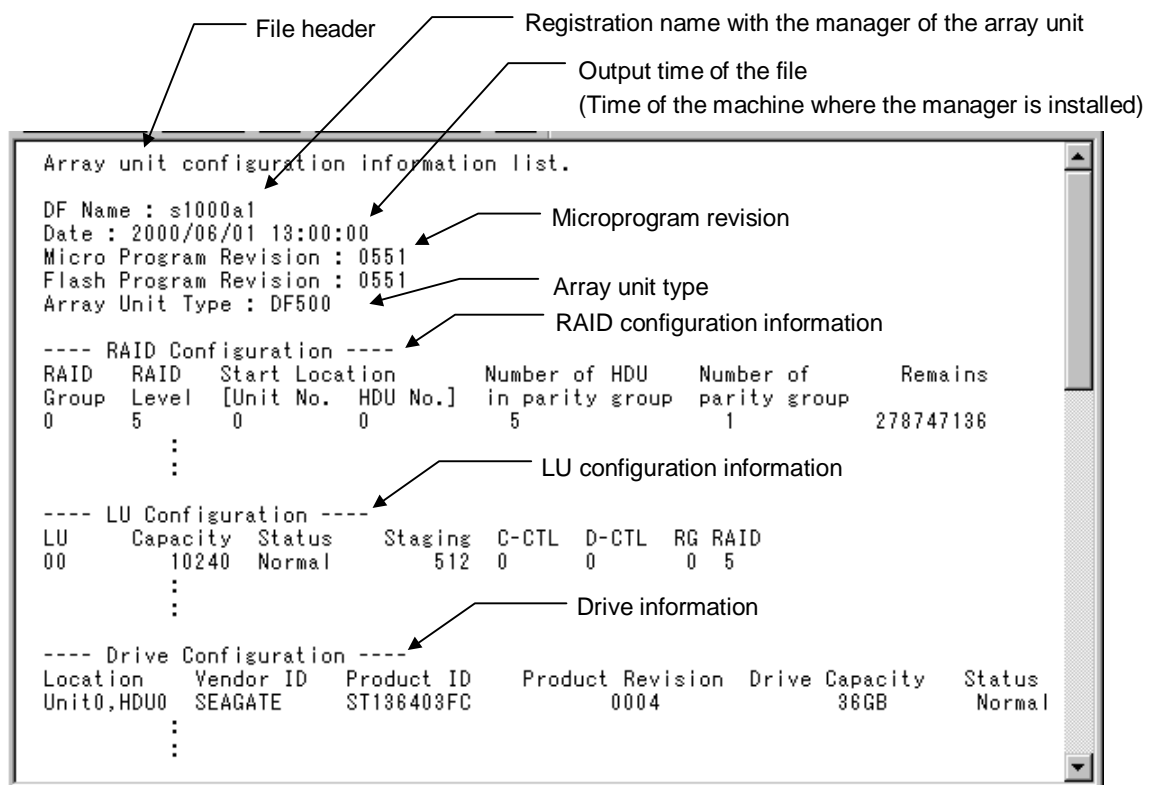


Figure 3.6 The Outline of the Format of RAID/LU Configuration Information Output File

When the 5700 or 5700E is connected, “---” will be shown for Flash Program Revision.

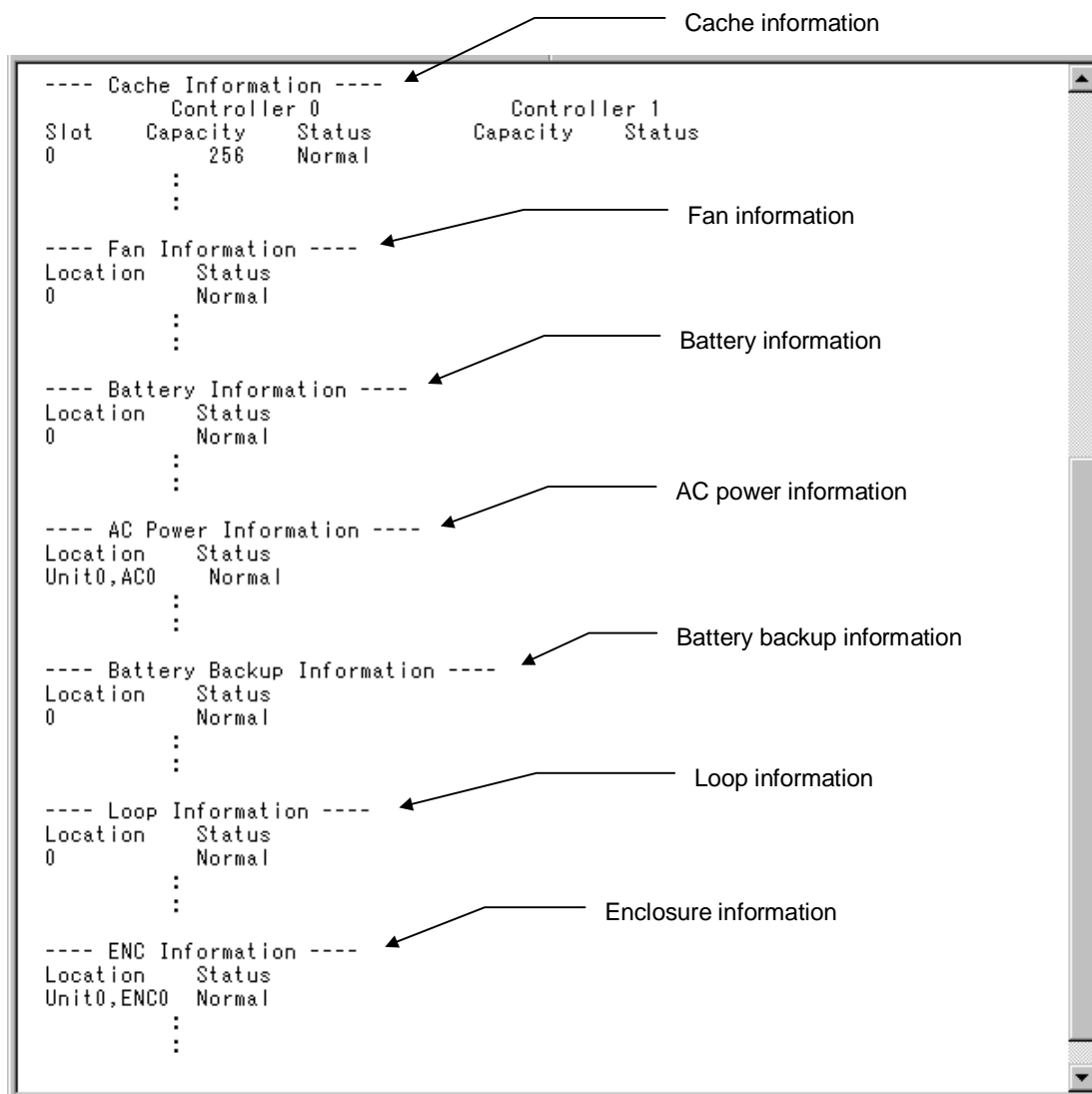


Figure 3.6 The Outline of the Format of RAID/LU Configuration Information Output File (Continued)

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 5700E, 5800:

```

---- 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 9200:

```

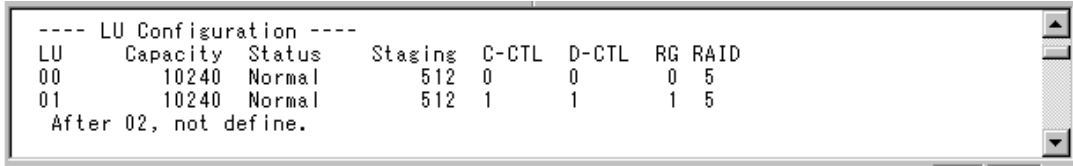
---- RAID Configuration ----
RAID  RAID  Start Location  Number of HDU  Number of  Remains
Group Level  [Unit No.  HDU No.]  in parity group  parity group
0      5      0          0          5          1      278747136
1      5      0          5          5          1      278747136
      :
18     -
19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

```

- **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 controller currently owning the LU
- **D-CTL:** Default controller owning 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 5800:

---- 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 9200:

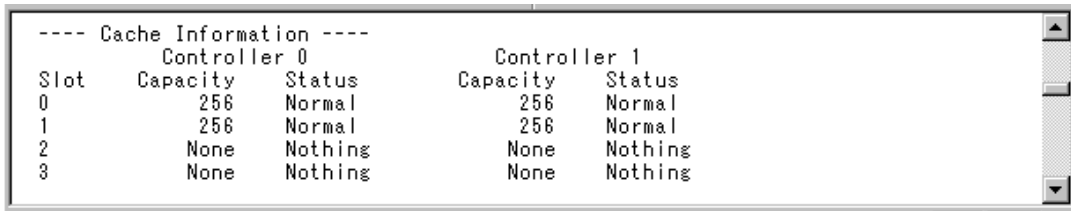
---- Drive Configuration ----					
Location	Vendor ID	Product ID	Product Revision	Drive Capacity	Status
Unit0,HDU0	SEAGATE	ST136403FC	0004	36GB	Normal
Unit0,HDU1	SEAGATE	ST136403FC	0004	36GB	Normal
Unit0,HDU2	SEAGATE	ST136403FC	0004	36GB	Normal
:					
Unit9,HDU7	Nothing				
Unit9,HDU8	Nothing				
Unit9,HDU9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

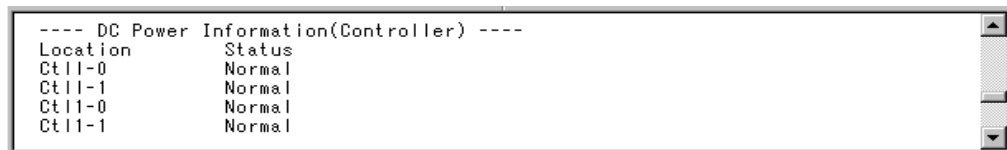
A screenshot of a software window titled "Battery Information". It contains a table with two columns: "Location" and "Status".

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 the 5800:

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

A screenshot of a software window titled "DC Power Information(Controller)". It contains a table with two columns: "Location" and "Status".

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 the 5800:

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

A screenshot of a software window titled "DC Power Information(Drive)". It contains a table with two columns: "Location" and "Status".

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 5700E:

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 the 5800 or 9200 only:

The status of the AC power supply of the array unit is output.

- For 5700E and 5800:



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

- For 9200:



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

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

- k) Format for Battery Backup Status Information : for connection with 5800 or 9200 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 9200 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 9200 only:

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

A screenshot of a terminal window with a white background and black text. The text is as follows:

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

The terminal window has a standard scrollbar on the right side.

- **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 the configuration of an array unit without optional software installed with a file that was saved from an array unit in which had any priced optional feature, setting may terminate abnormally. To use a file for setting, use a file that was saved under the condition in which all priced optional features are disabled.

For a connection with a dual system, settings 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 an RS232C connection, controller 0 must be operational.

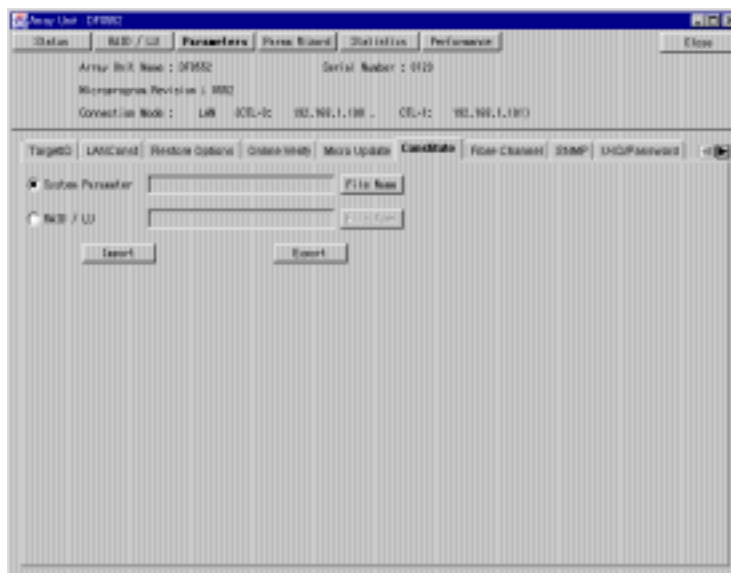
While system parameters are set, the array unit cannot execute commands from the host. Moreover, the functions of Resource Manager 9200 can no longer work, except the Wizard for setting the system parameters and failure monitoring. After the setting, please restart the array unit, and after confirming that it is up and running, connect to the host and Resource Manager 9200.

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.

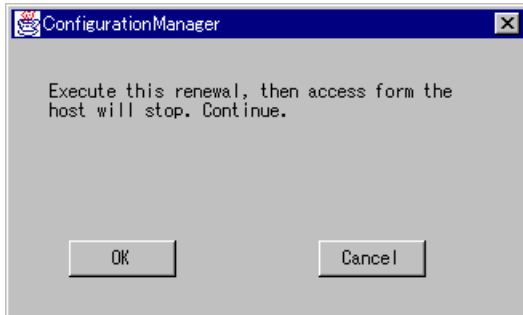
- For the format of the file : **3.9.1 File Output of Configuration : System Parameters**
- For the parameters : **3.5.1 Setting System Parameters**

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.

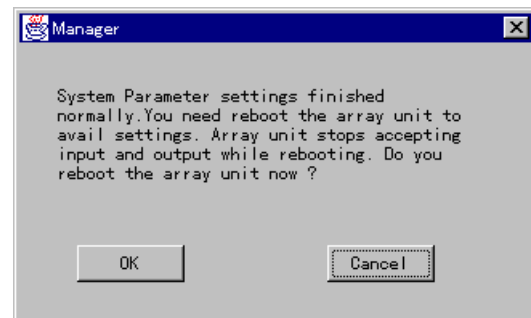
2. Click the **Parameters** button, and click the **Constitute** tab.



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

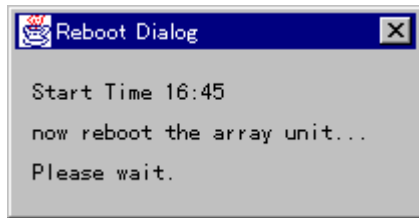


For the set configuration, confirm the parameters using the Wizard for setting system parameters.

Note 1: To validate the set system parameters, reboot the array unit. Until reboot, commands from the host and part of the functions of the Resource Manager 9200 cannot be executed. The new settings do not become effective until the array unit is rebooted. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

Note 2: When 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. Check the floppy disk in the array unit. After checking the floppy disk, and confirming the effectiveness of the previous settings, 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 configuration of the array unit.

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



When clicking the **OK** button, the unit window is closed. To perform other operations on the main window, select an array unit from the main window and open the selected unit.

3.9.4 Setting the Configuration with a File: RAID/LU Definition

Setting the array unit according to the RAID/LU setting information saved in a file.

Caution: If the set up 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, do a backup before setting the RAID/LU.

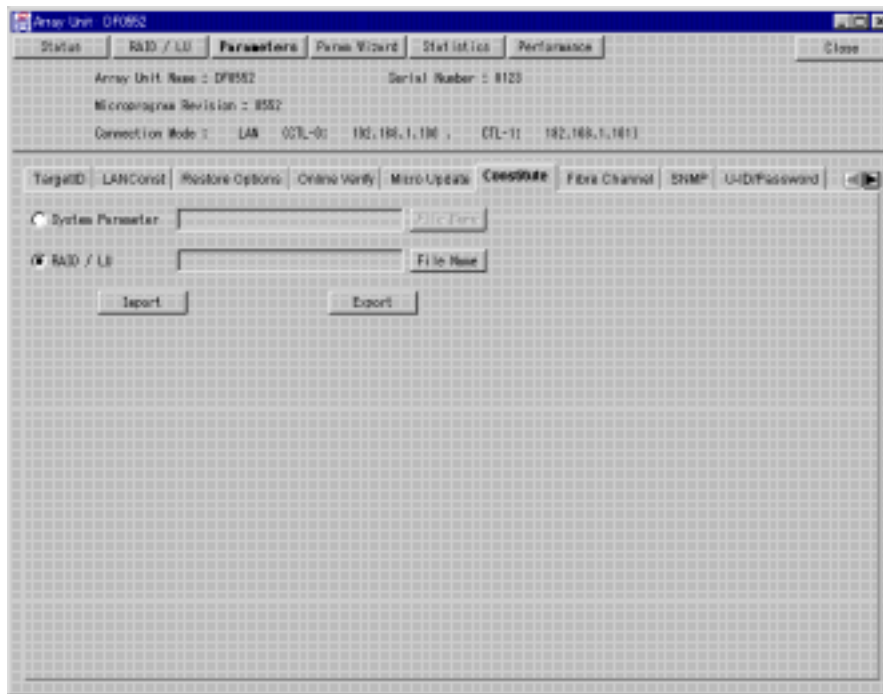
1. Edit the file for setting the RAID/LU to be set in the array unit. The file has a specified format. The format of the file is the same as that of file output by the array unit. Please refer to the following for the format of the file :

- **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 5800 and 9200 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.

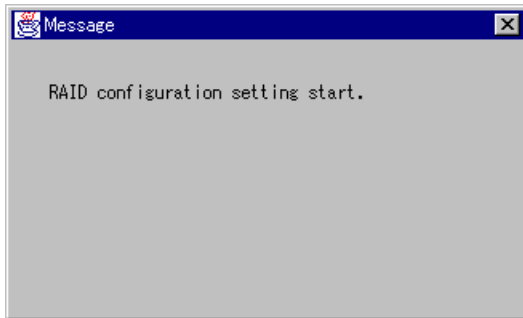
- Click the **Parameters** button, and click the **Constitute** tab.



- Click the **RAID/LU** radio button.
- 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.
- Click the button **Import**.
- As a confirmation screen for whether to carry out the setting is displayed, click the **OK** button.

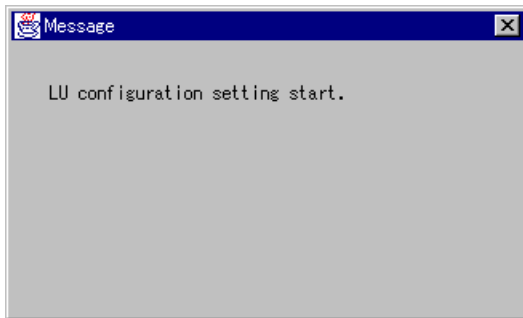


7. A message appears, stating that the setting of the RAID group has started. The setting of RAID group is carried out.



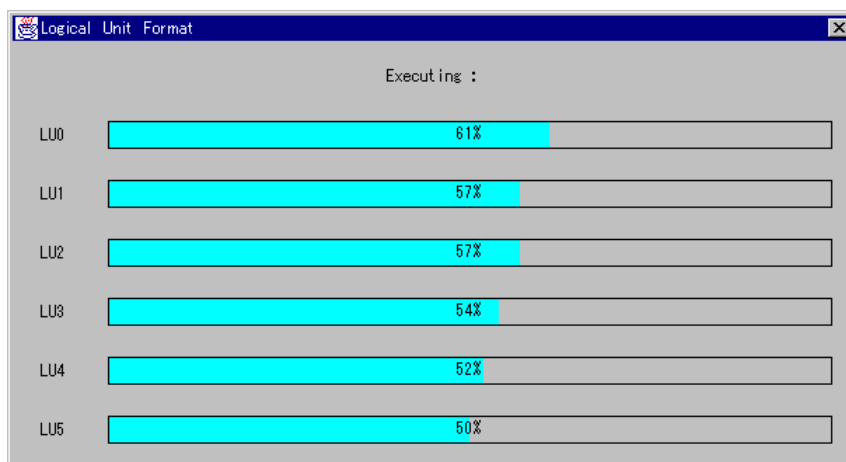
If the setting of the RAID group ends abnormally, an error message will be shown and the processing will be interrupted.

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.



If 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.

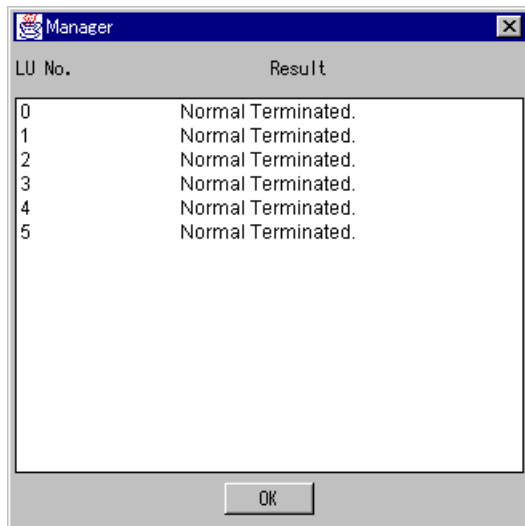


10. When a message appears, stating that the formatting of the LU has terminated, click the **OK** button.



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, the code is first saved in a directory of the RM workstation and then downloaded into the array unit before the running microcode is replaced.

3.10.1 Microprogram Download

Download the microprogram from the FD or directory on the HD into the array unit. During the download, the microprogram is only stored in the array unit and the microprogram of the current array unit is not replaced.

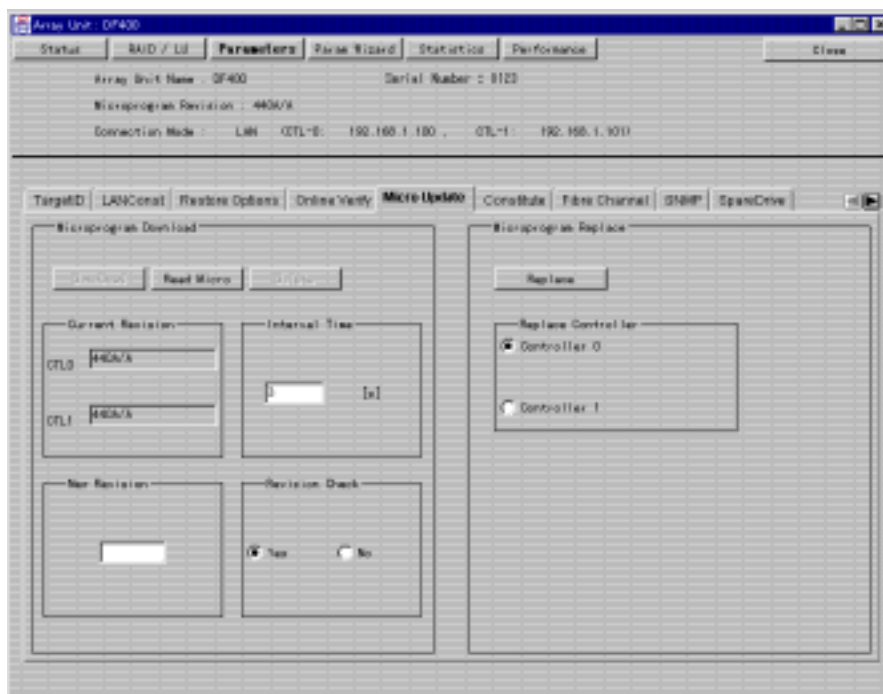
1. Copy the microprogram from the floppy disk to the hard disk.

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: Copy the microprogram to 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.

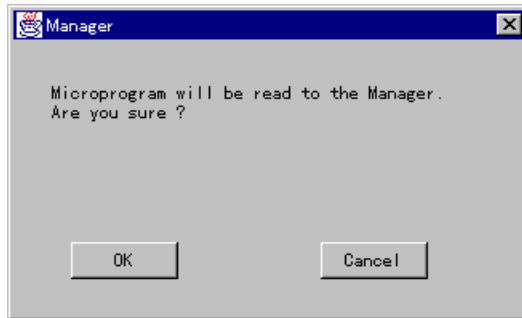


- **Current Revision:** Microprogram revision of each controller of the array unit when the 5800 is connected.
- **New Revision:** A microprogram revision stored in the PC or SUN server/workstation in which Resource Manager 9200 is installed. When the microprogram is not read, a blank is displayed.
- **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.
- **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**

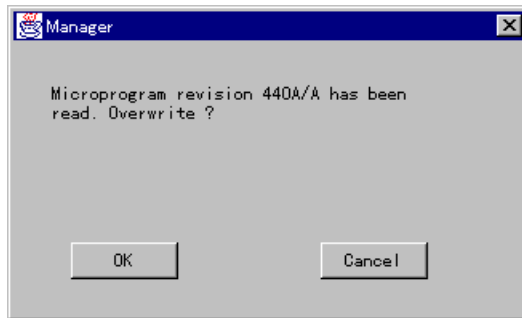
When no microprogram is read, the **DownLoad** and **Delete** buttons are displayed in halftone and cannot be selected.

3. The microprogram is read into the PC or SUN server/workstation in which Resource Manager 9200 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.

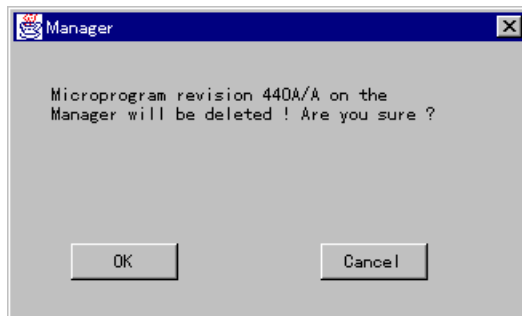
4. When a confirmation message as to whether or not to read the microprogram appears, click **OK**.



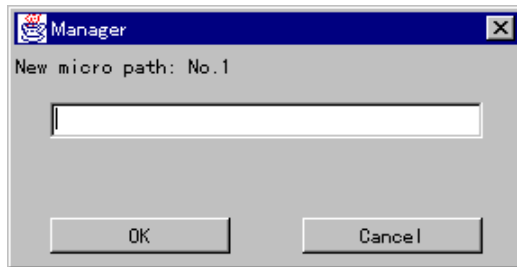
If the microprogram is already read, a confirmation message is displayed. When **OK** is clicked, the microprogram is overwritten. To stop reading the microprogram, click **Cancel**.



To delete the microprogram that is already read in the PC or SUN server/workstation, click **Delete**. When a confirmation message appears, click **OK**.



5. 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:

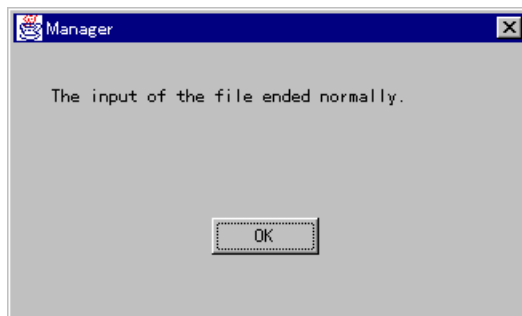
c:\manager\mp0409\disk1

When using Solaris : /home/usr/manager/mp0409/disk1

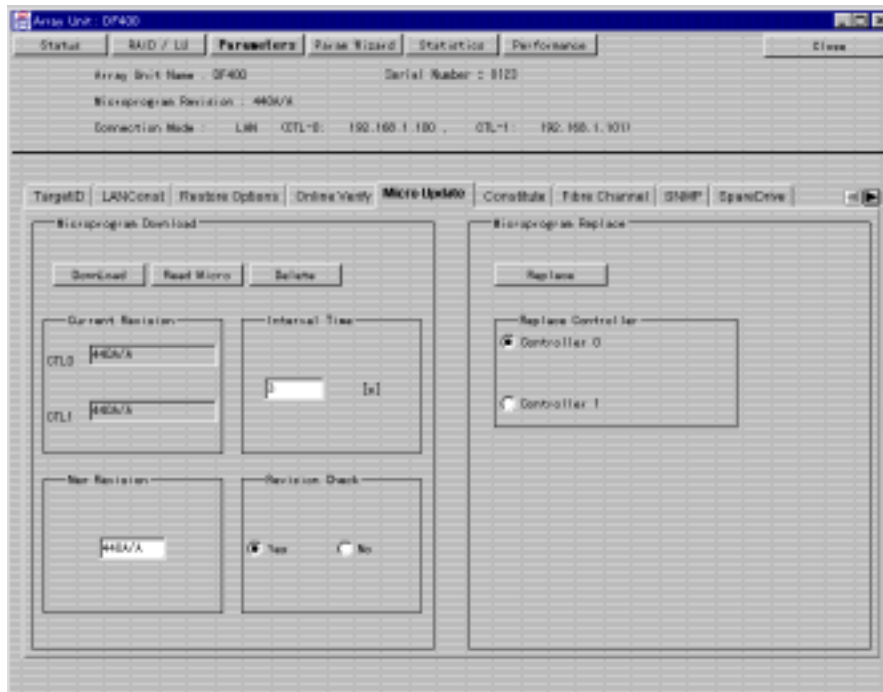
Directory in the hard disk in which the microprogram of the FD is copied.

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.

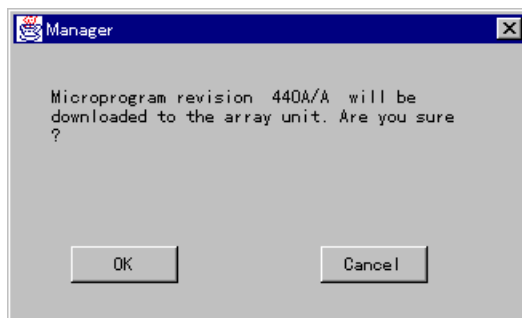
6. When a message indicating that all the microprogram has been read appears, click **OK**.



7. The revision of the read microprogram is displayed in the **New Revision** field.



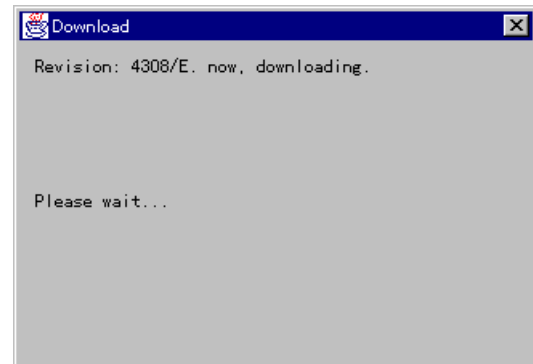
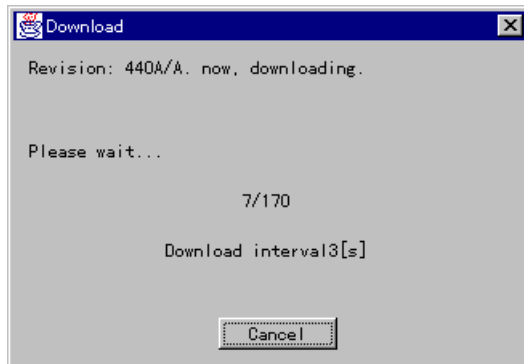
8. When downloading the microprogram, click the **DownLoad** button.
9. When a confirmation message as to whether or not to download the microprogram appears, click **OK**.



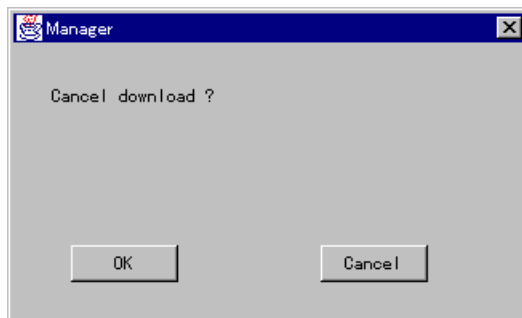
10. The message informing that the download is being executed is displayed. The message shows the revision of the program being downloaded, interval time, and progress.

■ When the 5800 or 9200 is connected

■ When the 5700E is connected



When the 5800 or 9200 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**.

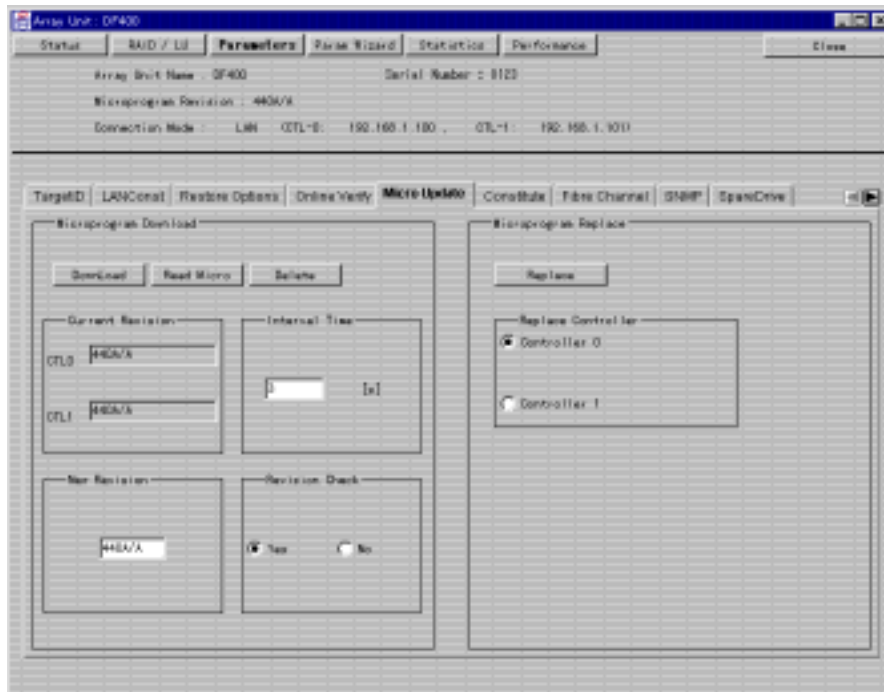


Note: After the download of the microprogram, be sure to restart the array unit or replace the microprogram. If a hot replacement of the controller board is done before the restart of the array unit or the microprogram replacement, the replaced new controller may be blocked. The download may terminate with a DMES05EA03 message when the array unit experiences heavy host I/Os. In the case, please perform the download operation again.

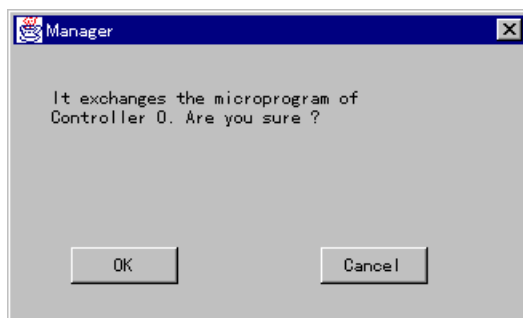
3.10.2 Replacing the microprogram

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.

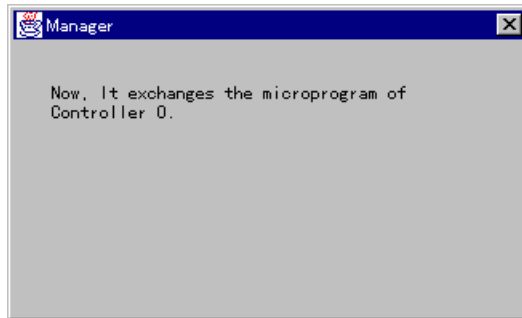
1. Click **Parameters**, then click the **Micro Update** tab.



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 with the same version of the new microprogram.

3.11 Setting and Outputting the SNMP Environmental Information File

The SNMP configuration information file is used to set the SNMP configuration information . The array unit can save the SNMP configuration to the file.

When connected to the dual system of the 5800, 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.

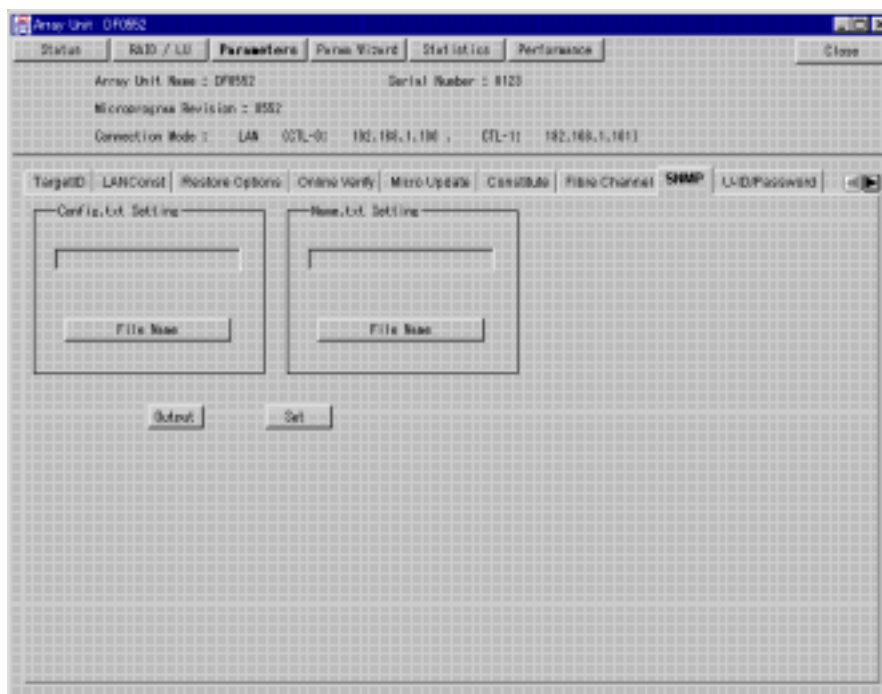
When the 5800 is connected, if the SNMP environmental information file is set, the array unit cannot execute a command issued from the host. Neither can it execute any functions other than the setting wizard function of the Resource Manager 9200, function for the SNMP configuration information file setting 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 Resource Manager 9200.

The registered SNMP configuration information file is not validated unless the array unit is restarted.

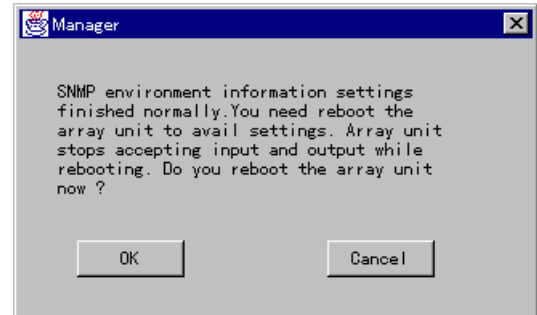
3.11.1 Setting SNMP Environmental Information File

Set the SNMP environmental information file into the array unit from the FD or hard disk.

1. Click the **Parameters** button, and click 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 rebooting, a confirmation message indicating a request for rebooting is displayed. Click the **OK** button when rebooting.
 - If an array unit does not support rebooting:
 - If an array unit supports rebooting:

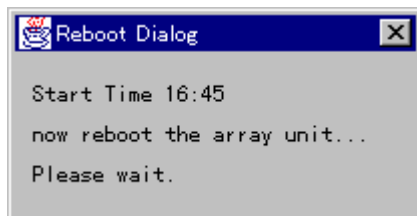


Note: To validate the set SNMP environment information, restart the array unit. The previous settings stay valid until restarting.

When connecting the to 5800, commands from the host cannot be executed until the array unit is restarted. The Resource Manager 9200 functions cannot be executed either.

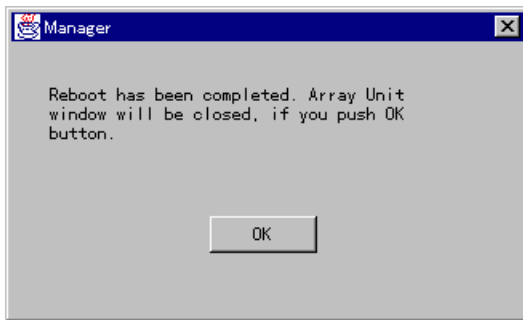
When rebooting is initiated, the array unit is not ready to accept an access from the host for duration from initiation until the restarting terminates. Therefore, after making sure that the host has stopped accessing, initiate rebooting.

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 configuration of the array unit.

A message indicating that the restarting has terminated is displayed. Click the **OK** button.

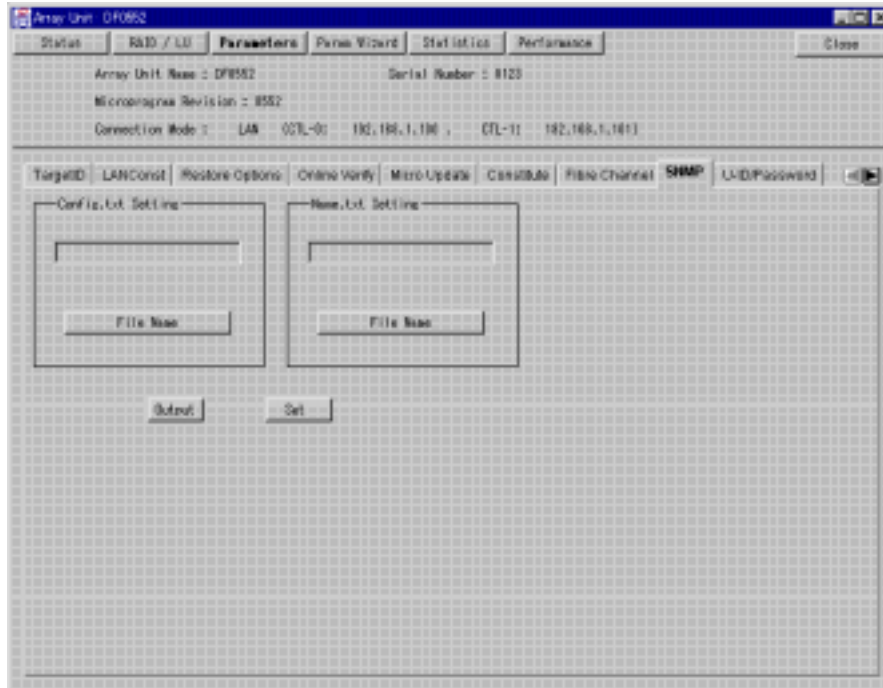


When clicking the **OK** button, the unit window is closed. To perform other operations on the main window, select an array unit from the main window and open the selected unit.

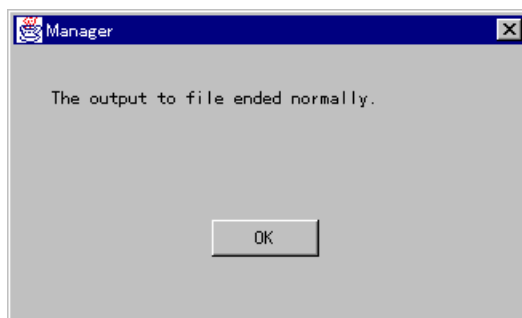
3.11.2 Outputting SNMP Environmental Information File

Output the SNMP environmental information file from the array unit and save in the text file format.

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



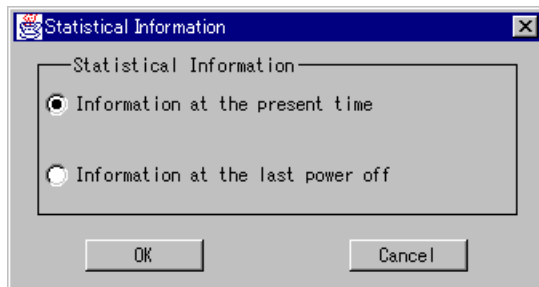
2. Specify the paths of the directory for storing the “config.txt” file and the “name.txt” file and click **Output**. To output only one file, specify only the path of the target file.
Note: Specify the name of a directory in the hard disk drive to which the microprogram is copied and the file name, with 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.

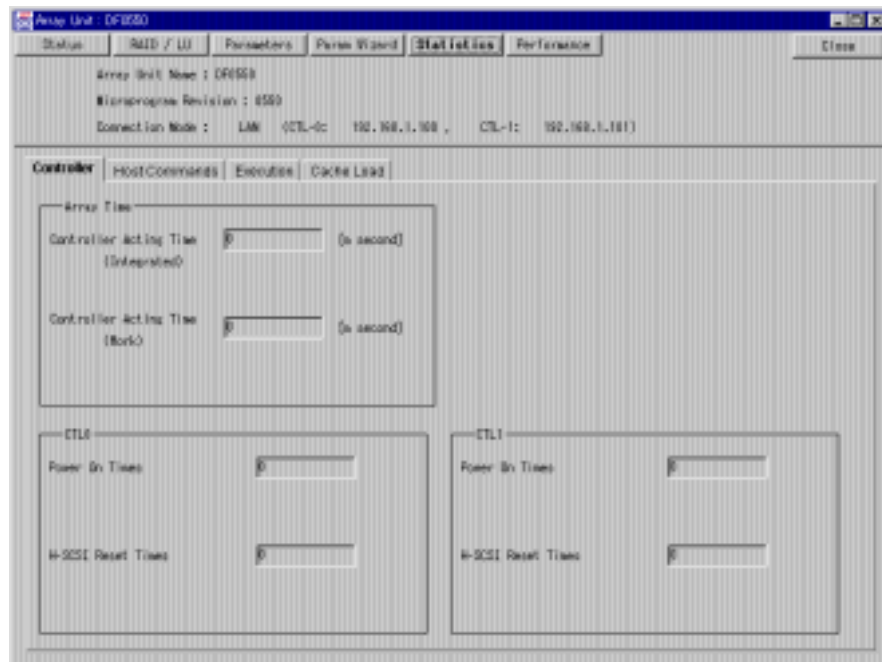
1. Click **Statistics**.



- **Statistical Information:** Statistical information to be displayed
 - **Information at the present time:** Current collected information
 - **Information at the last power off:** Information collected when an array unit was powered off.
2. Specifies statistical information which to display by **Statistical Information**, and click 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.

Array Unit : DF050

Status RAID / LU Parameters Partition Wizard Statistics Performance Close

Array Unit Name : DF050
Microprogram Revision : 0500
Connection Mode : LAN (CTL-0: 192.168.1.100 , CTL-1: 192.168.1.101)

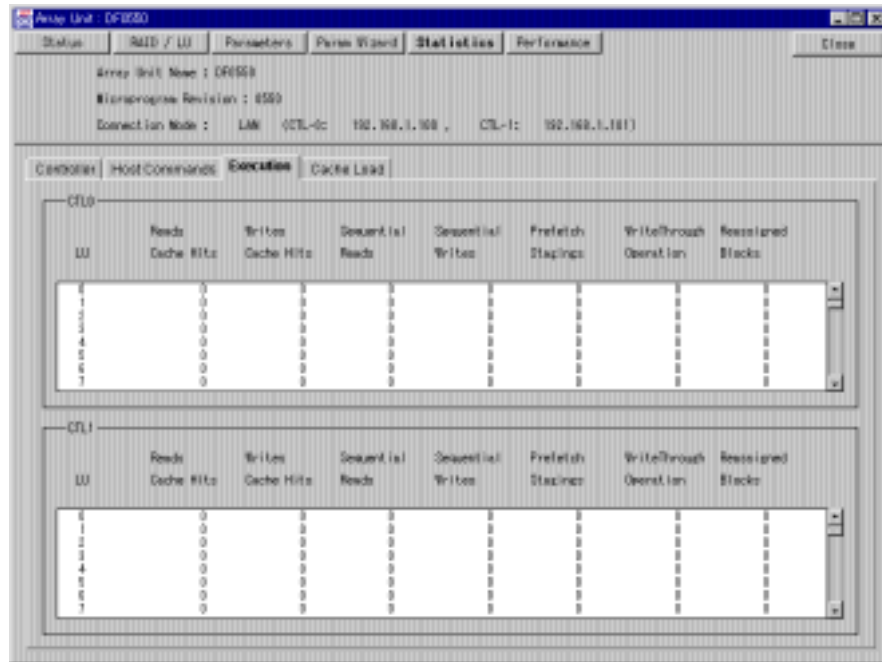
Categories Host Commands Execution Cache Load

CTL0			CTL1		
LU	READ	WRITE	LU	READ	WRITE
0	0	0	0	0	0
1	0	0	1	0	0
2	0	0	2	0	0
3	0	0	3	0	0
4	0	0	4	0	0
5	0	0	5	0	0
6	0	0	6	0	0
7	0	0	7	0	0
8	0	0	8	0	0
9	0	0	9	0	0
10	0	0	10	0	0
11	0	0	11	0	0
12	0	0	12	0	0
13	0	0	13	0	0
14	0	0	14	0	0
15	0	0	15	0	0
16	0	0	16	0	0
17	0	0	17	0	0
18	0	0	18	0	0
19	0	0	19	0	0
20	0	0	20	0	0
21	0	0	21	0	0
22	0	0	22	0	0
23	0	0	23	0	0
24	0	0	24	0	0
25	0	0	25	0	0
26	0	0	26	0	0

- **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

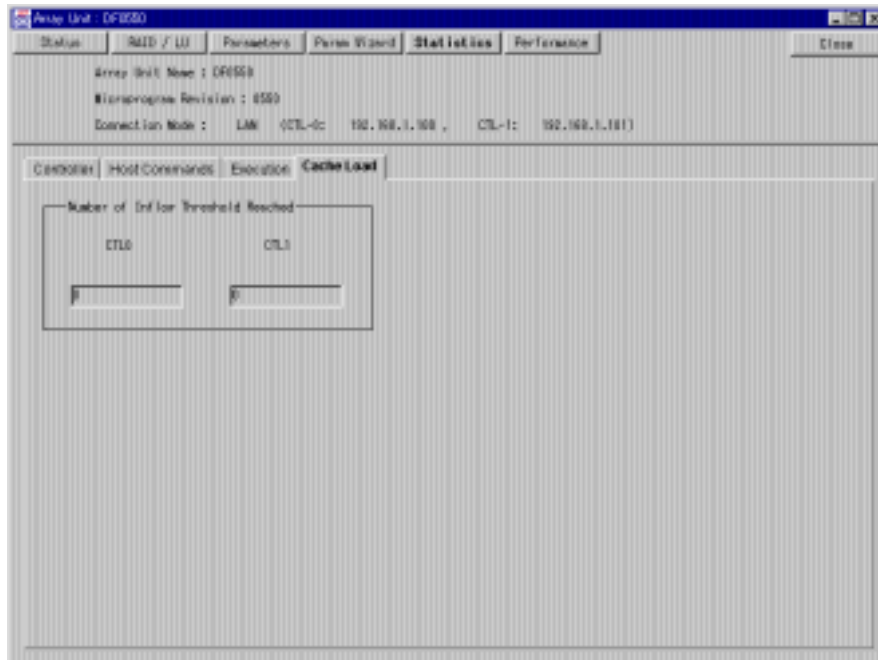
1. Click the **Execution** tab.



- **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

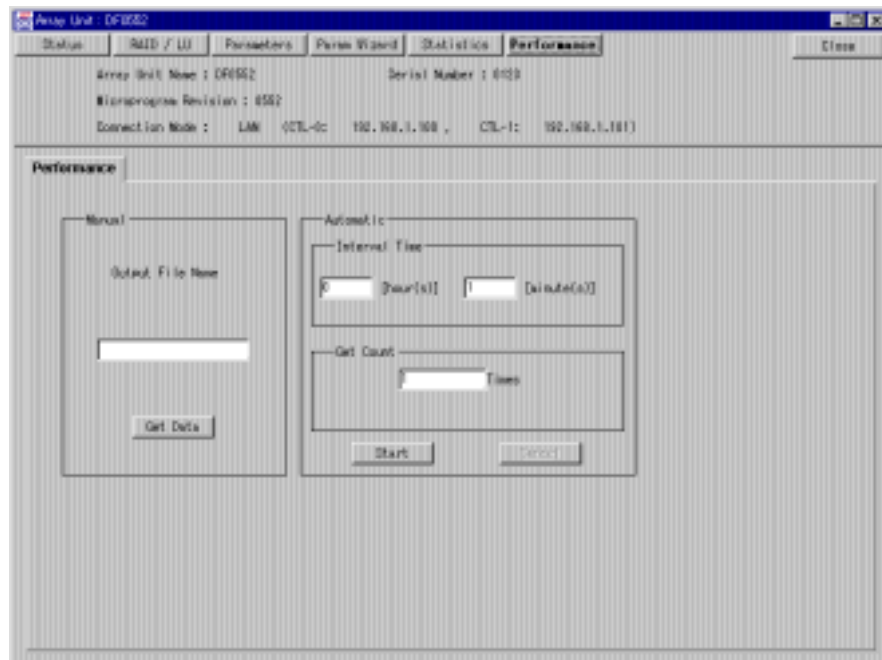
Command operation state is saved for each logical unit in the array unit.

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 alphanumerics.

2. Click **Get Data**.

The file names for getting performance information are displayed in the text box.

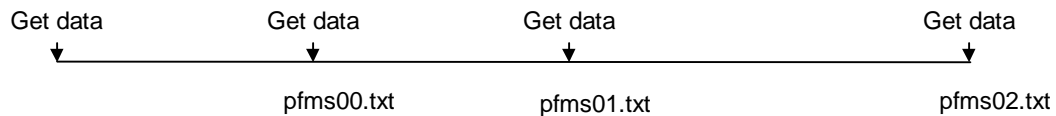
3. Click **Get Data** at a timing from which you want to get information. Files are output with the following file names. The files to be got are saved to the directory where the Resource Manager 9200 is installed in the text file format.

Single system : pfms\$.txt (\$\$: serial number from 00 to 99)

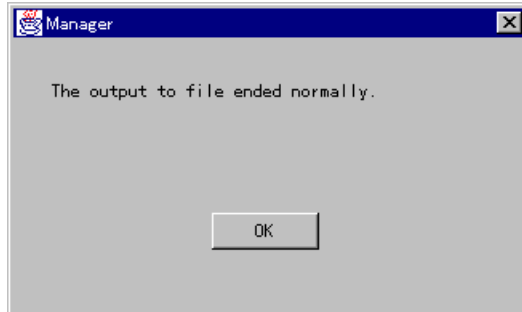
Dual system : pfmd\$.txt (\$\$: serial number from 00 to 99)

Note: Files are saved with the names of pfms00.txt/pfmd00.txt to pfms99.txt/pfmd99.txt. If the file name already exists, no warning will be displayed and the original file will be overwritten. After pfms99.txt/pfmd99.txt, pfms00.txt/pfmd00.txt is overwritten. Transfer necessary information to another directory.

The information is received according to the following timing.



4. After the file get processing is terminated, a confirmation message appears. Then, click **OK**.



5. Import the created text file by means of Excel using “SAMPLEPM.xls” on the supplied FD. The text file is tabulated in the format shown below when it is opened on Excel by using a delimiter “,”. For a RS-232C 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												

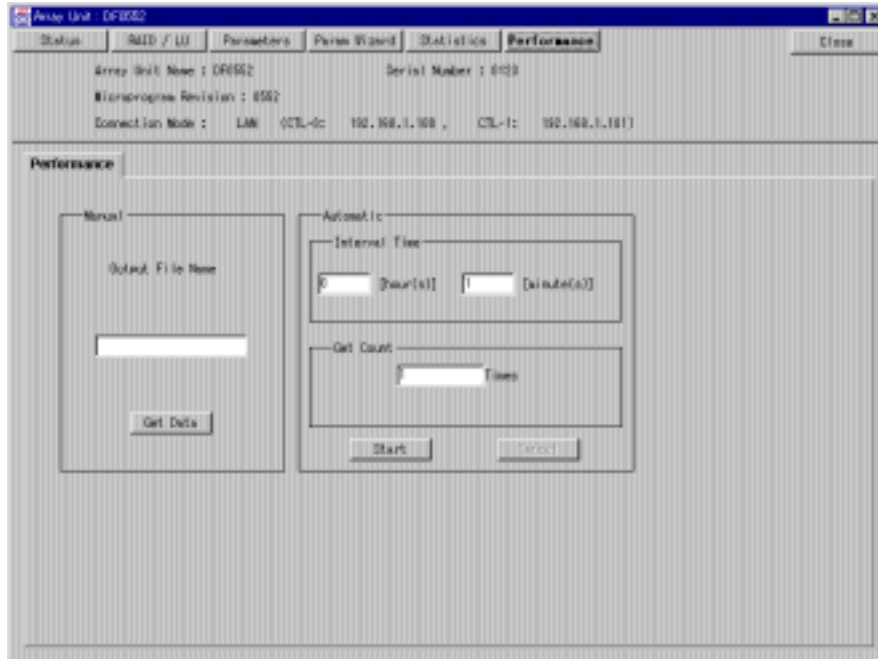
- **CTL0 and CTL1:** Controller number
- **LU0 to LU15:** Logical unit number
- **Total:** Entire controller
- **Read:** Number of received Read commands
- **Read Hit:** Number of cache-hit Read commands to received Read commands
- **Read Hit Rate:** Rate (%) of cache-hit Read commands to received Read 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 saved 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 Resource Manager 9200 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. Import created text files into 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 of the file to be received is the same as that of the file received manually.

Chapter 4 Error Monitoring (GUI)

Error monitoring is performed at the interval specified for array unit status monitoring which has been checked off in the **Error Alert** check box.

This chapter contains the following information:

- Setting Error Monitoring Options
- Saving Failure Information to a Log File
- Error Monitoring
- Checking Status

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.

Error Alert Mode

E-Mail

☐ E-Mail Error Report OFF

Domain Name

Mail Server Address

From Address

Send To Address

Add Delete Replace

Update Test

Interval

Interval Time

1 [minute(s)] Update

Application Setting

☒ Execute Application ON

Application Execute Mode

☐ On the first failure

☒ On every failures

Application Name

Update Test

Close

4.1.1 Interval Time

1. Specify the interval time for error monitoring. Specify the **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

For E-Mail, information about the failed part is included in 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.	For 5800, 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.	For the 9200: 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 checked, 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. 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

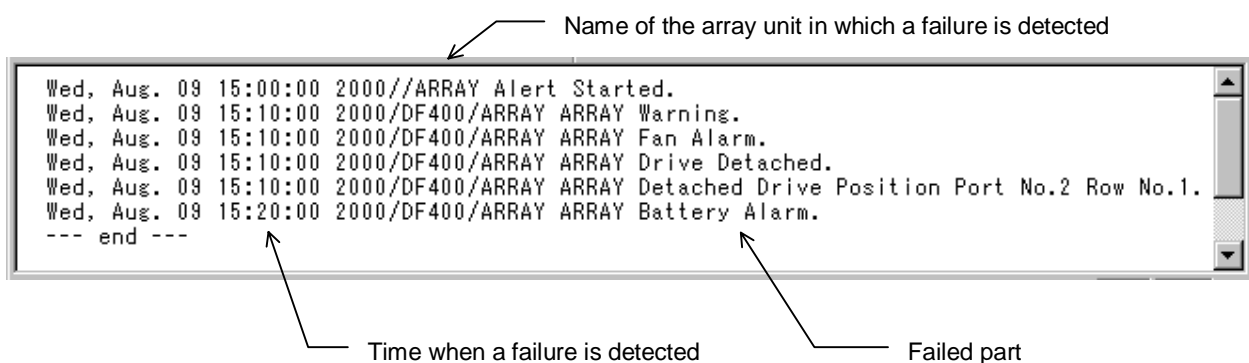
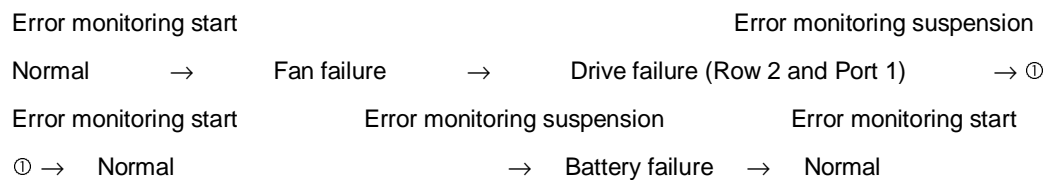
Data file name of the application

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.

4.2 Saving Failure Information to a Log File

When a failure is detected in the array unit in the case where the error monitoring is executed, the function saves the failure information to a log file.

The log file is saved in the text file format with a file name of `errlog.txt` to the same directory in which a manager execution file is. With respect to the file layout, the format for displaying the array unit state transition is shown below as an example. The file format is shown in the following figure.



The log file is output up to 223 k byte or up to 2,000 events. When the log information exceeds the limit, the log information is overwritten from the top of the file and output. At the end of the log information, “--- end ---” is output. Search for “--- end ---” and identify the latest information.

Note: “Time when a failure is detected” is that of a clock in the PC or SUN server/workstation installing 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

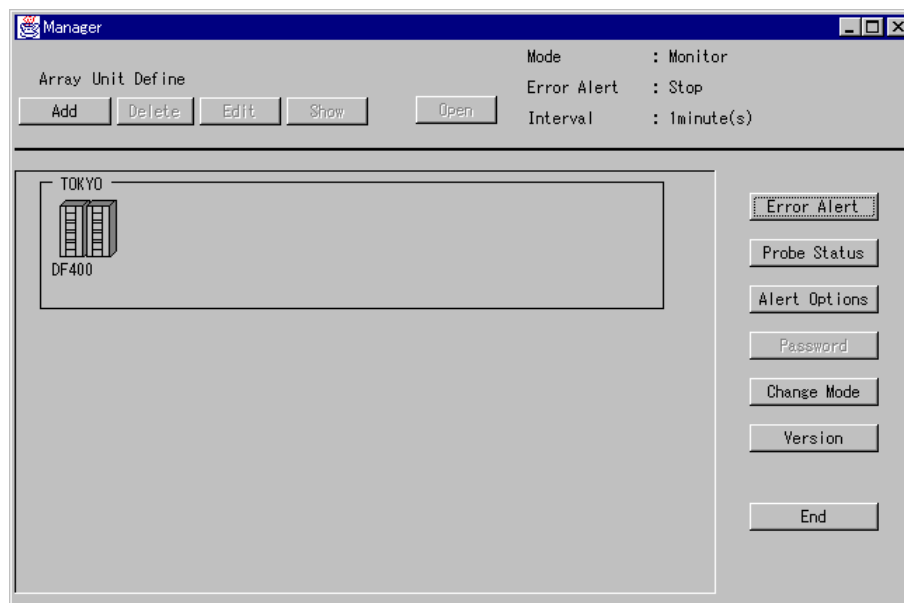
Table 4.3 List of Message Texts to Be Output

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.	For the 5700E and 5800: 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.	For the 9200: 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 : Winsock 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 xxxx: 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 all array units for which the **Error Alert Flag** in “Array Unit Define” has been checked off. While the Resource Manager is in Error Monitoring Mode, no other functions can be invoked.

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	Running (no alert)	Blue	Error monitoring is executed and the all the target array units are normal.
	Running (found alert)	Red	Error monitoring is executed and errors are detected in some of the target array units.
Waiting	Waiting (no alert)	Blue	Error monitoring is at the interval time and all the target array units that were previously monitored are normal.
	Waiting (found alert)	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.

- To display the detail information of the array unit, stop error monitoring, click an array unit to be displayed, and click **OPEN**. 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 **OPEN** 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 icon 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.

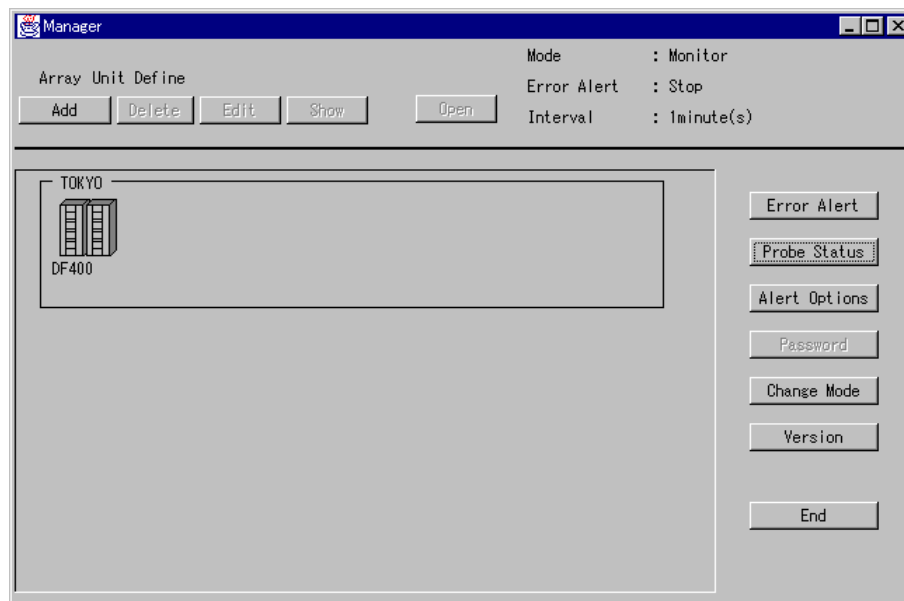
If a drive whose display color is not green in **Unit Status** in the unit window (a drive that is not LU-formatted or an undefined spare drive) is pulled out, no error report will be made but it has no effect on the operation. Insert it once again.

If an error occurs, contact Hitachi Data Systems maintenance personnel.

4.4 Checking Status

Check the status of such components of an array unit as drives, controllers, batteries, fans, power supply and cache. Checks are done on all array units for which the check box of the **Error Alert Flag** in “Array Unit Define” is selected.

1. Click 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 (GUI)

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 automatically when Windows is booted up if the Resource Manager 9200 error monitoring is set in the “startup group”.

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 group”.
4. When Windows is rebooted, the manager is started in an error monitoring executing status.

Chapter 6 Detailed Screen Display (GUI)

6.1 Detailed Screen Display

The detailed display of the array unit is made by specifying options in the manager startup file. The detailed display is available only for Windows.

6.1.1 Specific Array Unit Start-Up

Specific array units can be started by specifying options in the startmgr.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 5800  
>>clog
```

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 >>clog
```

Parameter for screen display →

IP address of the array unit to be display →

- Example with “-host” option

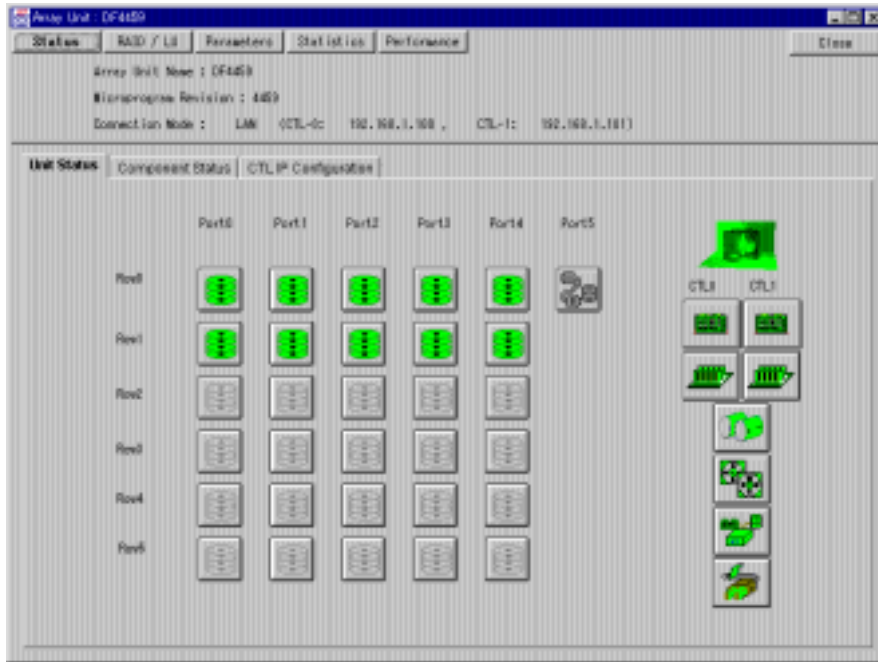
```
jrew -cp .\Confmng.jar jp.co.hitachi.str.diskarray.DiskArrayManager -host 5800  
>>exclog
```

Parameter for screen display →

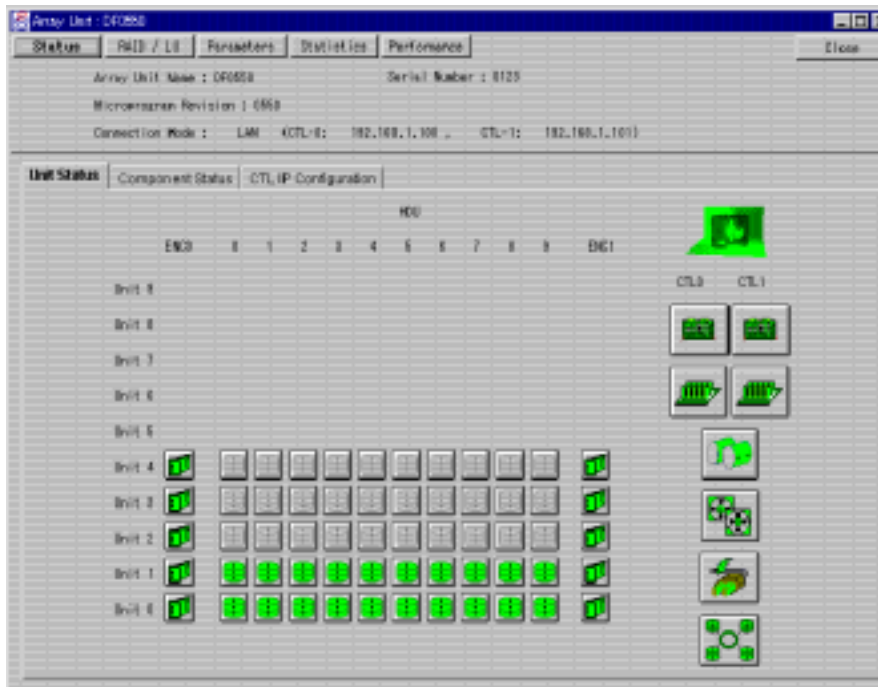
Host name of the array unit to be display →

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 5700E and 5800:

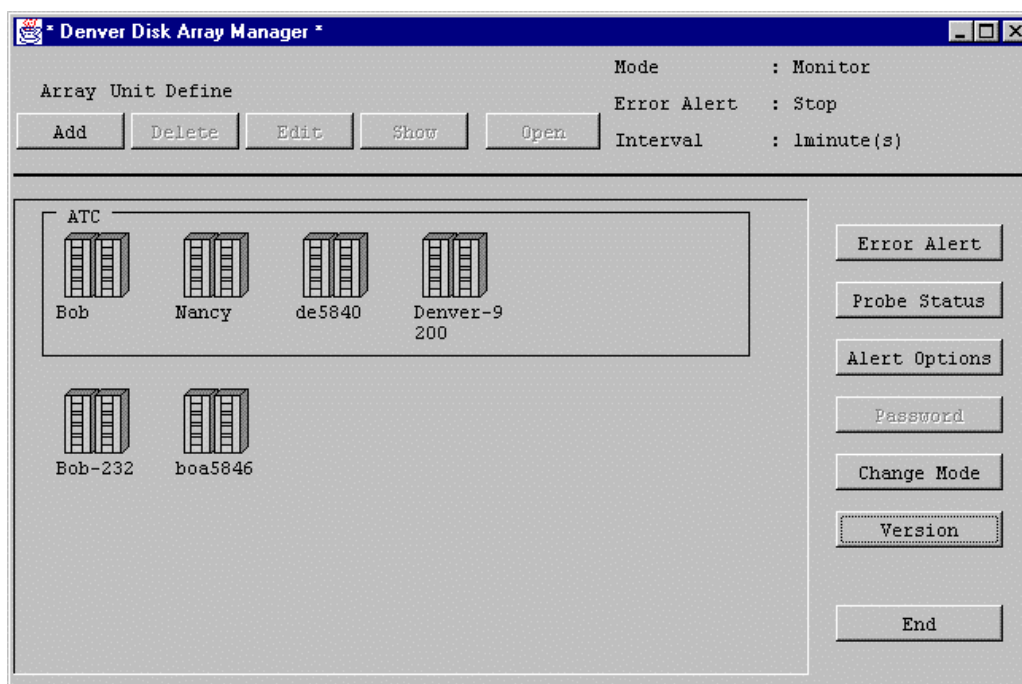


b) For 9200:



6.1.2 Customized Screen Displays on in RM Windows

The title in the startup window of the RM can be customized. Normally, the RM shows simply **Manager** in the title bar of the main window. Create a file in the same directory where RM is installed with the name **title.txt**. Enter the text to appear in the title of the main window on one line, up to 30 characters long and save it. This text will appear in the title bar of the main window.



Similarly, the text showing in the version screen can be customized. Normally, the RM shows **Disk Array management program** in this window. This text can be customized by creating a file in the same directory where RM is installed with the name **product.txt**. Enter the text to appear in the window showing the version information of the RM. Text should be on one line, up to 30 characters long. Save the file and test the result by clicking on the **VERSION** button in the main window. The text will appear inside the window.



Chapter 7 Typical Operation Examples (GUI)

This chapter explains procedures to define a RAID group and a logical unit as a typical operating example. This example assumes that the array unit, which is **one RAID group (RAID5)**, consists of **four rows of drives**, that each row of drives is defined as a **logical unit**, and that no RAID group has been defined initially.

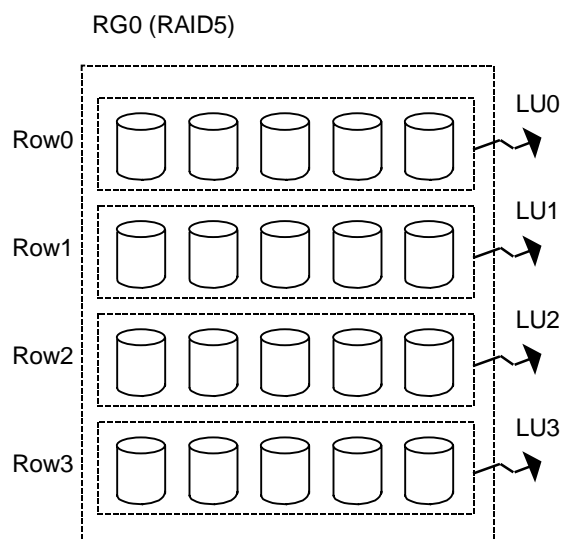
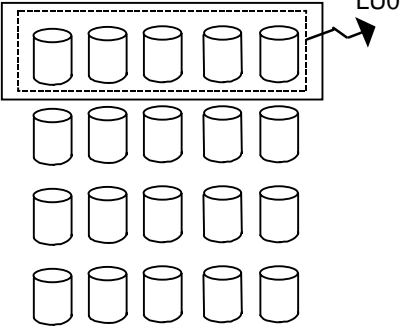
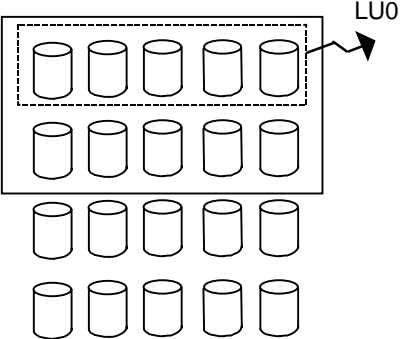
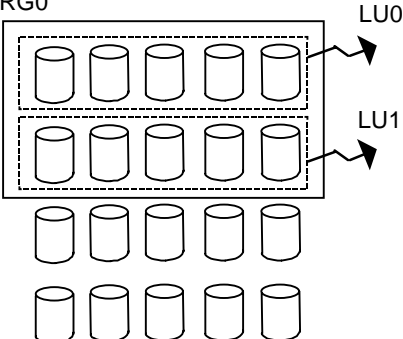


Figure 7.1 Definition of RAID Group and Logical Units

Table 7.1 Operating Procedure for Definition of RAID Group and Logical Units

Operating procedure	Defined status
0. Initial installed condition	
1. Defining one row of drives as a RAID group Define Row 0 as RG0(RAID5) according to "Creating a RAID group."	

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>RG0</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>RG0</p> 
<p>4. Defining LU1</p> <p>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>	<p>RG0</p> 

PART 2:

Command Line Interface (CLI)

Chapter 1 Resource Manager 9200 (CLI)

The Resource Manager 9200 is a collection of the commands (executed in command line mode) to reference status and set up the configuration of an array unit. The user operates these commands in a prompt state by selecting a command with the function appropriate for a user's purpose. This chapter includes the following:

- Notes on Using Resource Manager 9200
- Operating Environments
- Connecting
- Installing
- Updating
- Uninstalling

1.1 Notes on Using Resource Manager 9200

When using Resource Manager 9200, consider the following:



- When using Resource Manager 9200 on “RS232C connection”, the “ERROR INF” (a function to specify an error information transfer mode to the RS232C port) must be set to “OFF” (suspension of the 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 cause Resource Manager 9200 to fail to connect to the array unit or functions of Resource Manager 9200 to end abnormally.
- Regarding the functions to be executed by Resource Manager 9200, some are available and others are not available while the array unit is online with a host. For details, see chapter 2.
When high I/O load exists, functions that are available while online might cause a command time-out in the host or a recovering fault in Resource Manager 9200. It is recommended that these functions be executed while offline.
- At least one logical unit must be configured in the array unit, to make all of the Resource Manager 9200 functions available. If no logical unit is defined in the array unit, some functions cannot be executed.
- Resource Manager 9200 can control up to 1,024 array units. Configurations (setting of RAID groups, logical units, etc.) can be done on one array unit at a time. Error Alert monitoring must be stopped to configure array units.
- When the PC enters the suspension state(low power mode) while the Resource Manager 9200 is running, Resource Manager 9200 may not operate correctly after the PC is released from the suspension state.

When you operate Resource Manager 9200, disable power management by Windows so that the PC will not enter the suspension state.

- Resource Manager 9200 may hang up in the following cases.
 - 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 Resource Manager 9200 hangs up, terminate it forcibly and check the array unit status and the connection status of RS232C or LAN. Then, boot up Resource Manager 9200 once again.

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

1.2 Operating Environments

Resource Manager 9200 is operated by connecting to the array unit via a LAN or RS232C. When an array unit is connected to a LAN, a host (personal computer, UNIX server/workstation, SGI server/workstation or HP server/workstation), in which Resource Manager 9200 is installed, must be connected to the network 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, or Windows NT 4.0
 - CPU: Pentium
 - Memory: 16 M byte
 - Disk capacity: 6.5 Mbyte max.
 - Network adapter
- SUN server/workstation
 - Solaris 2.6, 2.7, 2.8
 - CPU: UltraSPARC or more is recommended.
 - Memory: 16 M byte
 - Disk capacity: 12.5 Mbyte max.
 - Network adapter
- SGI server/workstation
 - IRIX 6.4, 6.5
 - CPU: R10000 or more is recommended.
 - Memory: 16 Mbyte
 - Disk capacity: 21.5 Mbyte max.
 - Network adapter

- HP server/workstation
 - HP-UX 10.20, 11.0
 - CPU: HA8000 or more is recommended.
 - Memory: 16 M byte
 - Disk capacity: 13.5 Mbyte max.
 - Network adapter
- RS232C connection
 - Serial port
 - baud rate: 9600
 - data bit: 8
 - parity: none
 - stop bit: 1
 - flow control: none
 - Serial cable (9 pin, cross) for RS232C connection : 1 cable/controller
- LAN connection
 - When the array unit and the machine are connected directly, use 10BaseT/100BaseT cable (cross) or twisted pair cable (cross).
 When the array unit and machine are connected through a hub, use 10BaseT/100BaseT cable or twisted pair cable. 100BaseT works with 9200 products only, all 5800 products operate 10BaseT only.

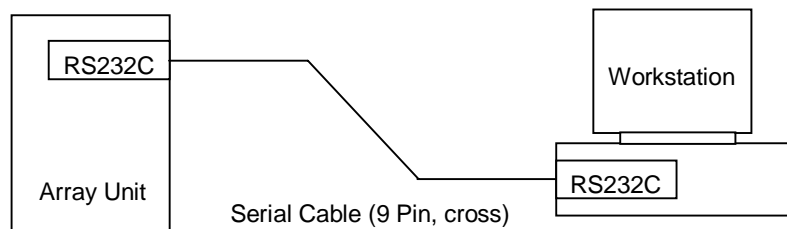
1.3 Connecting

This section provides examples of connections between a workstation in which Resource Manager 9200 has been installed and an array unit. These connections include:

- RS232C Connection
- LAN With a Hub
- LAN Without a Hub

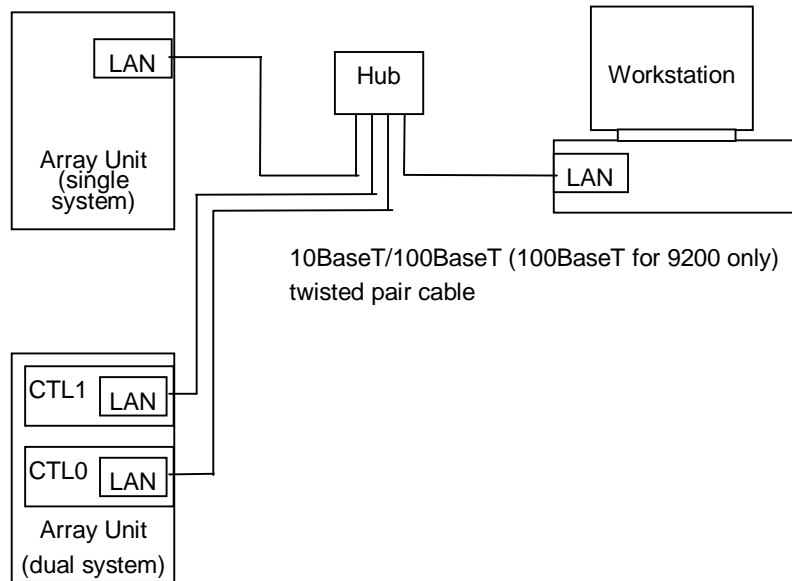
The following diagram is an example of a connection between a workstation in which Resource Manager 9200 is installed and an array unit.

- RS232C connection



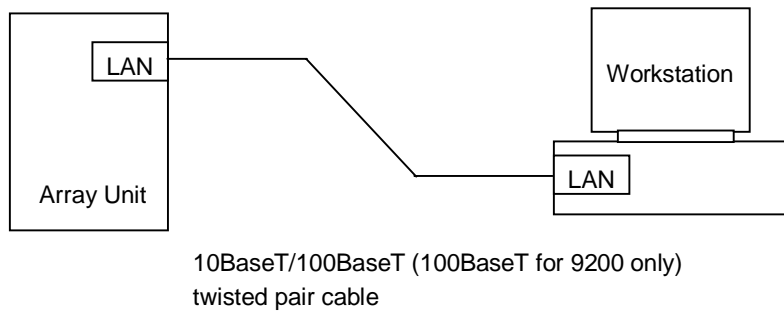
Note: In the dual system where two RS232C ports are in the workstation, connect the RS232C to both of controller 0 and controller 1.

1.3.1 LAN With a Hub



Note: If an array unit is already connected with a LAN, a workstation is connected to the same network as the array unit.

1.3.2 LAN Without a Hub



1.4 Installing

This section provides instructions for installing Resource Manager 9200 to the following systems:

- Windows
- Solaris
- IRIX
- HP-UX

1.4.1 Windows

1. Start the PC, then boot up Windows.
2. Execute the setup.exe in the CLI directory of the provided CD-R. By default, the files will be installed in \program files\da manager cli\
3. Execute the startmgr.bat (a Windows batch file used to start the Resource Manager), The following environment parameters have to be set correctly in startmgr.bat:

```
set CMDF_PATH=.
```

```
set LANG=en
```

Check with the command 'set' to verify the correct setting of environment parameters on the workstation

A prompt screen will be displayed and Resource Manager Commands can be executed from this screen.

Note :When executing commands from other than a directory in which the Resource Manager 9200 has been installed, edit the CMDF_PATH environment variable of the startmgr.bat in the developed file. Set up the install directory of the Resource Manager 9200 in the CMDF_PATH environment variable. However, if the LANG environment variable is not specified, the Resource Manager 9200 operates in English language mode.

Example : If Resource Manager 9200 has been installed in C:\manage:

```
set CMDF_PATH=C:\manage
```

```
set LANG=en
```

```
command.com
```

1.4.2 Solaris

1. Start the SUN server/workstation.
2. Create a new directory for installing the Resource Manager 9200. Copy the ArrayManage-S340-CLI.tar file in the supplied CD-R to the directory created in the hard disk.

Required disk capacities are approx: 13 M byte for the main program storage area, 512 k byte for the work area, and 6 M byte when executing the microprogram replacement.

3. The ArrayManage-S340-CLI.tar file is a Tar format file. Expand the file referring to the following example:

Example: tar xvf ArrayManage-S340-CLI.tar

When setting /usr/manage for the install directory, the following file structure is developed.

```
/usr/manage/          : executable and message files of Resource Manager
└── /lib/             : common library used when running Resource Manager
```

4. Add a path to the common library with the LD_LIBRARY_PATH environment variable. Example when setting DFHOME for the install directory /usr/manage/

If the LD_LIBRARY_PATH environment variable not yet defined (example uses C shell commands):

```
% setenv LD_LIBRARY_PATH ${DFHOME}/lib
```

If the LD_LIBRARY_PATH environment variable is already defined (example uses C shell commands):

```
% setenv LD_LIBRARY_PATH $LD_LIBRARY_PATH:${DFHOME}/lib
```

5. Set up a path to the directory, in which Resource Manager 9200 has been installed, in the CMDF_PATH environment variable.

Example: when setting DFHOME for the install directory (example of C shell) :

```
% setenv CMDF_PATH ${DFHOME}
```

It is recommended that environment variables should be defined in the login shell, of a user who uses the Resource Manager 9200.

6. Log in again.

1.4.3 IRIX

1. Start the SGI server/workstation.
2. Create a new directory for installing the Resource Manager 9200. Copy the ArrayManage-I340-CLI.tar file in the supplied CD-R to the directory created in the hard disk.

Required disk capacities are approx: 21 Mbyte for the main program storage area, 512 k byte for the work area, and 6 Mbyte when executing the microprogram replacement.

3. The ArrayManage-I340-CLI.tar file is a Tar format file. Expand the file referring to the example.

Example: tar xvf ArrayManage-I340-CLI.tar

When setting /usr/manage for the install directory, the following file structure is developed.

```
/usr/manage/           : Executable and message files of Resource Manager
|
|_ /lib/               : Common library used when running Resource Manager
```

4. Add a path to the common library to the LD_LIBRARY_PATH environment variable.
Example when setting DFHOME for the install directory

If the LD_LIBRARY_PATH environment variable not yet defined (example uses C shell commands) :

```
% setenv LD_LIBRARY_PATH ${DFHOME}/lib
```

If the LD_LIBRARY_PATH environment variable already defined (example of C shell) :

```
% setenv LD_LIBRARY_PATH $LD_LIBRARY_PATH:${DFHOME}/lib
```

5. Set up a path to the directory, in which the Resource Manager has been installed, in the CMDF_PATH environment variable.

Example: when setting DFHOME for the install directory (example using C shell commands) :

```
% setenv CMDF_PATH ${DFHOME}
```

It is recommended that environment variables should be defined in the login shell, of a user who uses the Resource Manager 9200.

6. Log in again.

1.4.4 HP-UX

1. Start the HP server/workstation.
2. Create a new directory for installing Resource Manager 9200. Copy the ArrayManage-H340-CLI.tar file in the supplied CD-R to the directory created in the hard disk.

Required disk capacities are approx: 13 M byte for the main program storage area, 512 k byte for the work area, and 6 M byte when executing the microprogram replacement.

3. The ArrayManage-H340-CLI.tar file is a Tar format file. Expand the file referring to the following example:

Example: tar xvf ArrayManage-H340-CLI.tar

When setting /usr/manage for the install directory, the following file structure is developed.

```
/usr/manage/          : Command and message file of Resource Manager
|
└── /lib/             : Common library used when running Resource Manager
```

4. Adds a path to the common library to the SHLIB_PATH environment variable.
Example when setting DFHOME for the install directory

If the SHLIB_PATH environment variable is not yet defined (example uses C shell commands) :

```
% setenv SHLIB_PATH ${DFHOME}/lib
```

If the SHLIB_PATH environment variable is already defined (example uses C shell commands) :

```
% setenv SHLIB_PATH $SHLIB_PATH:${DFHOME}/lib
```

5. Set up a path to the directory, in which Resource Manager 9200 has been installed, in the CMDF_PATH environment variable.

Example: when setting DFHOME for the install directory (example of C shell) :

```
% setenv CMDF_PATH ${DFHOME}
```

It is recommended that environment variables should be described in the of login shell, of a user who uses the Resource Manager 9200.

6. Log in again.

1.5 Updating

This section provides instructions for updating Resource Manager 9200 on the following systems:

- Windows
- Solaris
- IRIX
- HP-UX

Note: If you update, be sure to terminate Resource Manager 9200 before starting operations.

1.5.1 Windows

1. Execute the setup.exe in the CLI directory of the provided CD-R.

The new version of Resource Manager 9200 will be installed. Windows does not have to be restarted.

1.5.2 Solaris

1. Copy the ArrayManage-S340-CLI.tar file in the attached CD-R to the hard disk.
2. The ArrayManage-S340-CLI.tar file is a Tar type file. Open the file as described in the following example:

Example : tar xvf ArrayManage-S340-CLI.tar

The updated new version of Resource Manager 9200 will be installed.

1.5.3 IRIX

1. Copy the ArrayManage-I340-CLI.tar file in the attached CD-R to the hard disk.
2. The ArrayManage-I340-CLI.tar file is a Tar type file. Open the file as described in the following example:

Example : tar xvf ArrayManage-I340-CLI.tar

The new version of Resource Manager 9200 will be installed .

1.5.4 HP-UX

1. Copy the ArrayManage-H340-CLI.tar file in the attached CD-R to the hard disk.
2. The ArrayManage-H340-CLI.tar file is a Tar type file. Open the file as described in the following example:

Example : tar xvf ArrayManage-H340-CLI.tar

The new version of Resource Manager 9200 will be installed

1.6 Uninstalling

This section provides instructions for uninstalling Resource Manager 9200 on the following systems:

- Windows
- Solaris, IRIX, and HP-UX

1.6.1 Windows

1. Delete the Resource Manager 9200 using the Add and Delete Application icon in the Control Panel.
2. Delete the directory generated in the hard disk for installing the Resource Manager 9200.

1.6.2 Solaris, IRIX, and HP-UX

1. Delete the directory and all its files generated in the hard disk for installing the Resource Manager 9200.
2. Delete the statement of a path to the common library from the set contents of the LD_LIBRARY_PATH environment variable.
3. Delete the reference to the CMDF_PATH environment variable.

Chapter 2 Command List (CLI)

2.1 Command List

Table 2.1 shows a list of Resource Manager 9200 commands. There are two types of Resource Manager 9200 commands: one type is the standard command that is used in standard mode; the other is the administration command, that is used in administration mode.

When executing an administration command, a password must be set and entered. This password is for the workstation from which the commands are executed. It is stored in a password file on this workstation. (See Array Unit Registration Commands.) The administration commands that require password entry are shown with symbols “O” marked in the password column of Table 2.1. These commands can be either used or not while the array unit is online. (Commands that can be used during online are shown each with symbols “O” marked in the online use column in Table 2.1.)

Additionally, when the optional Password Security is installed on the array unit, some commands, cannot be executed unless a user ID and password is provided. These user IDs and passwords are stored on the array unit. (See Array Unit Management by User ID Commands.) The commands that require login if a user ID has been registered are shown with symbols “O” marked in the login column of Table 2.1.

Table 2.1 List of Resource Manager Commands

Classification	Function	Command	Online use	Password	Login
Array unit registration	Referencing array unit information	auunitref	O	x	x
	Adding array unit information	auunitadd	O	x	x
	Changing array unit information	auunitchg	O	x	x
	Deleting array unit information	auunitdel	O	x	x
	Setting password	aupasswd	O	O	x
Array unit management by user ID	Setting user ID	auuidadd	O	O	O
	Changing user ID	auuidchg	O	O	O
	Deleting user ID	auuiddel	O	O	O
	Changing password	aupwdchg	O	O	O
	Logging into array unit	aulogin	O	O	x
	Logging out from array unit	aulogout	O	O	O
	Checking login	auchkuid	O	x	O

Table 2.1 List of Resource Manager Commands (Continued)

Classification	Function	Command	Online use	Password	Login
Array unit status	Displaying microprogram revision	aurev	○	x	x
	Displaying drive configuration information	audrive	○	x	x
	Displaying cache configuration information	aucache	○	x	x
	Displaying status of power supply/fan/battery	ausupply	○	x	x
	Displaying current IP address	aucrlan	○	x	x
RAID /LU	Referencing RAID group	aurgref	○	x	x
	Setting up RAID group	aurgadd	○	○	○
	Expanding RAID group	aurgexp	○	○	○
	Deleting RAID group	aurgdel	x	○	○
	Referencing LU	auluref	○	x	x
	Setting up LU	auluadd	○	○	○
	Formatting LU	auformat	○	○	○
	Displaying progress of LU formatting	auformatst	○	○	x
	Expanding LU	auluexp	○	○	○
	Deleting LU	auludel	x	○	○
	Changing default controller of LU	auluchg	○	○	○
	Setting turbo LU (See Note 1.)	auturbolu	○	○	○
System parameters	Referencing/setting system parameters (See Note 1.)	ausysparam	x	○	○
	Referencing/setting RTC (See Note 1.)	aurtc	x	○	○
	Referencing/setting target information (See Note 1.)	autarget	○	○	○
	Referencing/setting LAN information (See Note 1.)	aulan	○	○	○
	Referencing/setting SCSI transfer rate (See Note 1.)	ausync	○	○	○

Table 2.1 List of Resource Manager Commands (Continued)

Classification	Function	Command	Online use	Password	Login
Setting up configuration	Referencing/setting fibre channel information	aufibre aufibre1	x	○	○
	Spare HDU setup	auspare	○	○	○
	Fee-Basis option reference/setup	auopt	○	○	○
	Referencing/setting drive restoration control information	audrecopt	x	○	○
	Referencing/setting online verify information	auonlineverify	x	○	○
File output of the RAID/LU configuration information	Save the RAID/LU configuration information and component conditions in file	auconfigout	○	x	x
RAID/LU configuration setup in file	RAID/LU configuration setup from file	auconfigset	○	○	○
File output of system parameter	Save system parameter in file	ausyspout	○	x	x
System parameter setup in file	System parameter setup from file	ausyspset	○	○	○
Microprogram replacement	Downloading/replacing microprogram	aumicro	x/○ See Note 2.	○	○
SNMP environment information	Setting SNMP environment information and storing in file (See Note 1.)	ausnmp	x/ .	○	○
Displaying statistical information	Displaying statistical information	austatistics	○	x	x
Obtaining performance information	Outputting performance information file	auperform	○	x	x
Monitoring errors	Setting up E-Mail reports	aumail	○	x	x
	Setting the starting of application	auextprog	○	x	x
	Monitoring errors	auerroralert	○	x	x

Note 1: Set items do not become effective until the array unit is restarted.

Note 2: When connecting the 5800, the function is available online.

Note 3: For information on password protection, refer to the *Hitachi Thunder 9200™ Password Protection User's Guide* (MK-90DF528).

For Commands that are listed as require login, if the command option -refer is specified , they can be executed without logging in. (i.e. aufibre)

Chapter 3 Command Specifications (CLI)

This chapter contains the following Resource Manager 9200 command information:

- Command Format
- Registering an Array Unit
- Array Unit Management by User ID
- Displaying Array Unit Status
- RAID/LU
- Setting UP Configuration
- System Parameters
- File Output of Configuration and Configuration Setting by File
- Microprogram Replacement
- SNMP Environment Information
- Displaying Statistical Information
- Obtaining Performance Information
- Monitoring Errors

3.1 Command Format

The command format of the Resource Manager 9200 is specified with a command name and succeeding options as shown in Figure 3.1. When specifying multiple options, the order in which options are specified does not matter. In addition, options may be omitted depending on the type of commands.

Command Option 1 Option 2 Option 3

Figure 3.1 Command Format of Resource Manager

Commands of the Resource Manager 9200 are classified mainly into the standard command and the administrator commands. The following describes specifications of each type of command.

3.1.1 Standard Command

The standard command is a command used mainly for reference. Figure 3.2 and Figure 3.3 show the formats of the standard command. When executing a standard command, the execution result will be displayed following its execution. If an error is detected in specification of options or while processing, you are notified of an error message.

```
%Command Option 1 Option 2 Option 3
Result
%
```

Figure 3.2 Format of Standard Command (when terminating normally)

```
%Command Option 1 Option 2 Option 3
Error message
%
```

Figure 3.3 Format of Standard Command (when an error is detected)

3.1.2 Administration command

The administration command is a command used to set up a configuration for the array unit. Taking into consideration the integrity and security of data, this command prompts you to enter a password when executing it, and is executed if the password can be authenticated. When option -refer is specified, for example in command aufibre a password is not required.

Figure 3.4 and Figure 3.5 show the formats of the administration command. When entering an administrator command, this command prompts you to enter a password following the entry. This time, when you enter a preset password, the command will be executed. When, in particular, performing operations associated with data configurations such as deletion of a RAID group or logical unit, commands prompt you to confirm whether or not to execute the function itself before entering a password (see Figure 3.5).

```
%Command Option 1 Option 2 Option 3 .....
Password : (Entering a already-set password)
%
```

Figure 3.4 Format 1 of Administration Command

```
%Command Option 1 Option 2 Option 3 .....
Are you executing ...? (y/n [n])
Password : (Entering a already-set password)
%
```

Figure 3.5 Format 2 of Administration Command

3.1.3 Referencing command syntax

When you want to reference the syntax of a command, specify the **-help** option in the command, then the **Usage** information will be displayed, as shown in Figure 3.6. The **Usage** display is the same in the description of each command as [Synopsis].

```
% auunitadd help
Disk Array management program
Version 3.40
Copyright (C) 2001 Hitachi, Ltd.

Usage :
auunitadd  -unit unit_name [ -group group_name ]  -DF350 | -DF400 -single |
           -dual -RS232C | -LAN [ -ctl0 device | address ]
           [ -ctl1 device | address ] [ -watch ]

%
```

Figure 3.6 Example of Referencing Command Syntax

3.2 Registering an Array Unit

3.2.1 Displaying Registration Information

- Command name

`auunitref`

- Synopsis

`auunitref [-unit unit_name]`

- Description

Displays registration information of an array unit registered in the Resource Manager 9200. When omitting the option of an array unit name, displays a list of all array units registered in the Resource Manager 9200. When specifying an array unit name for the option, displays information about a specified array unit.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit whose registration information to reference. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_ (underline)” of up to 16 characters long.

- Examples of using commands:

References all registered information.

```
% auunitref
```

Unit	Group	Array	Type	Watch	Comm	Device/IP addresses
df350a		DF350	Dual	on	LAN	192.168.33.120 192.168.33.130
df400a	hsp	DF400	Dual	on	LAN	192.168.0.50 192.168.0.51
df400a0	hsp	DF400	Single	on	LAN	192.168.0.60
df400a1	hsp	DF400	Dual	off	LAN	192.168.0.62 192.168.0.63
df400b1	hsp1	DF400	Dual	on	LAN	192.168.1.100 192.168.1.101
df400b2	hsp1	DF400	Dual	off	LAN	192.168.1.102 192.168.1.103
df400c1	hsp1	DF400	Single	off	232C	COM1
df500a1	hsp1	DF500	Dual	on	LAN	192.168.2.100 192.168.2.101
df500a2	hsp1	DF500	Dual	on	LAN	192.168.2.102 192.168.2.103

```
%
```

References registration information of an array unit whose name is df500a1.

```
% auunitref -unit df500a1
```

Unit	Group	Array	Type	Watch	Comm	Device/IP addresses
df500a1	hsp	DF500	Dual	on	LAN	192.168.0.100 192.168.0.101

```
%
```

3.2.2 Registering

- Command name

auunitadd

- Synopsis

```
auunitadd -unit unit_name [ -group group_name ] -DF350 | -DF400 | -DF500
          -single | -dual
          -RS232C | -LAN
          [ -ctl0 device | address ] [ -ctl1 device | address ] [ -watch ]
```

- Description

Registers an array unit into the Resource Manager. Registration information consists of an array unit name, a group name, a type, an configuration, an connection interface, and device.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose registration information to reference. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-group group_name	Specifies the name of a group in which multiple array units are managed all together. If this option is omitted, array units are not managed in a group all together. The maximum number of groups registered is 200. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-DF350 -DF400 -DF500	Specifies the type of an array unit.
-single -dual	Specifies the configuration (single system or dual system) of an array unit.
-RS232C -LAN	Specifies the connection interface (RS232C or LAN) to an array unit.
-ctl0 device address	Specifies the device or address used to connect to Controller 0. If "LAN" is selected as the [connection interface], specifies an "IP address" or "host name". If "RS232C", specifies a "device name". Specifies a host name with up to 15 one-byte coded characters. Specifies a device name with a RS232C port name or a device file name. (Example : Windows - COM1, Solaris - /dev/ttya)
-ctl1 device address	Specifies the device or address used to connect to Controller 1. If "LAN" is selected as the [connection interface], specifies an "IP address" or "host name". If "RS232C", specifies a "device name". Specifies a host name with up to 15 one-byte coded characters. Specifies a device name with a RS232C port name or a device file name. (Example : Windows - COM1, Solaris - ttya)
-watch	Specifies that an array unit registered is monitored for errors. If omitted, an array unit is not monitored for errors.

Note: For the dual system disk array unit, 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**.

When registering the array unit in the dual system, verify that you have selected the correct controller for the connection before specifying **Controller 0 IP Address/Host Name/Device Name** and **Controller 1 IP Address/Host Name/Device Name**. If you specify the wrong controller, depending on the specified contents, the controller configuration can be set to the opposite controller side.

■ Examples of using commands:

Registers a 5800 with a dual system configuration and a LAN connection interface by an array unit name of df400d1.

```
% auunitadd -unit df400d1 -DF400 -dual -LAN -ctl0 192.168.1.100 -ctl1  
192.168.1.101  
%
```

Registers an 5800 with a single system configuration and an RS232C connection interface by an array unit name of df400s1, and additionally subjects it to monitoring for errors.

```
% auunitadd -unit df400s1 -DF400 -single -RS232C -ctl0 /dev/ttya -watch  
%
```

Registers a 9200 with a dual system configuration and a LAN connection interface by an array unit name of df500a1.

```
% auunitadd -unit df500a1 -DF500 -dual -LAN -ctl0 192.168.1.100 -ctl1  
192.168.1.101  
%
```

3.2.3 Changing Registration Information

- Command name

auunitchg

- Synopsis

```
auunitchg -unit unit_name
          [ -newunit unit_name ] [ -group group_name ]
          [ -DF350 | -DF400 | -DF500 ] [ -single | -dual ]
          [ -RS232C | -LAN ]
          [ -ctl0 device | address ] [ -ctl1 device | address ]
          [ -watch | -ignore ] [ -f ]
```

- Description

Changes registration information (array unit name, group name, type, configuration, connection interface, and device) of an already-registered array unit.
However, items of array unit information, if their options are omitted, are not changed.

- Options

Options	Description
-unit unit_name	Specifies the name of a registered array unit. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-newunit unit_name	Specifies the array unit name to change. Specifies an array unit name after change, with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-group group_name	Specifies the group name to change. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-DF350 -DF400 -DF500	Specifies the type of an array unit to change.
-single -dual	Specifies the configuration (single system or dual system) of an array unit to change.
-RS232C -LAN	Specifies the connection interface (RS232C or LAN) of an array unit to change.
-ctl0 device address	Specifies the device or address to change, which address is used to connect to Controller 0. If the [connection interface] is "LAN", specifies an "IP address" or "host name". If "RS232C", specifies a "device name". Specifies a host name with up to 15 one-byte coded characters. Specifies a device name with a RS232C port name or a device file name. (Example : Windows - COM1, Solaris - /dev/ttya)

(Continued)

Options	Description
-ctl1 device address	Specifies the device or address to change, which address is used to connect to Controller 1. Specifies in the same way as for Controller 0.
-watch	Specifies that an array unit is monitored for errors.
-ignore	Specifies that an array unit is not monitored for errors.
-f	The confirmation message at command execution is omitted.

■ Examples of using commands:

Displays registration information of an array unit whose name is df500a1, and goes on to change it. Then, checks if changes have been made to the registration information of the array unit.

```
% auunitref -unit df500a1
Unit      Group  Array  Type   Watch  Comm      Device/IP addresses
df500a1   hsp      DF500  Dual   on      232C      /dev/ttya
%
% auunitchg -unit df500a1 -LAN -ctl0 192.168.1.100 -ctl1 192.168.1.101
change df500a1? (y/n [n]) y
%
% auunitref -unit df500a1
Unit      Group  Array  Type   Watch  Comm      Device/IP addresses
df500a1   hsp      DF500  Dual   on      LAN        192.168.1.100 192.168.1.101
%
```

If a specified array unit name is not yet registered, the following message is displayed.

```
% auunitchg -unit df500b1
DMEA001003 : Specified Unit name is not registered.
%
```

3.2.4 Deleting Registration Information

- Command name

auunitdel

- Synopsis

auunitdel -unit unit_name [-f]

- Description

Deletes registration information of an already-registered array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of a registered array unit whose registration information to delete. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-f	Specifies that confirmation of deletion is omitted.

- Examples of using commands:

Deletes registration information of an already-registered array unit whose name is df500a1.

```
% auunitdel -unit df500a1
remove df500a1? (y/n [n]) y
%
```

Checks the information registered about an array unit name that has been deleted.

```
% auunitdel -unit df500b1
DMEA001003 : Specified Unit name is not registered.
%
```

3.2.5 Setting a Password in Administration Mode

- Command name

aupasswd

- Synopsis

aupasswd

- Description

Sets a new password used in administration mode to execute administration commands. This command is also used to change an already-set password.

If a new password is set, enters the same password twice. If changed, enters an already-set password, and then enters a new password again. This password is for the workstation from which the commands are executed and it is stored in a password file on this workstation.

- Examples of using commands:

Sets a new password used in administration mode.

```
% aupasswd
New password : (Enters a password to be set newly.)
Retype new password : (Enters the same password as above.)
%
```

Changes a password used in administration mode.

```
% aupasswd
Old password : (Enters an already-set password.)
New password : (Enters a new password.)
Retype new password : (Enters the same password as above.)
%
```


3.3 Array Unit Management by User ID

3.3.1 Setting a User ID

- Command name

auuidadd

- Synopsis

auuidadd -unit unit_name [-num]

- Description

Registers a user ID and its password into an array unit. This user ID and password information is stored on the array unit specified. Up to 20 users can be registered in a array unit. Specifies the user ID and its password individually with one-byte coded alphanumerics and special symbols “- (minus)” and “_(underline)” of 4 to 12 characters long.

After registering, displays the number of user IDs set up in the array unit.

Note: Optional Password Security software must be installed on the array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit into which to register a user ID. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_(underline)” of up to 16 characters long.
-num	Displays the number of already-registered user IDs.

- Examples of using commands:

Adds a user ID into an array unit whose name is df400a1.

```
% auuidadd -unit df400a1
```

```
Password : (of Resource Manager on workstation set with  
command aupasswd)
```

```
User ID for array unit : (User ID to set)
```

```
Password for array unit : (Password of a user ID to set)
```

```
Retype New Password for array unit : (Same password as that of a user ID to  
set)
```

```
Number of registered User ID : n
```

```
%
```

Displays the number of user IDs already-registered in an array unit whose name is df400a1.

```
% auuidadd -unit df400a1 num
```

```
Password : (of Resource Manager on workstation set with  
command aupasswd)
```

```
Number of registered User ID : n
```

```
%
```

3.3.2 Changing a User ID

- Command name

auuidchg

- Synopsis

auuidchg -unit unit_name

- Description

Changes a user ID that has been set up in an array unit.

After changing, displays the number of user IDs set up in the array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which to change a user ID. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.

- Examples of using commands:

Changes a user ID that has been registered in an array unit whose name is df400a1.

```
% auuidchg -unit df400a1
```

```
Password : (of Resource Manager on workstation set with  
command aupasswd)
```

```
Old User ID for array unit : (Already-set user ID)
```

```
Old Password for array unit : (Password of an already-set user ID)
```

```
New User ID for array unit : (User ID to set)
```

```
New Password for array unit : (Password of a user ID to set)
```

```
Retype New Password for array unit : (Same password as that of a user ID to  
set)
```

```
Number of registered User ID : n
```

```
%
```

3.3.3 Deleting a User ID

- Command name

`auuidel`

- Synopsis

`auuidel -unit unit_name`

- Description

Deletes a user ID that has been set up in an array unit.
After deleting, displays the number of user IDs set up in the array unit.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit in which to delete a user ID. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.

- Examples of using commands:

Deletes a user ID that has been registered in an array unit whose name is `df400a1`.

```
% auuidel -unit df400a1
Password : (of Resource Manager on workstation set with
command aupasswd)
User ID for array unit : (Already-set user ID)
Password for array unit : (Password of an already-set user ID)
Number of registered User ID : n
%
```

3.3.4 Changing a Password

- Command name

aupwdchg

- Synopsis

aupwdchg -unit unit_name

- Description

Changes the password of a user ID that has been set up in an array unit.
After changing, displays the number of user IDs set up in the array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which to change the password of a user ID. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.

- Examples of using commands:

Changes the password of a user ID that has been registered in an array unit whose name is df400a1.

```
% aupwdchg -unit df400a1
```

```
Password : (of Resource Manager on workstation set with  
command aupasswd)
```

```
User ID for array unit : : (Already-set user ID)
```

```
Old Password for array unit : (Password of an already-set user ID)
```

```
New Password for array unit : (Password of a user ID to set)
```

```
Retype New Password for array unit : (Same password as that of a user ID to  
set)
```

```
Number of registered User ID : n
```

```
%
```

3.3.5 Logging In and Forcibly Logging into an Array Unit

- Command name

`aulogin`

- Synopsis

`aulogin -unit unit_name [-discon]`

- Description

Declares an intention to log into an array unit with a user ID registered in the array unit. When logging in with the option `-discon` login for any other user ID is disabled.

When forcibly logging into an array unit to which another user has already logged in, specify the `-discon` option. When forcibly logging in, the user ID of an already logged-in user is logged out.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit to which to log in. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_ (underline)” of up to 16 characters long.
<code>-discon</code>	Specify this option when forcibly logging into an array unit to which another user has already logged in.

- Examples of using commands:

Logs in, with a registered user ID, to an array unit whose name is `df400a1`.

```
% aulogin -unit df400a1
Password : (of Resource Manager on workstation set with
command aupasswd)
User ID for array unit : (Already-set user ID)
Password for array unit : (Password of an already-set user ID)
%
```

Logs in, with a registered user ID, to an array unit, whose name is `df400a1` and to which another user has logged in.

```
% aulogin -unit df400a1 -discon
Password : (of Resource Manager on workstation set with
command aupasswd)
User ID for array unit : (Already-set user ID)
Password for array unit : (Password of an already-set user ID)
User ID (xxxxxxxxxxxx) has been logged in.
Connected with (xxx.xxx.xxx.xxx). (See Note)
Do you want to forcibly log in ? (y/n [n])
%
```

Log in with a registered user ID to an array unit whose name is de5840 and to which a user has logged in with the option -discon

```
% aulogin -unit de5840
```

```
Password: (of Resource Manager on workstation set with command aupasswd)
```

```
User ID for array unit : peter
```

```
Password for array unit :
```

```
User ID(paul) has been logged in.
```

```
Connected with (148.92.197.152).
```

No option is offered to log in forcibly since the user peter has logged in with the option -discon

Note: Destination of connection is indicated as “Connected with (xxx.xxx.xxx.xxx).” (an item in parentheses is an IP address)” in the case of a connection via a LAN, or “Connected with (RS232C).” in the case of a connection via RS232C.

3.3.6 Logging Out from an Array Unit

- Command name

`aulogout`

- Synopsis

`aulogout -unit unit_name`

- Description

Logs out a user ID with which a user has already logged into an array unit.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit from which to log out. Specifies with one-byte coded alphanumerics and special symbols "-" (minus)" and " <u>" (underline)" of up to 16 characters long.</u>

- Examples of using commands:

Logs out a user ID with which a user has logged into an array unit whose name is `df400a1`.

```
% aulogout -unit df400a1
Password :
%
```


3.3.7 Checking Login

- Command name

auchkuid

- Synopsis

auchkuid -unit unit_name

- Description

Checks the user ID and connected unit of a user who has already logged in an array unit. Information about the connected unit is an IP address for LAN connection, and “RS232C” for RS232C connection.

This command is allowed for reference only with a user ID other than that of a user who has already logged in. Though this command is issued with the user ID of a user who has already logged in, the user information cannot be referenced.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose login status to check. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_(underline)” of up to 16 characters long.

- Examples of using commands:

Checks a user ID with which a user has logged into an array unit whose name is df400a1.

```
% auchkuid -unit df400a1
User ID (xxxxxxxxxxxx) has been logged in.
Connected with (xxx.xxx.xxx.xxx). (See Note)
%
```

Note: Destination of connection is indicated as “Connected with (xxx.xxx.xxx.xxx).” (an item in parentheses is an IP address)” in the case of a connection via a LAN, or “Connected with (RS232C).” in the case of a connection via RS232C.

3.4 Displaying Array Unit Status

3.4.1 Displaying a Microprogram Revision

- Command name

aurev

- Synopsis

aurev -unit unit_name [-ctl0 | -ctl1]

- Description

Displays the microprogram revision of a specified unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to display its microprogram revision. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-ctl0 -ctl1	Specifies the controller No. of an array unit for which to display its microprogram revision.

- Examples of using commands:

Displays the microprogram revision of an array unit whose name is df500a1.

```
% aurev -unit df500a1
micro revision : 0501
%
```

3.4.2 Displaying Drive Configuration Information

- Command name

`audrive`

- Synopsis

- For 5700E, 5800

`audrive -unit unit_name -status`

- For 9200

`audrive -unit unit_name -status [-uno unit_no -hno hdu_no]`

- For 5700E, 5800, and 9200

`audrive -unit unit_name -vendor`

- Description

Displays the status and type of drives in a specified array unit.

If an HDU on which data restoration is in progress is specified, a process of restoring is displayed.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit for which to display its drive configuration information. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_ (underline)” of up to 16 characters long.
<code>-status -vendor</code>	The drive information is displayed. -status: The drive condition is displayed. -vendor: The vendor ID, product ID, and revision of the mounted drive are displayed. For the DF500, the storage capacity of drives is displayed.

For the exclusive use of 9200

Options	Description
-uno unit_no -hno hdu_no	<p>Displays the operating status of the drive at a specified position. In addition, if the drive is a data drive subject to data recovery, the following information is displayed additionally.</p> <p>When recovery is in progress, "(nn%)" is displayed to indicate the progress rate of recovery.</p> <p>When no recovery is performed, "(0%)" is displayed.</p> <p>When recovery terminates normally or recovery is terminated forcibly, "(100%)" or "Normal" is displayed.</p> <p>When recovery terminates abnormally, "(nn% Aborted)" is displayed to indicate the progress rate of the recovery already processed until an abnormal termination and the resulting abnormal termination.</p>

■ Examples of using commands:

Displays the status of drives in an array unit whose name is df400a1.

```
% audrive -unit df400a1 -status
Port   Row    Type    Physics  Status
  0      0    Data    Mount    Normal
  1      0    Data    Mount    Normal
  2      0    Data    Mount    Normal
  3      0    Data    Mount    Normal
  4      0    Data    Mount    Normal
  5      0    Spare    Mount    Standby
  0      1    Data    Mount    Normal
  1      1    Data    Mount    Standby
  2      1    Undefine Mount    Out of RG
  3      1    Undefine Mount    Out of RG
  4      1    Undefine Mount    Out of RG
```

%

Displays the status of drives in an array unit whose name is df500a1.

```
% audrive -unit df500a1 -status
Unit No. HDU No.  Type    Physics  Status
  0        0    Data    Mount    Normal
  0        1    Data    Mount    Normal
  0        2    Data    Mount    Normal
      :
      :
  0        8    Data    Mount    Normal
  0        9    Spare    Mount    Standby
  1        0    Undefine Mount    Out of RG
  1        1    Undefine Mount    Out of RG
      :
      :
  1        8    Undefine Mount    Out of RG
  1        9    Undefine Mount    Out of RG
      :
      :
```

Displays the status of drive HDU No. 7 in UNIT No. 0 of an array unit whose name is df500a1.

```
% audrive -unit df500a1 -status uno 0 hno 7
Unit No. HDU No. Type    Physics    Status
      0         7 Data    Mount     Reconst
                               (75%)
```

Displays the drive information of an array unit whose name is df400a1.

```
% audrive -unit df400a1 -status
Port  Row    Vendor    Product    Revision
  0     0   HITACHI   DK328-43   D0D4
  1     0   HITACHI   DK328-43   D0D4
  2     0   HITACHI   DK328-43   D0D4
  3     0   HITACHI   DK328-43   D0D4
  4     0   HITACHI   DK328-43   D0D4

%
```

Displays the drive information of an array unit whose name is df500a1.

```
% audrive -unit df500a1 -status
Unit No. HDU No. Vendor    Product    Revision    Capacity
      0         0   HITACHI   DK328-43   D0D4       18GB
      0         1   HITACHI   DK328-43   D0D4       18GB
      0         2   HITACHI   DK328-43   D0D4       18GB
      :
      :
      0         8   HITACHI   DK328-43   D0D4       18GB
      0         9   HITACHI   DK328-43   D0D4       18GB
      1         0   HITACHI   DK328-43   D0D4       18GB
      1         1   HITACHI   DK328-43   D0D4       18GB
      :
      :

%
```

Displays the drive information of an array unit whose name is df400a1.

```
% audrive -unit df400a1 -vendor
```

Port	Row	Vendor	Product	Revision
0	0	HITACHI	DK328H-43	D0D4
1	0	HITACHI	DK328H-43	D0D4
2	0	HITACHI	DK328H-43	D0D4
3	0	HITACHI	DK328H-43	D0D4
4	0	HITACHI	DK328H-43	D0D4
5	0	HITACHI	DK328H-43	D0D4
0	1	HITACHI	DK328H-43	D0D4
1	1	HITACHI	DK328H-43	D0D4
2	1	HITACHI	DK328H-43	D0D4
3	1	HITACHI	DK328H-43	D0D4
4	1	HITACHI	DK328H-43	D0D4

%

Displays the drive information of an array unit whose name is df500a1.

```
% audrive -unit df500a1 -vendor
```

Unit No.	HDU No.	Vendor	Product	Revision
0	0	HITACHI	DK32CJ-18FC	F6A6
0	1	HITACHI	DK32CJ-18FC	F6A6
0	2	HITACHI	DK32CJ-18FC	F6A6
	:			
	:			
0	8	HITACHI	DK32CJ-18FC	F6A6
0	9	HITACHI	DK32CJ-18FC	F6A6
	:			
	:			

%

3.4.3 Displaying Cache Configuration Information

- Command name

aucache

- Synopsis

aucache -unit unit_name

- Description

Displays the status and capacity of cache memory.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to display cache configuration information. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.

Examples of using commands:

Displays the cache memory configuration information of an array unit whose name is dff400a1:

```
% aucache -unit df400a1
```

Ctl	Slot	Status	Size(MB)
0	0	Normal	128
0	1	Normal	128
0	2	Normal	128
0	3	Normal	128
1	0	Normal	128
1	1	Normal	128
1	2	Normal	128
1	3	Normal	128

3.4.4 Displaying the Status of Power Supply/Fan/Battery

- Command name

ausupply

- Synopsis

ausupply -unit unit_name

- Description

Displays the status of DC power supplies, AC power supplies, batteries, fans, and backup circuits individually.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to display information. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.

- Examples of using commands:

Displays the status of power supplies, batteries, and fans of an array unit whose name is df400a1 individually.

```
% ausupply -unit df400a1
```

```
DC PS Information
```

```
No. Status
```

```
0 normal
```

```
1 normal
```

```
2 normal
```

```
3 normal
```

```
4 alarm
```

```
5 normal
```

```
6 normal
```

```
7 nothing
```

```
FAN Information
```

```
No. Status
```

```
0 normal
```

```
1 normal
```

```
2 normal
```

```
3 normal
```

```
4 normal
```

```
5 alarm
```

```
6 normal
```


Battery Information

No.	Status
-----	--------

0	normal
---	--------

1	normal
---	--------

Battery Backup Information

No.	Status
-----	--------

0	normal
---	--------

1	normal
---	--------

AC PS Information

No.	Status
-----	--------

0	alarm
---	-------

1	normal
---	--------

%

3.4.5 Displaying the Current IP Address

- Command name

`aucrlan`

- Synopsis

`aucrlan -unit unit_name`

- Description

The LAN information with the enabled array unit is displayed.

For the 5800, the IP address and the subnet mask are displayed; for the 9200, the IP address, the subnet mask, and the default gateway address are displayed.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit for which to display LAN information. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.

- Examples of using commands:

Display the LAN information with enabled array unit name df400a1.

```
% aucrlan -unit df400a1
CTL  IP address  Net mask
  0  125.0.9.98  255.255.255.0
  1  125.0.9.99  255.255.255.0
%
```

Display the LAN information with enabled array unit name df500a1.

```
% aucrlan -unit df500a1
CTL  IP address  Net mask      Default gateway
  0  125.0.9.98  255.255.255.0  125.0.9.5
  1  125.0.9.99  255.255.255.0  125.0.9.5
%
```

3.5 RAID/LU

3.5.1 Referencing a RAID Group

- Command name

aurgref

- Synopsis

aurgref -unit unit_name

- Description

The definition of the RAID groups set to the array unit is displayed in list form. The display contents include the RAID group number, the RAID level, the definition frame of the RAID group.

- Options

Options	Description
-unit unit_name	Specify the name of the array unit which references the definition of the RAID group. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline)" of up to 16 characters long.

- Examples of using commands:

Reference the definition of the RAID group of the array unit name df400a1.

```
% aurgref -unit df400a1
RG      Level  Port  Width  Row  Depth
  0         5    0     5     0     1
  2         0    0     3     1     1
  3         1    0     4     2     1
%
```

Reference the definition of the RAID group of the array unit name df500a1.

```
% aurgref -unit df500a1
RAID      RAID  Start Location      Number of HDU      Number of      Remains
Group No.  Level  [Unit No, HDU No.]  in parity group  parity group
          0     5          0         5          0          1  10000000
%
```

3.5.2 Setting Up a RAID Group

- Command name

aurgadd

- Synopsis

– For 5800:

```
aurgadd -unit unit_name -rg rg_no
        -RAID0 | -RAID1 | -RAID5 | -RAID01 | -RAIDB | -RAIDC
        -row row_no -port port_no -width width_num -depth depth_num
```

– For 9200:

```
aurgadd -unit unit_name -rg rg_no
        -RAID0 | -RAID1 | -RAID5 | -RAID01
        -uno unit_no -hno hdu_no -hnum hdu_num -pnum pty_num
```

- Description

Sets up a RAID group in a specified array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which to set up a RAID group. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-rg rg_no	Specifies the RAID group No.
-RAID0, -RAID1, -RAID5, -RAID01, -RAIDB, -RAIDC	Specifies the RAID level.

For the exclusive use of DF400

Options	Description
-row row_no	Specifies the row No. of the top HDU in a RAID group.
-port port_no	Specifies the port No. of the top HDU in a RAID group.
-width width_num	Specifies the number of HDU arranged horizontally in a RAID group (width). Sets the value of 2 or more.
-depth depth_num	Specifies the number of HDU arranged vertically in a RAID group (depth).

For the exclusive use of 9200:

Options	Description
-uno unit_no	Specifies the Unit No. of the top drive in a RAID group.
-hno hdu_no	Specifies the HDU No. of the top drive in a RAID group.
-hnum hdu_num	Specify the number of HDUs in the parity group of the RAID group.
-pnum pty_num	Specify the number of parity groups of the RAID group.

■ Examples of using commands:

Sets up a RAID group in an array unit whose name is df400a1 (DF400). Set RAID group number to 2, RAID level to RAID5, starting drive Port to 0, Row to 2, Width to 5, and Height to 1.

```
% aurgadd -unit df400a1 -rg 2 -RAID5 -port 0 -row 2 -width 5 -depth 1
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
%
```

Set up the RAID group of array unit name df500a1. Set RAID group number to 2, RAID level to RAID5, starting drive Unit number to 0, HDU number to 2, number of HDUs in the parity group to 5, number of parity groups to 1.

```
% aurgadd -unit df500a1 -rg 2 -RAID5 -uno 0 -hno 0 -hnum 5 -pnum 1
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
%
```

3.5.3 Expanding a RAID Group

- Command name

aurgexp

- Synopsis

- For 5800:

aurgexp -unit unit_name -rg rg_no -width width_num

aurgexp -unit unit_name -rg rg_no -depth depth_num

- For 9200:

aurgexp -unit unit_name -rg rg_no -pnum pty_num

- Description

Expands the already-defined size of a RAID group.

For 5700E and 5800, only either the width or the height is specified for the expansion direction, and specification depends on each RAID level.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which a RAID group whose size to expand has been defined. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_ (underline)” of up to 16 characters long.
-rg rg_no	Specifies the RAID group No. of a RAID group for which to expand its already-defined size.

For the exclusive use of 5700E and 5800

Options	Description
-width width_num	Specifies the number of drives arranged horizontally in a RAID group (width) after expansion.
-depth depth_num	Specifies the number of drives arranged vertically in a RAID group (depth) after expansion.

For the exclusive use of 9200

Options	Description
-pnum pty_num	Specifies the number of parity groups after expansion.

- Examples of using commands:

Expands the depth of RAID group 2, which has been set up in an array unit whose name is df400a1, from 1 to 3.

```
% aurgref -unit df400a1
RG   Level  Port   Width   Row   Depth
  2      5    0      5      0      1

%
% aurgexp -unit df400a1 -rg 2 -depth 3
Password :                (of Resource Manager on workstation set with
command aupasswd)
%
% aurgref -unit df400a1
RG   Level  Port   Width   Row   Depth
  2      5    0      5      0      3

%
```

Expands the number of parity groups of RAID group 0, which number has been set in an array unit whose name is df500a1, from 1 to 3.

```
% aurgref -unit df500a1
RAID      RAID   Start Location      Number of HDU      Number of      Remains
Group No.  Level   [Unit No. HDU No.] in parity group  parity group
          0      5          0      5          0          1 10000000

%
% aurgexp -unit df500a1 -rg 0 -pnun 3
Password :                (of Resource Manager on workstation set with
command aupasswd)
%
% aurgref -unit df500a1
RAID      RAID   Start Location      Number of HDU      Number of      Remains
Group No.  Level   [Unit No. HDU No.] in parity group  parity group
          0      5          0      5          0          3 30000000

%
```

3.5.4 Deleting a RAID Group

- Command name

aurgdel

- Synopsis

```
aurgdel -unit unit_name -rg rg_no [ -f ]
```

```
aurgdel -unit unit_name -ALL [ -f ]
```

- Description

Deletes a specified RAID group or all RAID groups in an array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which RAID groups to be deleted have been defined. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-rg rg_no	Specifies the RAID group No. of a RAID group which to delete.
-ALL	Specifies to delete all RAID groups.
-f	The confirmation message at command execution is omitted.

- Examples of using commands:

Deletes RAID group 1 that has been defined in an array unit whose name is df400a1.

```
% aurgdel -unit df400a1 -rg 1
remove RAID group 1? (y/n [n]) y
Password :                      (of Resource Manager 9200 on workstation set with
                                command aupasswd)
%
```

An attempt was made to delete all RAID groups that have been defined in an array unit whose name is df400a1, but the deletion was canceled.

```
% aurgdel -unit df400a1 -ALL
This function invalidates user data of the deleted RAID groups.
remove all RAID groups? (y/n [n]) n
Terminate execution.
%
```


3.5.5 Referencing an LU

- Command name

auluref

- Synopsis

auluref -unit unit_name [-lu lun ...]

- Description

Displays already-defined LU information (capacity, status, pre-read staging amount, current controller No., default controller No., RAID group No. of a RAID group to which to belong, and its RAID level).

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference LU information. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-lu lun ...	When you want to reference LU information, specifies an LU No. If omitted, all already-defined LU information is displayed.

- Examples of using commands:

Displays all LU information in an array unit whose name is df400a1.

```
% auluref -unit df400a1
LU   Capacity   Status   Staging   C-CTL   D-CTL   RG   RAID
0     100352    Normal     512       0       0       0     5
1     100352    Normal     512       0       0       0     5
2     100352    Normal     512       0       0       0     5
3     100352    Normal     512       0       0       0     5
%
```

Displays information about LU 0 in an array unit whose name is df400a1.

```
% auluref -unit df400a1 -lu 0
LU   Capacity   Status   Staging   C-CTL   D-CTL   RG   RAID
0     100352    Normal     512       0       0       0     5
%
```

3.5.6 Setting Up an LU

- Command name

au luadd

- Synopsis

- In the case of dual system

```
au luadd -unit unit_name [ -lu lun ] -rg rg_no -size num | lest  
        -ct10 | -ct11
```

- In the case of single system

```
au luadd -unit unit_name [ -lu lun ] -rg rg_no -size num | lest
```

- Description

Sets up an LU.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit to which to add an LU. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_(underline)” of up to 16 characters long.
-lu lun	Specifies the LU No. of an LU to add. An LU No. to be specified must be the next number to the last of already-set numbers. If omitted, the Resource Manager 9200 automatically determines an LU No. For connection of the 5800, the determination processing is performed with the increase in the number of set LUs, resulting in inferior response. If the LU number to be added is known, specification of the LU number is recommended.
-rg rg_no	Specifies the RAID group No. of a RAID group to which to add an LU.
-size num lest	Specifies the capacity (number of blocks) of an LU. If “lest” is specified for the capacity, all remaining capacity of the RAID group is assigned.
-ct10 -ct11	Specifies the default controller No. of an LU. This option is specified when array unit is dual system.

- Examples of using commands:

Adds LU 3 to RAID group 2 in an array unit with a dual system configuration, whose name is df400a1. The capacity shall be 1,024,000, and the default controller be no. 0.

```
% auluadd -unit df400a1 -lu 3 -size 1024000 -ctl0 -rg 2
```

```
Password : (of Resource Manager 9200 on workstation set with  
command aupasswd)
```

```
%
```

3.5.7 Formatting an LU

- Command name

auformat

- Synopsis

auformat -unit unit_name -N | -I | -Im -lu lun ... [-f]

- Description

Formats a specified LU.

If multiple LUs are specified, LUs are formatted in the ascending order of LUNs regardless of formatting methods.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which an LU to format has been defined. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_ (underline)” of up to 16 characters long.
-N -I -Im	Specifies the formatting method. -N: Formats in the Normal mode in units of LUs. Formatting is executed from the current controller controlling an LU. In registering unit information, the current controller controlling an LU that formats LUs must be registered. -I: Formats in the Immediate mode in units of LUs. Formatting is executed from the current controller controlling an LU. In registering unit information, the current controller controlling an LU that formats LUs must be registered. -Im: Formats up to six LUs concurrently in the Immediate mode. If this mode is specified, LUs are formatted from their respective controllers with which they are connected regardless of the current controller controlling an LU.
-lu lun ...	Specifies the LU Nos. of LUs which to format. When specifying, a single LU No. or multiple LU Nos. can be specified. Single specification: Specifies a single LU No.. Example: -lu 3 Multiple specification: Specifies multiple LU Nos.. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8
-f	The confirmation message at command execution is omitted.

- Examples of using commands:

Formats LU 3 in an array unit, whose name is df400a1, in Normal mode.

```
% auformat -unit df400a1 -N -lu 3
format LU 3? (y/n [n]) y
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
%
```

Formats, in the Immediate mode, LUs from LUNs 4 to 7 in an array unit whose name is df400a1.

In addition, confirmation of whether or not to format is not done.

```
% auformat -unit df400a1 -I -lu 4-7 -f
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
%
```

3.5.8 Displaying Progress of LU Formatting

- Command name

auformatst

- Synopsis

auformatst -unit unit_name -lu lun

- Description

Displays the progress of formatting LUs for which to specify formatting in the Immediate mode.

While a specified LU is being formatted, the progress (in percent) of formatting is displayed. When formatting immediately after an LU has been set up or its size has been expanded, or the formatting has been completed, the following indication is displayed:

- “100%” is displayed when the LU is normal.
- “0%” is displayed when the LU is in condition other than above.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which LUs have been defined. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_ (underline)” of up to 16 characters long.
-lu lun	Specifies the LU No. of an LU for which to check the progress.

- Examples of using commands:

After specifying to format LU 4 in an array unit, whose name is df400a1, in Immediate mode, checks the progress of formatting.

```
% auformat -unit df400a1 -lu 4 -I -f
Password :
%
% auformatst -unit df400a1 -lu 4
df400a1 LU 4 17 %
% auformatst -unit df400a1 -lu 4
df400a1 LU 4 50 %
% auformatst -unit df400a1 -lu 4
df400a1 LU 4 81 %
% auformatst -unit df400a1 -lu 4
df400a1 LU 4 94 %
% auformatst -unit df400a1 -lu 4
df400a1 LU 4 100 %
%
```

3.5.9 Expanding an LU

- Command name

`auluexp`

- Synopsis

`auluexp -unit unit_name -lu lun -incr size | lest`

- Description

Expands the size of an LU. Note that only the last LU in each RAID group can be expanded (LU with the largest LU No. assigned within each RAID group).

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit in which an LU whose size to expand has been defined. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
<code>-lu lun</code>	Specifies the LU No. of an LU for which to expand its size.
<code>-incr size lest</code>	Specifies the increment (in the number of blocks) by which to expand. size: Specifies the number of blocks. lest: Assigns all remaining capacity of an RAID group.

- Examples of using commands:

Expands the capacity of LU 3 in an array unit, whose name is `df400a1`, by an increment of 3072 blocks.

```
% auluexp -unit df400a1 -lu 3 -incr 3072
```

```
Password : (of Resource Manager 9200 on workstation set with  
command aupasswd)
```

```
%
```

Assigns to LU 3 in an array unit, whose name is `df400a1`, all remaining capacity of an RAID group to which this LU belongs.

```
% auluexp -unit df400a1 -lu 3 -incr lest
```

```
Password : (of Resource Manager 9200 on workstation set with  
command aupasswd)
```

```
%
```

3.5.10 Deleting an LU

- Command name

auludel

- Synopsis

auludel -unit unit_name -last | -ALL [-f]

- Description

Deletes the last of already-defined LUs or all LUs.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which LUs have been defined. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-last -ALL	Specifies LUs to delete. -last: Deletes the last LU. -ALL: Deletes all LUs.
-f	The confirmation message at command execution is omitted.

- Examples of using commands:

Deletes the last LU in an array unit whose name is df400a1.

```
% auludel -unit df400a1 -last
This function invalidate data on the deleted logical unit.
remove the last LU? (y/n [n]) y
Password : (of Resource Manager 9200 on workstation set with
           command aupasswd)
%
```

An attempt was made to delete all LUs in an array unit whose name is df400a1, but the deletion was canceled.

```
% auludel -unit df400a1 -ALL
This function invalidate data on the deleted logical unit.
remove all LU? (y/n [n]) n
Aborts the processing.
%
```


3.5.11 Changing the Default Controller of an LU

- Command name

auluchg

- Synopsis

auluchg -unit unit_name -lu lun

- Description

Changes the default controller, with which an LU is connected, to another controller.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which LUs have been defined. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-lu lun	Specifies the LU No. of an LU whose default controller is changed.

- Examples of using commands:

Changes the default controller with which LU 2 is connected in an array unit whose name is df400a1.

```
% auluchg -unit df400a1 -lu 2
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
Default controller for the LU settings finished normally.
You need reboot the array unit to avail settings.
%
```

Changes the default controller with which LU 2 is connected in an array unit, whose name is df400a2 and which supports restarting.

```
% auluchg -unit df400a2 -lu 2
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
Default controller for the LU settings finished normally.
You need to reboot the array unit to avail settings.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]) : y
Now reboot the array unit. Start Time HH : MM
Reboot has been completed.
%
```

3.5.12 Setting Turbo LU

- Command name

auturbolu

- Synopsis

auturbolu -unit unit_name -refer

auturbolu -unit unit_name -set
[-ctl0_assign enable | disable -ctl0_lu lun]
[-ctl1_assign enable | disable -ctl1_lu lun]

- Description

References the status of whether turbo LU is resident or not, and sets the turbo LU.

Note: Optional software must be installed on array unit. The Array Unit must be rebooted for the setting to become effective.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference the LU cache residence state and in which to set LU cache resident. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_ (underline)” of up to 16 characters long.
-refer	References the status of whether turbo LU is resident or not.
-set	Sets turbo LU.
-ctl0_assign enable disable -ctl1_assign enable disable	Specifies to validate or invalidate that turbo LU of Controllers 0 and 1 is resident individually.
-ctl0_lu lun -ctl1_lu lun	Specifies the LU No. of an LU for which turbo LU is set resident.

- Examples of using commands:

References the state of whether LU cache of an array unit, whose name is df400a1, is resident or not.

```
% auturbolu -unit df400a1 -refer
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

Controller 0
Current Configuration
  Turbo LU Assignment      : disable
  Turbo LU                 :
  Turbo LU Status          :
Reserved Configuration
  Turbo LU Assignment      : disable
  Turbo LU                 :

Controller 1
Current Configuration
  Turbo LU Assignment      : disable
  Turbo LU                 :
  Turbo LU Status          :
Reserved Configuration
  Turbo LU Assignment      : disable
  Turbo LU                 :

%
```

Sets LU cache resident for an array unit whose name is df400a1.

```
% auturbolu -unit df400a1 -set -ctl0_assign enable -ctl0_lu 3 \
-ctl1_assign disable -ctl1_lu 4
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

Turbo LU settings finished normally.
You need reboot the array unit to avail settings.

%
```

Sets LU cache resident for an array unit, whose name is df400a2 and which supports restarting.

```
% auturbolu -unit df400a2 -set -ctl0_assign enable -ctl0_lu 3 \
-ctl1_assign disable -ctl1_lu 4
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

Turbo LU settings finished normally.
You need reboot the array unit to avail settings.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]) : y
Now reboot the array unit. Start Time HH:MM
Reboot has been completed.

%
```

3.6 Setting Up Configuration

3.6.1 Referencing/Setting Fibre Channel Information

- Command name

aufibre

- Synopsis

```
aufibre -unit unit_name -refer
```

```
aufibre -unit unit_name -set -ctl0 | -ctl1 -port A | B  
[ -FC-AL | -Fabric ]  
[ -portinfo n_port_id ] [ -access-guard on | off ]  
[ -permission node_name port_name [ -permission-lu lun ... ] ]
```

```
aufibre -unit unit_name -set -ctl0 | -ctl1 -port A | B  
[ -FC-AL | -Fabric ]  
[ -portinfo n_port_id ] [ -access-guard on | off ]  
[ -file filename ]
```

```
aufibre -unit unit_name -rm -ctl0 | -ctl1 -port A | B  
-permission node_name port_name [ -permission-lu lun ... ]
```

- Description

References and sets fibre channel information.

Note: Optional software must be installed in array unit to use LUN Security. The array unit must be rebooted for changes to become effective.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference, set, and delete fibre channel information. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-refer	Displays all already-set fibre channel information.
-set	Sets fibre channel information.
-rm	Deletes port security information and LUN security information.
-ctl0 -ctl1	Specifies a controller for which to set and delete fibre channel information.
-port A B	Specifies a port for which to set and delete fibre channel information.
-FC-AL -Fabric	Sets the topology of a specified port in a specified controller. -FC-AL: Sets the topology to FC_AL. -Fabric: Sets the topology to Fabric.

(Continued)

Options	Description
<code>-portinfo n_port_id</code>	Specifies the N_port ID of a specified port in a specified controller. Specifies <code>n_port_id</code> with six hexadecimal characters.
<code>-access-guard on off</code>	Specifies whether to validate or invalidate port security of a specified port in a specified controller. on: Validates port security (a port specified by <code>-port</code> option accepts security from only a host specified by <code>-permission</code> option). off: Invalidates port security (does not limit the host that accesses a port specified by <code>-port</code> option).
<code>-permission node_name port_name</code>	[<code>-set</code> option specified] When using port security, specifies access permission host information (node name, port name). node_name: Node name of a host (character string of 16 hexadecimal characters) port_name: Port name of a host (character string of 16 hexadecimal characters)
<code>-permission-lu lun ...</code>	[<code>-set</code> option specified] When using LUN security, specifies access permission LUNs (multiple LUNs can be specified). When specifying <code>-permission-lu</code> option, host information must be specified by <code>-permission</code> option. If host information specified by <code>-permission</code> is not yet set, access permission host information and LUN security information are set together at the same time. If host information specified by <code>-permission</code> option is already set, LUN security information is set additionally.
<code>-file filename</code>	When setting host security all together by file input, specifies the host permission information file.
<code>-permission node_name port_name</code>	[<code>-rm</code> option specified] Specifies host information (node name, port name) which to exclude from host security. node_name: Node name of a host (character string of 16 hexadecimal characters) port_name: Port name of a host (character string of 16 hexadecimal characters)
<code>-permission-lu lun ...</code>	[<code>-rm</code> option specified] When using LUN security, specifies LUNs (multiple LUNs can be specified) which to exclude from access permission LUs. When specifying <code>-permission-lu</code> option, host information must be specified by <code>-permission</code> option.

- Examples of using the command

References the fibre channel information of an array unit whose name is df400a1.

```
% aufibre -unit df400a1 -refer
```

```
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
```

LUN security

```
CTL 0 on
CTL 1 on
```

Topology Information

CTL	Port	Topology
0	A	FC-AL
0	B	FC-AL
1	A	FC-AL
1	B	FC-AL

Port Information

CTL	Port	Node name	Port name	N port_ID
0	A	50000E100000232F	50000E100000232F	0000EF
0	B	0000000000000000	0000000000000000	0000EF
1	A	0000000000000000	0000000000000000	0000EF
1	B	0000000000000000	0000000000000000	777777

SFC Firmware Revision

CTL	Port	BIU	Sequence Manager	Operational Firmware	PowOnSelf TestFirm	ENDEC+	FC-PH
0	A	00000004	10020193	02125805	01102000	3001506D	09/09
0	B	00000000	00000000	00000000	00000000	00000000	00/00
1	A	00000000	00000000	00000000	00000000	00000000	00/00
1	B	00000000	00000000	00000000	00000000	00000000	00/00

Security Information

CTL	Port	Access Guard	Node name	Port name	N port_ID
0	A	disable	AAAAAAAAAAAA0A00 25 30 50 60 63	0AAAAAAAAAAAAA00	000000
0	B	disable	0B01000000000000	0B00000000000001	0B0100
1	A	disable	AAAAAAAAAAAA1A00 6 12 34 43	1AAAAAAAAAAAAA00	000000
1	B	disable	BBBBBBBBBBBB1B00 15 23 31 34 55	1BBBBBBBBBBBB00	000000

%

Sets to Fabric the topology of Port A on controller 0 of an array unit whose name is df400a1.

```
% aufibre -unit df400a1 -set -ctl0 -port A -Fabric
```

```
Password : (of Resource Manager 9200 on workstation set with  
command aupasswd)
```

Fibre channel information settings finished normally.

You need reboot the array unit to avail settings.

%

Sets to Fabric the topology of Port A on controller 0 of an array unit, whose name is df400a2 and which supports remote restarting.

```
% aufibre -unit df400a2 -set -ctl0 -port A -Fabric
```

```
Password : (of Resource Manager 9200 on workstation set with  
command aupasswd)
```

Fibre channel information settings finished normally.

You need reboot the array unit to avail settings.

Array unit stops accepting input and output while rebooting.

And if you already logged in, login status is canceled when the reboot starts.

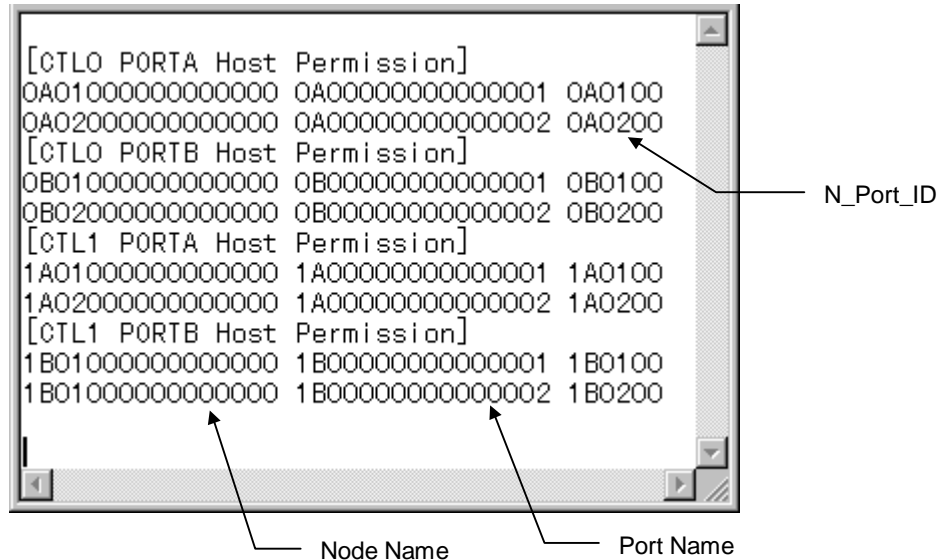
Do you reboot the array unit now (y/n [n]) : y

Now reboot the array unit. Start Time HH : MM

Reboot has been completed.

%

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.

- Command name

aufibre1

- Synopsis

- For 5800 and 9200:

```
aufibre1 -unit unit_name -refer
```

- For 5800:

```
aufibre1 -unit unit_name -set
[ -topo ctl_no topology1 ]
[ -portaddr ctl_no port_no port_address ]
[ -accguard ctl_no port_no on | off ]
[ -perm ctl_no port_no node_name port_name ]
[ -permlu ctl_no port_no node_name port_name lun... ]
[ -permluall ctl_no port_no node_name port_name ]
[ -file ctl_no port_no filename ]
```

- For 9200:

```
aufibre1 -unit unit_name -set
[ -topo ctl_no topology2 ]
[ -portaddr ctl_no port_no port_address ]
[ -lus ctl_no port_no on | off ]
[ -perm ctl_no port_no node_name port_name ]
[ -permlu ctl_no port_no node_name port_name lun... ]
[ -permluall ctl_no port_no node_name port_name ]
[ -file ctl_no port_no filename ]
```

- For 5800 and 9200:

```
aufibre1 -unit unit_name -rm
[ -perm ctl_no port_no node_name port_name ]
[ -permlu ctl_no port_no node_name port_name lun... ]
[ -permluall ctl_no port_no node_name port_name ]
```

- Description

References and sets fibre channel information.

■ Option

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference, set, and delete fibre channel information. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-refer	Displays all already-set fibre channel information.
-set	Sets fibre channel information.
-rm	Deletes port security information and LUN security information.
-topo ctl_no topology1	Specifies the topology of the specified controller. ctl_no: Controller number (0 or 1) topology1: Type of topology FC-AL: FC-AL Fabric: Fabric Point-to-Point
-topo ctl_no port_no topology2	Specifies the topology of the specified port. ctl_no: Controller number (0 or 1) port_no: Port name (A or B) topology2: Type of topology loop: loop ptop: Point-to-Point
-portaddr ctl_no port_no port-address	Specifies the port address of the specified port. ctl_no: Controller number (0 or 1) port_no: Port name (A or B) port-address: Port address (6 hexadecimal characters)
-accguard ctl_no port_no on off	Specifies whether the port security of the specified port is enabled or disabled. ctl_no: Controller number (0 or 1) port_no: Port name (A or B) on: Enables the port security. off: Disables the port security.
-lus ctl_no port_no on off	Specifies whether the LUN security of the specified port is enabled or disabled. ctl_no: Controller number (0 or 1) port_no: Port name (A or B) on: Enables the LUN security. off: Disables the LUN security.

(Continued)

Options	Description
-perm ctl_no port_no node_name port_name	<p>[-set option specification]</p> <p>Specifies host information (node name and port name) that can be accessed by the specified port.</p> <p>[-rm option specification]</p> <p>Specifies the host information to be deleted from the host information (node name and port name) that can be accessed by the specified port.</p> <p>ctl_no: Controller number (0 or 1) port_no: Port name (A or B) node_name: Node name of the host (16 hexadecimal characters) port_name: Port name of the host (16 hexadecimal characters)</p>
-permlu ctl_no port_no node_name port_name lun...	<p>[-set option specification]</p> <p>When using the LUN security function at a specified port, specifies LUs, to which the host is permitted to access, into host information registered with the -perm option (multiple LUs can be specified). Host information and LUN security are not allowed to be registered at the same time.</p> <p>[-rm option specification]</p> <p>Specifies the LUNs whose access permission is to be deleted from the LUN security set by the specified port. (Multiple LUs can be specified.)</p> <p>ctl_no: Controller number (0 or 1) port_no: Port name (A or B) node_name: Node name of the host (16 hexadecimal characters) port_name: Port name of the host (16 hexadecimal characters) lun..: LU number</p>
-permluall ctl_no port_no node_name port_name	<p>[-set option specification]</p> <p>When using the LUN security function at a specified port, specifies host information that is already registered with the -perm option, which specifies permission to access to all LUs. Host information and LUN security are not allowed to be registered at the same time.</p> <p>[-rm option specification]</p> <p>Specifies the host information whose access permission is to be deleted from the LUN security set by the specified port.</p> <p>ctl_no: Controller number (0 or 1) port_no: Port name (A or B) node_name: Node name of the host (16 hexadecimal characters) port_name: Port name of the host (16 hexadecimal characters)</p>
-file ctl_no port_no filename	<p>When setting host security all together by file input, specifies the host permission information file.</p> <p>ctl_no: Controller No. (0 or 1) port_no: Port name (A or B) filename: File name which to input</p>

- Examples of using commands:

Reference the fiber channel information of the array unit name df400a1. Same as aufibre.

Reference the fiber channel information of array unit name df500a1. Same as aufibre.

Set the topology of Port A of controller 0 of the array unit name df400a1 to Fabric.

```
% aufibre1 -unit df400a1 -set -topo 0 Fabric
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
Fibre channel information settings finished normally.
You need reboot the array unit to avail settings.
%
```

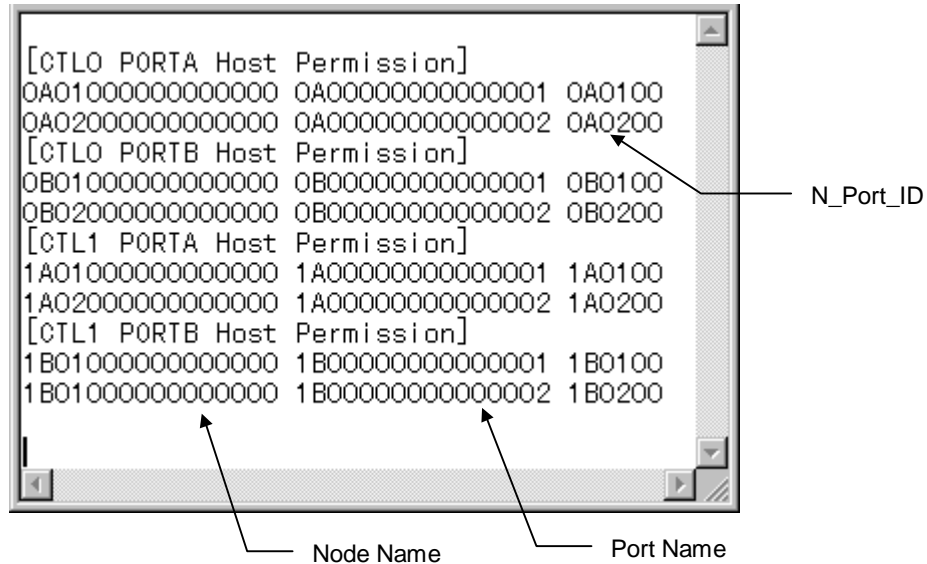
Set the topology of Port A of controller 0 of array unit name df400a2 supporting re-activation: to Fabric.

```
% aufibre1 -unit df400a2 -set -topo 0 Fabric
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
Fibre channel information settings finished normally.
You need reboot the array unit to avail settings.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]) : y
Now reboot the array unit. Start Time HH : MM
Reboot has been completed.
%
```

Set the topology of Port A of controller 0 of array unit name df500a1 to loop.

```
% aufibre1 -unit df500a1 -set -topo 0 A loop
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
Fibre channel information settings finished normally.
You need reboot the array unit to avail settings.
%
```

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.

3.6.2 Spare HDU Setup

- Command name

auspare

- Synopsis

auspare -unit unit_name -set -uno unit_no -hno hdu_no

auspare -unit unit_name -rm -uno unit_no -hno hdu_no

- Description

The specified HDU is set up as a spare HDU. The spare HDU attribute of the specified spare HDU is canceled.

An HDU that is not installed cannot be set as a spare HDU.

- Options

Options	Description
-unit unit_name	Specifies the name of the array unit to set or cancel the spare HDU. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_ (underline)” of up to 16 characters long.
-set	Sets up the spare HDU.
-rm	Cancels the spare HDU.
-uno unit_no	Specifies the Unit number of the spare HDU.
-hno hdu_no	Specifies the HDU number of the spare HDU.

- Examples of using commands:

Set up the spare HDU of array unit name df500a1. The position of the spare HDU is the HDU position with Unit number of 0 and HDU number of 9.

```
% auspare -unit df500a1 -set -uno 0 -hno 9
Password : (of Resource Manager 9200 on workstation set with
           command aupasswd)
%
```

Checks, with an audrive command, settings of the spare HDU in an array unit whose name is df500a1. “Spare” is displayed in the “Type” field for HDUs that are set to “Spare”.

```
% audrive -unit df500a1 -status -uno 0 -hno 9
Unit No.  HDU No.  Type   Status   Physics
         0         9  Spare  Standby  Mount
%
```

3.6.3 Fee-Basis Option Reference/Setup

- Command name

`auopt`

- Synopsis

`auopt -unit unit_name -refer`

- Case of used key-FD

`auopt -unit unit_name -lock off | on [-keyfd fd-path]`

- Case of used key-code

`auopt -unit unit_name -lock off | on [-keycode key-code]`

`auopt -unit unit_name -option option_name -st enable | disable`

- Description

Locks or unlocks the specified fee-basis option. Unlocks or locks can be carried out by the key FD or the key code described in key FD appended in the option.

Enables or disables the fee-basis option after unlocking.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of the array unit to set up or reference the fee-basis option. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
<code>-refer</code>	The unlocked fee-basis option is displayed.
<code>-lock off on</code>	Specifies locking or unlocking of the fee-basis option. off: Unlocks the fee-basis option. on: Locks the fee-basis option.
<code>-keyfd fd-path</code>	Specifies the directory storing the key FD when it is used to unlock or lock the fee-basis option. fd-path: Directory in which the key FD exists
<code>-keycode key-code</code>	Specifies the key code when used to unlock or lock the fee-basis option. key-code: Key code
<code>-option option-name</code>	Specifies the option name when enabling or disabling the unlocked fee-basis option. option-name: Option name For the option name, refer to the manual for each individual fee-basis option.

(Continued)

Options	Description
-st enable disable	Specifies whether the fee-basis option is enabled or disabled. enable: Enables the fee-basis option. disable: Disables the fee-basis option.

■ Examples of using commands:

Display the unlocked fee-basis option of array unit name df400a1. [its standard on df500]

```
% auopt -unit df400a1 -refer
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

Option name      Status
SNMP             enable
%
```

Unlocks the SNMP fee-basis option that requires to restart an array unit name df400a1, using the key FD.

```
% auopt -unit df400a1 -lock off -keyfile a :
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

Option was opened.
You need reboot the array unit to avail setting.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]) : y
Now reboot the array unit. Start Time HH : MM
Reboot has been completed.
%
```

Enables the SNMP fee-basis option that requires to restart an array unit name df400a1.

```
% auopt -unit df400a1 -option SNMP -st enable
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

Option setting ended normally.
You need reboot the array unit to avail setting.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]) : y
Now reboot the array unit. Start Time HH : MM
Reboot has been completed.
%
```


Unlocks the LUN security fee-basis option that does not require to restart an array unit name df500a1, using the key FD.

```
% auopt -unit df500a1 -lock off -keyfile a :
```

```
Password :
```

```
Option was opened.
```

```
You need reboot the array unit to avail setting.
```

```
%
```

3.6.4 Referencing/Setting Drive Restoration Control Information

- Command name

audrecopt

- Synopsis

audrecopt -unit unit_name -refer

audrecopt -unit unit_name -set
[-restor back | normal | priority] [-auto enable | disable]
[-sparing rwv | rw | not] [-interval interval_time]
[-size n]

- Description

References and sets drive restoration control information.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set drive restoration control information. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-refer	References drive restoration control information.
-set	Sets drive restoration control information.
-restor back normal priority	Specifies the drive restoration mode. back: Execute the restoration processing in the intervals of the host command processing. normal: Gives priority to the processing of commands from the host, and executes the restoration processing at a certain interval after a host command terminates. priority: Executes the restoration processing at a certain interval with higher priority than that of the processing of commands from the host.
-auto enable disable	Specifies whether or not to automatically start copying back.
-sparing rwv rw not	Specifies the operating mode of dynamic sparing. rwv: When the count of either Read/Write errors or Online Verify errors exceeds a predetermined threshold value, starts dynamic sparing. rw: When the count of Read/Write errors exceeds a predetermined threshold value, starts dynamic sparing. not: Although the count of either Read/Write errors or Online Verify errors exceeds a predetermined threshold value, does not start dynamic sparing.

(Continued)

Options	Description
-interval interval_time	Specifies the interval at which to execute the restoration processing. Specifies it with a value from 0 to 255 in units of 10 ms. The default value is 10, and hence executes the restoration processing at an interval of 100 ms.
-size n	Specifies the unit of restored data per single operation in the restoration processing. Specifies a value of a multiple of 32 between 32 and 65,504 in units of 512 bytes. The default value is 32, and hence restores 16 kbyte data in a single operation.

■ Examples of using commands:

Displays the drive restoration control information of an array unit whose name is df400a1.

```
% audrecopt -unit df400a1 -refer
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

Drive restoration mode : Background
Drive restoration      : Automatically
Dynamic spare mode     : Executing (Read, Write, Online Verify)
Interval time [10msec] : 10
Restore data size [blocks] : 32
%
```

Sets drive restoration control information for an array unit whose name is df400a1.

```
% audrecopt -unit df400a1 -set -restor normal -auto enable -interval 10
-size 64 -sparing rwv
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
%
% audrecopt -unit df400a1 -refer
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

Drive restoration mode : Interleave (standard)
Drive restoration      : Automatically
Dynamic spare mode     : Execution (Read/Write & Online Verify)
Interval time [10msec] : 10
Restore data size [blocks] : 64
%
```

3.6.5 Referencing/Setting Online Verify Information

- Command name

`auonlineverify`

- Synopsis

`auonlineverify -unit unit_name -refer`

`auonlineverify -unit unit_name -set
[-verify enable | disable] [-time time]`

- Description

References and sets online verify information.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit for which to reference and set online verify information. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
<code>-refer</code>	References online verify information.
<code>-set</code>	Sets online verify information.
<code>-verify enable disable</code>	Specifies whether or not to perform an online verify test.
<code>-time time</code>	Specifies the idling time (0 to 30 seconds). If "0" is specified, the idling time is set to 10 seconds.

- Examples of using commands:

References the online verify information of an array unit whose name is `df400a1`.

```
% auonlineverify -unit df400a1 -refer
```

```
Password : (of Resource Manager 9200 on workstation set with  
command aupasswd)
```

```
Online verify test : Yes
```

```
Idling time [sec] : 0
```

```
%
```

Sets online verify information for an array unit whose name is df400a1, then references it.

```
% auonlineverify -unit df400a1 -set -verify enable -time 5
```

```
Password : (of Resource Manager 9200 on workstation set with  
command aupasswd)
```

```
%
```

```
% auonlineverify -unit df400a1 -refer
```

```
Password :
```

```
Online verify test : Yes
```

```
Idling time [sec] : 5
```

```
%
```

3.7 System Parameters

3.7.1 Referencing/Setting System Parameters

- Command name

ausysparam

- Synopsis

- For 5800 and 9200:

ausysparam -unit unit_name -refer

- For 5800 (SCSI version):

```
ausysparam -unit unit_name -set
[ -SystemStartup single | DualIDTake | DualNotIDTake |
                        HotIDTake | HotNotIDTake ]
[ -TakingID Port_no ctl_no ]
[ -DataShare used | notUsed ]
[ -SpareDisk one | two | not ]
[ -HostConnection standard | OpenVMS | TRESPASS | WolfPack |
                        IBM7135 | NCR ]
[ -SerialNumber string ]
[ -DriveCapacity row_no disk_size ]
[ -VxVM enable | disable ]
[ -CLAM enable | disable ]
[ -Solaris enable | disable ]
[ -DriveDetach enable | disable ]
[ -MP5400 enable | disable ]
[ -OdeMapper enable | disable ]
[ -MultipathController enable | disable ]
[ -ReportInquiry enable | disable ]
[ -PROCOM enable | disable ]
[ -ReportStatus enable | disable ]
[ -MultipathArrayUnit enable | disable ]
[ -LuCacheWarning enable | disable ]
[ -UASuppress enable | disable ]
[ -DataStriping 16 | 32 | 64 ]
[ -Buzzer on | off ]
```

```

[ -LuSizeReport auto | not ]
[ -ScsiResetLip on | off ]
[ -ProcessorFailures reset | shutdown ]
[ -inquiryCommandQueue on | off ]
[ -inquiryAnsiVersion 2 | 3 ]
[ -inquiryVendor string ]
[ -inquiryProduct string ]
[ -inquiryRomMicro string ]
[ -inquiryRamMicro string ]
[ -CacheMode off | random | sequential | randseq ]
[ -PortType normal | multiple ]
[ -PortTypeResetLip ctl_no port_no on | off ]
[ -PseudoResponse ctl_no busy | notReady ]
[ -SaveDataPointer ctl_no port_no
                        nothing | data | cmd | datacmd ]
[ -ControllerIdentifier ctl_no enable | disable ]
[ -ControllerID ctl_no string1 ]
[ -Rs232cOutflow ctl_no off | normal | hitrac ]
[ -WriteVerifyExecution ctl_no on | off ]
[ -ConnectLAN ctl_no on | off ]
[ -dhcp ctl_no enable | disable ]
[ -IPAddress ctl_no inet_addr ]
[ -SubnetMask ctl_no netmask ]
[ -DefaultGateway ctl_no gateway ]
[ -setSM ctl_no port_no tid ]
[ -rmSM ctl_no port_no tid ]
[ -setMS ctl_no port_no tid lu ]
[ -rmMS ctl_no port_no tid lu ]
[ -setMM ctl_no port_no tid hlu lu ]
[ -rmMM ctl_no port_no tid hlu lu ]
[ -sync ctl_no port_no atandard | async | N5 | N10 | N13 | N20 |
                        N33 | N40 | W10 | W20 | W26 | W40 | W66 | W80 ]
[ -fd on | off ]

```

– For the 5800 (Fibre version):

```
ausysparam -unit unit_name set
[ -SystemStartup single | Dual | DualIDTake | DualNotIDTake |
    HotIDTake | HotNotIDTake ]
[ -TakingID Port_no ctl_no ]
[ -DataShare used | notUsed ]
[ -SpareDisk one | two | not ]
[ -HostConnection standard | OpenVMS | TRESPASS | WolfPack ]
[ -SerialNumber string ]
[ -DriveCapacity row_num disk_size ]
[ -VxVM enable | disable ]
[ -CLAM enable | disable ]
[ -Solaris enable | disable ]
[ -DriveDetach enable | disable ]
[ -HPUX enable | disable ]
[ -MultipathController enable | disable ]
[ -ReportInquiry enable | disable ]
[ -PROCOM enable | disable ]
[ -ReportStatus enable | disable ]

[ -MultipathArrayUnit enable | disable ]
[ -LuCacheWarning enable | disable ]
[ -UASuppress enable | disable ]
[ -SGI enable | disable ]
[ -PortIdTaking enable | disable ]
[ -DataStriping 16 | 32 | 64 ]
[ -Buzzer on | off ]
[ -ScsiResetLip on | off ]
[ -ProcessorFailures reset | shutdown ]
[ -inquiryCommandQueue on | off ]
[ -inquiryVendor string ]
[ -inquiryProduct string ]
[ -inquiryRomMicro string ]
[ -inquiryRamMicro string ]
[ -CacheMode off | random | sequential | randseq ]
[ -PortType normal | multiple ]
[ -PortTypeResetLip ctl_no port_no on | off ]
[ -PortTypeOption ctl_no port_no SGI | HP enable | disable ]
[ -ControllerIdentifier ctl_no enable | disable ]
[ -ControllerID ctl_no string1 ]
[ -Rs232cOutflow ctl_no off | normal | hitrac ]
[ -WriteVerifyExecution ctl_no on | off ]
[ -ConnectLAN ctl_no on | off ]
[ -dhcp ctl_no enable | disable ]
[ -IPAddress ctl_no inet_addr ]
[ -SubnetMask ctl_no netmask ]
[ -DefaultGateway ctl_no gateway ]
[ -setMM ctl_no port_no hlu lu ]
[ -rmMM ctl_no port_no hlu lu ]
[ -fd on | off ]
```


– For 9200 (SCSI version):

```
ausysparam -unit unit_name -set
[ -SystemStartup Single | DualIDTake | DualNotIDTake |
    HotIDTake | HotNotIDTake ]
[ -TakingID port_no ctl_no ]
[ -DataShare used | notUsed ]
[ -HostConnection ctl_no port_no
    standard | OpenVMS | TRESPASS | WolfPack |
    IBM7135 | NCR ]
[ -SerialNumber string ]
[ -VxVM ctl_no port_no enable | disable ]
[ -DriveDetach enable | disable ]
[ -OdeMapper ctl_no port_no enable | disable ]
[ -ReportInquiry ctl_no port_no enable | disable ]
[ -MultipathController enable | disable ]
[ -PROCUM enable | disable ]
[ -ReportStatus enable | disable ]
[ -MultipathArrayUnit enable | disable ]
[ -LuCacheWarning enable | disable ]
[ -UASuppress ctl_no port_no enable | disable ]
[ -HISUP ctl_no port_no enable | disable ]
[ -CCHS ctl_no port_no enable | disable ]
[ -DataStriping 16 | 32 | 64 ]
[ -LuSizeReport auto | not ]
[ -ProcessorFailures reset | shutdown ]
[ -inquiryCommandQueue on | off ]
[ -inquiryAnsiVersion 2 | 3 ]
[ -inquiryVendor string ]
[ -inquiryProduct string ]
[ -inquiryRomMicro string ]
[ -inquiryRamMicro string ]
[ -WebTitle string ]
[ -CacheMode off | random ]
[ -PortTypeOption ctl_no port_no
    ResetLipSignal | ResetLipProcess |
    TargetReset | Reserve enable | disable ]
[ -PseudoResponse ctl_no busy | notReady ]
[ -SaveDataPointer ctl_no port_no
    nothing | data | cmd | datacmd ]
[ -ControllerIdentifier ctl_no enable | disable ]
[ -ControllerID ctl_no string ]
[ -Rs232cOutflow ctl_no off | normal | hitrack ]
[ -WriteVerifyExecution ctl_no on | off ]
[ -dhcp ctl_no enable | disable ]
[ -IPAddress ctl_no inet_addr ]
[ -SubnetMask ctl_no netmask ]
```

```

[ -DefaultGateway ctl_no gateway ]
    [ -setSM ctl_no port_no tid ]
    [ -rmSM ctl_no port_no tid ]
    [ -setMS ctl_no port_no tid lu ]
    [ -rmMS ctl_no port_no tid lu ]
    [ -setMM ctl_no port_no tid hlu lu ]
    [ -rmMM ctl_no port_no tid hlu lu ]
    [ -sync ctl_no port_no standard | async |
        N5 | N10 | N20 | N40 | W10 | W20 | W40 | W80 ]
    [ -fd on | off ]

```

– For the 9200 (Fibre version):

```
ausysparam -unit unit_name set
[ -SystemStartup Single | DualIDTake | DualNotIDTake |
    HotIDTake | HotNotIDTake ]
[ -TakingID Port_no ctl_no ]
[ -DataShare used | notUsed ]
[ -HostConnection ctl_no port_no
    standard | OpenVMS | TRESPASS | WolfPack ]
[ -SerialNumber string ]
[ -VxVM ctl_no port_no enable | disable ]
[ -DriveDetach enable | disable ]
[ -HPUX ctl_no port_no enable | disable ]
[ -ReportInquiry ctl_no port_no enable | disable ]
[ -MultipathController enable | disable ]
[ -PROCCom enable | disable ]
[ -ReportStatus enable | disable ]
[ -MultipathArrayUnit enable | disable ]
[ -LuCacheWarning enable | disable ]
[ -UASuppress ctl_no port_no enable | disable ]
[ -HISUP ctl_no port_no enable | disable ]
[ -CCHS ctl_no port_no enable | disable ]
[ -LinkSeparation enable | disable ]
[ -DataStriping 16 | 32 | 64 ]
[ -ProcessorFailures reset | shutdown ]
[ -inquiryCommandQueue on | off ]
[ -inquiryVendor string ]
[ -inquiryProduct string ]
[ -inquiryRomMicro string ]
[ -inquiryRamMicro string ]
[ -WebTitle string ]
[ -CacheMode off | random ]
[ -PortTypeOption ctl_no port_no
    ResetLipSignal | ResetLipProcess |
    LipPortAllReset | TargetReset |
    Reserve | LUReset | TPRL0
    enable | disable ]
[ -ControllerIdentifier ctl_no enable | disable ]
[ -ControllerID ctl_no string1 ]
[ -Rs232cOutflow ctl_no off | normal | hitrac ]
[ -WriteVerifyExecution ctl_no on | off ]
[ -dhcp ctl_no enable | disable ]
[ -IPAddress ctl_no inet_addr ]
[ -SubnetMask ctl_no netmask ]
[ -DefaultGateway ctl_no gateway ]
[ -setMM ctl_no port_no hlu lu ]
[ -rmMM ctl_no port_no hlu lu ]
[ -fd on | off ]
```

- Description

References the contents of system parameters or set the parameters.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set system parameters. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-refer	References system parameters.
-set	Sets system parameters.
-SystemStartup Single DualIDTake DualNotIDTake HotIDTake HotNotIDTake	Specifies the configuration of an array unit. Single: Single DualIDTake: Dual active (with the taking over of SCSI ID) DualNotIDTake: Dual active (without the taking over of SCSI ID) HotIDTake: Hot standby (with the taking over of SCSI ID) HotNotIDTake: Hot standby (without the taking over of SCSI ID)
-TakingID port_no ctl_no	Specifies the default controller of each port when specifying a dual active configuration in which the taking over of SCSI IDs is used. port_no: Port number (A, B, C, D) ctl_no: Controller number (0, 1)
-DataShare used notUsed	Specifies the data share mode. used: Uses the data share mode. notUsed: Does not use the data share mode.
-SerialNumber string	Specifies the lower four digits of the manufacturing serial number of an array unit with numeric characters. The number is reflected on the fiber version of 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.
-DriveDetach enable disable	Specifies whether to set the drive blockade mode effective or ineffective. enable: Enables the drive blockade mode. disable: Disables the drive blockade mode.
-MultipathController enable disable	Specifies whether or not to perform sequential judgment for each controller. enable: Sequential decision at the controller unit. disable: Sequential decision at the port unit.
-PROCOM enable disable	Specifies whether to set the PROCOM mode effective or ineffective. enable: Enables the PROCOM mode. disable: Disables the PROCOM mode.
-ReportStatus enable disable	Specifies whether to set the warning status reporting mode effective or ineffective. enable: Enables the warning status report. disable: Disables the warning status report.

(Continued)

Options	Description
-MultipathArrayUnit enable disable	Specifies whether or not to perform sequential judgment for each array unit. enable: Sequential decision at array unit. disable: Sequential decision at port unit.
-LuCacheWarning enable disable	Specifies whether or not to report a warning when the turbo LU function is set effective. enable: Reports the warning. disable: Does not report the warning.
-DataStriping 16 32 64	Specifies the data striping size. 16 : To treat as 16 kbyte. 32 : To treat as 32 kbyte. 64 : To treat as 64 kbyte.
-ProcessorFailures reset shutdown	Specifies action when a processor failure occurs. reset: Resets the failure and restarts the controller. shutdown: Shuts down the array unit.
-inquiryAnsiVersion 2 3	Sets the ANSI version of standard INQUIRY data. 2: SCSI2 3: SCSI3
-inquiryCommandQueue on off	Specifies execution of command queuing of INQUIRY response information. on: Executes command queuing. off: Suppresses command queuing.
-inquiryVendor string	Specifies the vendor name of Inquiry response information with up to eight characters.
-inquiryProduct string	Specifies the product type of Inquiry response information with up to sixteen characters.
-inquiryRomMicro string	Specifies the ROM microprogram version of Inquiry response information with up to two characters.
-inquiryRamMicro string	Specifies the RAM microprogram version of Inquiry response information with up to two characters.
-CacheMode off random sequential randseq	Specifies the method of allocating cache memory. off: Uses cache memory by the common allocation method. random: Uses it by allocating to the buffer for random read only. sequential: Uses it by allocating to the buffer for sequential read only. randseq: Uses it by allocating to the buffers for both random read and sequential read only.
-ControllerIdentifier ctl_no enable disable	Specifies whether the controller identifier is valid or invalid. ctl: 0, 1 enable/disable: Valid/Invalid

(Continued)

Options	Description
-ControllerID ctl string1	Specifies the controller ID. ctl: 0, 1 string1: Controller ID (up to eight characters)
-LuSizeReport auto not	Specifies the LU size to be reported to the host. Valid for the SCSI version only. auto: The LU size is automatically determined by the array unit. not: The LU size is set to an identical value.
-PseudoResponse ctl_no busy notReady	Sets the response mode for duration from power on until the controller gets ready (in the case of SCSI version). ctl_no: Controller number (0, 1) busy: Responds with Busy. notReady: Respond with Not Ready.
-SaveDataPointer ctl port nothing data cmd datacmd	Specifies the request for the controller to report a Save Data Pointer to the host. ctl_no: Controller number (0, 1) port_no: Port number (A, B, C, D) nothing: Does not report. data: Reports after transferring data. cmd: Reports after receiving a command. datacmd: Reports after transferring data and after receiving a command.
-sync ctl_no port_no standard async N5 N10 N13 N20 N33 N40 W10 W20 W26 W40 W66 W80	Specifies the SCSI transfer rate of a port. When connecting the DF500, do not specify N13, W26, N33, and W66, because they are all not supported. standard: Sets to a value so as to match the transfer rate of an interface board mounted. async: Transfers in the mode in which synchronous transfer is not used. N5: Sets the maximum transfer rate to Narrow 5 [MB/s]. N10: Sets the maximum transfer rate to Narrow 10 [MB/s]. N13: Sets the maximum transfer rate to Narrow 13 [MB/s]. N20: Sets the maximum transfer rate to Narrow 20 [MB/s]. N33: Sets the maximum transfer rate to Narrow 33 [MB/s]. N40: Sets the maximum transfer rate to Narrow 40 [MB/s]. W10: Sets the maximum transfer rate to Wide 10 [MB/s]. W20: Sets the maximum transfer rate to Wide 20 [MB/s]. W26: Sets the maximum transfer rate to Wide 26 [MB/s]. W40: Sets the maximum transfer rate to Wide 40 [MB/s]. W66: Sets the maximum transfer rate to Wide 66 [MB/s]. W80: Sets the maximum transfer rate to Wide 80 [MB/s].

(Continued)

Options	Description
-WriteVerifyExecution ctl_no on off	Specifies execution of a write & verify operation ctl_no : Controller No. (0, 1) on : Executes a write & verify operation. off : Does not execute a write & verify operation.
-Rs232cOutflow ctl_no off normal hitrac	Sets the mode of sending out error information onto RS232C. ctl_no : Controller No. (0, 1) off : Does not send out information. normal : Sends out information. hitrac : Sends out information in the HITRAC mode.
-dhcp ctl_no enable disable	Specifies whether the DHCP mode is enable or disable. ctl_no : Controller number (0, 1) enable : Enables the DHCP mode disable : Disables the DHCP mode.
-IPAddress ctl_no inet_addr	Specifies the IP address. ctl_no : Controller number (0, 1) inet_addr : IP address (format xxx.xxx.xxx.xxx)
-SubnetMask ctl_no netmask	Specifies the subnet mask. ctl_no : Controller number (0, 1) netmask : Subnet mask (format xxx.xxx.xxx.xxx)
-DefaultGateway ctl_no gateway	Specifies the default gateway. ctl_no : Controller number (0, 1) gateway : Default gateway (format xxx.xxx.xxx.xxx)
-setSM ctl_no port_no tid	Sets the target ID by S-TID, M-LUN modes. ctl_no : Controller number (0, 1) port_no : Port number (A, B, C, D) tid : Target ID
-rmSM ctl_no port_no tid	Deletes the target ID by S-TID, M-LUN modes. ctl_no : Controller number (0, 1) port_no : Port number (A, B, C, D) tid : Target ID

Note: If LAN configuration information (such as an IP Address) is modified, an error message (Interface Error) may be displayed without displaying a restart completion message when restarting an array unit. When modifying LAN configuration information, restart an array unit manually .

(Continued)

Options	Description
<code>-setMS</code> <code>ctl_no port_no</code> <code>tid lu</code>	Sets the target ID by M-TID, S-LUN modes. ctl_no : Controller number (0, 1) port_no : Port number (A, B, C, D) tid : Target ID lu : LU number
<code>-rmMS</code> <code>ctl_no port_no</code> <code>tid lu</code>	Deletes the target ID by M-TID, S-LUN modes. ctl_no : Controller number (0, 1) port_no : Port number (A, B, C, D) tid : Target ID lu : LU number
<code>-setMM</code> <code>ctl_no port_no</code> <code>tid hlu lu</code>	Sets the target ID by M-TID, M-LUN modes. (for the case of SCSI version) ctl_no : Controller number (0, 1) port_no : Port number (A, B, C, D) tid : Target ID hlu : LU number recognized by the host lu : LU number
<code>-rmMM</code> <code>ctl_no port_no</code> <code>tid hlu lu</code>	Delete the target ID by M-TID, M-LUN modes. (for the case of SCSI version) ctl_no : Controller number (0, 1) port_no : Port number (A, B, C, D) tid : Target ID hlu : LU number recognized by the host lu : LU number
<code>-setMM</code> <code>ctl_no port_no</code> <code>hlu lu</code>	Sets the target ID by M-TID, M-LUN modes. (for the case of Fibre version) ctl_no : Controller number (0, 1) port_no : Port number (A, B) hlu : LU number recognized by the host lu : LU number
<code>-rmMM</code> <code>ctl_no port_no</code> <code>hlu lu</code>	Deletes the target ID by M-TID, M-LUN modes. (for the case of Fibre version) ctl_no : Controller number (0, 1) port_no : Port number (A, B) hlu : LU number recognized by the host lu : LU number

(Continued)

Options	Description
-fd on off	Specifies whether or not to make a backup copy to the FD. System parameter information is already saved in the backup FD in an array unit. When settings are modified, the information must be saved again, and hence be sure to specify on. on: Makes a backup copy. off: Does not make a backup copy.

For the 5800:

Options	Description
-SpareDisk one two not	Specifies the configuration of spare disk drives. one: Uses one spare disk drive. two: Uses two spare disk drives. not: Does not use spare disk drive.
-HostConnection standard OpenVMS TRESPASS WolfPack IBM7135 NCR	Specifies the mode to be emulated. standard: Open system emulation mode OpenVMS: Open VMS mode TRESPASS: TRESPASS mode WolfPack: WolfPack mode IBM7135: IBM7135 I/O path switching emulation mode NCR: NCR I/O path switching emulation mode
-DriveCapacity row_num disk_size	Specifies the capacity of installed drives in units of rows. ROW 0 cannot be specified. row_num: 1, 2, 3, 4, 5 disk_size: 4, 9, 18, 36, 72 (Gbyte) 0XXXXXXXX (user-specified value : hex. value)
-VxVM enable disable	Specifies whether to set the VxVM mode effective or ineffective. enable: Enables the VxVM mode. disable: Disables the VxVM mode.
-OdeMapper enable disable	Specifies whether to set the ODE Mapper mode effective or ineffective. enable: Enables the ODE Mapper mode. disable: Disables the ODE Mapper mode.
-HPUX enable disable	Specifies whether to set the HP connection mode effective or ineffective. enable: Enables the HP connection mode. disable: Disables the HP connection mode.
-ReportInquiry enable disable	Specifies whether to set the Inquiry Page : 83 reporting mode effective or ineffective. enable: Enables the report of Inquiry Page : 83. disable: Disables the report of Inquiry Page : 83.

(Continued)

Options	Description
-UASuppress enable disable	Specifies whether or not to suppress a unit attention (06/2A00). enable: Suppress the unit attention. disable: Dose not suppress the unit attention.
-Buzzer on off	Specifies whether to set the buzzer in the sounding mode or silent mode. on: Turn on the buzzer. off: Turn off the buzzer.
-PortTypeOption ctl_no port_no SGI HP enable disable	For the fibre version of the array unit, options can be specified for each port. ctl_no: Controller number (0, 1) port: Portnumber (A, B, C, D) SGI: Sets the SGI mode. HP: Sets the HP connection mode. enable: Enables the setting of SGI mode and HP connection mode. disable: Disables the setting of SGI mode and HP connection mode.
-CLAM enable disable	Specifies whether to set the CLAM mode effective or ineffective. enable: Enables the CLAM mode. disable: Disables the CLAM mode.
-Solaris enable disable	Specifies whether to set the SUN Solaris2.5.1 mode effective or ineffective. enable: Enables the SUN Solaris2.5.1 mode. disable: Disables the SUN Solaris2.5.1 mode.
-MP5400 enable disable	Specifies whether to set the MP5400 mode effective or ineffective. enable: Enables the MP5400 mode. disable: Disables the MP5400 mode.
-OdeMapper enable disable	Specifies whether to enable or disable the ODE Mapper mode. enable: Enables the ODE Mapper mode. disable: Disables the ODE Mapper mode.
-SGI enable disable	Specifies whether to set the SGI mode effective or ineffective. enable: Enables the SGI mode. disable: Disables the SGI mode.
-PortIdTaking enable disable	Specifies whether to set the taking over of port IDs effective or ineffective. enable: Enables the taking over of port ID. disable: Disables the taking over of port ID.
-ScsiResetLip on off	For the SCSI version, sets the reset mode when receiving a SCSI reset from other ports. For the fibre version, sets the LIP mode when receiving an LIP from other ports. When the -PortType option is multiple, the setting is invalid. on: Sets a SCSI reset/LIP from other ports effective. off: Sets a SCSI reset/LIP from other ports ineffective.

(Continued)

Options	Description
-PortType normal multiple	Sets the multi-port expansion function. normal : Validates the setting specified with -ScsiResetLip option. multiple : Sets the SCSI reset/LIP mode for each port.
-PortTypeResetLip ctl_no port_no on off	Sets the SCSI reset/LIP mode for each controller and each port. ctl_no : Controller number (0, 1) port_no : Port number (A, B, C, D) on : Sets a SCSI reset/LIP from other ports effective. off : Sets a SCSI reset/LIP from other ports ineffective.
-ConnectLAN ctl_no on off	Specifies the validity/invalidity of interface with applications through LAN ctl_no : Controller number (0, 1) on : Enable. off : Disable

For the 9200:

Options	Description
-HostConnection ctl_no port_no standard OpenVMS TRESPASS WolfPack	Specifies the mode to be emulated. ctl_no: Controller number (0, 1) port_no: Port number (A, B) standard: Open system emulation mode OpenVMS: Open VMS mode TRESPASS: TRESPASS mode WolfPack: WolfPack mode
-VxVM ctl_no port_no enable disable	Specifies whether to set the VxVM mode effective or ineffective. ctl_no: Controller number (0, 1) port_no: Port number (A, B) enable: Enables the VxVM mode. disable: Disables the VxVM mode.
-OdeMapper ctl_no port_no enable disable	Specifies whether to set the ODE Mapper mode effective or ineffective. ctl_no: Controller number (0, 1) port_no: Port number (A, B) enable: Enables the ODE Mapper mode. disable: Disables the ODE Mapper mode.
-HPUX ctl_no port_no enable disable	Specifies whether to set the HP connection mode effective or ineffective. ctl_no: Controller number (0, 1) port_no: Port number (A, B) enable: Enables the HP connection mode. disable: Disables the HP connection mode.
-HISUP ctl_no port_no enable disable	Specifies whether to set the HISUP mode effective or ineffective. ctl_no: Controller number (0, 1) port_no: Port number (A, B) enable: Enables the HISUP mode. disable: Disables the HISUP mode.
-CCHS ctl_no port_no enable disable	Specifies whether to set the CCHS convert mode effective or ineffective. ctl_no: Controller number (0, 1) port_no: Port number (A, B) enable: Enables the CCHS convert mode. disable: Disables the CCHS convert mode.
-WebTitle string	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 alphanumerics or characters (except for the ' (single quotation mark), " (double quotation mark), and \ (backslash) symbols) other than numeric.

(Continued)

Options	Description
-LinkSeparation enable disable	Specifies whether to set the Link Separation effective or ineffective. enable : Enables the Link Separation. disable : Disables the Link Separation.
-ReportInquiry ctl_no port_no enable disable	Specifies whether to set the Inquiry Page : 83 reporting mode effective or ineffective. ctl_no : Controller number (0, 1) port_no : Port number (A, B) enable : Enables the report of Inquiry Page : 83. disable : Disables the report of Inquiry Page : 83.
-UASuppress ctl_no port_no enable disable	Specifies whether or not to suppress a unit attention (06/2A00). ctl_no : Controller number (0, 1) port_no : Port number (A, B) enable : Suppress the unit attention. disable : Does not suppress the unit attention.
-PortTypeOption ctl_no port_no ResetLipSignal ResetLipProcess LipPortAllReset TargetReset Reserve LUReset enable disable	For the Fibre Channel version of array units, sets options for individual ports. ctl_no : Controller No. (0, 1) port_no : Port No. (A, B, C, D) ResetLipSignal : Sets ResetLip (signal). ResetLipProcess : Sets ResetLip (processing). LipPortAllReset : Sets the resetting of all ports by an LIP. TargetReset : Enables the Target reset. Reserve : Enables the Reserve. LUReset : Enables the LU reset. enable : Enables the settings described above. disable : Disables the settings described above.

- Examples of using commands:

References the system parameters of an array unit whose name is df500a1.

```
% ausysparam -unit df500a1 -refer
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
```

System parameter list.

```
DF Name : df500a1
Date : 2000/12/01 13:00:00
Micro Program Revision : 0553
Flash Program Revision : 0553
Array Unit Type : DF500
--- Common Parameter ---
System Startup Attribute = Dual Active Mode
  SCSI ID/Port ID Take-over Mode = ----
  Default Controller
    Port A = ---
    Port B = ---
  Data Share Mode = Not 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 = ---
    HP Connection mode enable = OFF
    Report Inquiry page 83H = OFF
    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 = ---
    HP Connection mode enable = OFF
    Report Inquiry page 83H = OFF
    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 = ---
    HP Connection mode enable = OFF
    Report Inquiry page 83H = OFF
    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 = ---
 HP Connection mode enable = OFF
 Report Inquiry page 83H = OFF
 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 = HITACHI
 Product ID = DF500F
 ROM Microprogram Version =
 RAM Microprogram Version =
 Web Title
 Web Title = ""
 Cache Mode = All OFF
 Host Connection Mode
 Link Separation

```

--- CTLO 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
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 = 00:00:87:70:9F:F3
SCSI transfer rate
  Port A = ---
  Port B = ---

```



```

--- 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
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 = 00:00:87:70:9F:F3
SCSI transfer rate
  Port A = ---
  Port B = ---
%
```

Sets a system parameter (to suppress the mode in which to send error information to an RS232C interface) of an array unit whose name is df500a1.

```
% ausysparam -unit df500a1 -set -Rs232cOutflow off
```

Execute this command, then access from the host will stop.

Continue (y/n [n]) : y

Password : (of Resource Manager 9200 on workstation set with
command aupasswd)

System Parameter settings finished normally.

You need reboot the array unit to avail settings.

%

Sets a system parameter (to set the buzzer in the sounding mode) of an array unit, whose name is df400a1 and which supports restarting.

```
%ausysparam -unit df400a1 -set -Buzzer on
```

Execute this command, then access from the host will stop.

Continue (y/n [n]) : y

Password : (of Resource Manager 9200 on workstation set with
command aupasswd)

System Parameter settings finished normally.

You need reboot the array unit to avail settings.

Array unit stops accepting input and output while rebooting.

And if you already logged in, login status is canceled when the reboot starts.

Do you reboot the array unit now (y/n [n]) : y

Now reboot the array unit. Start Time HH : MM

Reboot has been completed.

%

Note: When setting all system parameters with Windows, you cannot set them on a prompt screen because of a limitation on the number of characters. Create the command sequence in a batch file , then execute then run the batch file.

3.7.2 Referencing/Setting RTC

- Command name

`aurtc`

- Synopsis

`aurtc -unit unit_name -refer`

`aurtc -unit unit_name -set -auto [-f]`

`aurtc -unit unit_name -set -manual -date yyyy/mm/dd -time HH:MM:SS [-f]`

- Description

References and sets RTC.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit for which to reference and set RTC. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
<code>-refer</code>	References RTC.
<code>-set</code>	Sets RTC.
<code>-auto</code>	Sets RTC by the date and time of the machine on which Resource Manager 9200 is running.
<code>-manual</code>	Sets to RTC the date and time specified by <code>-date</code> and <code>-time</code> options, respectively.
<code>-date yyyy/mm/dd</code>	Specifies the date to set. yyyy : in A.D. (1900 to 2089) mm : month (01 to 12) dd : day (01 to 31)
<code>-time HH:MM:SS</code>	Specifies the time to set. HH : hour (00 to 23) MM : minute (00 to 59) SS : second (00 to 59)

- Examples of using commands:

References RTC of an array unit whose name is df500a1.

```
% aurtc -unit df500a1 -refer
Password : (of Resource Manager 9200 on workstation set with
           command aupasswd)
Date 1999/1/9   Time 18:14:28
%
```

Automatically sets RTC of an array unit whose name is df500a1.

```
% aurtc -unit df500a1 -set -auto
Execute this command, then access from the host will stop.
Continue (y/n [n]) : y
Password : (of Resource Manager 9200 on workstation set with
           command aupasswd)
RTC settings finished normally.
You need reboot the array unit to avail settings.
%
```

Sets RTC of an array unit, whose name is df500a1, by specifying the date and time.

```
% aurtc -unit df500a1 -set -manual -date 2000/01/01 -time 12:34:56
Execute this command, then access from the host will stop.
Continue (y/n [n]) : y
Password : (of Resource Manager 9200 on workstation set with
           command aupasswd)
RTC settings finished normally.
You need reboot the array unit to avail settings.
%
```

By specifying the date and time, sets RTC of an array unit, whose name is df400a1 and which supports restarting.

```
% aurtc -unit df400a1 -set -manual -date 2000/01/01 -time 12:34:56
Execute this command, then access from the host will stop.
Continue (y/n [n]) : y
Password : (of Resource Manager 9200 on workstation set with
           command aupasswd)
RTC settings finished normally.
You need reboot the array unit to avail settings.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]) : y
Now reboot the array unit. Start Time HH : MM
Reboot has been completed.
%
```

3.7.3 Referencing/Setting Target Information

- Command name

autarget

- Synopsis

- For 5800 and 9200:

```
autarget -unit unit_name -refer
```

- For the 5800 (SCSI version):

```
autarget -unit unit_name -set | -rm -mode SM
        -ctl0 | -ctl1 -port A | B | C | D -tid n [ -fd on | off ]
```

```
autarget -unit unit_name -set | -rm -mode MS
        -ctl0 | -ctl1 -port A | B | C | D -tid n -lu lun
        [ -fd on | off ]
```

```
autarget -unit unit_name -set | -rm -mode MS
        -ctl0 | -ctl1 -port A | B | C | D -tid num -hlu lun -lu lun
        [ -fd on | off ]
```

- For the 5800 (Fibre Channel version), 9200 (Fibre Channel version):

```
autarget -unit unit_name -set | -rm -mode MM
        -ctl0 | -ctl1 -port A | B -hlu lun -lu lun [ -fd on | off ]
```

- For the 9200 (SCSI version):

```
autarget -unit unit_name -set | -rm -mode SM
        -ctl0 | -ctl1 -port A -tid n [ -fd on | off ]
```

```
autarget -unit unit_name -set | -rm -mode MS
        -ctl0 | -ctl1 -port A -tid n -lu lun [ -fd on | off ]
```

```
autarget -unit unit_name -set | -rm -mode MM
        -ctl0 | -ctl1 -port A -tid n -hlu lun -lu lun [ -fd on | off ]
```

- For the 5800 and 9200:

```
autarget -unit unit_name -file filename [ -fd on | off ]
```

- Description

References and sets target ID information.

■ Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set target ID information. Specifies with one-byte coded alphanumerics and special symbols "-" (minus)" and "_" (underline)" of up to 16 characters long.
-refer	References target ID information.
-set	Adds target ID information.
-rm	Deletes target ID information.
-mode SM MS MM	Specifies individual types of a target ID and a LUN configuration. SM: Single target ID and multi-LUN (Sets the target ID for a port, and the host uses an LUN shared by the port for the same LUN.) MS: Multi-target ID and single LUN (Sets the port and target ID for an LUN, and the host uses with a set target ID as LUN="0".) MM: LU mapping (Sets the port, target ID, and H-LUN for an LUN by mapping, and the host uses with a set configuration)
-ctl0 -ctl1	Specifies the controller No.
-port A B C D -port A B	Specifies the port No.
-tid n	Specifies the target ID for the SCSI version. Cannot specify it for the fibre version.
-hlu n	Specifies the LUN recognized from the host.
-lu n	Specifies the internal LUN in the array unit.
-file filename	Specifies the target ID configuration file. If this option is specified, reads a target ID configuration file, and sets according to its contents.
-fd on off	Specifies whether or not to make a backup copy of the FD. Target ID information has been saved in the backup FD in the array unit as system parameter information. When changing settings, target ID information needs to be saved again, so be sure to specify "on".

- Examples of using commands:

Displays target ID information in an array unit (SCSI version) whose name is df400a1.

[S-TID, M-LUN]

```
% autarget -unit df400a1 -refer
```

Password : (of Resource Manager 9200 on workstation set with
command aupasswd)

Current target ID mode : S-TID, M-LUN

CTL	PORT	T-ID	H-LUN	LUN
0	A	0	--	--
0	B	1	--	--
1	A	2	--	--
1	B	3	--	--

Reserved target ID mode : S-TID, M-LUN

CTL	PORT	T-ID	H-LUN	LUN
0	A	0	--	--
0	B	0	--	--
1	A	0	--	--
1	B	0	--	--

%

Displays target ID information in an array unit (SCSI version) whose name is df400b1.

[M-TID, S-LUN]

```
% autarget -unit df400b1 -refer
```

Password : (of Resource Manager 9200 on workstation set with
command aupasswd)

Current target ID mode : M-TID, S-LUN

CTL	PORT	T-ID	H-LUN	LUN
0	A	0	--	0
0	A	1	--	0
0	B	2	--	1
0	B	3	--	1
1	A	0	--	2
1	A	1	--	2
1	B	2	--	3
1	B	3	--	3

Reserved target ID mode : M-TID, S-LUN

CTL	PORT	T-ID	H-LUN	LUN
0	A	0	--	0
0	A	2	--	0
0	B	4	--	1
0	B	6	--	1
1	A	1	--	2
1	A	3	--	2
1	B	5	--	3
1	B	7	--	3

%

Displays target ID information in an array unit (SCSI version) whose name is df400c1.

[LU mapping]

```
% autarget -unit df400c1 -refer
```

```
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
```

```
Current target ID mode : M-TID, M-LUN
```

CTL	PORT	T-ID	H-LUN	LUN
0	A	0	0	0
0	B	1	2	4
1	A	2	0	1
1	B	3	2	5

```
Reserved target ID mode : M-TID, M-LUN
```

CTL	PORT	T-ID	H-LUN	LUN
0	A	0	1	2
0	B	1	3	6
1	A	2	1	3
1	B	3	3	7

%

Displays target ID information in an array unit (Fibre version) whose name is df500a1.

[LU mapping]

```
% autarget -unit df500a1 -refer
```

```
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
```

```
Current target ID mode : M-TID, M-LUN
```

CTL	PORT	T-ID	H-LUN	LUN
0	A	--	0	0
0	B	--	2	4
1	A	--	0	1
1	B	--	2	5

```
Reserved target ID mode : M-TID, M-LUN
```

CTL	PORT	T-ID	H-LUN	LUN
0	A	--	1	2
0	B	--	3	6
1	A	--	1	3
1	B	--	3	7

%

Sets target ID information in an array unit (SCSI version) whose name is df400a1. Sets the target ID of Controller 0, Port A to 0 with a single target ID and multi-LUN configuration.

```
% autarget -unit df400a1 -set -mode SM -ctl0 -port A -tid 0 -fd on
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
Target ID settings finished normally.
You need reboot the array unit to avail settings.
%
```

Sets target ID information in an array unit (SCSI version), whose name is df400a2 and which supports remote restarting. Sets the target ID of Controller 0, Port A to 0 with a single target ID and multi-LUN configuration.

```
% autarget -unit df400a2 -set -mode SM -ctl0 -port A -tid 0 -fd on
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
Target ID settings finished normally.
You need reboot the array unit to avail settings.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot.
Do you reboot the array unit now (y/n [n]) : y
Now reboot the array unit. Start Time HH : MM
Reboot has been completed.
%
```

The format of the target ID configuration file when setting by file input is shown in the figure below.

Enter the **Target ID** by specifying “Yes” or “No”. Input necessary data 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 LU mapping 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 Single target ID and multi-LUN mode

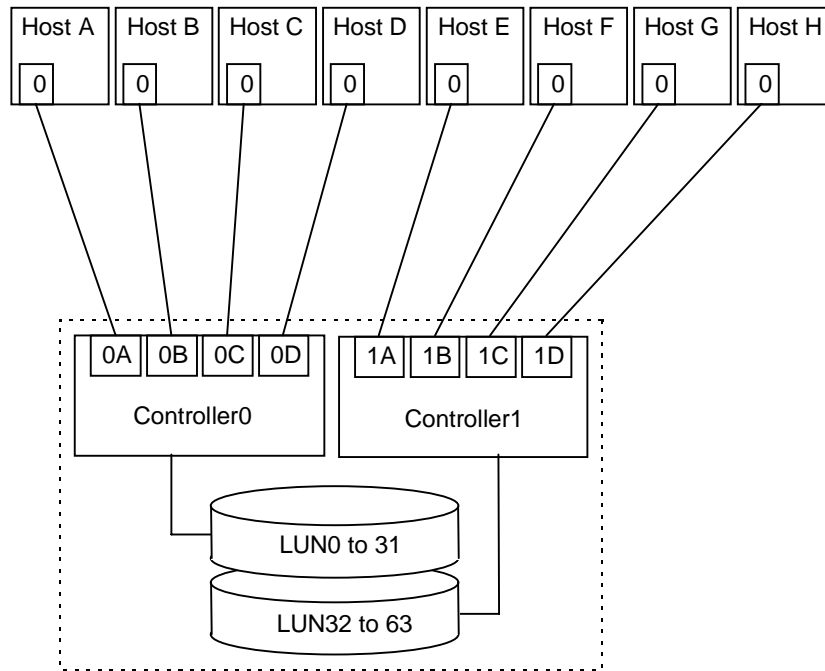
```
Information file for Target ID configuration
S-TID, M-LUN : YES
M-TID, S-LUN : NO
M-TID, M-LUN : NO

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

Note: When the Resource Manager 9200 is connected to array unit with the Fibre Channel connection, set ‘--’ for the **T-ID**.

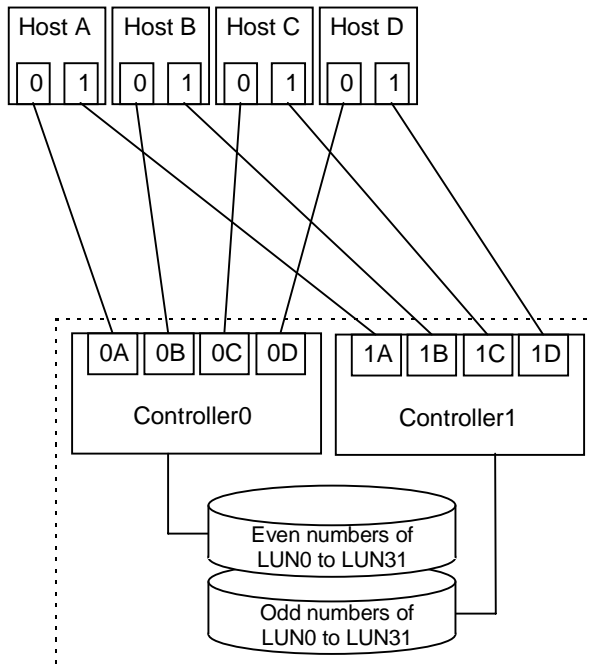
Two types of the sample files when setting by file input are provided. The sample file configuration is shown below.

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

3.7.4 Referencing/Setting LAN Information

- Command name

aulan

- Synopsis

- For 5800 and 9200:

```
aulan -unit unit_name -refer
```

- For 5800:

```
aulan -unit unit_name -set -ctl0 | -ctl1  
      [ -addr inet_addr ] [ -mask netmask ] [ -gate gateway ]  
      [ -link enable | disable ] [ -dhcp enable | disable ]  
      [ -fd on | off ]
```

- For 9200:

```
aulan -unit unit_name -set -ctl0 | -ctl1  
      [ -addr inet_addr ] [ -mask netmask ] [ -gate gateway ]  
      [ -dhcp enable | disable ] [ -fd on | off ]
```

- Description

Displays and sets LAN information of the array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set LAN information. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-refer	References LAN information.
-set	Sets LAN information.
-ctl0 -ctl1	Specifies the controller.
-addr inet_addr	Specifies individual IP addresses.
-mask netmask	Specifies individual subnet masks.

(Continued)

Options	Description
-gate gateway	Specifies individual default gateways.
-link enable disable	Specifies whether LAN connection is valid or invalid.
-dhcp enable disable	Specifies whether the DHCP mode is set enable or disable.
-fd on off	Specifies whether or not to make a backup copy of the FD. LAN information has been saved in the backup FD in the array unit as system parameter information. When changing settings, LAN information needs to be saved again, so be sure to specify "on".

■ Examples of using commands:

References LAN information of an array unit whose name is df500a1.

```
% aulan -unit df500a1 -refer
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
CTL   IP address      Net mask      Gateway      Ethernet address  Conn  DHCP
  0   125.0.9.98      255.255.255.0  125.0.9.15   00:00:87:50:78:AF enable  NO
  1   125.0.9.99      255.255.255.0  125.0.9.15   00:00:87:50:78:9F enable  NO
%
```

References LAN information of an array unit (DF350) whose name is df350a1.

```
% aulan -unit df350a1 -refer
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
CTL   IP address      Net mask      Gateway      Ethernet address
  0   125.0.9.98      255.255.255.0  125.0.9.15   00:00:87:50:78:AF
  1   125.0.9.99      255.255.255.0  125.0.9.15   00:00:87:50:78:9F
%
```

Sets LAN information for the Controller 0 side of an array unit (DF350) whose name is df350b1.

```
% aulan -unit df350b1 -set -ctl0
-addr 192.168.100.100 -mask 255.255.255.0 -gate 192.168.100.3
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
%
```

Sets LAN information for the Controller 0 side of an array unit whose name is df500a1.

```
% aulan -unit df500a1 -set -ctl0
-addr 192.168.100.100 -mask 255.255.255.0 -gate 192.168.100.5
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
LAN information settings finished normally.
You need reboot the array unit to avail settings.
%
```

Sets LAN information for the Controller 0 side of an array unit whose name is df400a1 and which supports remote restarting.

```
% aulan -unit df400a1 -set -ctl0
-addr 192.168.100.100 -mask 255.255.255.0 -gate 192.168.100.5
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
LAN information settings finished normally.
You need reboot the array unit to avail settings.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]) : y
Now reboot the array unit. Start Time HH : MM
Reboot has been completed.
%
```

3.7.5 Referencing/Setting SCSI Transfer Rate

- Command name

`ausync`

- Synopsis

- For 5800 and 9200:

`ausync -unit unit_name -refer`

- For 5800:

`ausync -unit unit_name -set -ctl0 | -ctl1 -port A | B | C | D
-sync standard | async | N5 | N10 | N13 | N20 | N33 | N40 | W10 |
W20 | W26 | W40 | W66 | W80
[-fd on | off]`

- For 9200:

`ausync -unit unit_name -set -ctl0 | -ctl1 -port A
-sync standard | async | N5 | N10 | N20 | N40 |
W10 | W20 | W40 | W80
[-fd on|off]`

- Description

Displays and sets the SCSI transfer rate of each port. When setting, one entry of the command can set the transfer rate only for one port.

■ Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set the SCSI transfer rate. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-refer	References SCSI transfer rate information.
-set	Sets SCSI transfer rate information.
-ctl0 -ctl1	Specifies the controller for which to set information.
-port A B C D	Specifies the port for which to set information.
-sync standard async N5 N10 N13 N20 N33 N40 W10 W20 W26 W40 W66 W80	Specifies the transfer rate of a port. When connecting the DF500, do not specify N13, W26, N33, and W66, because they are all not supported. standard: Sets the transfer rate so as to match that of a mounted interface board. async: Transfers in a mode in which synchronous transfer is not used. N5, W10: Maximum transfer rate: Narrow 5 [MB/s], Wide 10 [MB/s] N10, W20: Maximum transfer rate: Narrow 10 [MB/s], Wide 20 [MB/s] N13, W26: Maximum transfer rate: Narrow 13 [MB/s], Wide 26 [MB/s] N20, W40: Maximum transfer rate: Narrow 20 [MB/s], Wide 40 [MB/s] N33, W66: Maximum transfer rate: Narrow 33 [MB/s], Wide 66 [MB/s] N40, W80: Maximum transfer rate: Narrow 40 [MB/s], Wide 80 [MB/s]
-fd on off	Specifies whether or not to make a backup copy of the FD. SCSI transfer rate information has been saved in the backup FD in the array unit as system parameter information. When changing settings, SCSI transfer rate information needs to be saved again, so be sure to specify "on".

- Examples of using commands:

References the SCSI transfer rate information of an array unit whose name is df400a1.

```
% ausync -unit df400a1 -refer
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

CTL   Port   I/F board type   Velocity
  0    A    no set        standard
  0    B    no set        standard
  0    C    no set        standard
  0    D    differential  async
  1    A    no set        standard
  1    B    differential  5 (10) MB
  1    C    no set        standard
  1    D    no set        standard

%
```

Sets SCSI transfer rate information for port A on Controller 0 side of an array unit whose name is df400a1.

```
% ausync -unit df400a1 -set -ctl0 -port A -sync standard -fd on
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

SYNC CONTROL settings finished normally.
You need reboot the array unit to avail settings.

%
```

Sets SCSI transfer rate information for port A on Controller 0 side of an array unit, whose name is df400a2 and which supports remote restarting.

```
% ausync -unit df400a2 -set -ctl0 -port A -sync standard -fd on
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

SYNC CONTROL settings finished normally.
You need reboot the array unit to avail settings.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]) : y
Now reboot the array unit. Start Time HH : MM
Reboot has been completed.

%
```

3.8 File Output of Configuration and Configuration Setting by File

This section explains how to save the configuration information of the array unit in a text file, or to set its configuration using a text file. The configuration information saved in the text file is the status of the system parameters, and those of the constituent parts of the RAID/LU and 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 saving a text file of the configuration from an array unit, and then by using the saved text file to set another array unit.

Editing a text file to set an array unit can be carried out, but it is suggested that this function be used only for the configuration of the same array unit. To change the configuration, carry it out by the individual functions.

3.8.1 File Output of the Configuration: System Parameters

- Command name

ausyspout

- Synopsis

ausyspout -unit unit_name -file file_name

- Description

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

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose system parameters are to be output into the file. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-file file_name	Specifies the name the file (path) to output the system parameters.

- Examples of using commands:

Output the setting information of the system parameters of the array unit with the name: df500a1 in a file with the name : sysprm.txt in the directory where the Resource Manager 9200 is installed.

```
% ausysypout -unit df500a1 -file sysprm.txt
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
%
```

The format of the output file consists of the following items. The outline of the layout of the output file is shown in Figure 3.7.

- File header
- Registration name with the Resource Manager 9200 of the array unit
- Output time (Time of the machine where the Resource Manager 9200 is installed)
- Microprogram revision
- Array unit type
- Common controller parameters
- Controller 0 parameters
- Controller 1 parameters
- Direction for FD backup

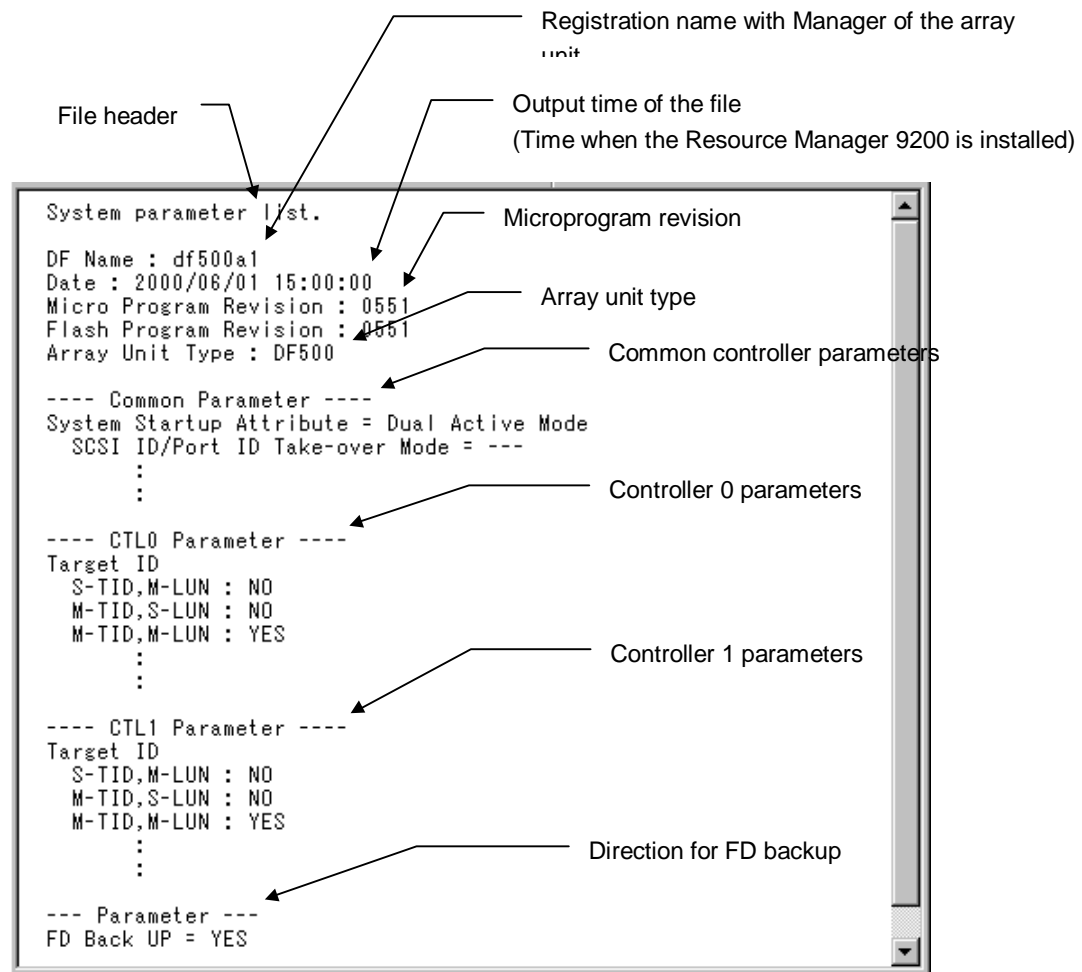


Figure 3.7 Outline of the Format of the System Parameter Output File

- Common Controller Parameters

The common system parameters of the array unit are output. An output example of the system parameters of 9200 is shown in Figure 3.8.

```

---- 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 3.8 System Parameters: Output Example of Common Parameters

The common parameters are the items shown in Table 3.1.

Table 3.1 List of Common Parameters

No.	Parameter	Option
1	System Startup Attribute Single Mode Dual Active Mode Hot Standby Mode SCSI ID/Port ID Take-over Mode Used Not Used Default Controller Data Share Mode	-SystemStartup Single DualIDTake DualNotIDTake HotIDTake HotNotIDTake -TakingID -DataShare
2	Spare Disk One spare disk is valid Two spare disk is valid Spare disk not mounted	-SpareDisk one two not
3	Host Connection Mode 1 Standard Mode Open VMS Mode TRESSPASS Mode Wolfpack Mode IBM7135 I/O path switch emulation Mode NCR I/O path switch emulation Mode	-HostConnenction standard OpenVMS TRESSPASS WolfPack IBM7135 NCR
4	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	-VxVM -OdeMappar -HPUX -ReportInquiry -UASuppress -HISUP -CCHS
5	Serial Number	-SerialNumber
6	Drive Capacity (ROW LAST LBA)	-DriveCapacity

Table 3.1 List of Common Parameters (Continued)

No.	Parameter	Option
7	Option 1 VxVM DMP mode enable CLAM mode enable SUN Solaris2.5.1 mode enable Drive Detach mode enable MP5400 mode enable ODE Mapper mode enable HP Connection mode enable	-VxVM -CLAM -Solaris -DriveDetach -MP5400 -OdeMapper -HPUX
8	Option 2 Multi path (Controller) Report inquiry page 83H PROCOM mode enable Report status (normal/warning) Multi path (Array Unit) Turbo LU Warning UA (06/2A00) suppress mode enable SGI mode enable Port-ID Taking-over enable	-MultipathController -ReportInquiry -PROCOM -ResetStatus -MultipathArrayUnit -LuCacheWarning -UASuppress -SGI -PortIdTaking
9	Data Striping Size	-DataStriping
10	Buzzer	-Buzzer
11	LU size Report to the Host	-LuSizeReport
12	SCSI Reset/LIP Mode for all Ports	-ScsiResetLip
13	Operation if the Processor failures Occurs	-ProcessorFailures
14	INQUIRY Information Command Queuing ANSI Version Vendor ID Product ID ROM Microprogram Version RAM Microprogram Version	-inquiryCommandQueue -inquiryAnsiVersion -inquiryVendor -inquiryProduct -inquiryRomMicro -inquiryRammicro
15	Cache Mode All OFF Random mode Sequential mode Random & Sequential mode	-CacheMode off random sequential randseq
16	Web Title	-WebTitle

Table 3.1 List of Common Parameters (Continued)

No.	Parameter	Option
17	Host Connection Mode Link Separation	-LinkSeparation

Depending on the array unit in connection, there are items that do not need to be set, and these items will not be saved 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.

- Controller 0 Parameters

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

```

---- 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
0B      --        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
ROM Pseudo-response command processing = ---
Save Data pointer response
  Port A = ---
  Port B = ---
Controller Identifier = Disable
RS232C Error Information Outflow Mode = ON (NORMAL)
Write & Verify Execution Mode = ON
LAN Const
  DHCP = OFF
  IP Address = 192.168.1.100
  Subnet Mask = 255.255.255.0
  Default Gateway = 192.168.1.3
  Ether Address = 00:00:87:00:DF:01
SCSI transfer rate
  Port A = ---
  Port B = ---

```

Figure 3.9 System Parameters: Output Example of Controller 0 Parameters

The parameters of controller 0 are the items shown in Table 3.2.

Table 3.2 List of Parameters of Controller 0

No.	Parameter	Option
1	Target ID	-setSM -rmSM -setMS -rmMS -setMM -rmMM
2	Port Type	-PortType -PortTypeResetLp
3	ROM Pseudo-response command processing	-PseudoResponse
4	Save Data pointer resource	-SaveDataPointer
5	Controller Identifier	-ControllerIdentifier -ControllerID
6	RS232C Error Information Outflow Mode	-Rs232cOutflow
7	Write & Verify Execution Mode	-WriteVerifyExecution
8	LAN Const	-ConnectLAN -dhcp -IPAddress -SubnetMask -DefaultGateway
9	SCSI transfer rate	-sync

Depending on the array unit in connection, there are items that do not need to be set, and these items will not be saved 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.

- 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
1A      --      2      2
1B      --      3      3
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
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 = 192.168.1.101
  Subnet Mask = 255.255.255.0
  Default Gateway = 192.168.1.3
  Ether Address = 00:00:87:70:3F:00
SCSI transfer rate
  Port A = ---
  Port B = ---

```

Figure 3.10 System Parameters: Output Example of the Parameters of Controller 1

The parameters of controller 1 are the items shown in Table 3.3.

Table 3.3 List of Parameters of Controller 1

No.	Parameter	Option
1	Target ID	-setSM -rmSM -setMS -rmMS -setMM -rmMM
2	Port Type	-PortType -PortTypeResetLp
3	ROM Pseudo-response command processing	-PseudoResponse
4	Save Data pointer resource	-SaveDataPointer
5	Controller Identifier	-ControllerIdentifier -ControllerID
6	RS232C Error Information Outflow Mode	-Rs232cOutflow
7	Write & Verify Execution Mode	-WriteVerifyExecution
8	LAN Const	-ConnectLAN -dhcp -IPAddress -SubnetMask -DefaultGateway
9	SCSI transfer rate	-sync

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.

■ Controller 1 Parameters

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



Figure 3.11 Output Example for FD Backup Specification

3.8.2 File Output of the Configuration: the Status of RAID/LU and Constituent Parts

- Command name

`auconfigout`

- Synopsis

`auconfigout -unit unit_name -file file_name`

- Description

RAID/LU configuration information already set in an array unit is saved to a specified file in a text format.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of the array unit that outputs the RAID/LU information file. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
<code>-file file_name</code>	Specifies the name of a file (path) into which to output configuration information.

- Examples of using commands:

Outputs RAID/LU configuration information of an array unit, whose name is `df500a1`, by a file name of `config.txt` into a directory in which the Resource Manager 9200 has been installed.

```
% auconfigout -unit df500a1 -file config.txt
%
```

The format of the output file consists of the following items. The outline of the layout of the output file is shown in Figure 3.12. Figure 3.12 is the outline of the layout of the output file for the 9200.

- File header
- Registration name at the Resource Manager 9200 of the array unit
- Output time (Time of the machine where the Resource Manager 9200 is installed)
- Microprogram revision
- Array unit type
- RAID/LU configuration
- Status of constituent parts

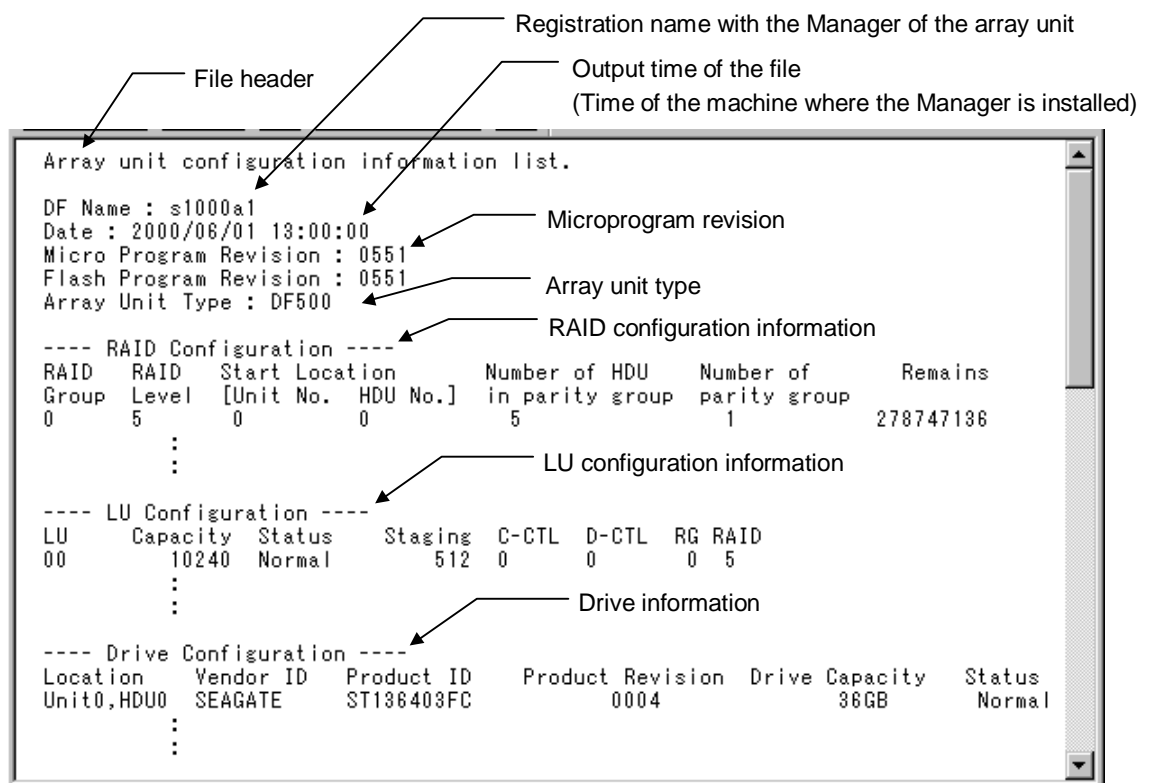


Figure 3.12 The Outline of the Format of RAID/LU Configuration Information Output File

Cache information

```

---- 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,ENC0 Normal
:
:

```

Fan information

Battery information

AC power information

Battery backup information

Loop information

Enclosure information

**Figure 3.12 The outline of the format of RAID/LU configuration information output file
(Continued)**

- 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 5800:

---- RAID Configuration ----					
RAID Group	RAID 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

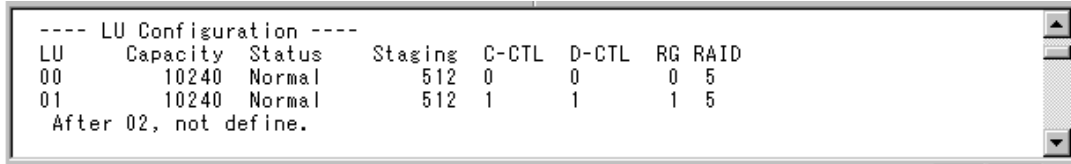
For 9200:

---- RAID Configuration ----						
RAID Group	RAID Level	Start Location [Unit No. HDU No.]		Number of HDU in parity group	Number of parity group	Remains
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 [Block] that can be defined by LU of the RAID group

- Formatting LU configuration information

The LU configuration of the array unit is listed . 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 Size:** 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

- **Format for Drive Information**

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

For the 5800:

---- 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 9200:

---- 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.

- **Format for Cache Information**

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

---- 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 [Mbyte] 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 [Mbyte] 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

- **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

- 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

- Format for DC Power (Controller) Information: for connection with 5800:

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

- Format for DC Power (Driver) Information: for connection with 5800:
The status of the DC power supply (driver) of the array unit is output.



```

---- DC Power Information(Driver) ----
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

- Format for AC Power Information : for connection with 5800 or 9200:
The status of the AC power supply of the array unit is output.

For the 5800:



```

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

For the 9200:



```

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

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

- Format for Battery Backup Status Information: for connection with 5800 or 9200:
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

- Format for Loop Information: for connection with 9200:
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

- Format for Enclosure Information: for connection with 9200:
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

3.8.3 Setting the Configuration with a File: System Parameters

- Command name

ausyspset

- Synopsis

ausyspset -unit unit_name -file file_name

- Description

To set the array unit with configuration information for the system parameters saved in the file.

If you set by use of a file that was saved under the condition in which any priced optional feature is in an unlocked state, setting may terminate abnormally. To use a file for setting, use a file that was saved under the condition in which all priced optional features are in a locked state.

Files have a standard format. The format of files is the same as that of files that are output from an array unit. For the file format and the contents of settings in files, see the following individually:. When specifying individual items of a file, insert one space character after a “=”.

- For the file format, see Subsection **3.8.1 File Output of the Configuration : System Parameters**.
- For setting items, see Subsection **3.7.1 Referencing/Setting System Parameters**, and Subsection **3.8.1 File Output of the Configuration : System Parameters**.

For setting items for backup in system parameter information, the set system parameters must be saved into the backup FD in an array unit, and hence be sure to specify “Yes”.

For connection with a dual system, setting will not be carried out if one of the controllers is detached. Confirm that the array unit is not in warning status before using it.

When executing the command, an array unit is disabled to execute commands from both the host and the Resource Manager 9200. In addition, to make the set system parameters effective, restart an array unit. Until the unit is restarted up, the previous settings remain effective.

After setting is finished, restart an array unit, make sure that the unit has started up, and then connect the unit to the host and the Resource Manager 9200. After initiating the restarting of an array unit, the unit is not ready to accept I/O requests from the host until restarting is complete.

Options

Options	Description
-unit unit_name	Specifies the name of the array unit to be set with the configuration information for the system parameters. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-file file_name	Specifies the name of the file (path) to output the configuration information.

■ Examples of using commands::

Sets the array unit with name : df400a1 according to the configuration system parameters described in the text file with name : sysprm.txt.

```
% ausyspset -unit df400a1 -file sysprm.txt
```

Execute this command, then access from the host will stop.

Continue (y/n [n]) : y

Password : (of Resource Manager 9200 on workstation set with
command aupasswd)

System parameter settings finished normally.

You need reboot the array unit to avail settings.

Array unit stops accepting input and output while rebooting.

And if you already logged in, login status is canceled when the reboot starts.

Do you reboot the array unit now (y/n [n]) : y

Now reboot the array unit. Start Time HH : MM

Reboot has been completed.

%

Sets the array unit with name: df500a1 according to the configuration system parameters described in the text file with name : sysprm.txt.

```
% ausyspset -unit df500a1 -file sysprm.txt
```

Execute this command, then access from the host will stop.

Continue (y/n [n]) : y

Password : (of Resource Manager 9200 on workstation set with
command aupasswd)

System parameter settings finished normally.

You need reboot the array unit to avail settings.

%

3.8.4 Setting the Configuration with a File: RAID/LU Definition

- Command name

`auconfigset`

- Synopsis

`auconfigset -unit unit_name -file file_name`

- Description

To set the array unit according to the RAID/LU setting information described in the file. In the case of setting RAID/LU, as the current RAID/LU will all be first deleted, all the user data before setting will be lost. If the user data is needed, please do a backup first.

Files have a standard format. The format of files is the same as that of files that are output from an array unit. For the file format, see the following:

- Subsection **3.8.2 File output of the configuration : the status of RAID/LU and constituent parts.**

Setting items in files are “RAID configuration information”, “LU configuration information”, and “drive information” in the format of output files. The output files include items about the status of configuration components, but the items are ignored at the time of setting. The contents of setting items are described below.

RAID configuration information : Sets up an RAID configuration.

Specifies the RAID level, the RAID group No., and the RAID size.

For RAID groups that are not set up, enter “-” for “Level”, and other items are not set.

LU configuration information : Sets up an LU configuration.

Specifies the LU No., the LU capacity, the amount of data pre-read, the No. of the current controller controlling an LU, the No. of the default controller controlling an LU, the RAID group No., the RAID level, and the status of an LU.

When formatting, specifies “Normal” for the LU status. If other status is specified, formatting is not executed.

If all capacity contained in an RAID group is allocated to one LU in the group, specifies “All” for “Capacity”.

Although “0” or “1” is specified for the No. of the current controller controlling an LU, the current controller No. is set to the same as the No. of the default controller controlling an LU.

Up to 64 LUs can be set up for the 5800 and the 9200. When setting up LUs less than the maximum, specify “After nn, not define” (nn : the last LU No. + 1) at the end.

Drive information : Sets up the configuration of HDUs mounted in array unit for which to set drive information.

Specifies the drive capacity. Other items are not set, but the items are listed.

Specifies “Nothing” for not-mounted HDUs.

If a capacity larger than a total capacity of mounted HDUs is specified, it is handled as an error, and an HDU configuration is not set up.

■ Options

Options	Description
-unit uniat_name	Specifies the name of the array unit to be set with the RAID/LU configuration. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_(underline)” of up to 16 characters long.
-file file_name	Specifies the name of the file (path) to output the configuration information.

■ Examples of using commands:

Sets the array unit with name : df500a1 according to the RAID/LU configuration described in the text file with name : config.txt.

```
% auconfigset -unit df500a1 -file config.txt
```

The new RAID/LU configuration will be set in array unit.

When setup process starts, current RAID/LU configuration will be deleted.

Are you sure (y/n [n]) : y

Password : (of Resource Manager 9200 on workstation set with
command aupasswd)

RAID configuration setting start.

RAID configuration setting complete.

LU configuration setting start.

LU configuration setting complete.

LUX format start

LUY format start

LUX format end : Normally terminated

LUZ format start

LUX format end : CHECK CONDITION : xx-xxxx

:

:

%

3.9 Microprogram Replacement

3.9.1 Downloading/Replacing Microprogram

- Command name

aumicro

- Synopsis

– For 5800 and 9200:

```
aumicro -unit unit_name -read -path disk01 disk02 disk03 ...
```

```
aumicro -revision
```

```
aumicro -clean
```

– For 5800 and 9200:

```
aumicro -unit unit_name -upload -time time -check on | off
```

```
aumicro -unit unit_name -change -ct10 | -ct11
```

- Description

Downloads a microprogram into the array unit. In addition, replaces the current microprogram with a downloaded microprogram.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose microprogram to download and replace. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_(underline)” of up to 16 characters long.
-read	Reads a microprogram onto the Resource Manager 9200.
-path disk01 disk02 disk03 ...	Specifies sequentially the path names to individual directories in which each FD file of a microprogram to be downloaded is stored.
-upload	Downloads a microprogram into an array unit.
-time time	Specifies the time interval (1 to 60 seconds) at which to download a microprogram. When downloading into the 5700E, specification of the interval time is ignored. See Note.
-check on off	Specifies whether or not to check the revision of a microprogram.

(Continued)

Options	Description
-change	Replaces a microprogram.
-ctl0 -ctl1	Specifies the controller whose microprogram to replace.
-revision	Displays the revision of a microprogram with which to replace.
-clean	Deletes the microprogram read in.

Note: the time interval can be specified from 0 second, however, values over 3 seconds are recommended if execution is carried out while ON.

■ Examples of using commands:

Downloads a microprogram into an array unit whose name is df500a1, and afterward performs microprogram replacement.

Checks the revision of a microprogram of an array unit, whose name is df500a1, when downloading it.

```
% aurev -unit df500a1
micro revision : 0500
%
```

First reads in a microprogram to be downloaded. The microprogram is provided in multiple number of floppy disks, the contents in every floppy disk have operation examples, in the case that they are stored under each of the directories disk01, disk02, disk03, disk04, disk05.

```
% aumicro -unit df500a1 -read -path disk01 disk02 disk03 disk04 disk05
%
```

Checks the revision of the microprogram read in.

```
% aumicro -revision
Version : 0503 [0503 is the current version]
%
```

Downloads the read-in microprogram into an array unit whose name is df500a1. Sets the time interval to 3 seconds, and specifies checking of the microprogram revision. While downloading, the number of files already downloaded: mmm and the total number of files to be downloaded: nnn are shown.

```
% aumicro -unit df500a1 -upload -time 3 -check on
Password : (of Resource Manager 9200 on workstation set with
command aupasswd)

df500a1 : mmm/nnn done.
%
```

Replaces the current microprogram with the downloaded microprogram. Replaces the microprogram on the controller 0 side and controller 1 side, in that order.

```
% aumicro -unit df500a1 -change -ctl0
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

%
% aumicro -unit df500a1 -change -ctl1
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)

%
```

Because micro-program downloading and replacing were completed, the microprogram read in Resource Manager is removed.

```
% aumicro -clean
%
```

3.10 SNMP Environment Information

3.10.1 Setting SNMP Environment Information and Outputting Its File

- Command name

ausnmp

- Synopsis

```
ausnmp -unit unit_name -get [ -config config.txt ] [ -name name.txt ]
```

```
ausnmp -unit unit_name -set [ -config config.txt ] [ -name name.txt ]
```

- Description

Reads and sets up the SNMP environment file.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to read and set up an SNMP environment file. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-get	Reads SNMP environment information and outputs it into a specified file.
-set	Sets up the contents of a specified SNMP environment information file in the array unit.
-config config.txt	Specifies the file name of SNMP config information.
-name name.txt	Specifies the file name of SNMP name information.

- Examples of using commands:

Acquires config.txt information and name.txt information from an array unit whose name is df500a1.

```
% ausnmp -unit df500a1 -refer -config config.txt -name name.txt
%
```

Sets config.txt and name.txt information individually for an array unit, whose name is df400a1 and that does not support the restart.

```
% ausnmp -unit df400a1 -set -config config.txt -name name.txt
Execute this command, then access from the host will stop.
Continue (y/n [n]) : y
Password :
SNMP Configuration settings finished normally.
You need reboot the array unit to avail settings.
%
```

Sets up config.txt information and name.txt information in an array unit whose name is df500a1.

```
% ausnmp -unit df500a1 -set -config config.txt -name name.txt
Execute this command, then access from the host will stop.
Continue (y/n [n]) : y
Password : (of Resource Manager 9200 on workstation set with
            command aupasswd)
SNMP Configuration settings finished normally.
You need reboot the array unit to avail settings.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]) : y
Now reboot the array unit. Start Time HH : MM
Reboot has been completed.
%
```


3.11 Displaying Statistical Information

3.11.1 Displaying Statistical Information

- Command name

`austatistics`

- Synopsis

`austatistics -unit unit_name -memory | -drive`

- Description

Displays statistical information that has been accumulated in the array unit. Items to be displayed are as follows:

- Controller use condition
- Number of host commands received
- Command execution condition
- Cache load condition

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit for which to display statistical information. Specifies with one-byte coded alphanumerics and special symbols “- (minus)” and “_ (underline)” of up to 16 characters long.
<code>-memory -drive</code>	Specifies the location of the statistical information to be displayed. -memory: The statistical information (the current information) in the current memory is displayed. -drive: The statistical information stored in the system drive (the information at the time of activation of the array unit) is displayed.

- Examples of using commands:

Displays statistical information of an array unit whose name is df500a1.

```
% austatistics -unit df500a1 -memory
```

Controller Use Condition

Controller acting time (integrated) : 4676

Controller acting time (work) : 256969390

CTL 0 CTL 1

Power on time : 22 22

Host SCSI reset time : 4676 4676

Number of Host Commands

CTL	LU	READ	WRITE
0	0	2677	3261
0	1	2752	2835
0	2	2506	2860
0	3	2614	2829
0	4	0	0
:	:	:	:
0	61	0	0
0	62	0	0
0	63	0	0
1	0	0	0
1	1	0	0
1	2	0	0
1	3	0	0
1	4	0	0
:	:	:	:
1	61	0	0
1	62	0	0
1	63	0	0

Command Execution Condition

		Read	Write	Sequential	Sequential	Prefetch	Write through	Reassign
CTL	LU	Cache Hits	Cache Hits	Reads	Writes	Stagings	Operation	Blocks
0	0	1067	2904	384	424	31229	0	0
0	1	969	2651	387	386	30291	0	0
0	2	937	2664	374	371	26475	0	0
0	3	846	2629	360	368	24916	0	0
0	4	0	0	0	0	0	0	0
:	:	:	:	:	:	:	:	:

Cache Load Condition

CTL 0 CTL 1

Number of inflow threshold reached : 0 0

%

3.12 Obtaining Performance Information

3.12.1 Outputting Performance Information File

- Command name

`auperform`

- Synopsis

```
auperform -unit unit_name -manual
```

```
auperform -unit unit_name -auto time [ -count nn ]
```

- Description

Acquires the command operational condition of each LU in an array unit, and outputs their respective information in a text-file format into the current directory.

Items to be acquired are the following six ones.

- Number of Read commands received
- Number of the cache-hitting ones of Read commands received
- Rate of the number of the cache-hitting ones to the number of Read commands received
- Number of Write commands received
- Number of the cache-hitting ones of Write commands received
- Rate of the number of the cache-hitting ones to the number of Write commands received

The output file names are as follows:

For acquiring manually: “pfms???.txt” for a single configuration, and “pfmd???.txt” for a dual configuration (“??” is a number from 00 to 99.)

For acquiring automatically: “pfmsing.txt” for a single configuration, and “pfmdual.txt” for a dual configuration

■ Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to acquire performance information. Specifies with one-byte coded alphanumerics and special symbols "-" (minus) and "_" (underline) of up to 16 characters long.
-manual	Acquires performance information manually.
-auto time	Automatically acquires performance information at an interval of time (1 to 1439 minutes) specified for this option.
-count nn	If automatic acquisition is specified, specifies the number of times acquisition is repeated (1 to 99).

■ Examples of using commands:

Acquires the performance information of an array unit, whose name is df500a1, only once at an interval of 10 minutes.

```
% auperform -unit df500a1 -auto 10
%
```

3.13 Monitoring Errors

3.13.1 Setting Up E-Mail Reports

- Command name

aumail

- Synopsis

aumail -refer

aumail -set [-domain domain_name] [-srv mail_server_addr]
[-from from_addr] [-add to_addr] [-rm to_addr]

aumail -test

- Description

Sets E-Mail information that is transmitted when an error is detected while monitoring errors.

- Options

Options	Description
-refer	Displays the E-Mail information set currently.
-set	Sets E-Mail information.
-domain domain_name	Specifies the domain name. Specify it in 39 or less alphanumeric characters or a code.
-srv mail_server_addr	Specifies the IP address or host name of a mail server. Specify the host name in 99 or less alphanumeric characters.
-from from_addr	Specifies the mail address of an E-Mail sender. Specify it in 99 or less alphanumeric characters or a code.
-add to_addr	Adds the mail address of an E-Mail receiver. Specify it in 99 or less alphanumeric characters or a code. Up to 20 addresses can be set as receivers.
-rm to_addr	Deletes the mail address of an E-Mail receiver.
-test	Performs a test of originating an E-Mail.

- Examples of using commands:

Displays the contents of an E-Mail information setup.

```
% aumail -refer
Domain name  : abc.hitachi.co.jp
Mail server  : server1.abc.hitachi.co.jp
From address : sender1@str.hitachi.co.jp
To address   : receiver1@abc.hitachi.co.jp
%
```

Sets E-Mail information

```
% aumail -set -domain abc.hitachi.co.jp -srv server1.abc.hitachi.co.jp
-from sender2@abc.hitachi.co.jp -add receiver2@abc.hitachi.co.jp
%
```

Adds a receiver address.

```
% aumail -set -add receiver3@abc.hitachi.co.jp
%
```

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 entry in the subject line, so the failed part is appended to the subject as a matter of format. The subject format is shown below. Table 3.4 shows a list of subjects.

Resource Manager/Obstruction (failed part)

Table 3.4 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 occurred.
7	Cache Memory	A cache failure occurred.
8	Cache Backup Circuit	A backup circuit failure occurred.
9	ENC	An enclosure error occurred.
10	loop	A loop error occurred.
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

The E-mail reports a failed section with a message text. The format of the message text is shown below. A list of message texts is shown in Table 3.5.

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 3.5 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	A drive blockade occurred. (The blocked drive is indicated with a set of a Port No. and a Row No.)
2	ARRAY DC Power Supply Failure	A DC power supply failure occurred.
3	ARRAY Battery Alarm	A battery voltage error occurred.
4	ARRAY Fan Alarm	A fan failure occurred.
5	ARRAY CONTROLLER Detached	A controller blockade occurred. (This occurs only in the dual controller configuration.)
6	ARRAY AC Power Supply Failure	An AC power supply error occurs.
7	ARRAY Cache Memory Alarm	A cache failure occurred.
8	ARRAY Cache Backup Circuit Alarm	A backup circuit failure occurred.
9	ARRAY ENC Alarm	An enclosure error occurred.
10	ARRAY Loop Alarm	A loop error occurred.
11	ARRAY Warning	The array unit entered the warning state.
12	ARRAY Resource 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.

3.13.2 Setting the Starting of Application

- Command name

auextprog

- Synopsis

auextprog -refer

auextprog -set command

auextprog -test

- Description

Sets up an external program that is started when an error is detected while monitoring errors.

- Options

Options	Description
-refer	Displays (references) the external program set up.
-set command	Sets up an external program that is started when an error is detected while monitoring errors.
-test	Starts an external program specified by the -set option.

- Examples of using commands:

Sets up the application “go” to be started.

```
% auextprog -set go
%
```

Displays an application setup to be started.

```
% auextprog -refer
Program name          : go
%
```

3.13.3 Monitoring Errors

- Command name

auerroralert

- Synopsis

auerroralert [-time uptime] [-mail] [-prog every | once]

- Description

Monitors an array unit subject to monitoring (an array unit registered with auunitadd by specifying the **-watch** option) for errors. While monitoring errors, the word “Execution” indicating that monitoring is in execution, and information on failures that are detected by the error monitor are displayed. The contents of failure information displayed are the same as those of messages output to a log file. The word “Execution” indicating that monitoring is in execution is displayed repeatedly on a line, and the time for which monitoring is in execution is updated and displayed.

Terminates forcibly to stop monitoring for errors (for example, press “ctl” + “c”).

- Options

Options	Description
-time uptime	Specifies the time interval at which to monitor errors. Specifies a value from 1 to 720 (minutes). If omitted, monitors only once.
-mail	Originates an E-Mail when an error is detected.
-prog every once	Starts an external program when an error is detected. every: After error monitoring is started, a specified application is started when an error is detected. If the same error is detected while monitoring errors, the application is no longer started from the second detection onward. once: After error monitoring is started, a specified application is started when an error is detected for the first time. If errors are detected continuously, the application is not started. After a specified application is started, in order to start the application again when an error is detected, terminate and then restart error monitoring.

- Examples of using commands:

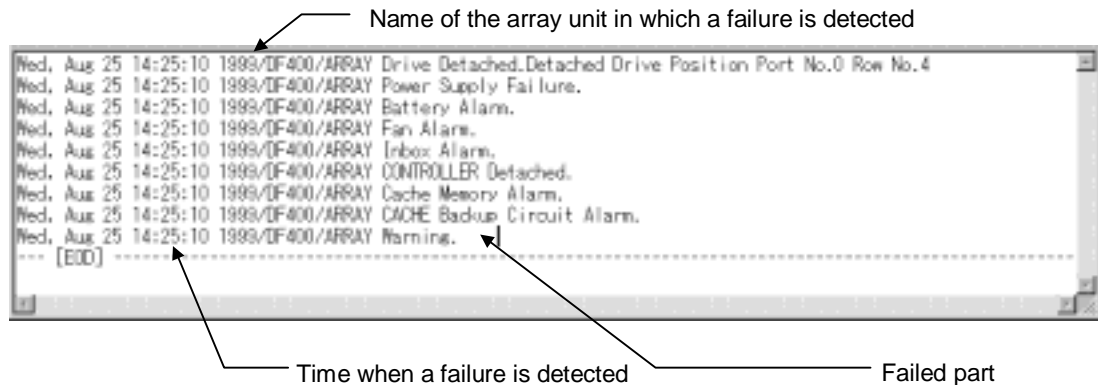
Monitors errors at an interval of 10 minutes. During error monitoring, a battery failure is detected in an array unit whose name is df400a1.

```
% auerroralert -time 10
Mon, May 01 10:10:00 2000 Executing
Mon, May 01 10:30:00 2000/df400a1/ARRAY Battery Alarm
Mon, May 01 10:40:00 2000 Executing
```

When a failure is detected in the array unit in the case where the error monitoring is executed, the function outputs the failure information to a log file.

The log file is saved , with a file name: errlog.txt and in a text file format, onto a path set up by the CMDF_PATH environmental variable. The file format is shown in the following figure.

```
Error monitoring start                                Error monitoring suspension
Normal      →      Fan failure      →      Drive failure (Row 2 and Port 1)      → ①
Error monitoring start                                Error monitoring suspension      Error monitoring start
① → Normal                                          → Battery failure → Normal
```



The log file size is allowed to grow up to 223 kbyte or up to 2,000 events. When the log information exceeds the limit, the log information is overwritten from the top of the file and the line .

“--- end ---” is put at the end of log information. Search for “--- end ---” to determine the latest information.

Note: The failure detection time is a time of the clock on a personal computer or SUN server/workstation in which the Resource Manager 9200 has been installed.

The log information 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 3.6.

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 3.6 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. Detached Drive Position Port No.X Row No.Y	A drive blockade occurred. (The blocked drive is indicated with a set of a port No. and a row 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 occurred.
11	ARRAY Loop Alarm	A loop error occurred.
12	ARRAY Warning	The array unit entered the warning state.
13	ARRAY Resource Manager Interface error occurred	A failure occurred in the connection with the array unit. A power OFF and a failure occurred in the array unit.
14	ARRAY Resource Manager Interface error occurred. Error Code (nnnnn).	When the array unit was connected via an LAN, a connection disability occurred. nnnnn: Winsock error code
15	ARRAY Resource Manager Interface error occurred.	When the array unit was connected via RS232C, a connection disability occurred.
16	Errinf.Txt File Error (xxxx).	A failure occurred in an access to a work file. xxxx: OPEN : File open failure xxxx: File operation failure

Chapter 4 Resource Manager 9200 Operation Procedure (CLI)

The following section describes basic operation procedures of Resource Manager 9200 after installation.

4.1 Executing Commands by Setting Administrator Mode

1. Setting a password

When, as an administrator of the array unit, performing operations on the Resource Manager 9200 such as setting up the configuration of an array unit, a password is required. For this, first set a password. Use an `aupasswd` command to set a password. A password, if set once, is saved in the workstation, so a password does not need setting for every operation.

Note that changing a password at regular intervals is recommended. An `aupasswd` command is also used to change a password.

2. Registering an array unit

Registers in the Resource Manager 9200 an array unit that you operate. Uses an `auunitadd` command to register an array unit. When registering, gives a unique unit name (up to 16 alphanumeric characters) to one array unit, and registers information such as the unit type (5800, 9200), a configuration (Single, Dual), and a connection interface (LAN, RS232C). This time, a registered array unit name is used as a key word to specify an array unit with individual commands of the Resource Manager 9200. Array unit information, if registered once, is kept under control of the Resource Manager 9200, so array unit information does not need registering at every operation.

In addition, uses an `auunitchg` command to change the registered contents. In such a case as when a unit no longer needs to be controlled by the Resource Manager 9200, registered unit information can be deleted with an `auunitdel` command.

3. Operations with various commands

After an array unit is placed under control of the Resource Manager 9200 by registering the unit, performs operations on the array unit such as referencing, setting, and monitoring by use of various Resource Manager 9200 commands.

4.2 Executing Commands Using a User ID

1. Setting the user ID

Register the user ID of a user who manages an array unit that has been registered in the Resource Manager 9200. The optional software must be installed on the array unit for this function. Use an `auuidadd` command to set up a user ID.

Note that once a user ID is registered, commands cannot be executed on the relevant array units without entering the user ID (login : `aulogin`).

2. Logging into array unit

Log into an array unit with a registered user ID. Uses an `aulogin` command. When forcibly logging into an array unit to which another user has already logged in, use an `aulogin` command with the `-discon` option appended.

3. Operations with various commands

After an array unit is placed under control of the Resource Manager 9200 by registering the array unit, perform operations on the array unit such as referencing, setting, and monitoring by use of various Resource Manager 9200 commands. When executing commands after logged in, you are not prompted to enter the user ID used for logging in and the password.

4. Logging out from array unit

Log out from an array unit to which you have logged in. Use an `aulogout` command.

Chapter 5 Examples of Using Commands (CLI)

The following shows an example in which one RAID group is set up in an array unit, and then one logical unit is set up.

```
% aupasswd -----For registering a password.
New password : -----Enters a password.
Retype new password : -----Enters the password again.
%
% auunitadd -unit array01 -DF400 -dual -LAN -ctl0 125.0.9.98 -ctl1 125.0.9.99
-----Registers a DF400 array unit with a dual
configuration by unit name array01. The
connection interface is LAN connection for both
unit.
% auunitref -----Checks that registration is complete.
Unit      Group   Array   Type   Watch   Comm   Device/IP addresses
array01           DF400   Dual   off    LAN    125.0.9.98 125.0.9.99
%
% aurgadd -unit array01 -rg 0 -RAID5 -row 0 -port 0 -width 5 -depth 1
-----Adds a RAID group with a RAID5 level.
Password : -----Enters a already-registered password.
%
% auluadd -unit array01 -----Checks that a RAID group has been configured.
RG   Level  Port  Width  Row  Depth
  0     5    0     5     0     1
%
% auliadd -unit array01 -lu 0 -rg 0 -size 100352 -ctl0 --- Adds LU0.
Password : -----Enters a already-registered password.
%
% auluref -unit array01 -----Checks that an LU has been configured.
LU      Capacity  Status   Staging  C-CTL  D-CTL  RG   RAID
  0      100352   Unformat  512      0       0     0    5
```

