



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

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The following source document were used to produce this 9200 user guide:

- *Disk Array Management Program 2 (for GUI) User's Guide*, Eighth Edition.
- *Disk Array Management Program (for CLI) User's Guide*, Eighteenth 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 subsystem (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 section **Safety Precautions** thoroughly and follow the instructions in this manual.
- The user is presupposed to have thorough knowledge of the basic operation of Windows, Solaris, and IRIX.
- “Windows 95”, “Windows 98”, “Windows 2000” and “Windows NT Version 4.0” are abbreviated to “Windows” in the manual.
- This manual quotes screens that 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, Windows 2000, Solaris, and IRIX, displays on some screens differ from those on corresponding screens shown in this manual.

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) 2” 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-91DF555).

COMMENTS

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Please refer to specific page(s) and paragraph(s) whenever possible.

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Thank you!

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.
- Certain functions to be executed by Resource Manager 9200 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.
- 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.

- The Resource Manager 9200 can open multiple Unit screens for one array unit. When multiple Unit screens are open, a shortage of memory may occur, depending on the configuration of the system in which the Resource Manager 9200 has been installed; this results in program hang-ups. When opening Unit screens, open only one screen to operate an array unit.
- You can perform error monitoring when a Unit screen is open. When you perform error monitoring with operations of a Unit screen concurrently, error monitoring operation and unit screen operations may terminate abnormally. To start error monitoring, close all unit screens, then perform error monitoring.
- When Resource Manager 9200 is run with Windows 98, if MS-IME 98 (Ver.6.00) has been installed in a Windows 98 system, the initiation of the Resource Manager 9200 program may terminate abnormally. When running Windows 98, install MSIME 98-98-SRI.
- If the Resource Manager 9200 does not succeed in connecting to the array unit, the following message may appear:

`An invalid response was received from the subsystem`

This indicates that the Resource Manager 9200 may have been connected to the array unit while the array unit automatically rebooted. Connect to the array unit again after approximately three minutes.

- 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 the array unit receives a Reset/LIP from the host.
 - Other applications are working concurrently 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. Reboot Resource Manager 9200 once again.

- If you use the Resource Manager 9200 together with other programs for one array unit, the following restrictions will exist.

Table 1.1 Restrictions When Multiple Programs are used Concurrently for One Array Unit

No.	Program name	1	2	3	4	5	6	7
1	Disk Array management program (LAN)	×	Δ	×	Δ	×	○	○
2	Disk Array management program (RS232C connection)	Δ	×	Δ	×	Δ	○	○
3	Disk Array utility (LAN)	×	Δ	×	Δ	×	○	○
4	Disk Array utility (RS232C connection)	Δ	×	Δ	×	Δ	○	○
5	Disk Array utility for Web	×	Δ	×	Δ	×	○	○
6	SNMP Agent Support Function	○	○	○	○	○	○	○
7	9200-built-in Web Server Function	○	○	○	○	○	○	○

○: Concurrent use allowed.

×: Concurrent use not allowed (operations performed with a program terminate abnormally).

Δ: Configuration in which concurrent use is allowed, but is not recommended.

To operate other programs, refer to their respective user's guides provided with the program products.

Note: 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, Windows 2000, or Windows NT 4.0
 - CPU: Pentium-II, III, IV (233 MHz or more is recommended.)
 - Memory: 64 MB (128 MB or more is recommended.)
 - Disk capacity: 3 MB max. (A free capacity of 100 MB or more is required.)
 - Network adapter
 - Monitor (Resolution 800 × 600, 1,024 × 768 or more is recommended, 256 color or more.)
- SUN server/workstation
 - Solaris 2.6, 2.7, 2.8
 - CPU: UltraSPARC or more is recommended.
 - Memory: 64 MB (128 MB or more is recommended.)
 - Disk capacity: 4 MB max. (A free capacity of 100 MB or more is required.)
 - Network adapter
 - Monitor (Resolution 800 × 600, 1,024 × 768 or more is recommended, 256 color or more.)
- SGI server/workstation
 - IRIX 6.5
 - CPU: R10000 or more is recommended.
 - Memory: 64 MB (128 MB or more is recommended.)
 - Disk capacity: 4 MB max. (A free capacity of 100 MB or more is required.)
 - Network adapter
 - Monitor (Resolution 800 × 600, 1,024 × 768 or more is recommended, 256 color or more.)
- JRE
 - Windows: jre-1_2_2_008
 - Solaris: JRE1_2_2_06

- 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 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.

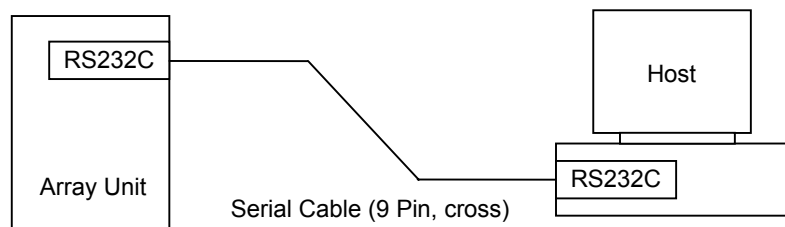
1.3 Connecting

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

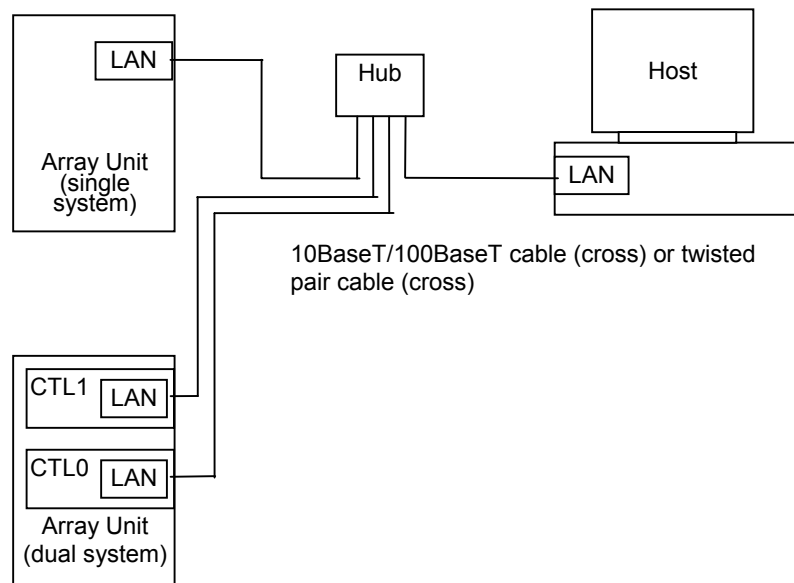
1.3.1 RS232C Connection

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



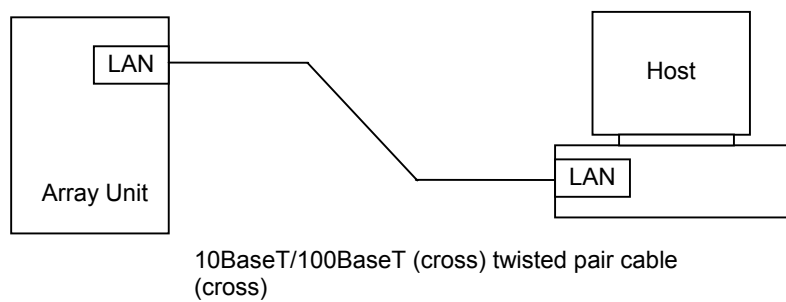
Note: If an array unit is configured from a dual system and a machine is equipped with two RS232C ports, both controller 0 and controller 1 are connected through an RS232C interface.

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 1.2.2 must be installed on a host and in normal operation. Before installing JRE1.2.2, ensure that it is in normal operation. If JRE1.2.2 is not installed, install jre-1_2_2_008 or JRE1_2_2_06.

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 jre-1_2_2_008 is not yet installed, install jre-1_2_2_008 contained in the provided CD-R.
3. Execute setup.exe in the GUI2 directory of the provided CD-R. (For the bundle version, execute setup.exe in the WGUI2 directory of the provided CD-R.)

1.4.2 Solaris

1. Start a SUN server/workstation, and start up a session in the common desk-top environment.
2. If JRE1_2_2_06 is not yet installed, install JRE1_2_2_06 contained in the provided CD-R. When installing JRE1_2_2_06, OS patches need to be applied; apply the patch in the provided CD-R.
3. Create a new directory (Example: /usr/damp) for installing Resource Manager 9200 and copy the ArrayManage2-xSxxx-GUI.tar file in the provided CD-R into the created directory in the hard disk drive.
(The portion "xSxxx" of file names varies with the version of the Resource Manager 9200.)
4. The ArrayManage2-xSxxx-GUI.tar is the Tar format of a file. Develop the file by referring to the example below.
Example: tar_xvf ArrayManage2-xSxxx-GUI.tar
5. Change scripts in the startmgr2 (a shell script used to start the Resource Manager 9200) in the developed file as follows.
"DEFAULT_JAVAHOME=/usr/java" has been described in the startmgr2 as specification of a path to JRE.

6. Set up a path to JRE in the DEFAULT_JAVAHOME variable as appropriate with 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 JRE1.2.2, etc.

Example: If JRE has been installed in /usr/local/JRE1.2.2:

DEFAULT_JAVAHOME=/usr/local/JRE1.2.2

7. Log in again.

1.4.3 IRIX

1. Start an SGI server/workstation.

Create a new directory (for example: /usr/damp) for installing the Resource Manager 9200, and copy the ArrayManage2-xxxx-GUI.tar file in the provided CD-R into the created directory in the hard disk drive.

(The portion "xxxx" of file names varies with the version of Resource Manager 9200.)

2. The ArrayManage2-xxxx-GUI.tar is the Tar format of a file. Develop the file by referring to the example below.

Example: tar xvf ArrayManage2-xxxx-GUI.tar

3. Change scripts in the startmgr2 (a shell script used to start the Resource Manager 9200) in the developed file as follows.

"DEFAULT_JAVAHOME=/usr/java" has been described in the startmgr2 as specification of a path to JRE.

Set up a path to JRE in the DEFAULT_JAVAHOME variable appropriate with 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 JRE1.2.2, etc.

Example: If JRE has been installed in /usr/local/JRE1.2.2:

DEFAULT_JAVAHOME=/usr/local/JRE1.2.2

4. Log in again.

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

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 ArrayManage2-xSxxx-GUI.tar file in the provided CD-R to the hard disk. (The portion "xSxxx" of file names varies with the version of the Resource Manager 9200, etc.)
2. The ArrayManage2-xSxxx-GUI.tar is the Tar format of a file. Develop the file by referring to the example below.

Example: tar xvf ArrayManage2-xSxxx-GUI.tar

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

1.5.3 IRIX

1. Copy the ArrayManage2-xxxx-GUI.tar file in the provided CD-R to the hard disk. (The portion "xxxx" of file names varies with the version of Resource Manager 9200, etc.)
2. The ArrayManage2-xxxx-GUI.tar is the Tar format of a file. Develop the file by referring to the example below.

Example: tar xvf ArrayManage2-xxxx-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

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 [Normal] or management mode [Management]). The mode can be changed in the startup screen prior to connecting to the array unit. By default, it is in Monitor mode. Do not operate while online except for item 8: **Error monitoring**; otherwise, your connection may time out.

2.1 Resource Manager 9200 Functions

Table 2.1 Resource Manager 9200 Functions

No.	Category	Name of function	Outline of function	Remarks	Usability during operation	Mode	
						Standard	Administrator
1	Configuration display	Component status display	Displays the status of a component such as drive and fan by using an icon.	—	○	○	○
		Property display	Displays the status about system components of an array unit, RAID, logical units, etc.	—	○	○	○
2	RAID group definition	RAID group institution	Used to add a RAID group. You can set a new RAID group by specifying its disk number, RAID level, and group range for the RAID group to be created.	—	○	×	○
		RAID group extension	Used to extend a 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	Deletes a defined RAID group or a specified RAID group.	Note that this function invalidates user data of the deleted RAID group.	×	×	○

Table 2.1 Resource Manager 9200 Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Usability during operation	Mode	
						Standard	Administrator
3	LU definition	LU institution	Used to add a logical unit (LU). A new logical unit is added by specifying its capacity.	A logical unit can be added only in an order of lower to higher numbers.	○	×	○
		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 last defined logical unit can be extended.	○	×	○
		LU deletion	Deletes the last defined logical unit (LU).	Note that this function invalidates user data on the deleted logical unit.	×	×	○
		LU formatting	Used to make a defined logical unit (LU) accessible by the host. This function writes null data to the specified logical unit.	This operation is always required to make a logical unit accessible to the host. Note that this function invalidates all user data on disks when the data is already stored on them.	×/○	×	○
		Change of default controller in charge of an LU	Used to change the default controller in charge of an logical unit (LU) as follows: CTL0 → CTL1 and CTL1 → CTL0	Restart the array unit to make the setting valid.	○	×	○

Table 2.1 Resource Manager 9200 Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Usability during operation	Mode	
						Standard	Administrator
4	System parameter setting	Setting wizard	Sets a system parameter in the wizard format. There are two types of wizard formats: Basic Settings and Detailed Settings.	<p>To make the setting valid, restart the array unit.</p> <p>I/Os directed from the host cannot be executed after the setting is made, until the array unit is restarted.</p> <p>The function of the Resource Manager 9200 cannot be used with the exception of setting wizard or error monitoring.</p>	×	×	○

Table 2.1 Resource Manager 9200 Functions (Continued)

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

Table 2.1 Resource Manager 9200 Functions (Continued)

No.	Category	Name of function	Outline of function	Remarks	Usability during operation	Mode	
						Standard	Administrator
5	Configuration setup (continued)	Configuration information file output and its setup by use of a file.	Outputs system parameters and RAID group/logical unit configuration information to a file individually. Sets system parameters and RAID group/logical unit configuration information using a file.	If system parameters are set using a file, restart the array unit in order to validate the settings. When RAID/LU configuration information is set, if setting it with user data stored in the disk drive, the user data is set invalid.	○	○	○
		Microprogram replacement	Downloads and updates the microprogram of the array unit.	To validate the downloaded microprogram, restart the array unit.	×/○	×	○
		Setup and display of the priced optional features	Opens/closes the priced optional features key and sets and displays the enable/disable condition.	—	○	×	○
		Setup and display of RTC	Sets and displays the date and time.	—	○	×	○
6	Statistical information display	Controller use information display	Displays previous statistical information by selecting a related item.	—	○	○	○
7	Performance	Command operation status display	Outputs the command operation status during a certain period or a specified period to the file in the text format.	—	○	○	○
8	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 maintenance personnel.	○	○	○

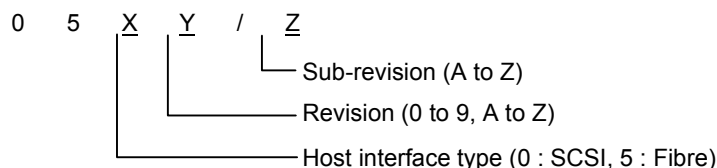
2.2 Applying Support Functions of Microprograms

Functions of the Resource Manager 9200 may be disabled depending on the revision number of the microprogram of the array unit connected. Table 2.2 shows the revision numbers of the microprogram which support the Resource Manager 9200 functions and the Resource Manager 9200 operations when the microprogram does not support the Resource Manager 9200 functions.

Table 2.2 Microprogram Revision Numbers and Their Supports for Resource Manager 9200 Functions

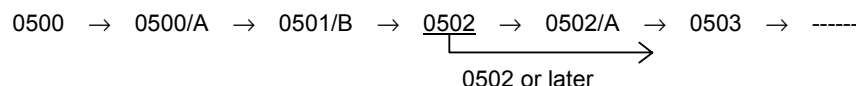
No.	Function	Revision Numbers of Microprograms which Support Resource Manager 9200	Remarks
1	Expanding RAID group	0552 or later	
2	SCSI transfer rate setting	0503 or later	
3	Array unit management by user ID	0552 or later	

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



- Host interface: SCSI
 - 050V (050V/Z): Version for the 9200 single/dual system used in the open system
- Host interface: Fibre Channel
 - 055V (055V/Z): Version for the 9200 single/dual system used in the open system

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



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

2.3 Screens

The Resource Manager 9200 operations screen consists of three screens, dialog boxes, and error messages, etc. This section describes the configurations of the three screens.

When you start Resource Manager 9200, the following screen will be displayed. This screen is the Main screen.

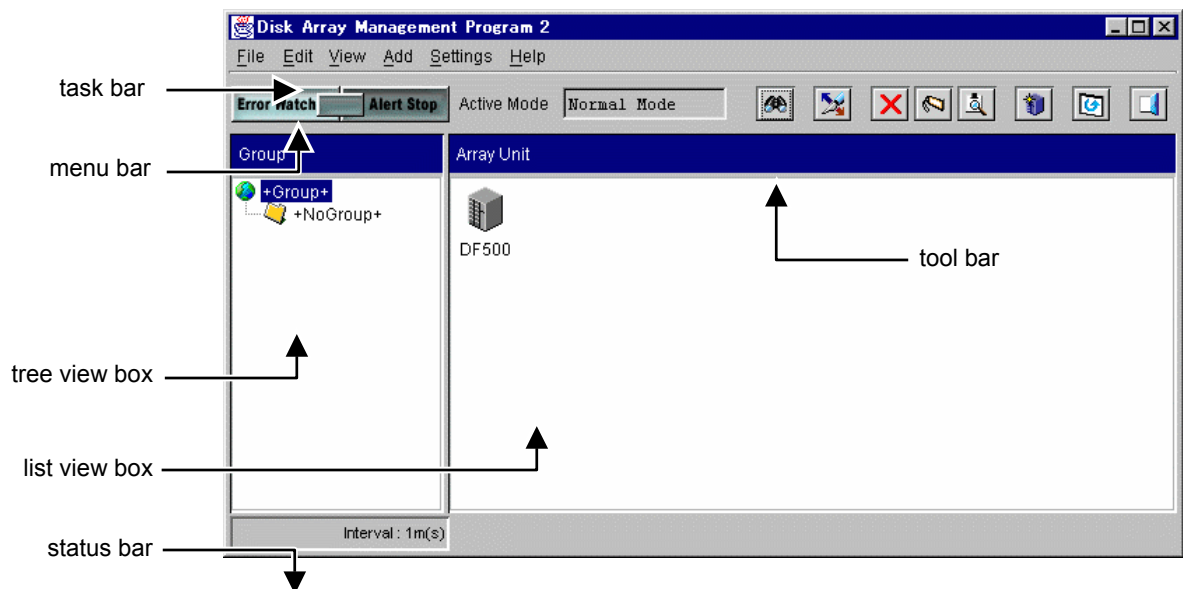


Figure 2.1 Resource Manager 9200 Main Screen

This screen includes the task bar, the menu bar, the tool bar, two view boxes, and the status bar; this is similar to other Windows applications.

Displayed in the tree view box are group names that have been registered. Displayed in the list view box are array unit names that have been registered in a group.

Double-clicking **+ Group +** enables you to fold a group into its icon and display the group. Clicking a group icon displays only the array units that have been registered in that specific group. Clicking **+ Group +** displays all array units that have been registered.

When you double-click a registered array unit name, a Unit screen will be displayed. On the Unit screen, the status of array unit system components and configuration information of logical units, etc. is displayed selectively by switching the tab. For example, the following screen displays a connection with a 9200(RK) array unit.

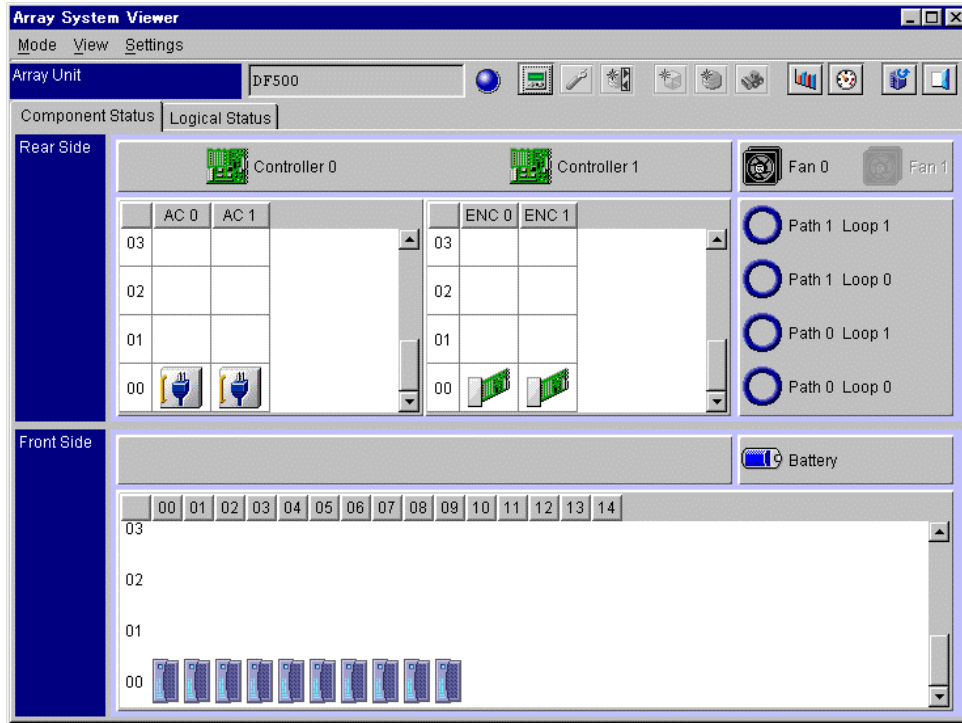


Figure 2.2 Component Status Tab: 9200 (RK)

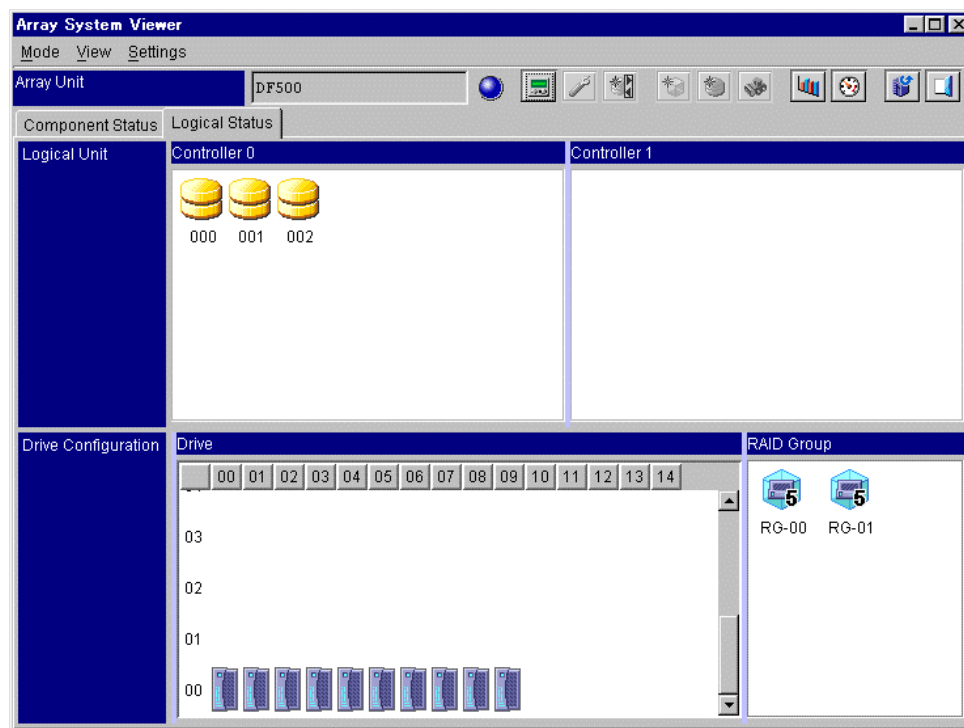


Figure 2.3 Logical Status Tab: 9200 (RK)

Double-clicking an icon in the Unit screen displays the Property screen of the double-clicked icon. Even while the Property screen is open, the Unit screen and other operations are allowed.

When you double-click another icon while the Property screen is open, the screen display is switched to information on the icon double-clicked last.

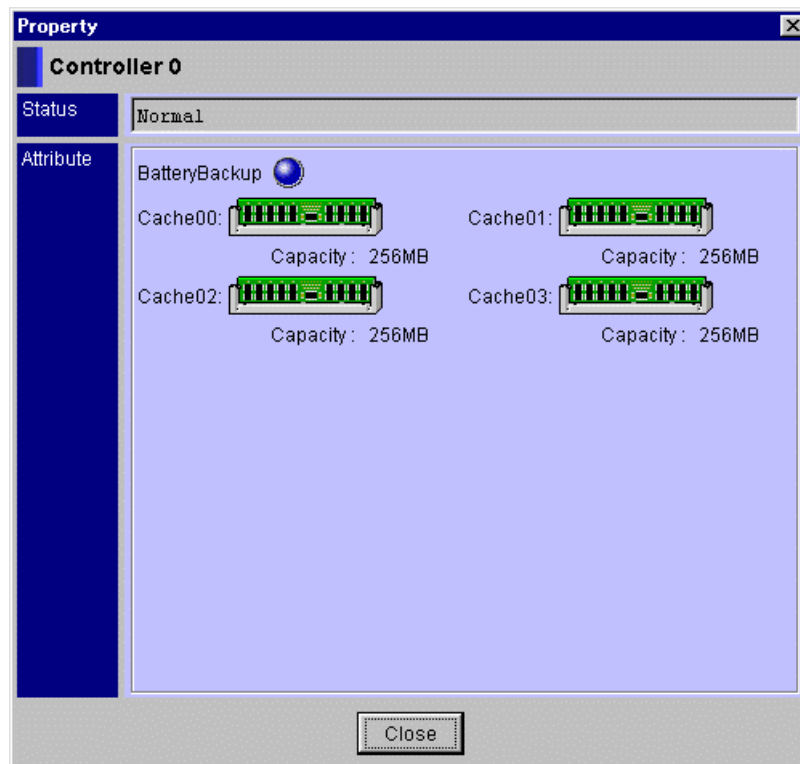




Figure 2.4 Property Screen (Controller)

2.3.1 Menu Bars and Tool Bars


The following shows a list of menu bars and tool bars, which are described throughout this User's Guide.

The Main screen



File

Menu	Tool bar	Function
Change Mode		Changing the active mode.
Exit		Terminate the Resource Manager 9200.


Edit

Menu	Tool bar	Function
Delete		Delete the registration of an array unit, which is registered in the Resource Manager 9200.



View

Menu	Tool bar	Function
Refresh		The status of an array unit is checked.
Properties		Display the property of an array unit.

Add

Menu	Tool bar	Function
Register Array Unit		Register the array unit.

Settings


Menu	Tool bar	Function
Change Properties	—	Change the registration contents of the array unit.
Monitoring Options		Display the Monitoring Options screen.
Display Details		Display the Unit screen.
Password	—	Change the password.

Help


Menu	Tool bar	Function
Version	—	Display the revision of the Resource Manager 9200.

The Unit screen







Mode

Menu	Tool bar	Function
Exit		Terminate the Unit screen.

View

Menu	Tool bar	Function
Refresh		Refresh the Unit screen.

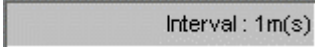
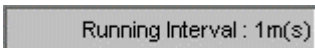

Settings

Menu	Tool bar	Function
System Parameter Wizard		Start the system parameter settings.
Configuration Settings		Display the configuration settings screen.
Logical Unit Wizard		Start the logical unit wizard.
RAID Group Settings		Display the RAID group settings screen.
Extend	—	Extend the RAID group.
Delete Specified RAID Group	—	Delete specified RAID group.
Delete All	—	Delete the all RAID group.
Logical Unit Settings		Display the logical unit settings screen.
Extend	—	Extend the logical unit.
Delete Last Defined Logical Unit	—	Delete last defined logical unit.
Format (Single)		Format the one logical unit.
Format (Multiple)	—	Format the logical unit (Max.6).
Change Default Controller	—	Change default controller of logical unit.
Select Last Defined Logical Unit	—	Select last defined logical unit.
Select All Logical Units	—	Select all logical units

2.3.2 Status Bars

The following table lists status bars which are described throughout this User's Guide.

Table 2.3 Status Bar Descriptions

Status Bar	Description
 Interval : 1m(s)	Error Monitoring is stopped.
 Running Interval : 1m(s)	Error Monitoring is running.
 Wait Interval : 1m(s)	Error Monitoring in the interval.

2.4 Context Menus

A list of the context menus, which are displayed when the right mouse button is clicked while the Main screen or the Unit screen (in the case where the **Logical Status** tab is selected) is displayed, is shown.

2.4.1 The Main Screen

The following context menus are displayed on the Main screen.

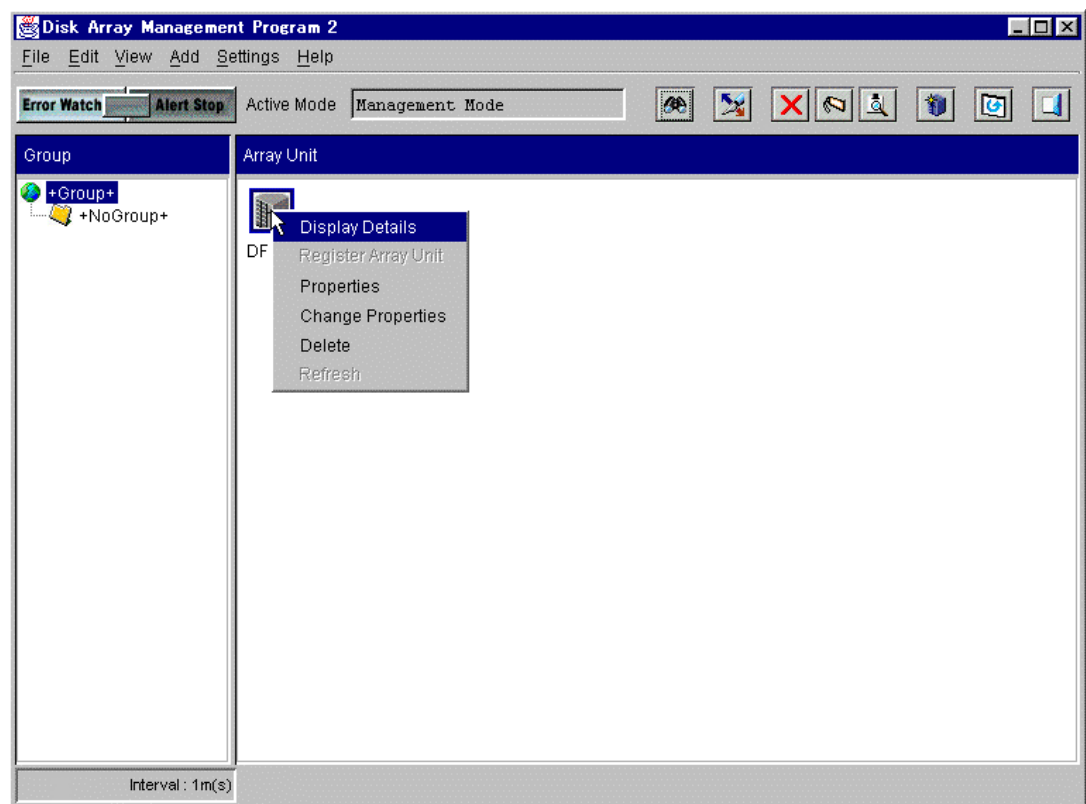


Figure 2.5 Disk Array Subsystem List View Box (when the icon is selected)

Table 2.4 Disk Array Subsystem Menu Options (when the icon is selected)

Pointer	Menu	Function
Disk array subsystem icon is selected.	Display Details	Display the Unit screen.
	Properties	Display the property of an array unit.
	Change Properties	Change the registration contents of the array unit.
	Delete	Delete the registration of an array unit which is registered in the Resource Manager 9200.

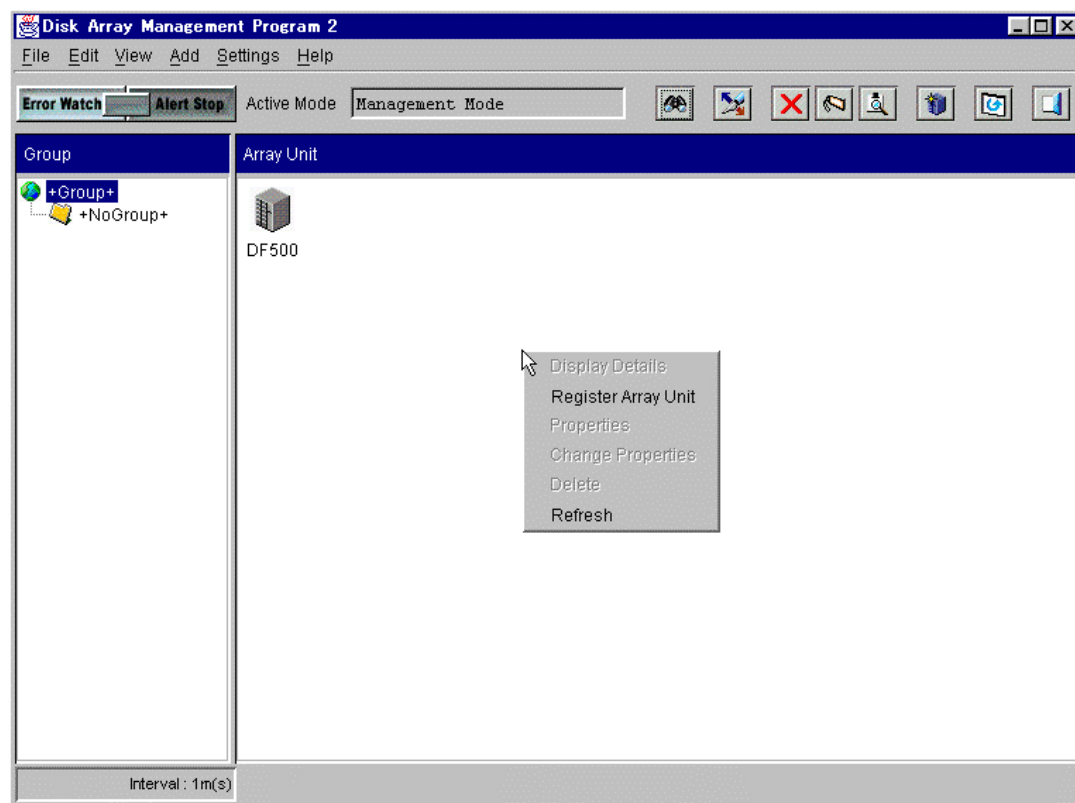


Figure 2.6 Disk Array Subsystem List View Box (when the icon is not selected)

Table 2.5 Disk Array Subsystem Menu Options (when the icon is not selected)

Pointer	Menu	Function
List view box when the icon is not selected.	Register Array Unit	Register the array unit.
	Refresh	The status of an array unit is checked.

2.4.2 The Unit Screen

The following functions can be used when the **Logical Status** tab is selected in the Unit screen. The **Component Status** tab does not provide a context menu.

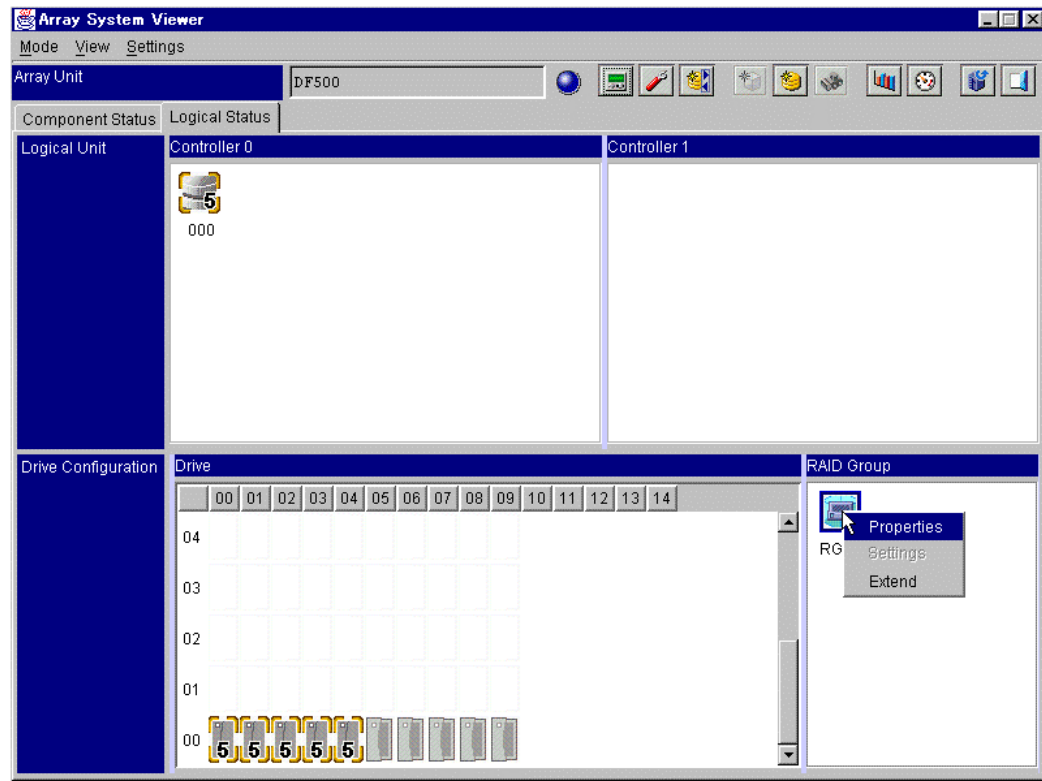


Figure 2.7 RAID Group List View Box (when the icon is selected)

Table 2.6 RAID Group Menu Options (when the icon is selected)

Pointer	Menu	Function
RAID group icon	Properties	Display the property of the RAID group.
	Extend	Extend the RAID group.

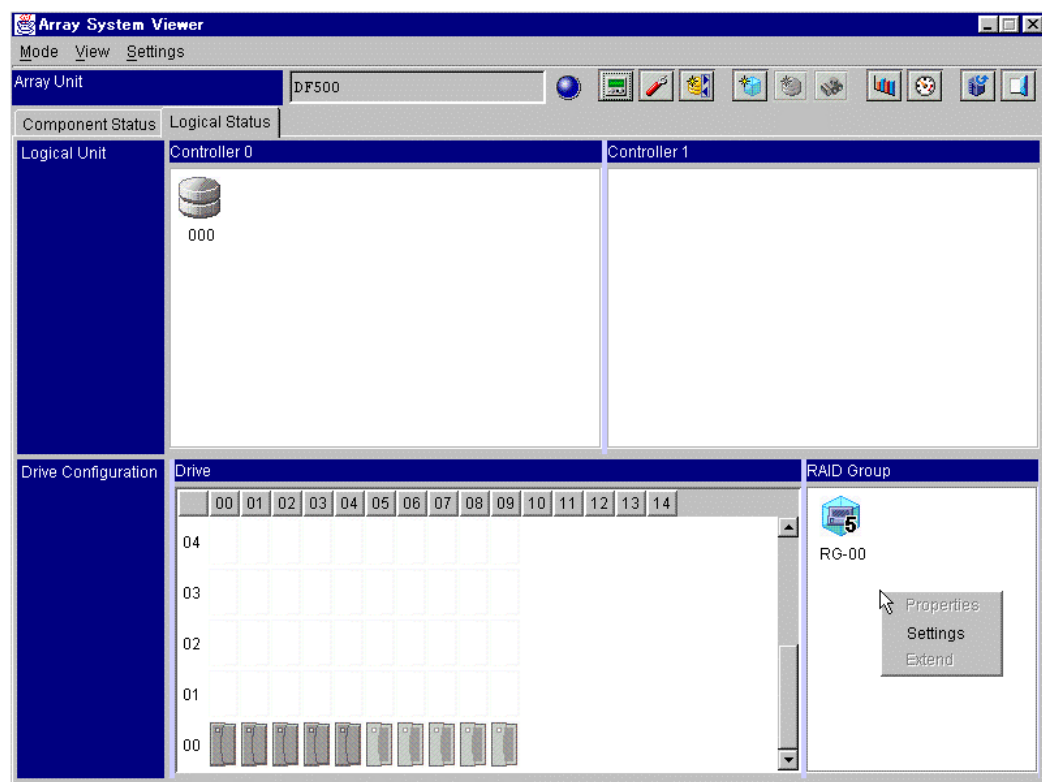


Figure 2.8 RAID Group List View Box (when the icon is not selected)

Table 2.7 RAID Group Menu Options (when the icon is not selected)

Pointer	Menu	Function
RAID Group box list view box when the icon is not selected.	Settings	Display the RAID group settings screen.

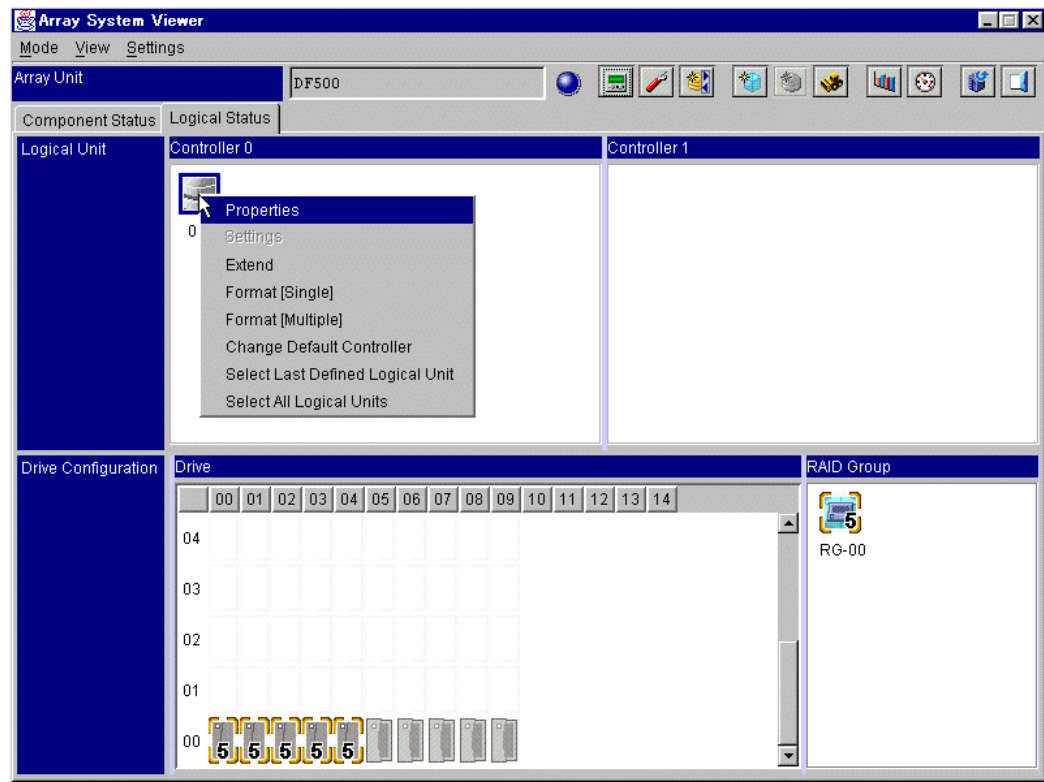


Figure 2.9 Logical Unit List View Box (when one icon is selected)

Table 2.8 Logical Unit Menu Options (when one icon is selected)

Pointer	Menu	Function
Logical unit icons (Select one of them)	Properties	Display the property of the logical unit.
	Extend	Extend the logical unit.
	Format [Single]	Format the one logical unit.
	Format [Multiple]	Format the logical units (Max.6).
	Change Default Controller	Change default controller of logical unit.
	Select Last Defined Logical Unit	Select last defined logical unit.
	Select All Logical Units	Select all logical units.

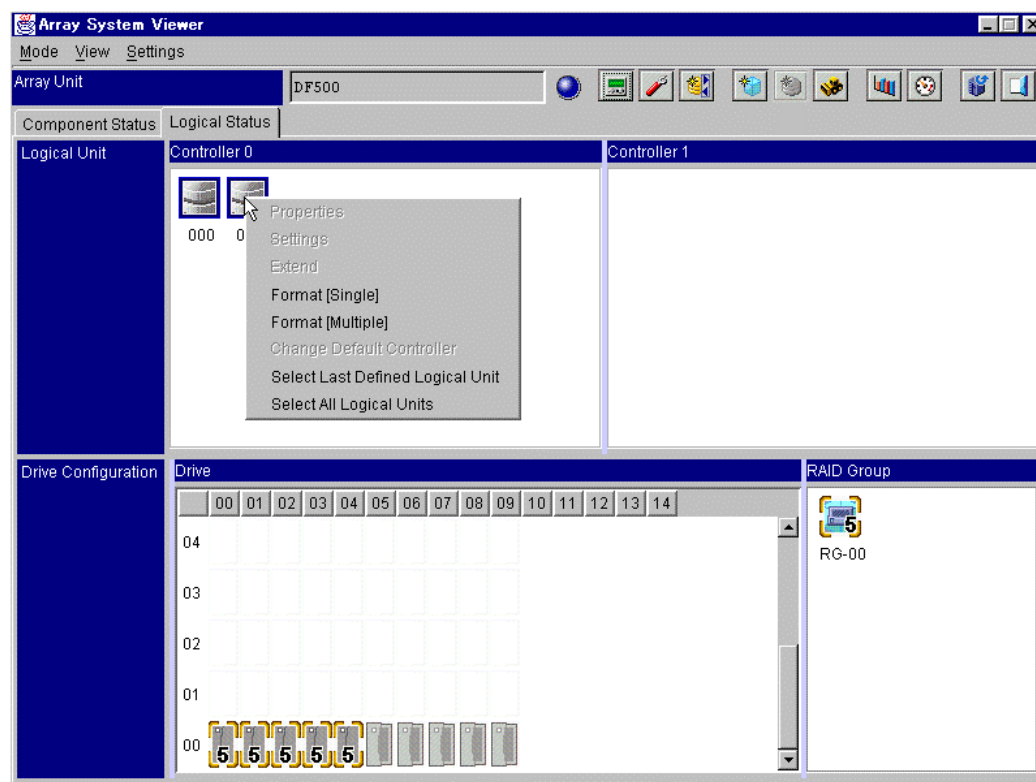


Figure 2.10 Logical Unit List View Box (when two or more icons are selected)

Table 2.9 Logical Unit Menu Options (when two or more icons are selected)

Pointer	Menu	Function
Logical unit icons (Select two or more of them)	Format [Single]	Format the one logical unit.
	Format [Multiple]	Format the logical units (Max.6).
	Select Last Defined Logical Unit	Select last defined logical unit.
	Select All Logical Units	Select all logical units.

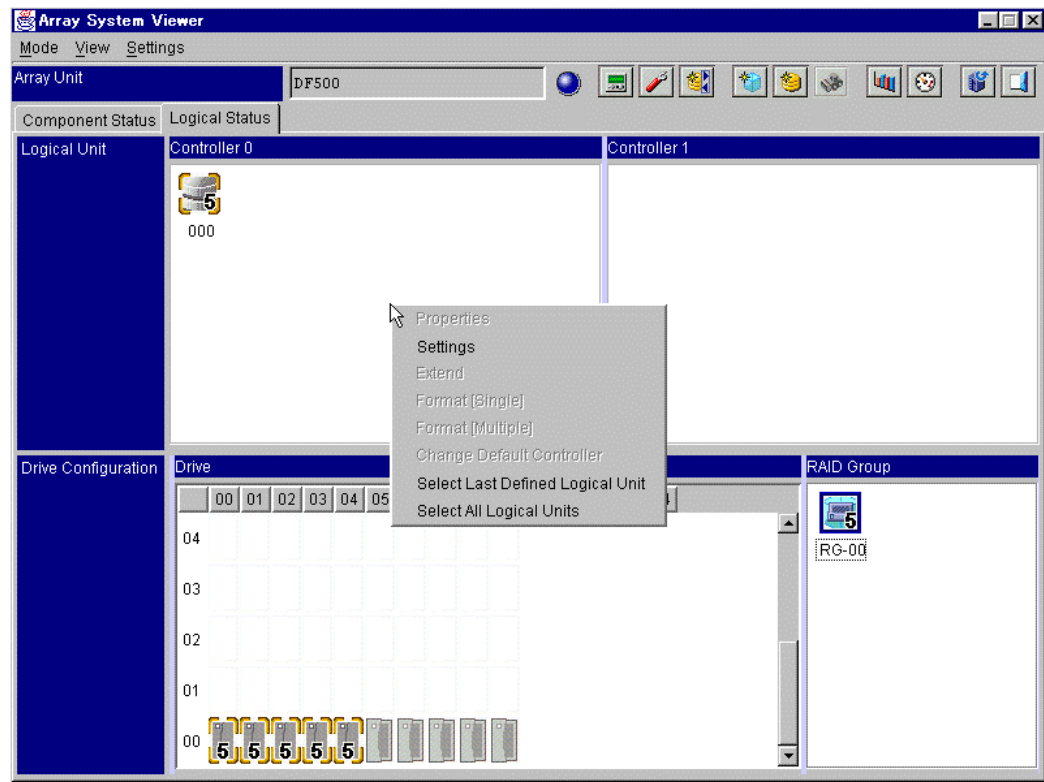


Figure 2.11 Logical Unit List View Box (when icons are not selected)

Table 2.10 Logical Unit Menu Options (when icons are not selected)

	Menu	Function
In a region of the Logical Unit box excepting icons	Settings	Display the logical unit settings screen.
	Select Last Defined Logical Unit	Select last defined logical unit.
	Select All Logical Units	Select all logical units.

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.

The operations in this chapter can be used for Windows®, Solaris™, and IRIX®. This chapter includes:

- Basic Operations
- Properties of the Main Screen and Unit Screen

3.1 Basic Operations

The basic operations described in this section include:

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

The operation of these functions conforms to Windows®, Solaris™, and IRIX®.

3.1.1 Starting

Use the appropriate Resource Manager 9200 starting procedures. This section includes starting procedures for:


- Windows®
- Solaris™ and IRIX®

3.1.1.1 Windows®

This section explains how to start Resource Manager 9200 based on location:

- Start the Resource Manager 9200 Program from the Directory where it is Installed
- Start the Resource Manager 9200 Program from a Directory other than where it is Installed

Start the Resource Manager 9200 Program from the Directory where it is Installed

1. Double click  : **Disk Array management program 2** (Resource Manager 9200) on the desktop. The Resource Manager 9200 program will start. Alternatively, on the **Start** menu, point to **Program** and click **Disk Array management program 2**.

When the **startmgr2.bat** file (a batch file used to start Resource Manager 9200) is executed, Resource Manager 9200 starts.

2. **Note:** When Resource Manager 9200 is used on Windows® 95/98/2000, an error may occur in which the menu display is disabled by a menu bar operation with the mouse. If this occurs, disable the pointer trail or the pointer shadow for the **Mouse** properties in the **Control Panel**.

If the menu display is not recovered, disable the **Scheme** for the **Pointers** tab in the **Mouse** properties.

It is also possible that the menu display may be disabled due to erroneous settings. If the menu display remains disabled, set the value to 65536 or less for the **Color pallet** properties in the **Display**.

Example:

If the Resource Manager 9200 has been installed in C:\damp:

```
set DAMP_ROOT_DIR_PATH=C:\damp
java -classpath .\CONFIMG2.JAR jp.co.Hitachi.str.diskarray.gui.ConmanFrame %1
```

For Windows®, the prompt screen is also displayed. The **Prompt** screen is not related to Resource Manager 9200 operations. Closing the Prompt screen terminates the Resource Manager 9200 forcibly. If the display is not necessary, specify "Minimizing icon" with the property of a batch file to "minimize the icon".

Start the Resource Manager 9200 Program from a Directory other than where it is Installed

1. Edit the **DAMP_ROOT_DIR_PATH** environment variable of **startmgr2.bat** in the developed file.
2. Set up the install directory of Resource Manager 9200 in the **DAMP_ROOT_DIR_PATH** environment variable.
3. **Note:** When Resource Manager 9200 is used on Windows® 95/98, it may terminate abnormally due to an insufficient area for the environmental variable, etc.

If activation fails, change a property of **startmgr2.bat**. To change it, open the property and set the **Initial environment** of the **Memory** tab for 1,024.

3.1.1.2 Solaris™ and IRIX®

This section explains how to start Resource Manager 9200 based on location:

- Start the Resource Manager 9200 Program from the Directory where it is Installed
- Start the Resource Manager 9200 Program from a Directory other than where it is Installed
- Main Screen Functions
- Unit Screen Functions

Start the Resource Manager 9200 Program from the Directory where it is Installed

1. Start the **startmgr2** shell script.
2. **Note:** When you start the batch file and the shell script, execute them using the same directory as the one for the Resource Manager 9200 program.

Example:

If the Resource Manager 9200 has been installed in /usr/damp:

```
#DAMP_ROOT_DIR_PATH environment variable
DAMP_ROOT_DIRPATH=/usr/damp
export DAMP_ROOT_DIR_PATH
```

Start the Resource Manager 9200 Program from a Directory other than where it is Installed

1. Edit the **DAMP_ROOT_DIR_PATH** environment variable of **startmgr2** in the developed file before logging in again (see step 6).
2. Set up the install directory of Resource Manager 9200 in the **DAMP_ROOT_DIR_PATH** environment variable.
3. **Note:** Depending on the environment setting of the server/workstation, correct character fonts may not be displayed on screens. The standard font size is 12. If the characters are not displayed correctly, set the font to a different size. To complete this setting, insert a one space character, following the last line **\$JAVABIN \$EXECJAVA** in **startmgr2**, and add **"-xfont#" (#: a font size)**.

Main Screen Functions

The Resource Manager 9200 program starts in the normal mode and the Main screen appears.

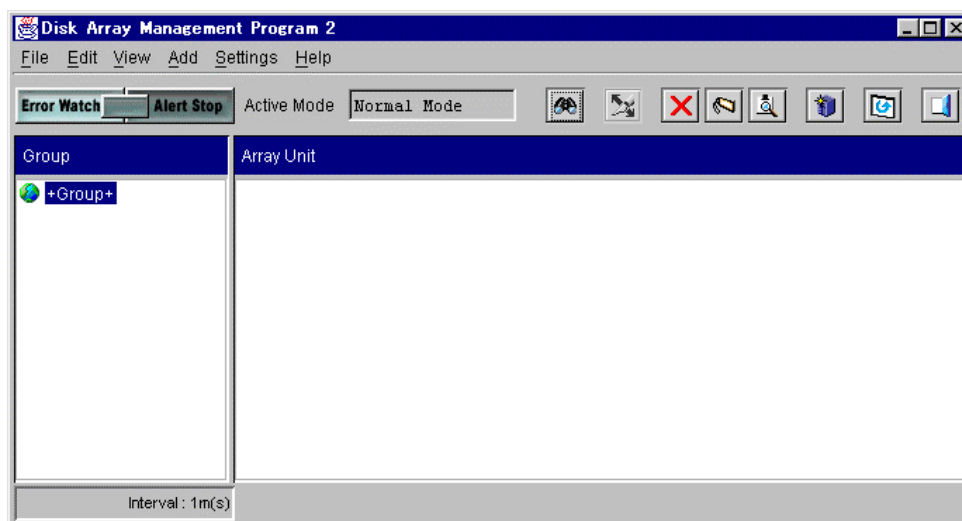



Figure 3.1 Resource Manager 9200 Main screen

The following functions are performed from the Main screen:

- Registering the array unit (Register, Delete, Change, Refer of the property)
- 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

Note: When Resource Manager 9200 is first started, the change mode function is disabled. Register the password and the change mode function will be enabled.

1. Click the icon of an array unit on the Main screen.
 2. From the **Settings** menu, click **Display Details**. Alternatively, click the : **Display Details** button in the tool bar. The Unit screen of an array unit will be displayed.
- This operation can also be done from the context menu of the disk array subsystem icon.

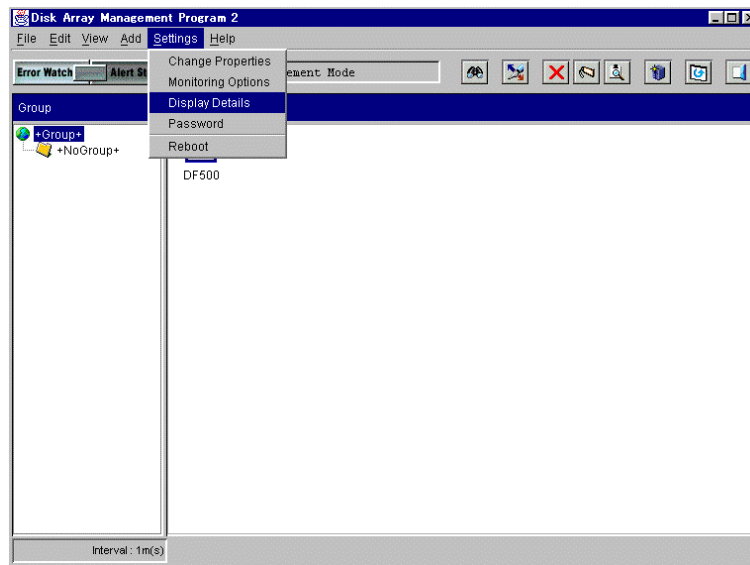


Figure 3.2 Display Details Tool Bar Selection from the Settings Menu

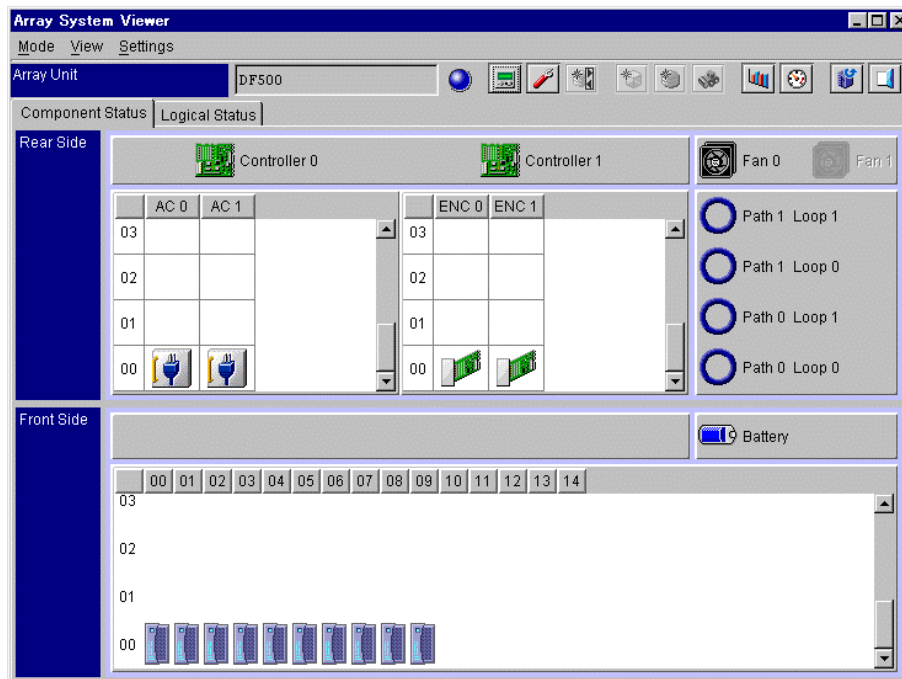


Figure 3.3 Unit Screen of an Array Unit

Unit Screen Functions

The following functions are performed in the Unit screen:

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

3.1.2 Password Setting

When using the Resource Manager 920 in the management mode, set a password.

3.1.2.1 Registration of a Password

Register a password.

1. On the **Settings** menu, click **Password**.

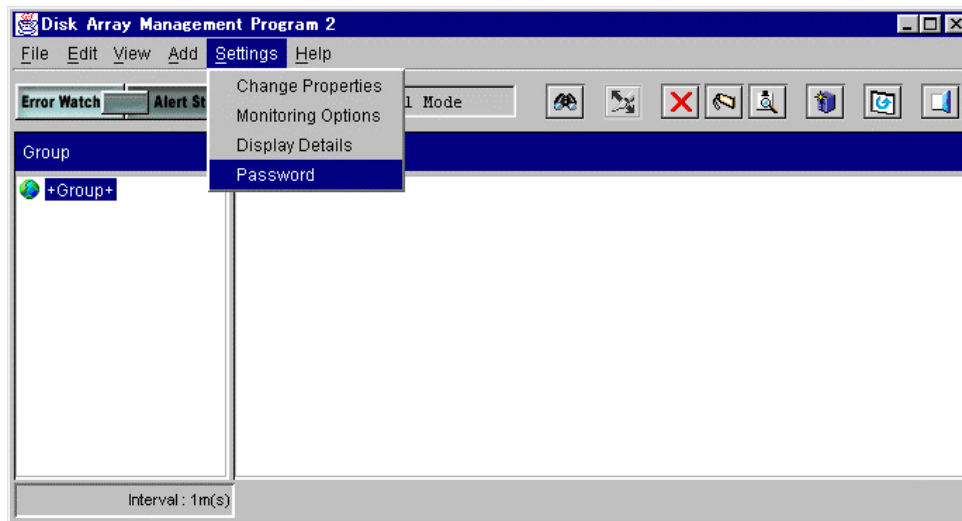


Figure 3.4 Registering a Password

2. Enter New Password and New Password (for confirmation) and click the **OK** button. Specify a password of up to 12 alphanumeric characters.

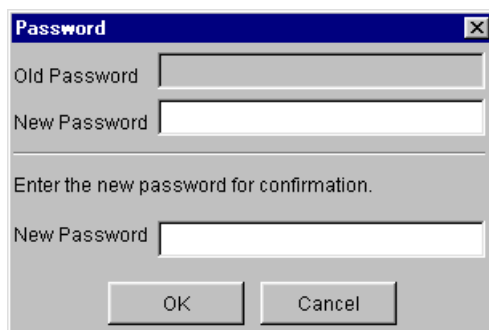


Figure 3.5 Entering a New Password

3.1.2.2 Changing the Password

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

1. On the **Settings** menu, click **Password** on the Main screen.
2. Input **Old Password**, **New Password**, and **New Password (for confirmation)** and click the **OK** button.

Specify a password of up to 12 alphanumeric characters.

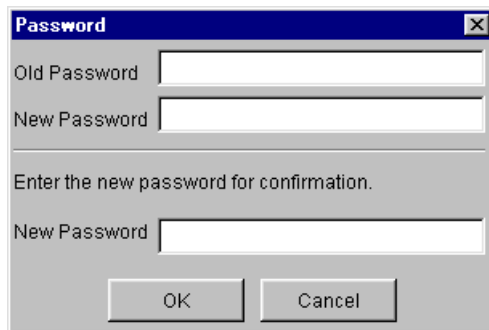


Figure 3.6 Changing the Password

3.1.2.3 Deleting the Password

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

1. Delete the directory where the Resource Manager 9200 is installed. Follow the "Uninstalling" directions on page 10.

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

2. Create a directory with the same path and the same name as those of the directory deleted in step 1.
3. Re-install the Resource Manager 9200 program.

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


3.1.3 Changing the Action Mode

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

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

3.1.3.1 Changing from Normal Mode to Management Mode

Change the action mode from normal mode to management mode. When logging-in is performed in normal mode, **Normal Mode** is displayed in **Active Mode:** in the upper part of the Main screen.

1. On the **File** menu, click **Change Mode**. Or click : **Change Mode** in the tool bar.

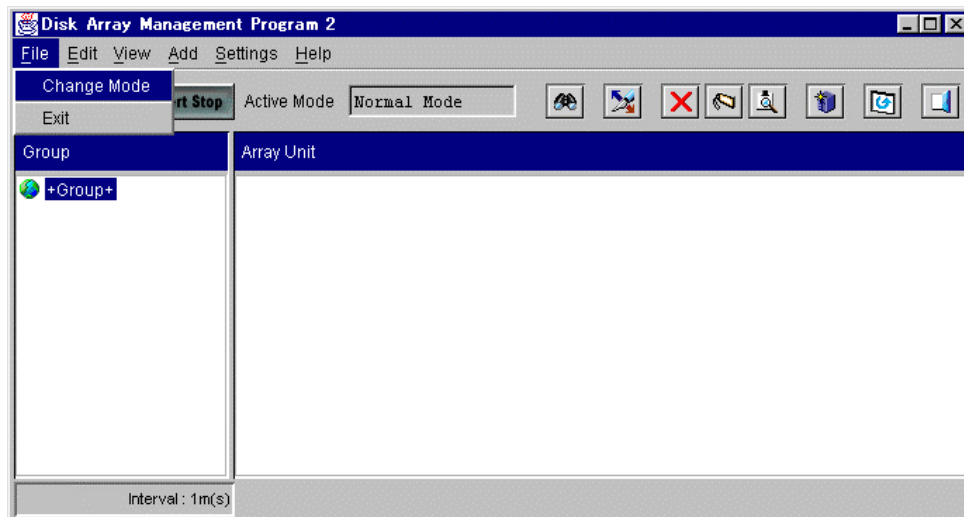


Figure 3.7 Changing from Normal Mode to Management Mode

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

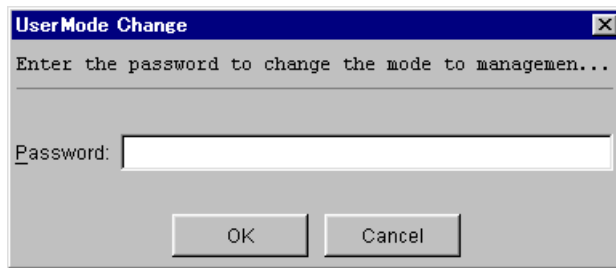



Figure 3.8 Password-Input Screen

Management Mode is displayed in **Active Mode:** in the upper part of the Main screen.
The Resource Manager 9200 will operate in Management Mode.

3.1.3.2 Change from Management Mode to Normal Mode

You can change the action mode from Management mode to Normal mode. When logging-in is performed in the Management mode, **Management Mode** is displayed in **Active Mode:**. (It appears in the upper part of the Main screen).

1. On the **File** menu, click **Change Mode** or click : **Change Mode** in the tool bar.

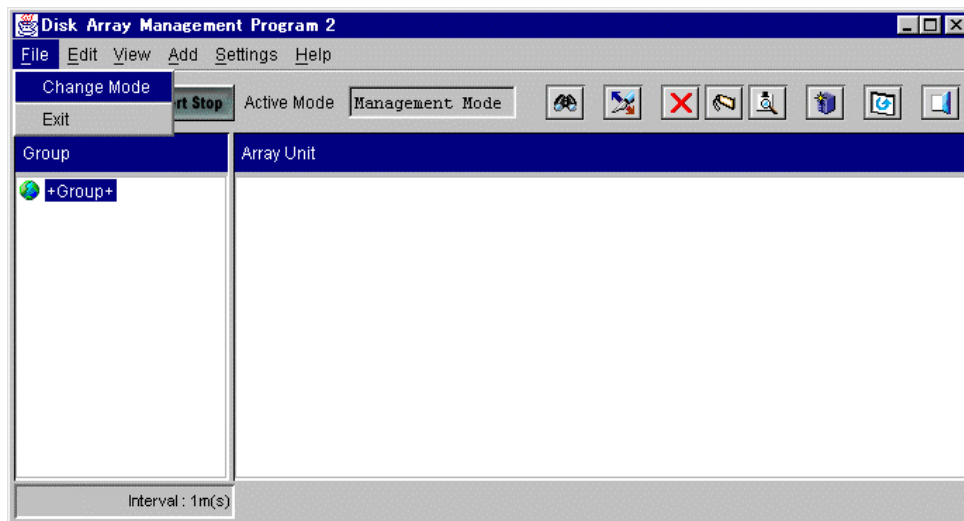
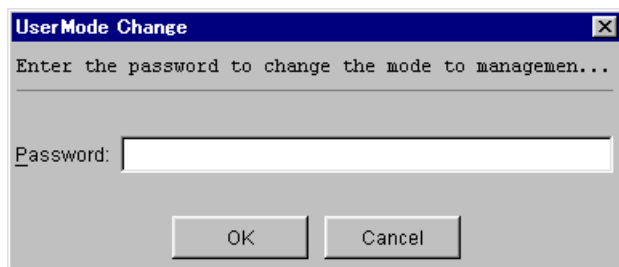


Figure 3.9 Changing from Management Mode to Normal Mode

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



Normal Mode is displayed in **Active Mode:** in the upper part of the Main screen. The Resource Manager 9200 will operate in Normal mode.

3.1.4 Registering an Array Unit

To operate the array unit from the Resource Manager 9200, register the array unit. You cannot temporarily register a non-existing array unit.

3.1.4.1 New Registration

1. On the **Add** menu, click the **Register Array Unit** or click : **Register Array Unit** in the tool bar.

This operation can also be completed from the context menu of the list view box.

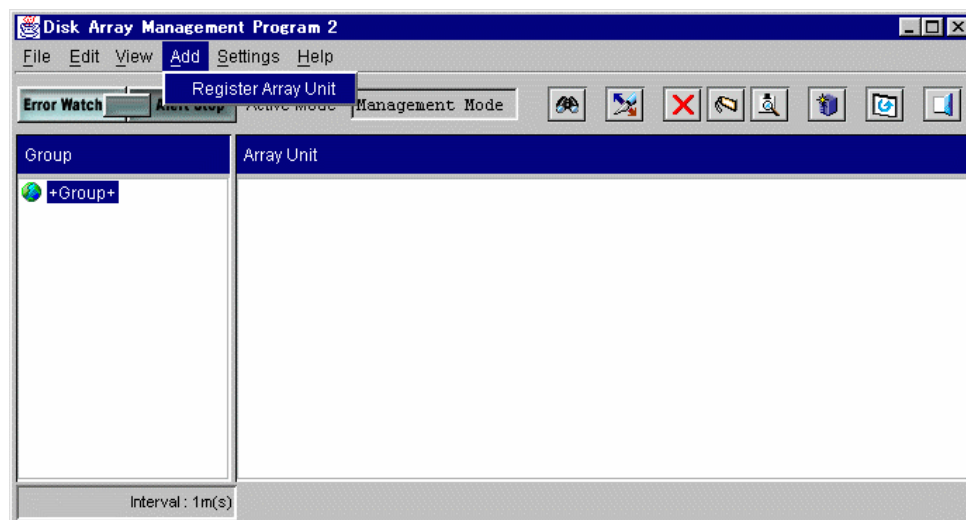


Figure 3.10 New Registration

2. Select either the TCP/IP or the RS232C Connection Type. Input the registration information and click the **OK** button.

Figure 3.11 Input Registration Information (TCP/IP)

- **Group Name:** Group name when array units are controlled as a group. Specify it in up to 16 alphanumeric characters or characters except numbers (-, _). When array units are controlled as a group, input its name. If not, it is not necessary to input the name. The maximum registered number of groups is 200.
- **Array Unit Name:** Registered name of array unit. Specify up to 16 alphanumeric characters or characters (-, _) except numbers.
- **Array Unit Type:** Select a type of array unit.
- **Connection Type:** Select a connection mode with the array unit.

TCP/IP(LAN): Connect LAN.

RS232C: Connect RS232C.

IP Address or Host Name or Port or Device Name: Specify the connection information of controller 0/1. When you select **TCP/IP** in **Connection Type**, specify **IP Address** or **Host Name**. When you select **RS232C**, specify **Device Name**.

Specify the RS232C port name or device file name as **Device Name**.

(Example: Windows-COM1, Solaris-ttya)

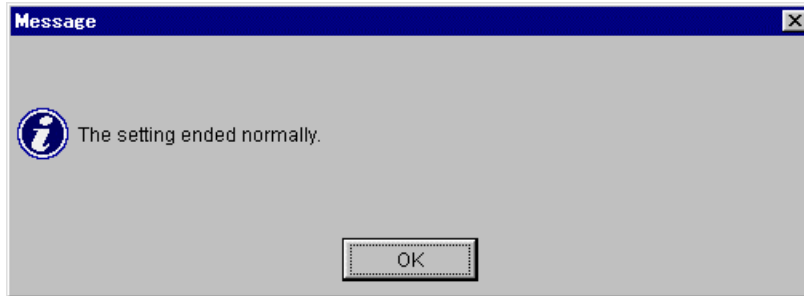
Error Monitoring: Specify whether or not to perform error monitoring.

Check (ON display): Error monitoring

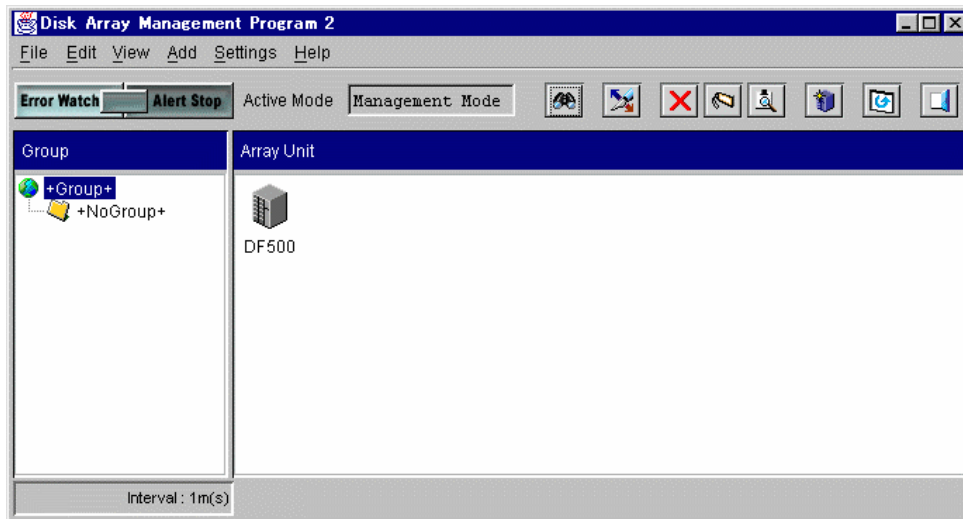
No check (OFF display): No error monitoring

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

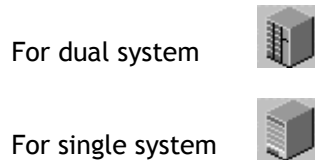
3. When a registration completion message appears, click the **OK** button.



The Main screen is updated and then displayed.



When you input **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.



Array unit icons are displayed in the order of registration.

3.1.4.2 Changing the Registration Contents

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

1. Click the icon of an array unit on the Main screen. On the **Settings** menu, click **Change Properties**.

This operation can also be completed from the context menu of the disk array subsystem icon.

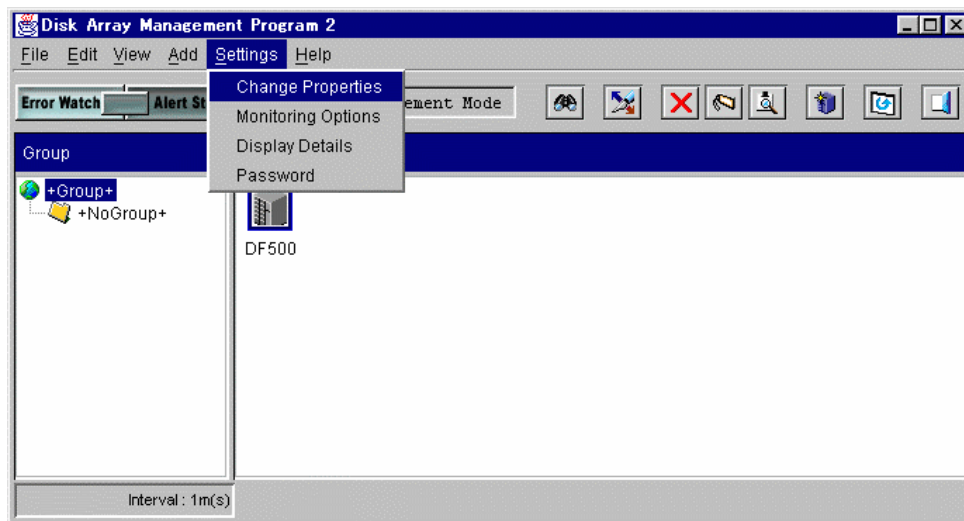


Figure 3.12 Changing the Registration Contents

2. Change the registration contents and click the OK button. (The following is an example for a TCP/IP setting.)

Property

Array Unit

Group Name

Array Unit Name: DF500

Array Unit Type: DF500 Dual

Connection Type: ☒ TCP/IP(LAN) ☐ RS232C

IP Address, Host Name or Device Name

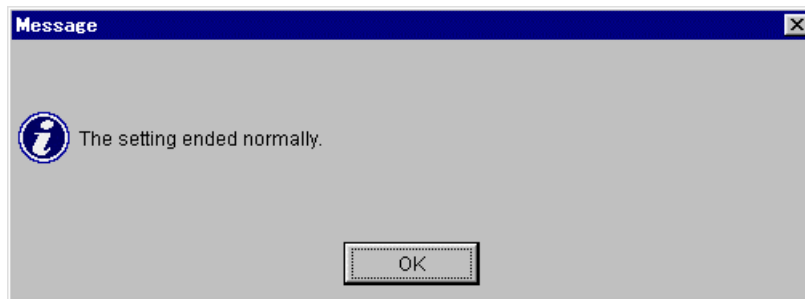
Controller 0: 192.168.1.100

Controller 1: 192.168.1.101

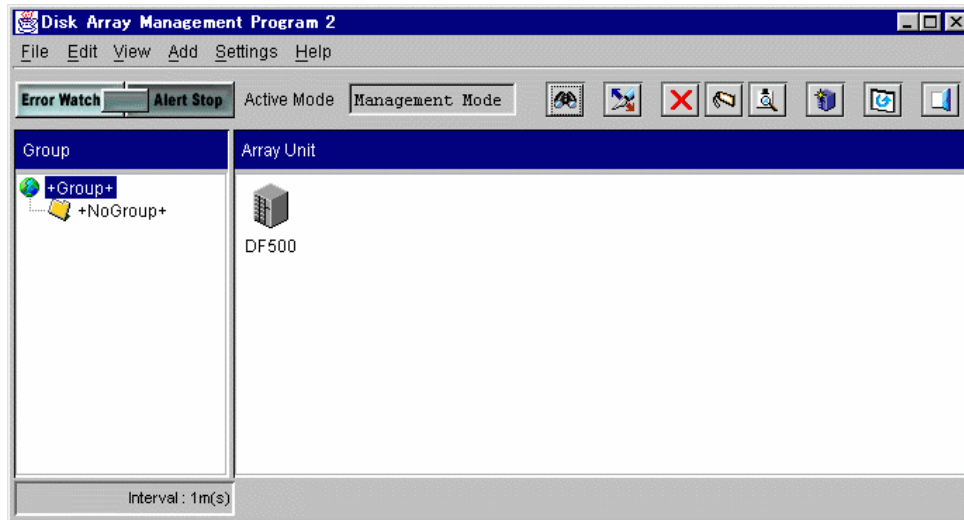
Error Monitoring: ☒ Monitoring Target

OK Cancel

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




The Main screen is updated and then displayed.



3.1.4.3 Deleting the Registration

Delete the registration of an array unit, which is registered in the Resource Manager 9200.

1. Click the icon of an array unit on the Main screen. On the Edit menu select **Delete** or click : **Delete** in the tool bar.

This operation can also be completed from the context menu of the disk array subsystem icon.

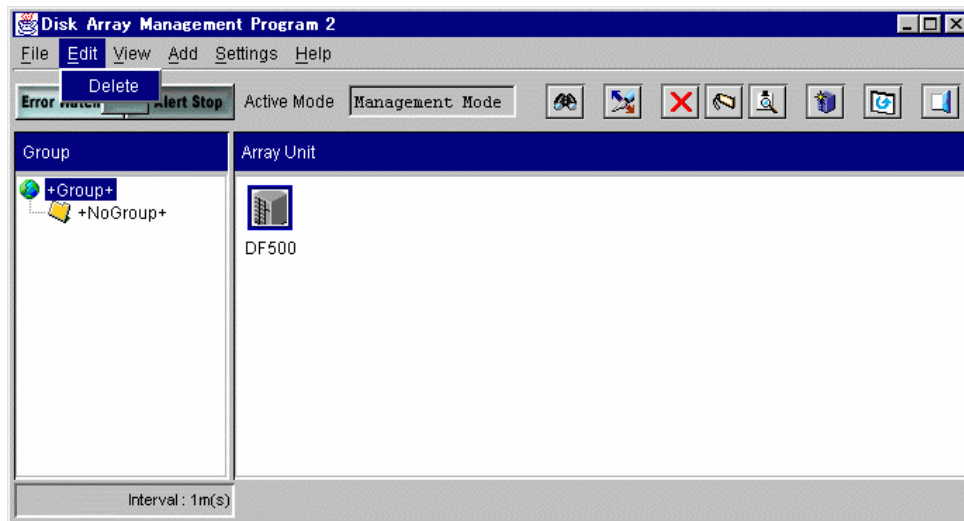
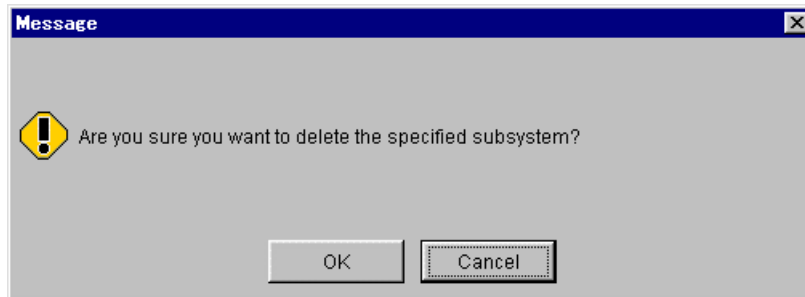
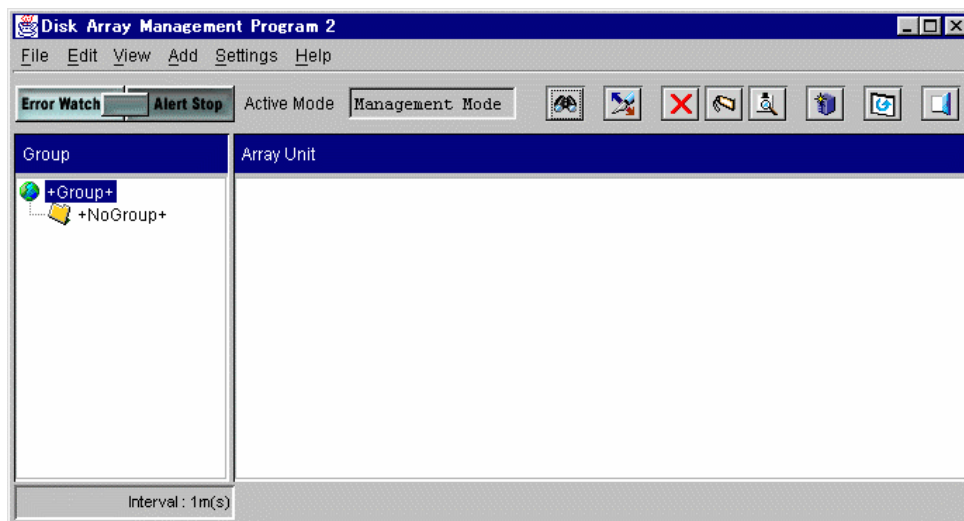


Figure 3.13 Changing the Registration Contents

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




The Main screen is updated and then displayed.



3.1.4.4 Displaying the Registration Contents

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

1. Click the icon of an array unit on the Main screen. On the View menu, select **Properties** or click : **Properties** in the tool bar.

This operation can also be completed from the context menu of the disk array subsystem icon.

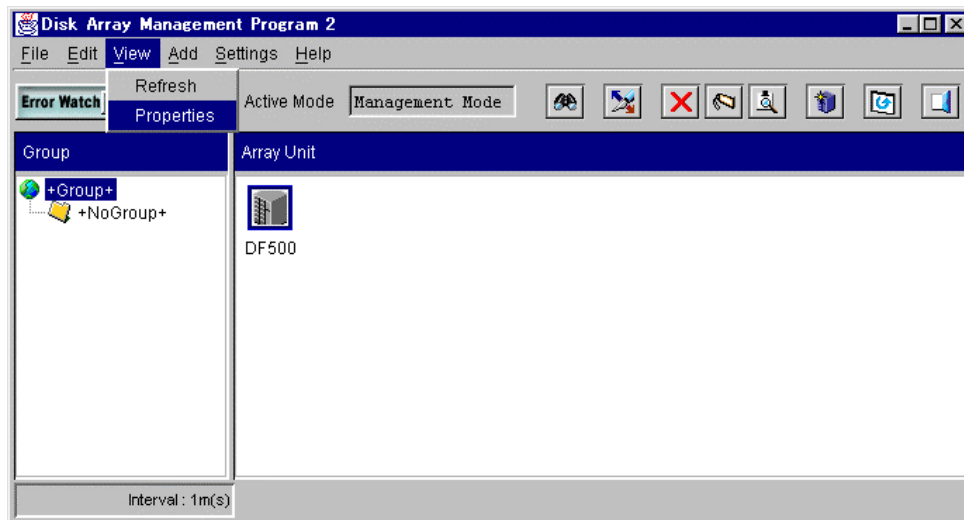
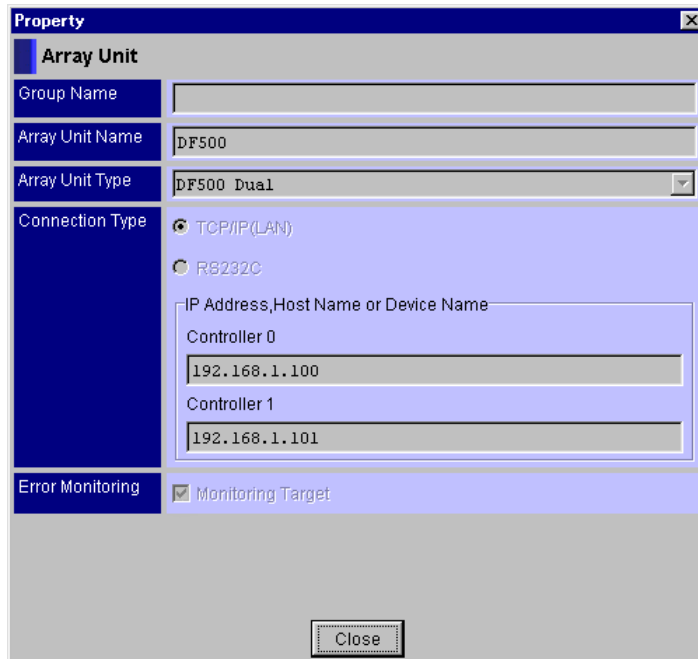


Figure 3.14 Displaying the Registration Contents

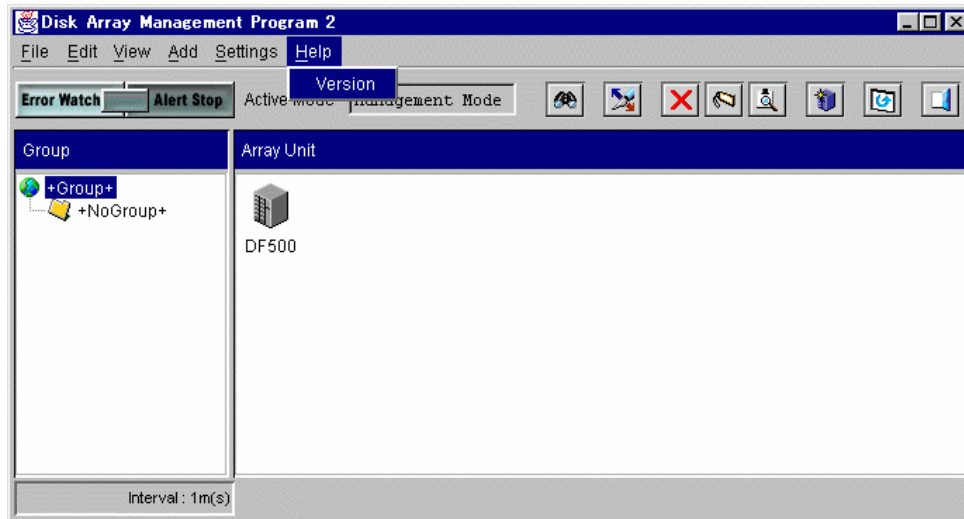
The registration contents of the array unit are displayed.



3.1.5 Version Display

Display the version of the Resource Manager 9200.

1. On the Help menu, select **Version**.



The version of the Resource Manager 9200 is displayed.

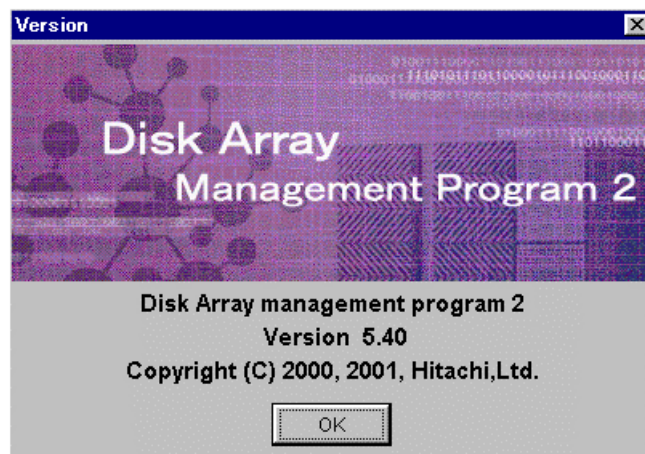



Figure 3.15 Version Display

3.1.6 Terminating

Terminate the Resource Manager 9200. When the Unit screen is open, close it and terminate the Resource Manager 9200.

1. Click the icon of an array unit on the Main screen. On the **File** menu, select **Exit** or click : **Exit** in the tool bar.

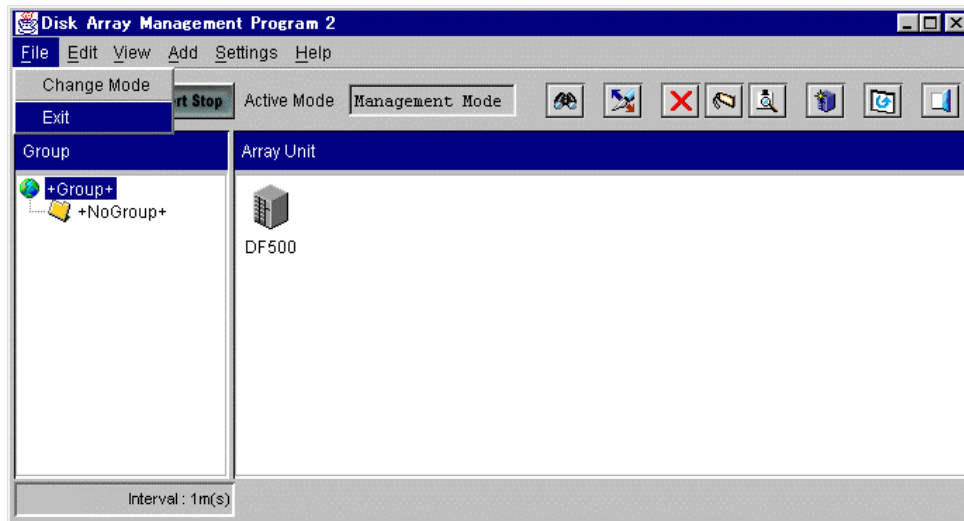


Figure 3.16 Terminating Resource Manager 9200

The Main screen is closed and Resource Manager 9200 is terminated.
When you run with Windows, close the prompt screen.

3.1.7 Restart an Array Unit

To restart the array unit:

1. Click the icon of an array unit on the Main screen. On the **Settings** menu, select **Reboot**.

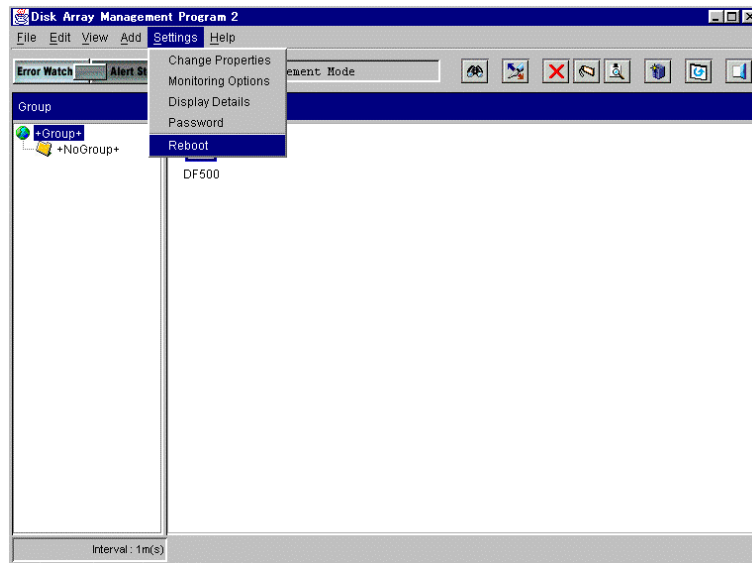
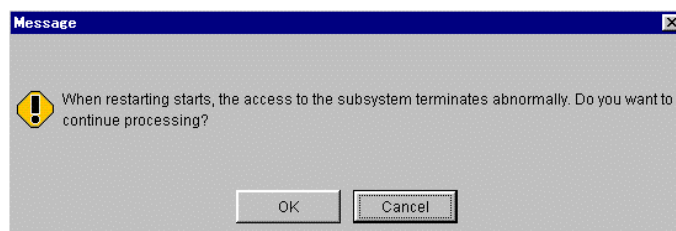
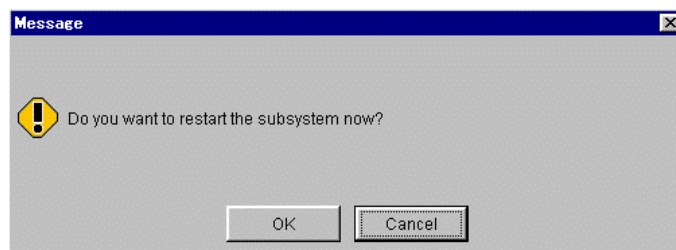
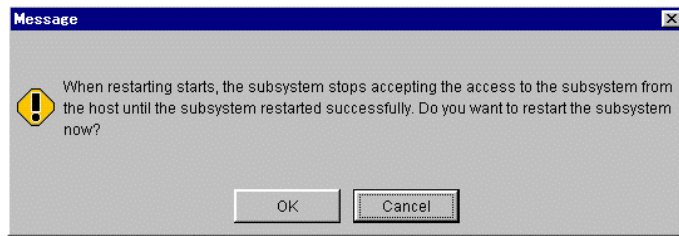


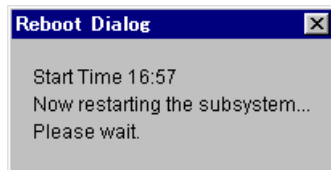
Figure 3.17 Restarting an Array Unit

2. A confirmation message is displayed. Click the OK button when restarting.



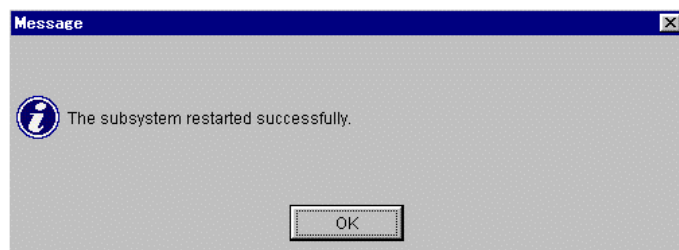


When restarting an array unit, the restart time is displayed. Restarting takes approximately two to six minutes.



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

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

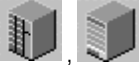









3.2 Properties of the Main Screen and Unit Screen

3.2.1 Displaying the Property of the Main Screen


Display the array unit status and information by using icons.

Array Unit Status

 ,  Gray	<ul style="list-style-type: none">• Initial Main screen when starting Resource Manager 9200.• Out of error monitoring.
 ,  Gray + Blue	<ul style="list-style-type: none">• Normal
 ,  Gray + Yellow	<ul style="list-style-type: none">• Warning
 ,  Red	<ul style="list-style-type: none">• Array unit is system down.• Array unit is power off.• Error in communication with an array unit.

3.2.2 Displaying the Properties of the Unit Screen

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

1. On the Settings menu, select **Display Details** and click the **Component Status** tab.
Alternatively, click : **Display Details** in the tool bar and click the **Component Status** tab.

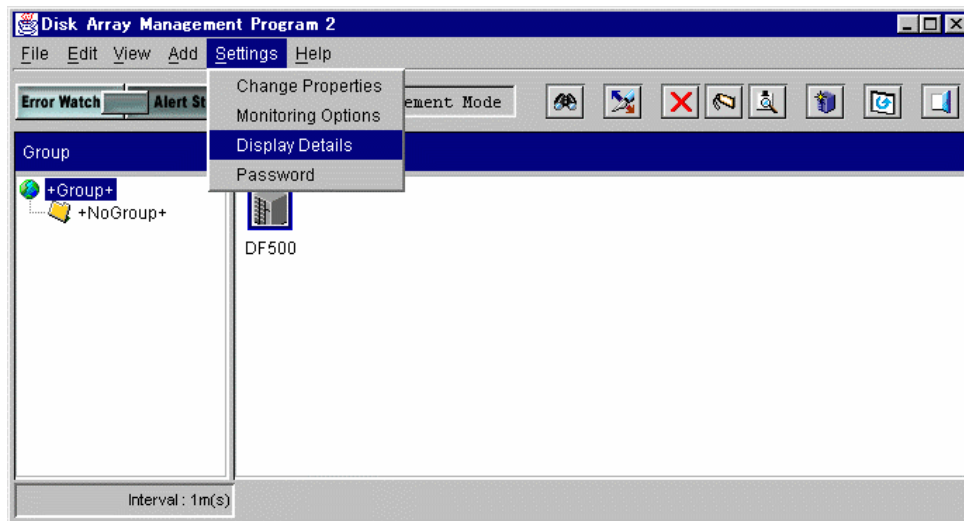



Figure 3.18 Displaying the Properties of the Unit Screen

2. Display the array unit component status.
To update the component display, on the View menu, select **Refresh** or click : **Refresh** in the tool bar.

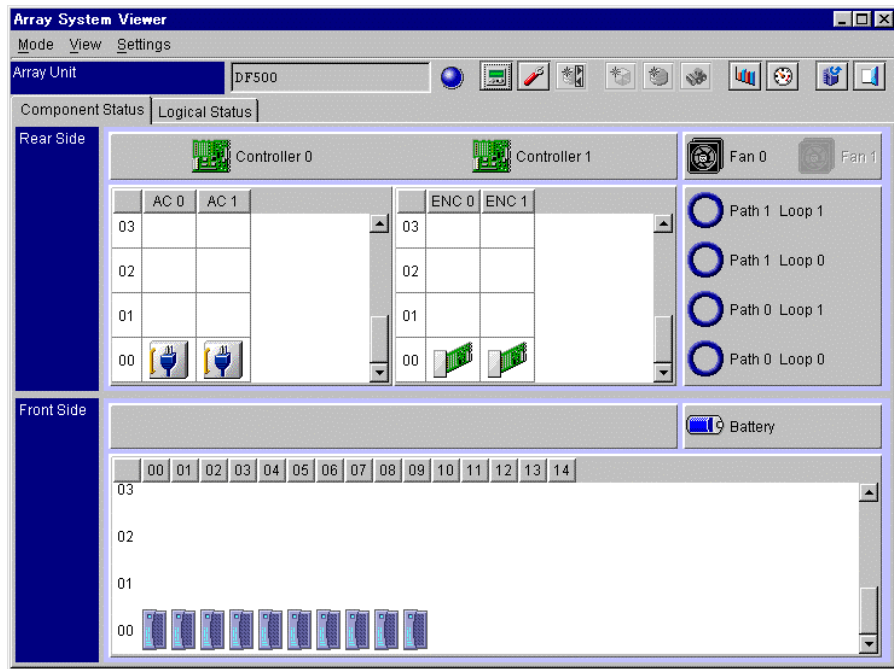


Figure 3.19 Display when Both controllers are Connected in the Dual System

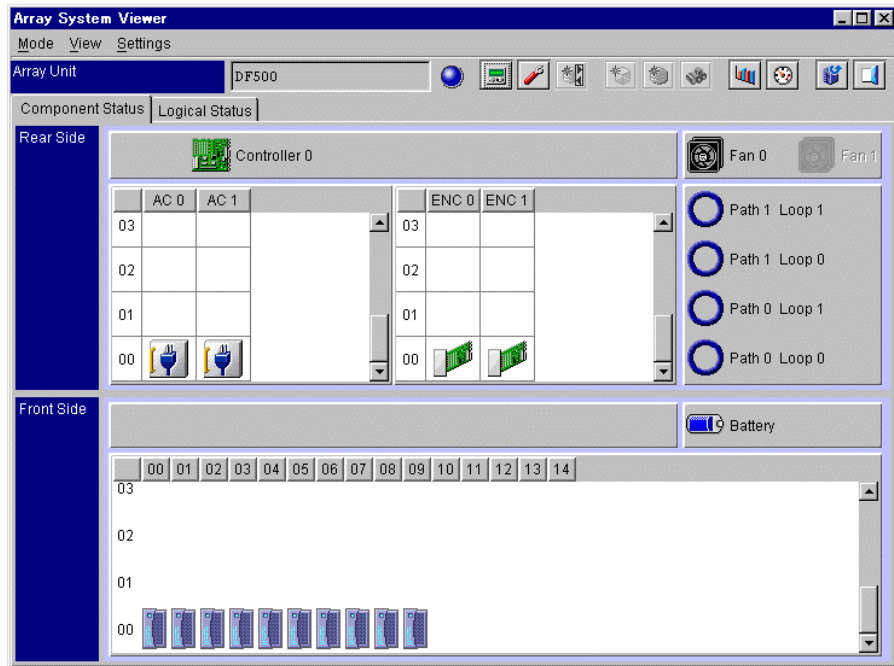















Figure 3.20 Display when a Single Controller is Connected in the Dual System











The controller icon represents only the connected controller side.

3. Display the array unit component status by using icons.



Data Drive

Display	Highlighting	Status
 Purple		<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. Disk Drive is blocked.
 Gray		<ul style="list-style-type: none"> RAID group defined, LU not defined LU defined, unformatted
 Red + Black		<ul style="list-style-type: none"> Not mounted in the blockade status
 Purple + Black		<ul style="list-style-type: none"> RAID group defined, Drive not mounted
 Gray	—	<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




Data Drive

Display	Highlighting	Status
 Purple		<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
 Purple + Black		<ul style="list-style-type: none"> Waiting
 Red		<ul style="list-style-type: none"> Busy or Disk Drive Detached for Restoring
 Red + Black		<ul style="list-style-type: none"> Spare disk not mounted though Use of Spare Disk is set as array unit



Enclosure

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



Controller

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



Battery

Display	Status
 Blue	<ul style="list-style-type: none">• Normal
 Red	<ul style="list-style-type: none">• Failure



Fan

Display	Status
 Black	<ul style="list-style-type: none">• Normal
 Red	<ul style="list-style-type: none">• Failure

Power supply

Display	Status
 Blue	<ul style="list-style-type: none">• Normal
 Red	<ul style="list-style-type: none">• Failure

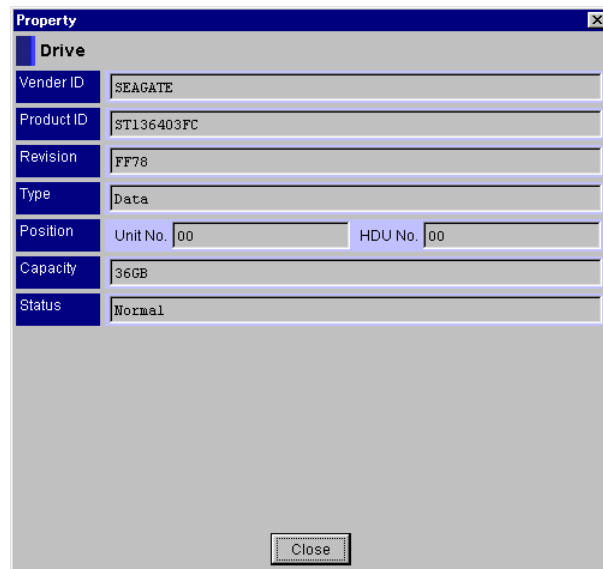
Loop

Display	Status
 Blue	• Normal
 Red	• Failure

4. When you double-click each icon, the property screen of the component part is displayed.

For information on data drives and spare drives, click their respective icons. For other components of an array unit, the following information is displayed.

a) Data Drive and Spare Drive



Property

Drive

Vendor ID: SEAGATE

Product ID: ST136403FC

Revision: FF78

Type: Data

Position: Unit No. 00 HDU No. 00

Capacity: 36GB

Status: Normal

Close

Figure 3.21 Data Drive and Spare Drive

- **Vendor ID:** Vendor ID of drive
- **Product ID:** Product ID of drive
- **Revision:** Firmware revision of drive
- **Type:** Drive using form
 - Data:** Data drive
 - Spare:** Spare drive
- **Position:** Array unit mounting position
 - Unit No.:** Unit No.
 - HDU No.:** HDU No.
- **Capacity:** Storage capacity of a drive

- **Status:** 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.

Recovery: Under recovery (correction copy or copyback in progress)

UnitX HDUY: Position of a corresponding data drive when using spare disk drives.

Waiting: Spare drive not used

Note: **Vendor ID**, **Product ID**, and **Revision** may not be displayed depending on the drive mounting and drive status.

- b) Enclosure

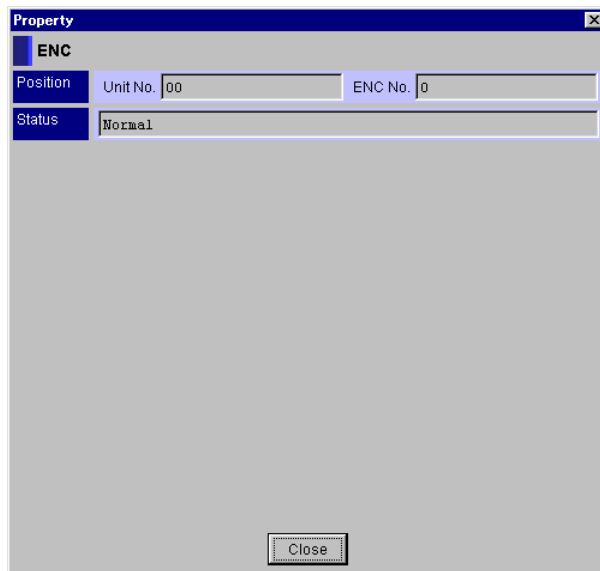


Figure 3.22 Enclosure

- **Position:** Mounting position of an enclosure

Unit No.: Unit No.

ENC No.: ENC No.

- **Status:** Status

Normal: Normal

Alarm: Failure

c) Controller

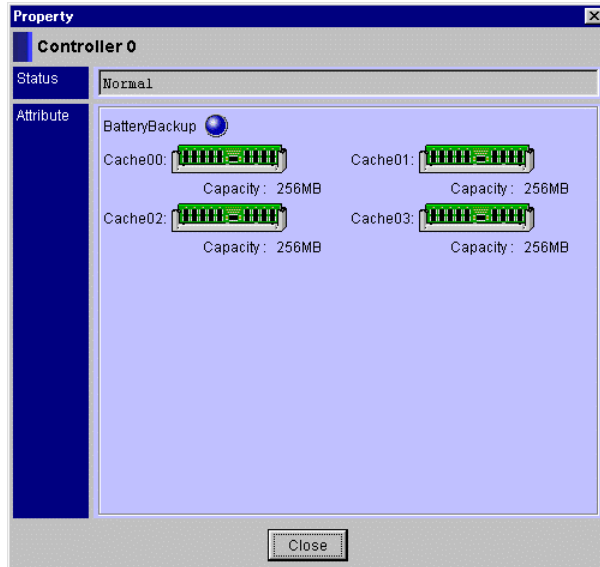




Figure 3.23 Controller



Controller n: Controller n (n: Controller No.)

- **Status:** Status
 - Normal:** Normal
 - Alarm:** Failure
 - Nothing:** Not installed
- **Attribute:** Status of battery backup circuit. Capacity and status of cache memory.
 - BatteryBackup (Blue):** Normal
 - BatteryBackup (Red):** Failure

Battery Backup Circuit

Display	Status
 Blue	• Normal
 Yellow	• Failure

Cache Memory

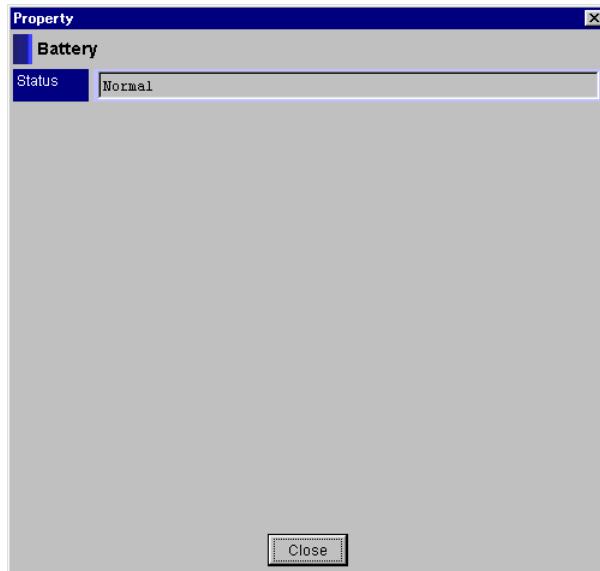
Display	Status
 Blue	• Normal
 Red	• Failure

d) Fan

The screenshot shows a 'Property' dialog box with a title bar containing a close button. The dialog has a tab labeled 'Fan'. Below the tab, there are two sections: 'Position' and 'Status'. The 'Position' section has a label 'Fan No.' followed by a text input field containing the value '0'. The 'Status' section has a label 'Status' followed by a text input field containing the value 'Normal'. At the bottom right of the dialog, there is a 'Close' button.

- **Position:** Mounting position
Fan No.: Fan No.
- **Status:** Status
Normal: Normal
Alarm: Failure
Nothing: Not installed

e) Battery



- **Status:** Status
Normal: Normal
Alarm: Failure
Nothing: Not installed

f) AC power supply

The screenshot shows a 'Property' dialog box with a title bar containing a close button. The dialog has a tab labeled 'AC Power Supply'. Below the tab, there are two sections: 'Position' and 'Status'. The 'Position' section contains two text input fields: 'Unit No.' with the value '00' and 'AC No.' with the value '0'. The 'Status' section contains a text input field with the value 'Normal'. At the bottom center of the dialog is a 'Close' button.

Property
AC Power Supply
Position
Unit No. 00 AC No. 0
Status
Normal
Close

- **Position:** Mounting position
Unit No.: Unit No.
AC No.: AC No.
- **Status:** Status
Normal: Normal
Alarm: Failure
Nothing: Not installed



g) Loop

The screenshot shows a 'Property' dialog box with a title bar containing a close button. The dialog has a tabbed interface with the 'Loop' tab selected. Below the tabs, there are two sections: 'Position' and 'Status'. The 'Position' section contains two text input fields: 'Path No.' with the value '0' and 'Loop No.' with the value '0'. The 'Status' section contains a text input field with the value 'Normal'. At the bottom center of the dialog is a 'Close' button.









- **Position:** Mounting position
Path No.: Path No.
Loop No.: Loop No.
- **Status:** Status
Normal: Normal
Alarm: Failure
Nothing: Not installed

Icon and Property of Logical Unit

RAID Group

Display	Highlighting	Status
 Blue		<ul style="list-style-type: none">• Normal

Logical unit

Display	Highlighting	Status
 Yellow		<ul style="list-style-type: none">• Normal (formatted logical unit.)
 Gray		<ul style="list-style-type: none">• Normal (unformatted logical unit.)
 Red		<ul style="list-style-type: none">• Blockade
 Pink		<ul style="list-style-type: none">• Regression

a) RAID Group

Property	
RAID Group	
RAID Group	00
RAID Level	RAID 5
HDU Combination	4D+1P
HDU Starting Point	Unit No. 00 HDU No. 00
Size (Number of Drives)	HDUs in the Parity Group 05
	Parity Groups 01
Close	

- **RAID Group:** RAID group No.
- **RAID Level:** RAID level
- **HDU Combination:** Parity group configuration
- **HDU Starting Point:** Unit No. and HDU No. defined for the top HDU in a RAID group.
- **Size (Number of Drives):** Number of HDUs in parity groups and number of parity groups.

b) Logical Unit

Property

Logical Unit

Logical Unit No. 000

Status Normal

Controller

Default: ☒ Controller 0 ☐ Controller 1

Current: ☒ Controller 0 ☐ Controller 1

Size 128000 Block(s)(1-277628928)

1Block 277628928Block(s)

RAID Group 00

Close

- **Logical Unit No.:** Logical unit No.
- **Status:** Status
 - Normal:** Normal
 - Unformat:** Normal (unformatted)
 - Alarm:** Blockade
 - Regression:** Regression
- **Controller:** Controller No. in charge of the default/current LU
- **Size:** Capacity in which the logical unit is defined

Note: When the value is expressed in Mbytes, one Mbyte is added per 2,048 blocks. A fraction less than 2,048 blocks is omitted.

0001 – 2,047 blocks = 0 MB
 2,048 – 4,095 blocks = 1 MB
 4,096 – 6,143 blocks = 2 MB

- **RAID Group:** RAID group number in which logical units are defined

3.2.3 Displaying the Array Unit Configuration Information

Display the array unit configuration information.

1. Click the icon of an array unit on the Unit screen. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.

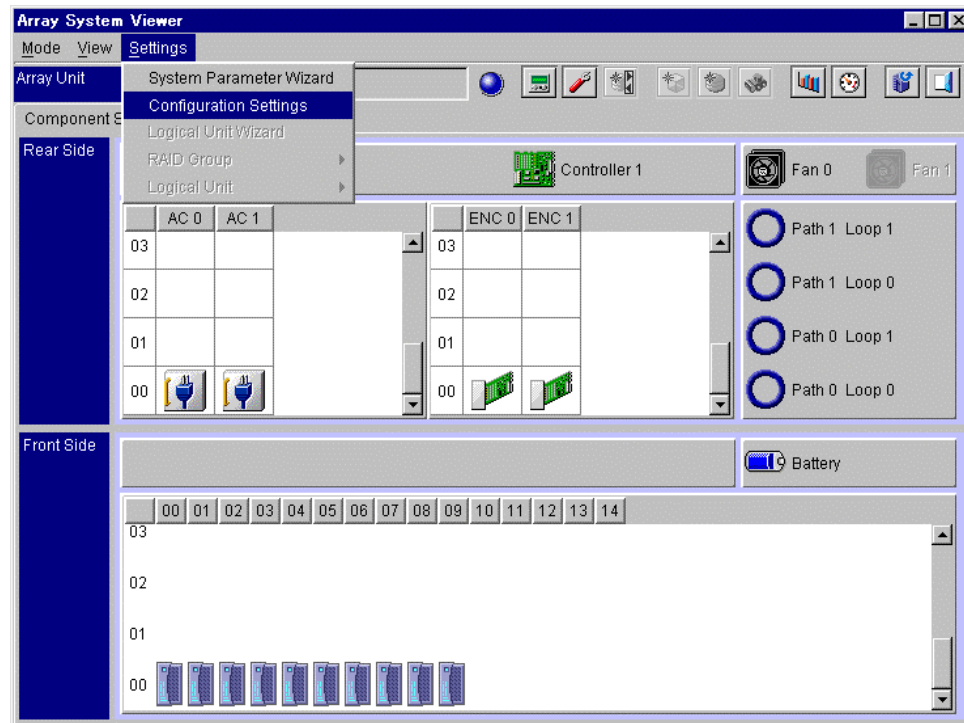


Figure 3.24 Displaying the Array Unit Configuration Information

2. Click the **LAN** tab.

The **IP Address** and **Subnet Mask** of the LAN configuration information validated in the array unit are displayed.

The screenshot shows a 'Parameter' window with a tabbed interface. The 'LAN' tab is selected. At the top, there is a field for 'Array Unit' set to 'DF500'. Below this are several tabs: 'Restore Options', 'Online Verify', 'Constitute', 'Fibre Channel', 'Spare Drive', 'Options', and 'Micro Update'. The 'LAN' tab is active, showing configuration for two controllers. Each controller has a 'DHCP' section with a checkbox (currently unchecked) and a 'Network' section with fields for 'IP Address', 'Subnet Mask', 'Default Gateway', and 'Ether Address'.

Controller 0		Controller 1	
DHCP	<input type="checkbox"/> ON	DHCP	<input type="checkbox"/> ON
Network	IP Address	192.168.1.100	192.168.1.101
	Subnet Mask	255.255.255.0	255.255.255.0
	Default Gateway	192.168.15.3	192.168.15.3
	Ether Address	00:00:87:70:FF:1A	00:00:87:F0:80:1C

At the bottom right, there is a checkbox for 'FD Backup' (checked), and 'Apply' and 'Reset' buttons. A 'Close' button is at the bottom center.

Figure 3.25 IP Address and Subnet Mask of the LAN Configuration Information

3.2.4 Displaying the Information Message

To display the **Information Message** dialog box:

1. Click a patrol lamp icon in the Unit Screen.

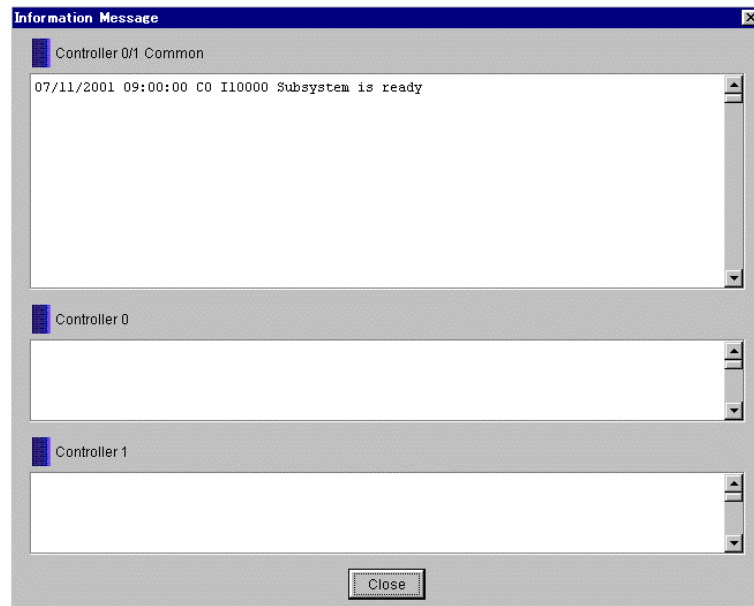


Figure 3.26 Displaying the Information Message

- **Controller 0/1 Common:** After the array unit starts, the fault information and status information are displayed in the Controller 0/1 Common box.
- **Controller 0:** As the array unit starts, the fault information and status information are displayed in the box of Controller 0.
- **Controller 1:** As the array unit starts, the fault information and status information are displayed in the box of Controller 1.

Chapter 4 Definition of RAID Group/Logical Unit (GUI)

The Resource Manager 9200 Graphical User Interface (GUI) can be used to set, expand, and delete the RAID group. Additionally, the logical unit can be created, expanded, and deleted.

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

This chapter includes the following:

- Displaying the RAID Group/Logical Unit Definition
- Creating a RAID Group
- Deleting a Specified RAID Group
- Deleting All RAID Groups
- Constituting a Logical Unit
- Formatting a Logical Unit
- Expanding a Logical Unit
- Deleting the Last Logical Unit
- Deleting All Logical Units
- Changing the Default Controller in Charge of a Logical Unit
- Logical Unit Wizard

4.1 Displaying the RAID Group/Logical Unit Definition

1. Click the **Logical Status** tab on the Unit screen.

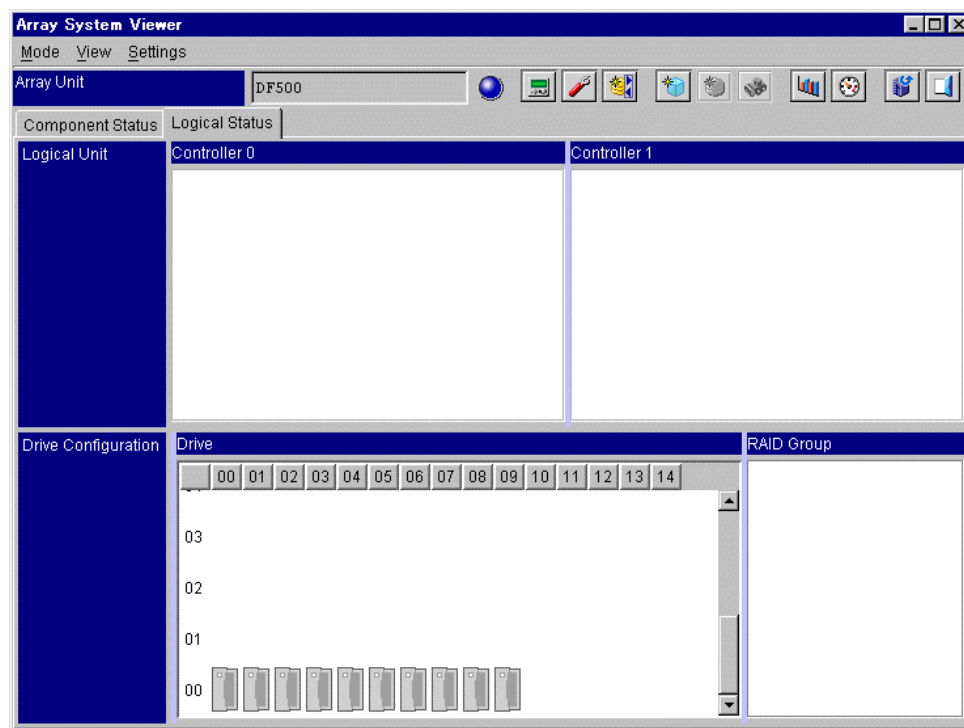


Figure 4.1 Displaying the Definition Information of All RAID Groups and All Logical Units

A screen appears which displays the definition information of all RAID groups and all logical units defined in the array unit.

- **Logical Unit:**

Controller 0: Displays the logical unit number (xxx) of logical units under control of Controller 0, the RAID levels of RAID groups for which logical units have been defined, and the status of logical units.

Controller 1: Displays the logical unit number (xxx) of logical units under control of Controller 1, the RAID levels of RAID groups for which logical units have been defined, and the status of logical units.

- **Drive Configuration:**

Drive: The status of disk drives mounted in an array unit is displayed.

RAID Group: Information about all RAID groups defined for an array unit is displayed.

The following screen displays information related to the RAID groups and drives for which logical units have been defined.

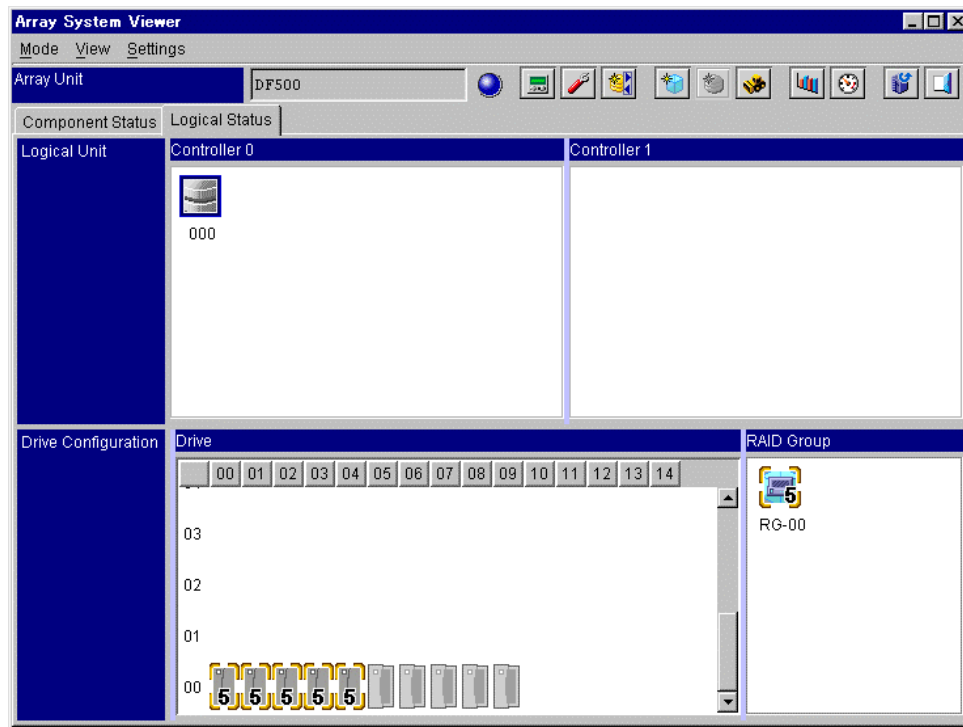


Figure 4.2 Displaying RAID Group and Drive Information for Defined Logical Units

Click the icon of a logical unit displayed in the **Controller Unit** box to display the following information.

- **RAID Group Unit:** Display, by highlighting, the RAID level in the icon of a drive for which logical units have been defined.
- **Drive Configuration:** Display, by highlighting in light blue, the RAID group for which the logical unit has been defined.

The following screen displays information for logical units and drives with defined RAID groups.

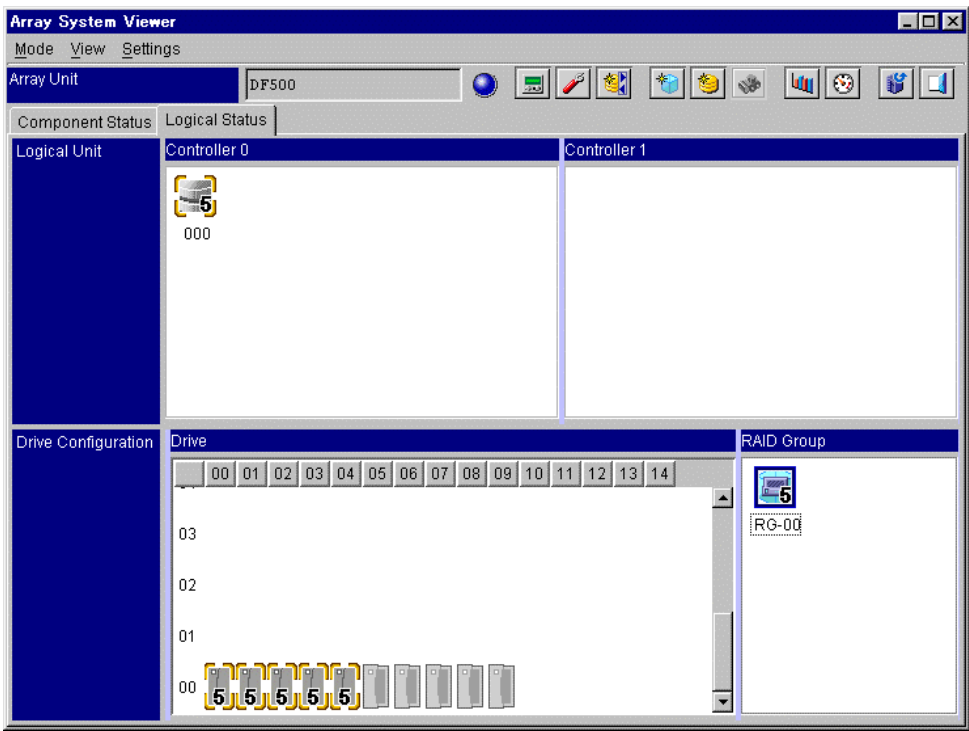


Figure 4.3 Displaying Logical Unit and Drive Information for Defined RAID Groups

Click the icon of a logical unit displayed in the **RAID Group** box to display the following information.

- **Controller Unit:** Displays, by highlighting, all logical units.
- **Drive Configuration:** Displays, by highlighting, a RAID level in the icon of the drives for which the RAID group has been defined.

4.2 Creating a RAID Group

To create a new RAID group:

1. Click the **Logical Status** tab on the Unit screen.
2. Click the top drive of a selected RAID group. The drive that is clicked is displayed.

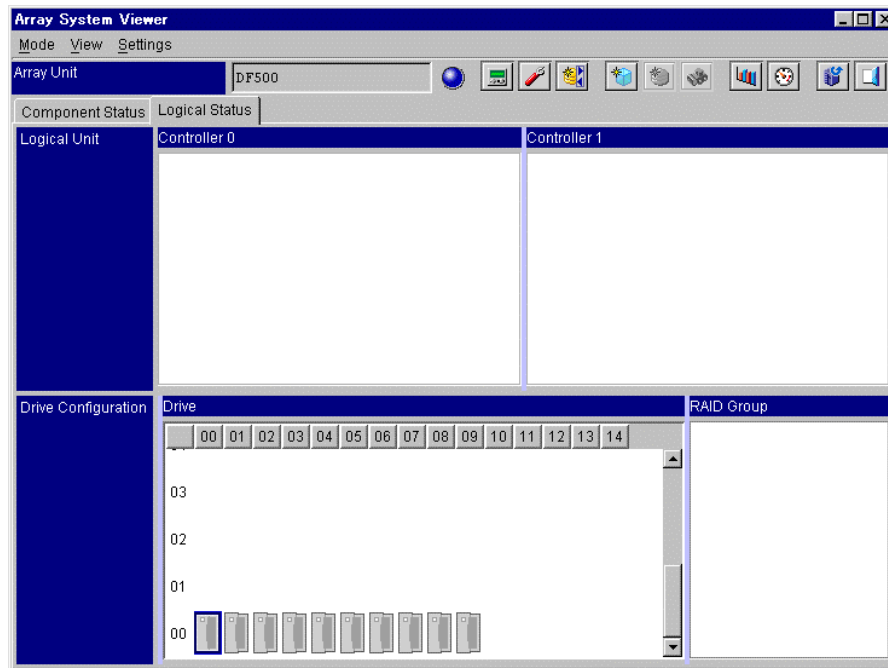
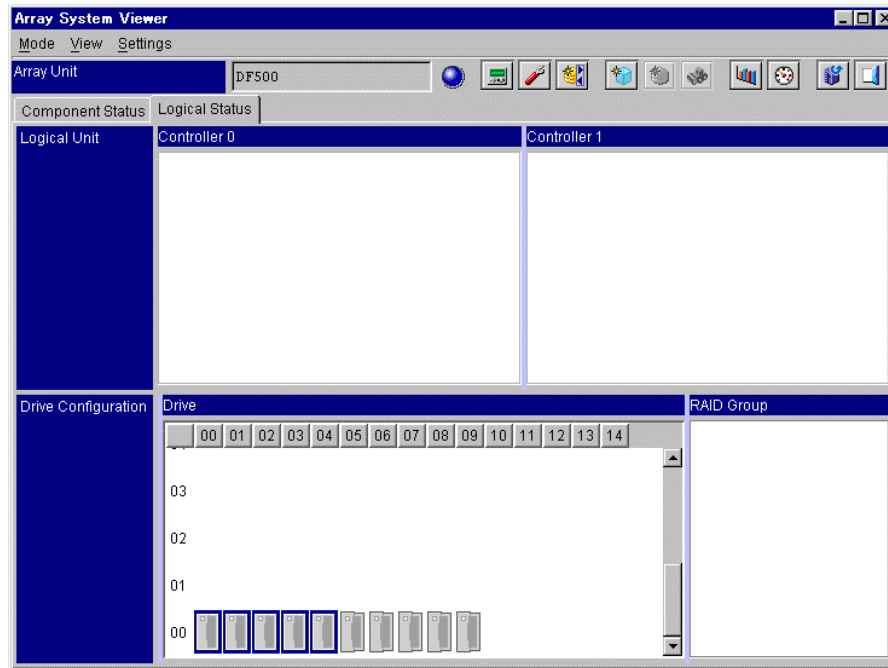



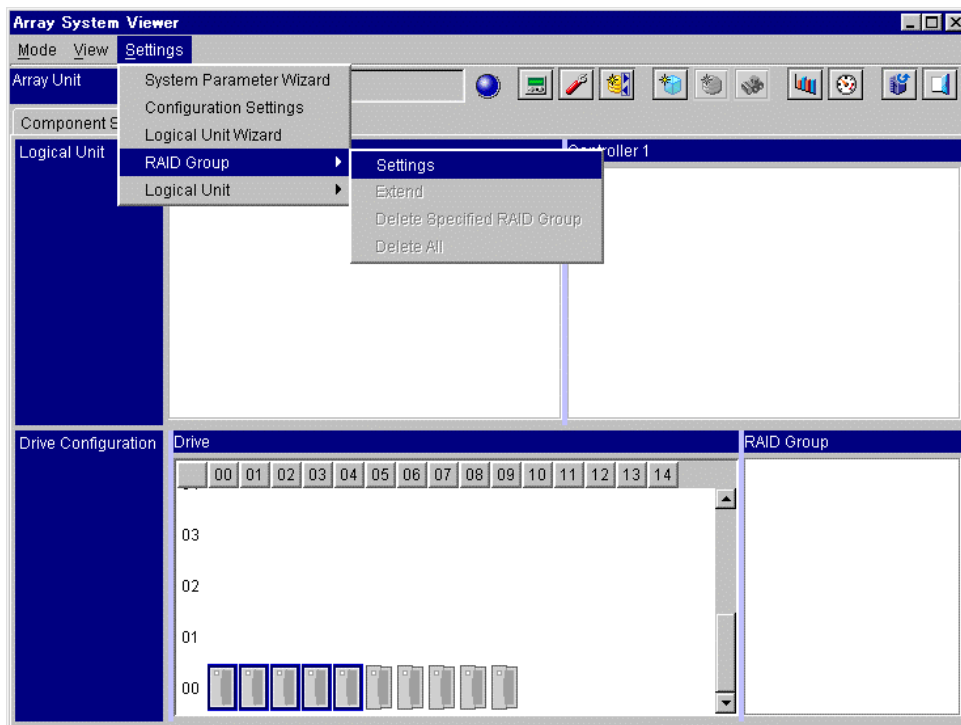
Figure 4.4 Creating a RAID Group

3. Holding down the **shift** key and click the last drive of a RAID group to be created. Drives of the RAID group to be created are enclosed by a rectangular box.



4. On the Settings menu, select **RAID Group**, then click **Settings**. Alternatively, click : **RAID Group Settings** in the tool bar.

This operation can also be completed from the context menu of the **RAID Group** box.



5. Select a RAID level and click the **OK** button.

The screenshot shows a 'Property' dialog box with a 'RAID Group' tab. The dialog contains the following fields and controls:

Field	Value
RAID Group	00
RAID Level	RAID 5
HDU Combination	Manual
HDU Starting Point	Unit No. 00 HDU No. 00
Size (Number of Drives)	HDUs in the Parity Group: 05 Parity Groups: 01

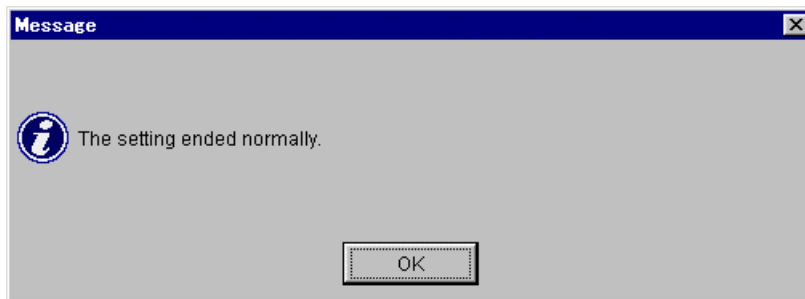
At the bottom of the dialog are 'OK' and 'Cancel' buttons.

In **RAID Level**, the RAID level to be added is set.

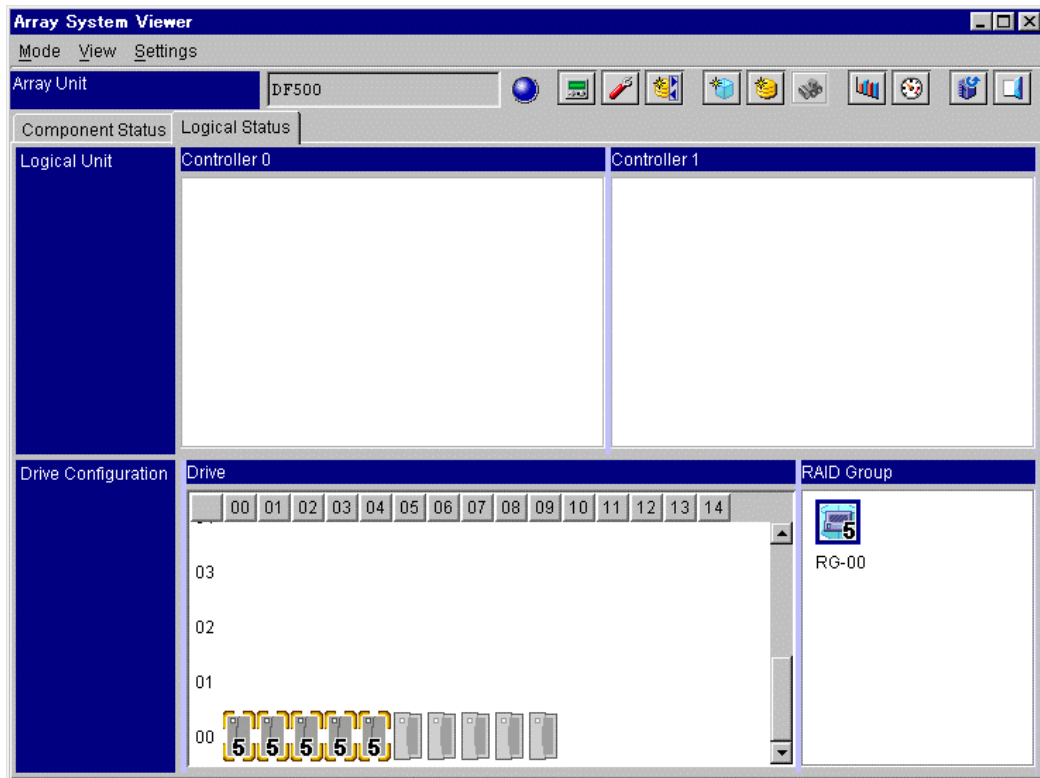
In **HDU Configuration**, RAID level configuration to be added is set.

If you select an option other than **Manual** as HDU Configuration, the size is automatically set to match the specified level. If you specify any size optionally, select **Manual** from the configuration window.

6. A message appears, stating that the setting is complete. Click the **OK** button.



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



4.3 Expanding a RAID Group

To expand a set RAID group:

1. Click the **Logical Status** tab on the Unit screen.
2. Click the icon of a RAID group on the Unit screen. On the Settings menu, select **RAID Group** and click **Extend**.

This operation can be completed from the context menu of the RAID group icon.

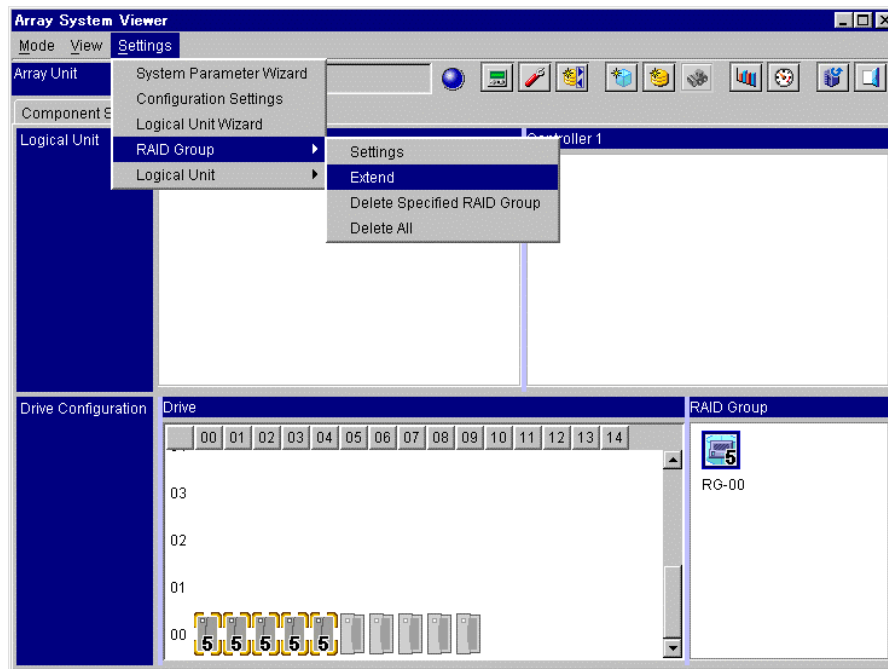


Figure 4.5 Expanding a RAID Group

3. A RAID Group can be expanded by incrementing the number of Parity Groups. Specify the number of parity group after expansion, and then click the **OK** button.

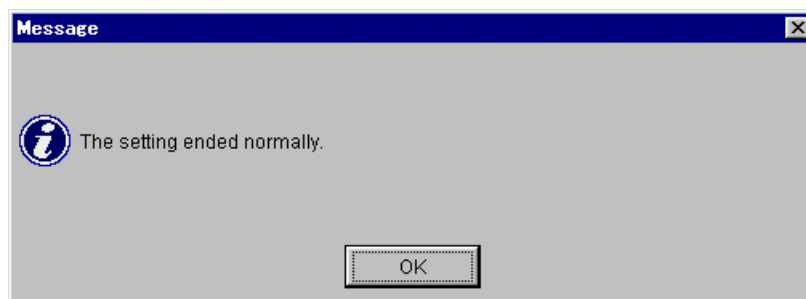


The image shows a 'Property' dialog box with a 'RAID Group' tab selected. The dialog contains several fields for configuring a RAID group. The 'RAID Group' field is set to '00'. The 'RAID Level' is set to 'RAID 5'. The 'HDU Combination' is set to '4D+1P'. The 'HDU Starting Point' shows 'Unit No.' as '00' and 'HDU No.' as '00'. The 'Size (Number of Drives)' section has 'HDUs in the Parity Group' set to '05' and 'Parity Groups' set to '01'. At the bottom are 'OK' and 'Cancel' buttons.

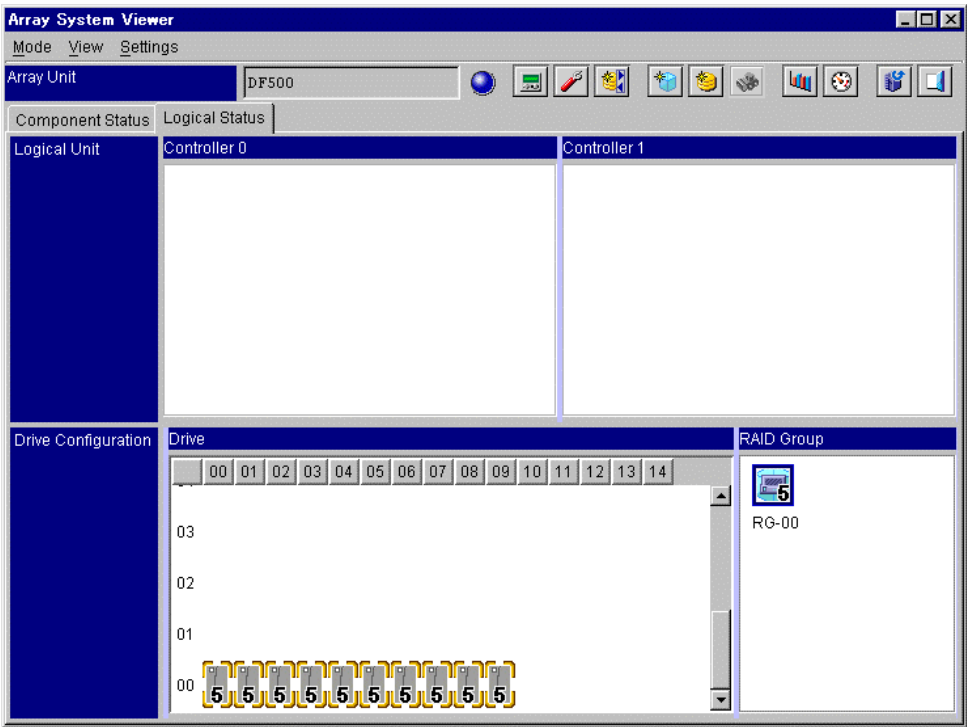
RAID Group	00	
RAID Level	RAID 5	
HDU Combination	4D+1P	
HDU Starting Point	Unit No. 00	HDU No. 00
Size (Number of Drives)	HDUs in the Parity Group	05
	Parity Groups	01

In RAID Level, the RAID level of RAID group to be expanded is displayed. In HDU Starting Point, the position of the RAID group to be expanded is displayed.

4. A message indicating completion of setting is displayed. Click the **OK** button.



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



4.4 Deleting a Specified RAID Group

To delete a specified RAID group out of set RAID groups:

1. Click the **Logical Status** tab on the Unit screen.
2. Click the icon of a RAID group on the Unit screen. On the Settings menu, select **RAID Group** and click **Delete Specified RAID Group**.

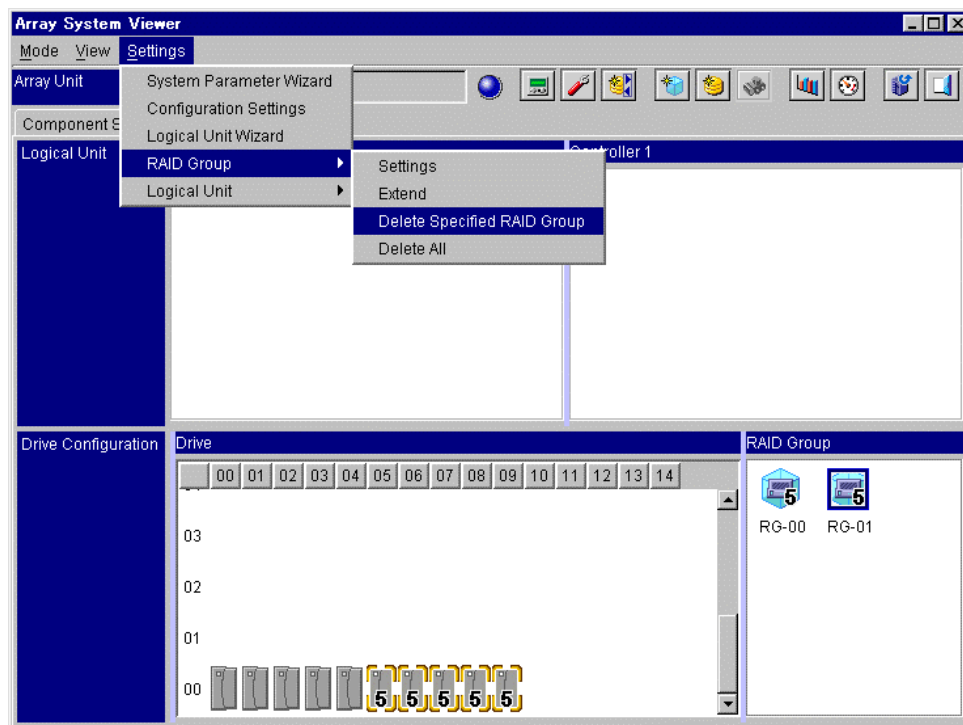
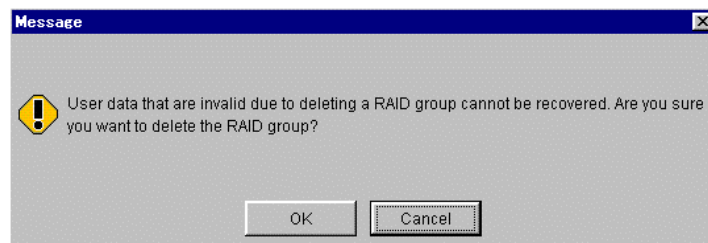
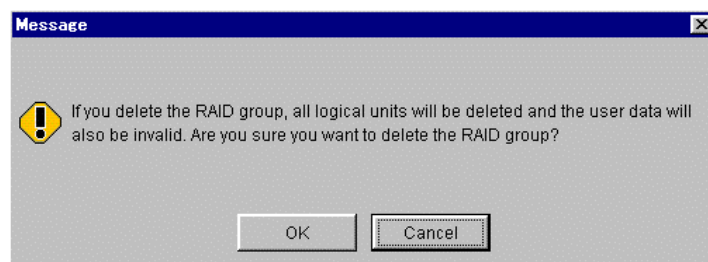
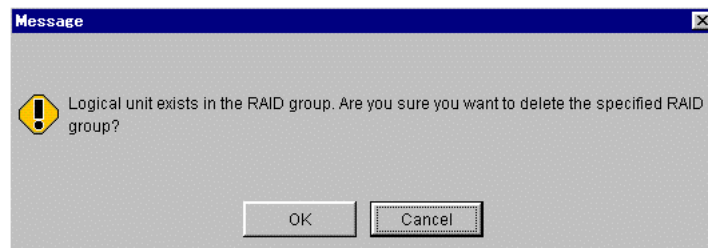


Figure 4.6 Deleting a Specified RAID Group

3. A message appears, requesting confirmation to delete the specified RAID group. Click the **OK** button.
 - a) When no Logical Unit Exists in the RAID Group:



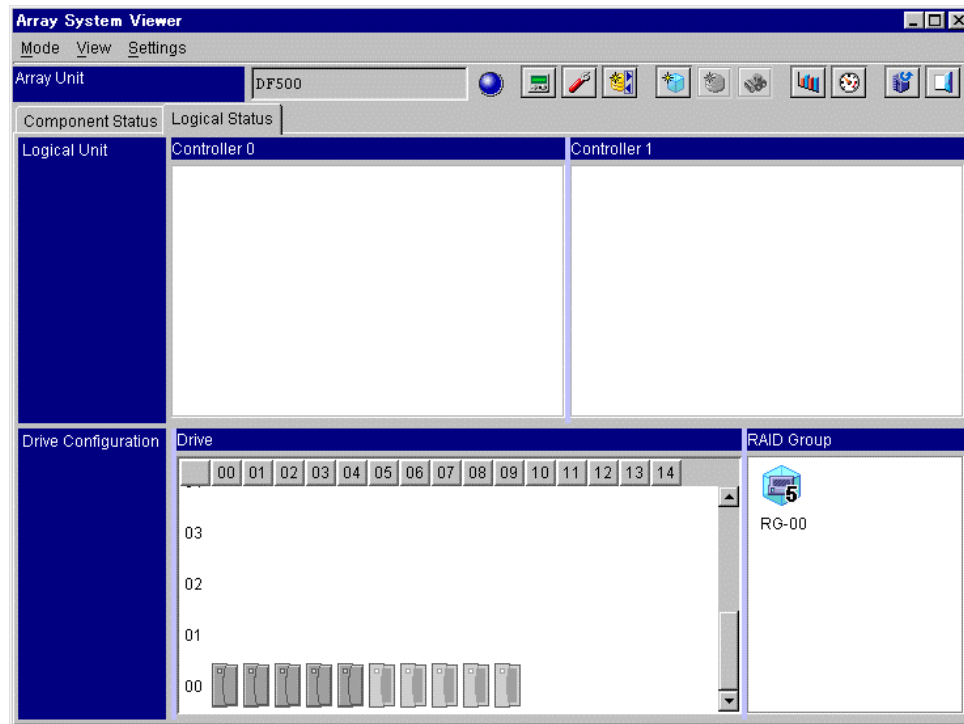
- b) When a Logical Unit Exists in the RAID Group



Note: If a logical unit is defined in the RAID group, all the user data will be invalidated by deleting the RAID group.

If a logical unit is defined in the specified RAID group, this RAID group cannot be deleted, depending on the disk array subsystem. To delete the specified RAID group, first delete all logical units in the specified RAID group, then delete the RAID group.

4. The expanded RAID group is updated and the following window is displayed.



4.5 Deleting All RAID Groups

To delete the entire RAID groups that are set:

1. Click the **Logical Status** tab on the Unit screen.
2. On the **Setting** menu, select **RAID Group** and click **Delete All**.

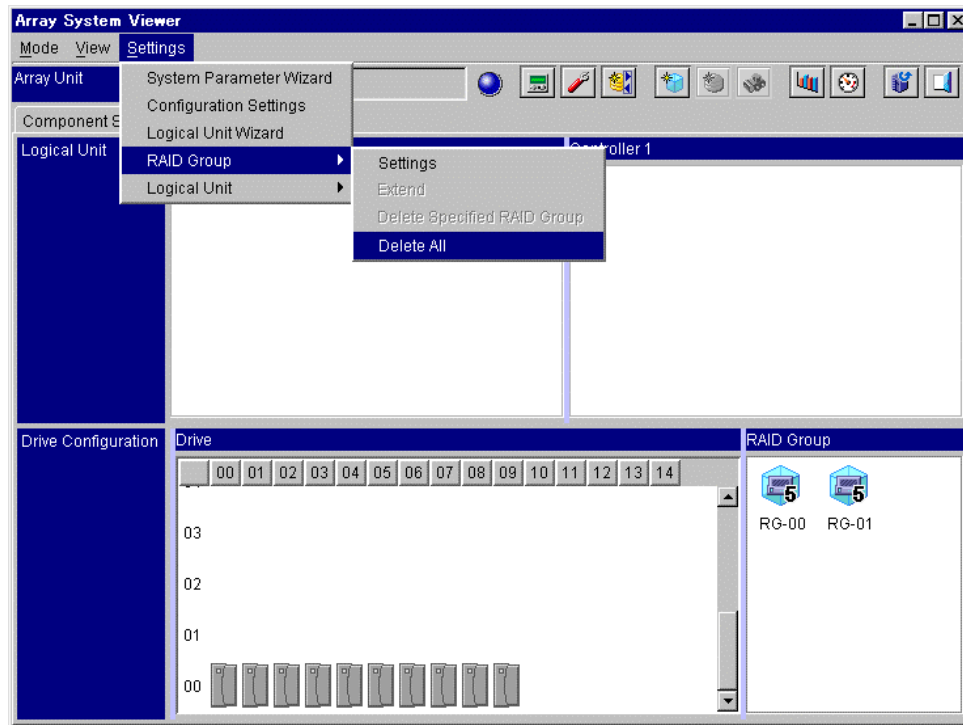
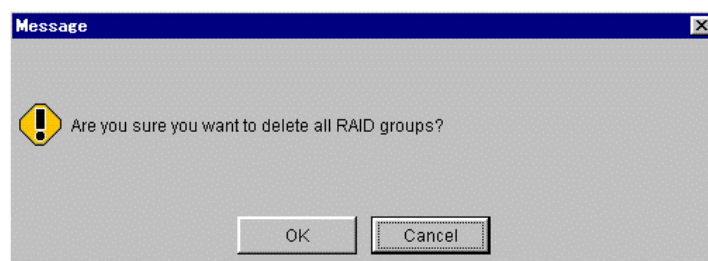
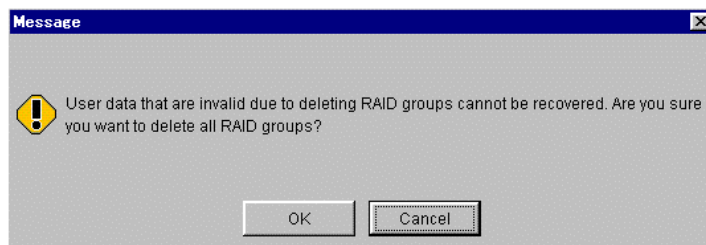
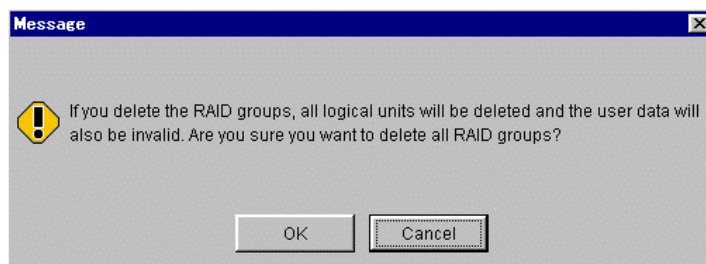
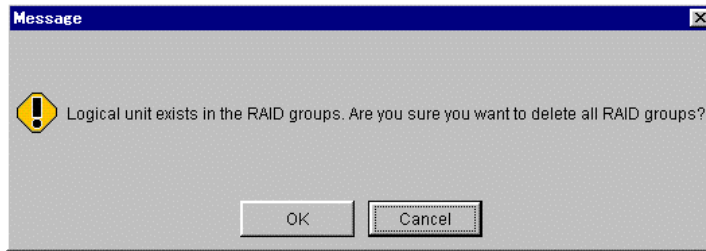


Figure 4.7 Deleting All RAID Groups

3. A message appears, requesting confirmation to delete all RAID groups. Click the **OK** button.
 - a) When there is no Logical Unit in the RAID group:

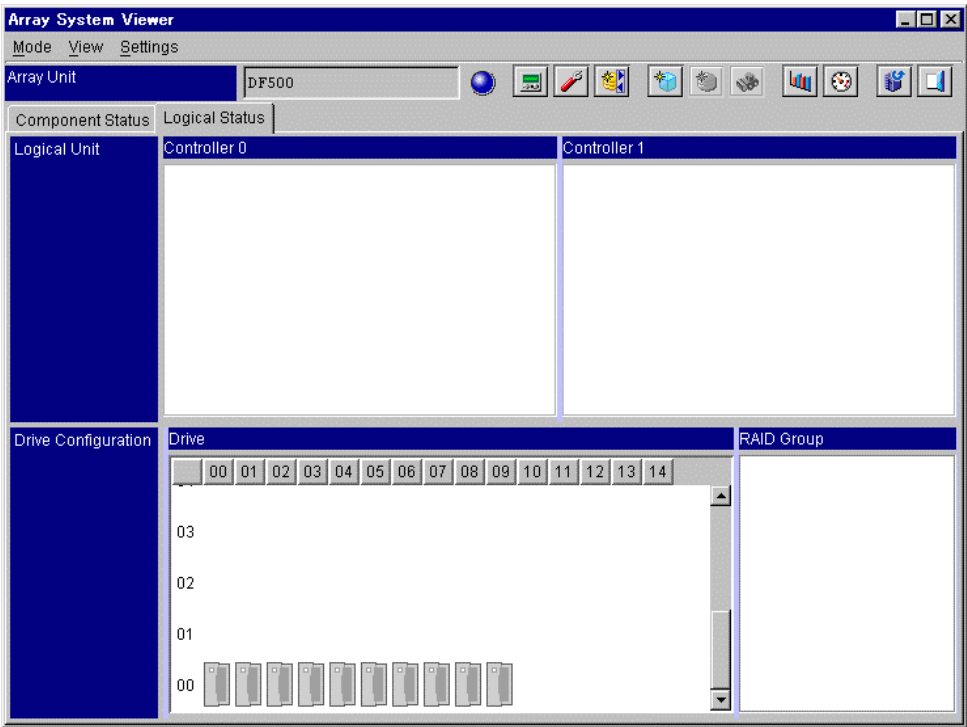


b) When there is a Logical Unit in the RAID group:




Note: If a logical unit is defined in the RAID group, all user data will be invalidated by deleting that RAID group.

The following updated window is displayed.



4.6 Constituting a Logical Unit

1. Click the **Logical Status** tab on the Unit screen.
2. Click the icon of a logical unit on the Unit screen. On the Settings menu, select **Logical Unit** and click **Settings**. Alternatively, click : **Logical Unit Settings** in the tool bar.

This operation can also be completed from the context menu of the Logical Unit box.

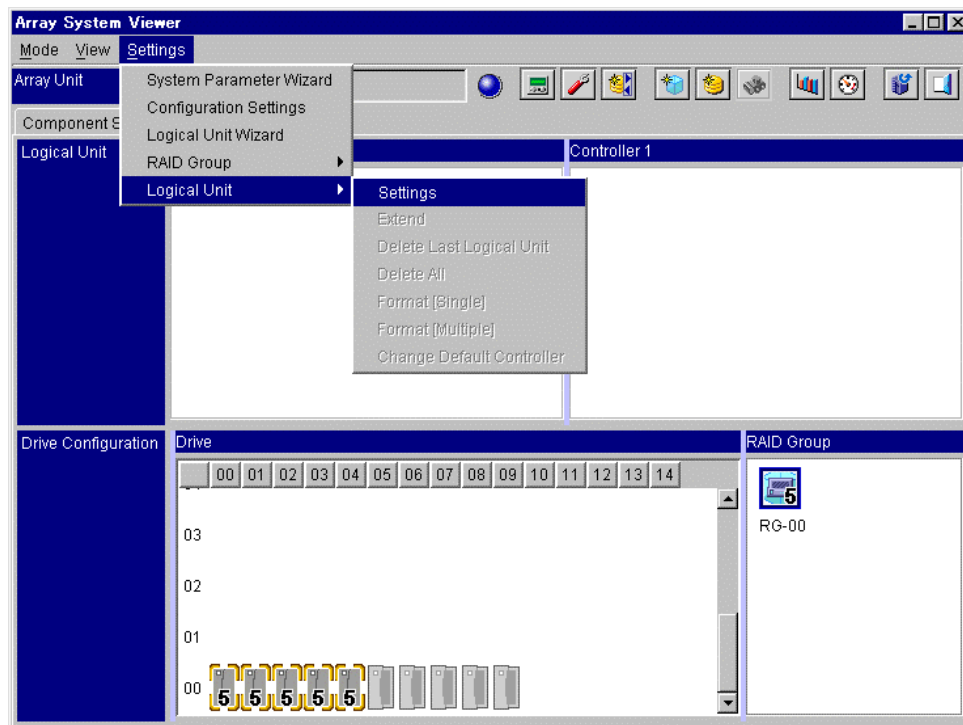


Figure 4.8 Constituting a Logical Unit

3. Select a controller in charge in **Controller** and input **Size**.

The screenshot shows a 'Property' dialog box for configuring a Logical Unit. The 'Logical Unit No.' is set to 000. The 'Controller' section has two sub-sections, 'Default' and 'Current', each with radio buttons for 'Controller 0' and 'Controller 1'. The 'Size' section has two options, 'Block' and 'MB', each with a text input field set to 0 and a corresponding range (e.g., 'Block(s)(1-278757376)' and 'MB(s)(1-136112)'). The 'RAID Group' is set to 00. The dialog has 'OK' and 'Cancel' buttons at the bottom.

A created logical unit number is displayed for the **Logical Unit No.** and RAID group number in which logical units are defined for the **RAID Group**. Additionally, a logical unit capacity that can be created is displayed.

- Specify Number of **Block** or **MB** Increased

To specify a value clearly, specify the allocation (number of blocks or MBs). When you allocate all the remaining capacity of the RAID group concerned, specify a capacity displayed on the screen.

Note: The relation between Mbytes and blocks is: 1 Mbyte = 2,048 blocks. A fraction less than 2,048 blocks is omitted.

Example: 2,048,000 blocks = 1,000 MB
2,049,024 blocks = 1,000 MB

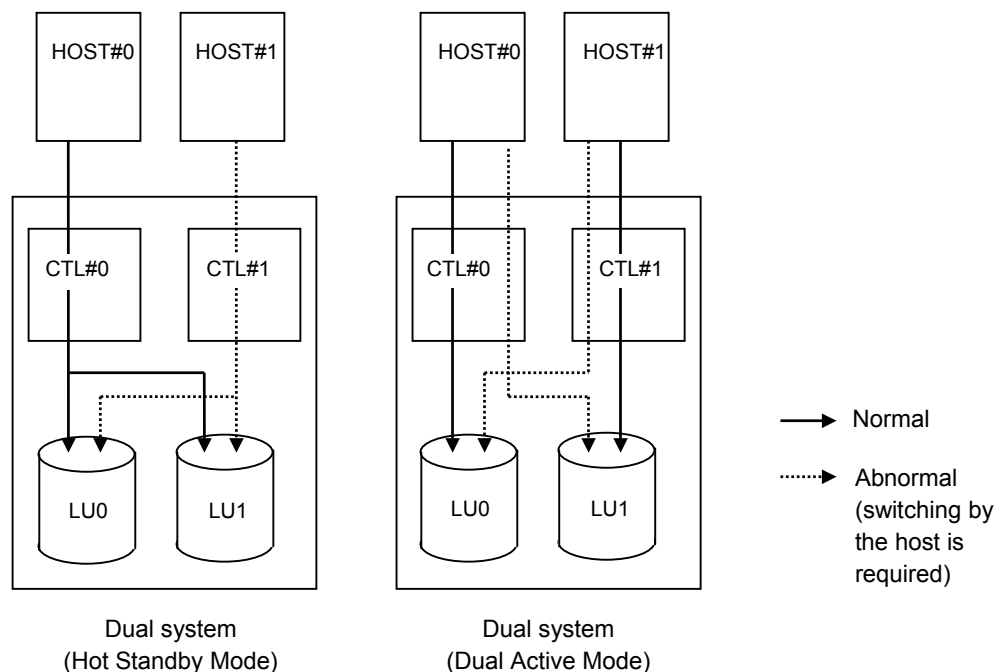
- Specify the **Controller No.**

Click the option button of **CTL#0** or **CTL#1** to select the controller in charge of the logical unit. (If you select the wrong controller, the logical unit can unexpectedly switch during operation. Performance quality may deteriorate as a result.)

This is necessary with a dual system connection. It is not displayed with a single system connection.

Note: When dual active mode is selected in the dual system, the controller in charge of a logical unit must be selected to set up the logical unit. Perform the logical unit setting, including the selection of the controller referred to in the following diagram. When you change a controller in charge of the logical unit, refer to "Changing the Default Controller in Charge of a Logical Unit" in this chapter.

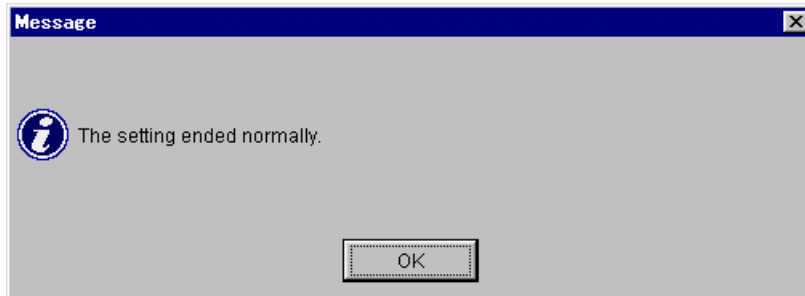
Example:



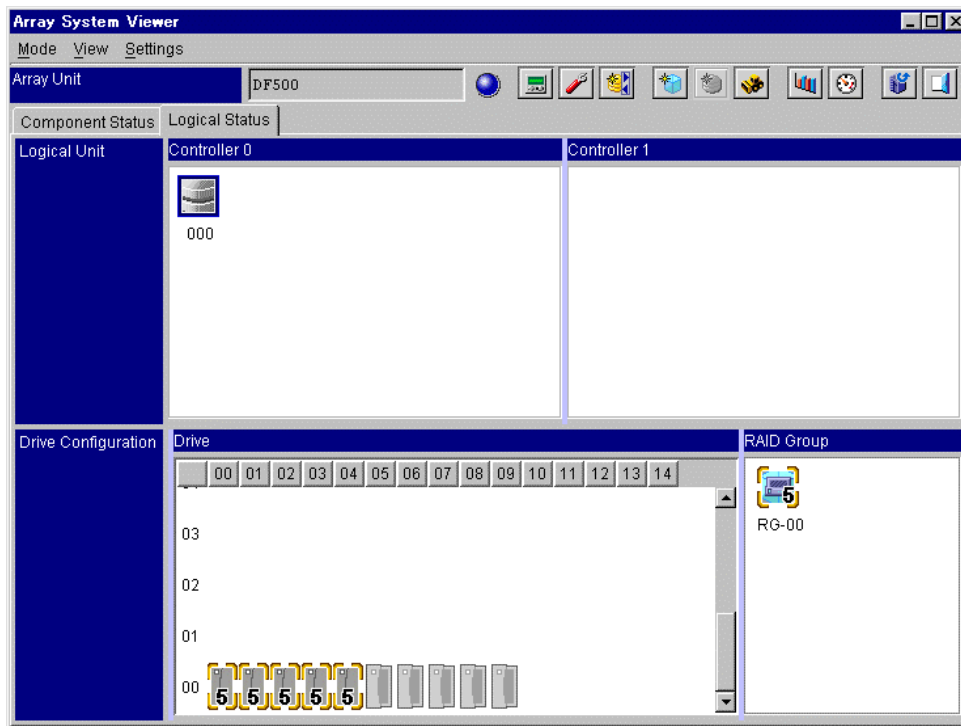
- **Hot Standby Mode:** When a failure in the host or in the controller occurs, processing can be maintained by switching the host command destination to another controller.
- **Dual Active Mode:** Select a controller to access from the host to the logical unit as the controller for the logical unit.

In the above drawing, CTL#0 is in charge of the logical unit0 and CTL#1 is in charge of the logical unit1 respectively. In this example, set up the logical unit by selecting optional button **CTL#0** to select logical unit0 and button **CTL#1** to select logical unit1 respectively.

4. After the logical unit information is set, click the **OK** button.
5. A message appears, stating that the setting is complete. Click the **OK** button.



The logical unit information is updated and the window is displayed.



4.7 Formatting a Logical Unit

To format the logical unit:

1. Click the **Logical Status** tab on the Unit screen.

The formatting method includes 2 modes.

- **Format (Single):** Specified logical units are formatted one by one and the progress of the formatting is displayed.
- **Format (Multiple):** If multiple logical units are specified, up to six logical units are formatted concurrently, and the progress of formatting is displayed.

When the logical units are configured for each drive, the time required for the formatting is reduced by 30 to 50 (percent).

- Configuration example: An array unit is configured to form six rows.
Each row is configured as RAID5 and each RAID group is set to one logical unit.

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

2. Click the icon of a logical unit on the Unit screen. On the **Settings** menu, select **Logical Unit**.

a) To format (Single) the logical unit, click **Format[Single]**.

b) To format (Multiple) the logical unit, click **Format[Multiple]**.

This operation can also be completed from the context menu of the logical unit icon.

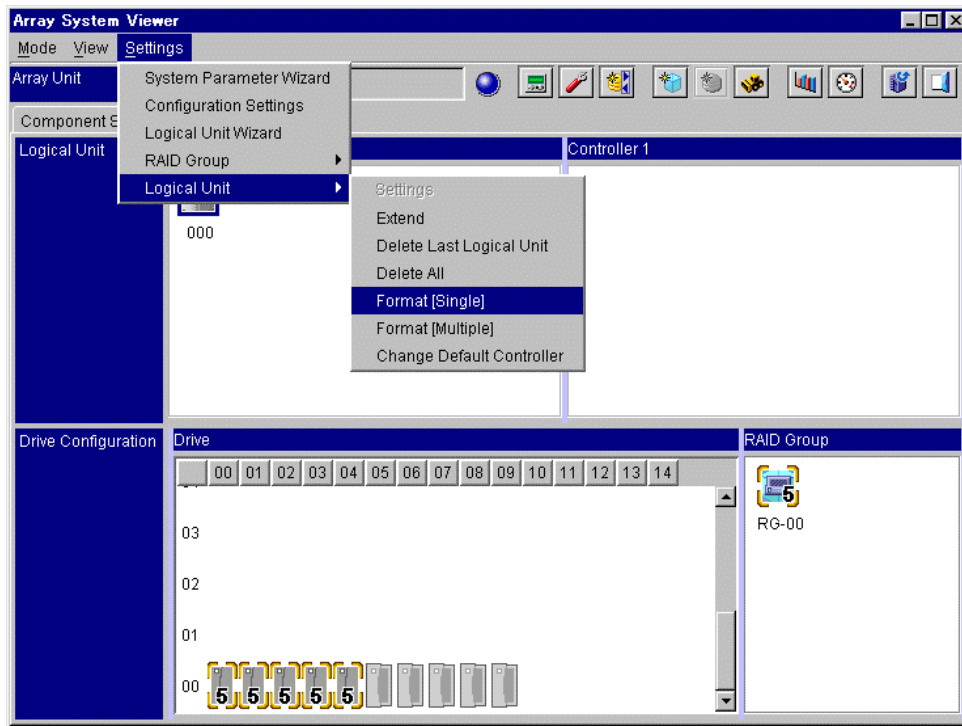


Figure 4.9 Formatting a Logical Unit

When you select multiple logical units, hold down the **Ctrl** key and click the icons of the logical units that you wish to format.

The capability of executing the formatting which corresponds to each logical unit formatting menu item varies with the Resource Manager 9200 connection type and array unit configuration, as shown in the following table.

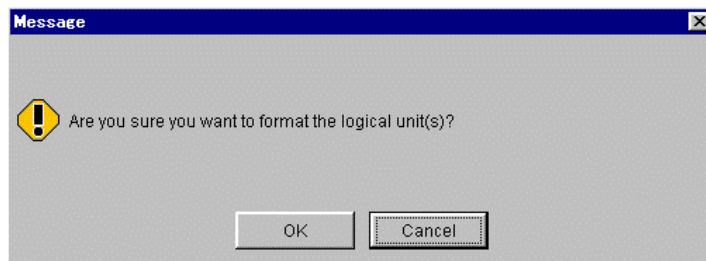
Table 4.1 Logical Unit Formatting

No.	Logical Unit 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 (Single)	The formatting can be executed in the online status.	The formatting can be executed in the online status. Only the logical unit currently controlled by the controller connected with the PC Resource Manager 9200 can be selected. (When formatting a logical unit not connected by the controller, cable connections must be changed.)
2	Format (Single) Format (Multiple)	The formatting can be executed in the online status. Format (Single) is selected. Only one logical unit is selected in Format (Multiple) .	The formatting can be executed in the online status. Format (Normal) or Format (Single) is selected and only a logical unit currently controlled by the controller connected with the Resource Manager 9200 is selected. Format (Multiple) is selected and only a logical unit 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 logical units are selected in Format (Multiple) .	The formatting cannot be executed in the online status. A logical unit not controlled by the controller connected with the Resource Manager 9200 is selected. Two or more logical units are selected in Format (Multiple) .

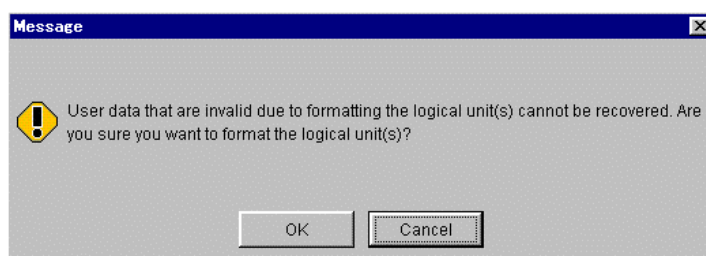
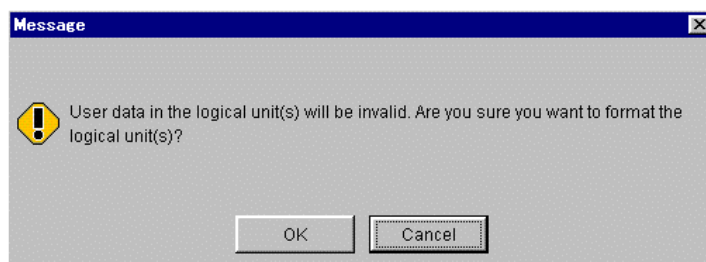
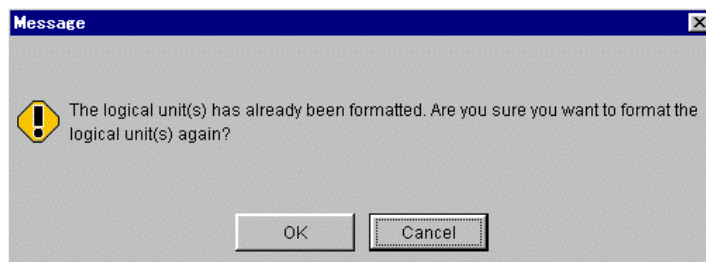
Note: The formatting may be interrupted during the following conditions:

- A host is rebooting
- I/O path switching
- Access to a logical unit by a host not controlling it occurs while an executable is formatted in the online status

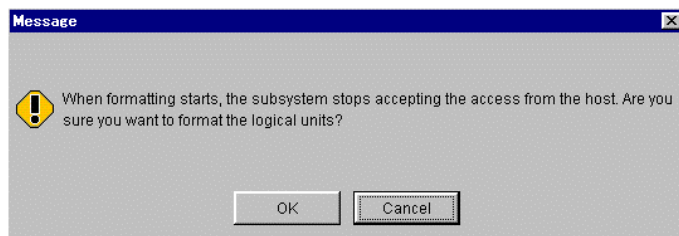
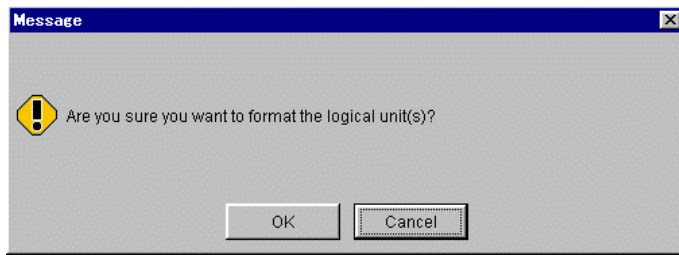
3. A message appears, requesting confirmation to format the selected logical units.
- a) When there is no formatted logical unit (single):



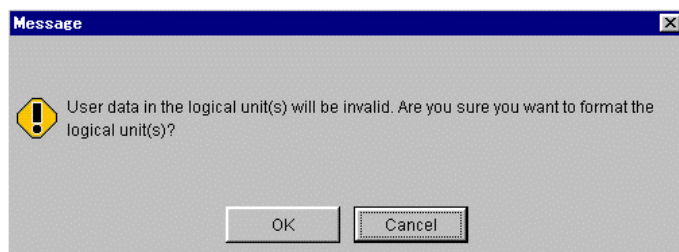
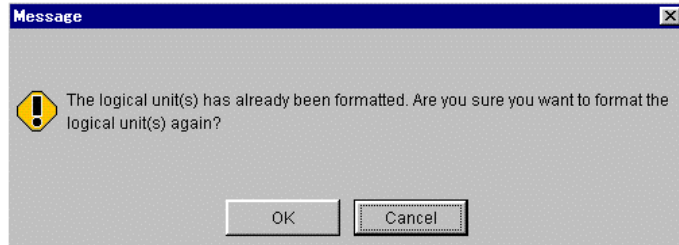
- b) When there is a formatted logical unit (single):

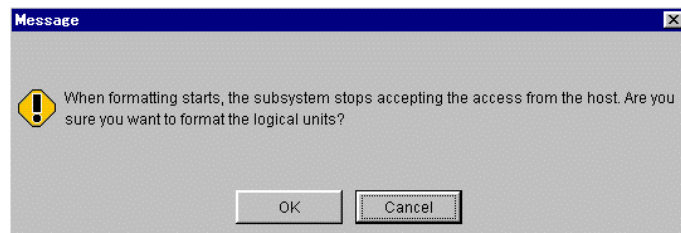
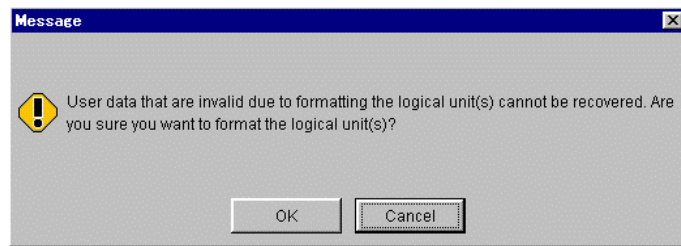


c) When there is no formatted logical unit (multiple):



d) When there is a formatted logical unit (multiple):

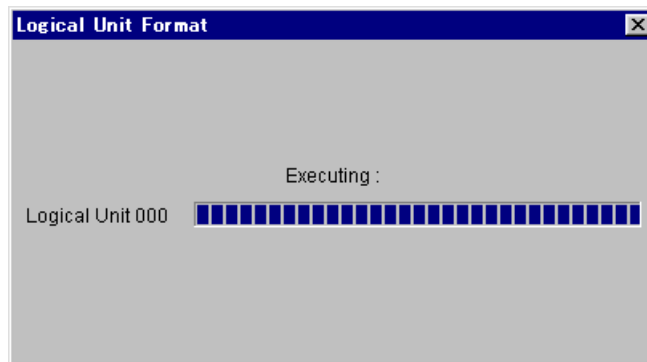




4. Click the **OK** button to format the specified logical units.

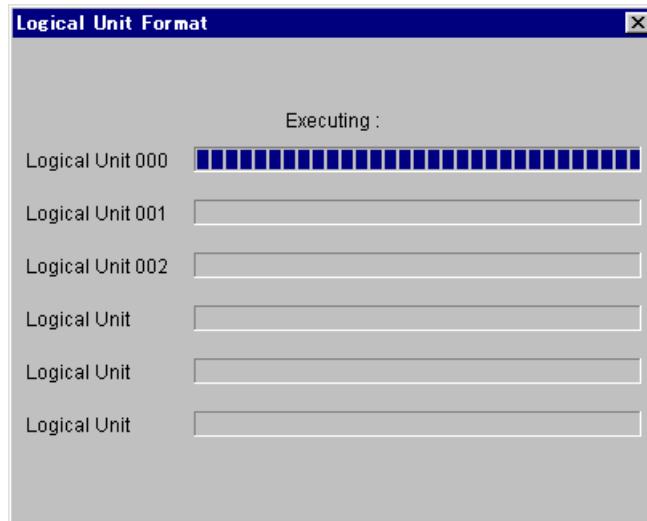
a) When **Format (Single)** is specified:

A screen displays the logical unit number being formatted and the execution progress for the specified logical unit. The progress status indication is renewed every 10 seconds.



b) When **Format (Multiple)** is specified:

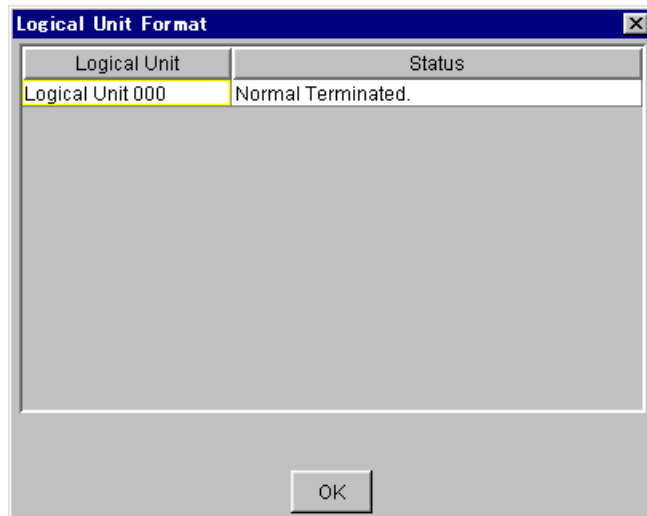
A screen displays the logical unit number being formatted and the execution progress for the specified logical unit. The progress of the formatting is renewed every 10 seconds.



When multiple logical units are specified, up to 6 logical units are formatted in order, starting with the smallest logical unit number; the progress of the formatting is displayed.

After one logical unit is formatted, the next logical unit is formatted; the progress of the formatting is displayed.

5. When a message is displayed indicating that the specified logical unit has been formatted, click the **OK** button.



If formatting is terminated abnormally, refer to the contents of the result.

The formatted logical unit information is updated and the following window is displayed.

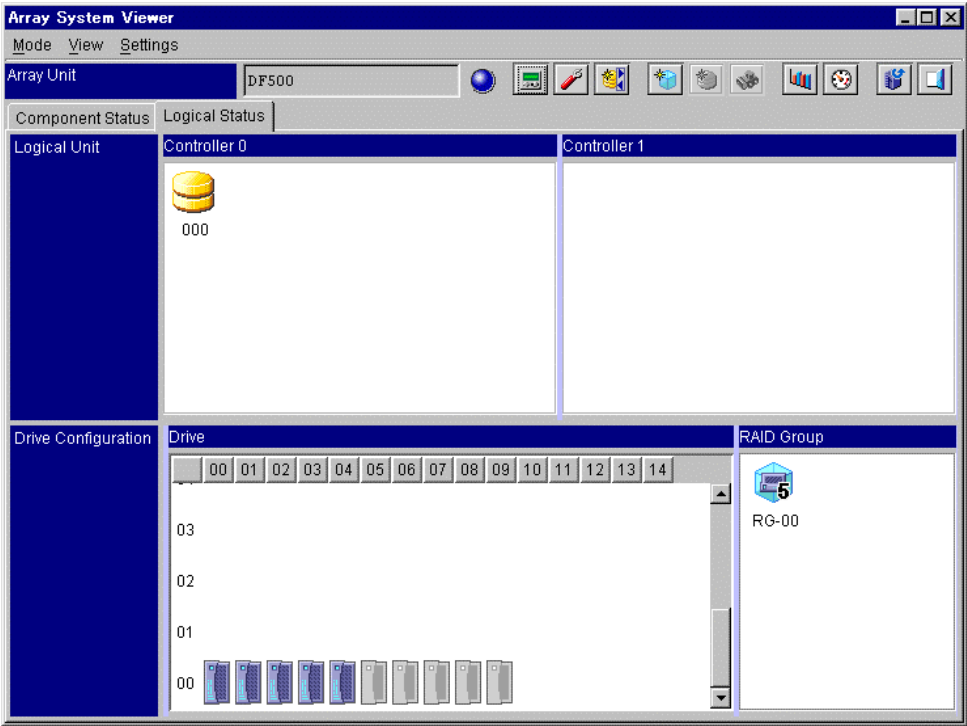


Table 4.2 Interpretation of “Logical Unit Format Results” Window

No.	Result of Logical Unit Formatting	“Status” Column	
1	Succeeded	Normal Terminated	
2	Failed (xx-xxxx) <div style="display: flex; justify-content: space-around; margin-top: 5px;"> Sense key Sense code </div> Failure of a FORMAT UNIT command	Abnormal end	# CHK CONDITION * This function internally uses a FORMAT UNIT command. A sense key and a sense code for the case the command returns the CHECK CONDITION status is displayed.
3	Failed The other error		A message is displayed.

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

- Sense key - sense code = 02-xxxx, 03-xxxx, 04-xxxx, or 0B-xxxx
 The fault may possibly be caused by a hardware failure. Retry. Call maintenance personnel if the problem persists.
- Sense key - sense code = 05-xxxx
 The error may possibly be caused by a wrong operation. Check the items below and retry. Call maintenance personnel if the problem persists.
 - **Logical unit #0 defined?**
 The related sense-key and sense-code combinations are 05-2500 and 05-2581.
 - **Attempt made to define a logical unit over the capacity of the defined RAID group?**
 Related sense-key and sense-code combination is 05-2580.
- Sense key - sense code = 0B-FD01
 The controller in charge of the logical unit was switched during formatting. Check the controller in charge of the logical unit and re-execute 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. The logical unit formatting continues.

4.8 Expanding a Logical Unit

1. Click the **Logical Status** tab on the Unit screen.
2. Click the last logical unit in the Unit screen. On the **Settings** menu, select **Logical Unit** and click **Extend**.

This operation can also be completed from the context menu of the logical unit icon.

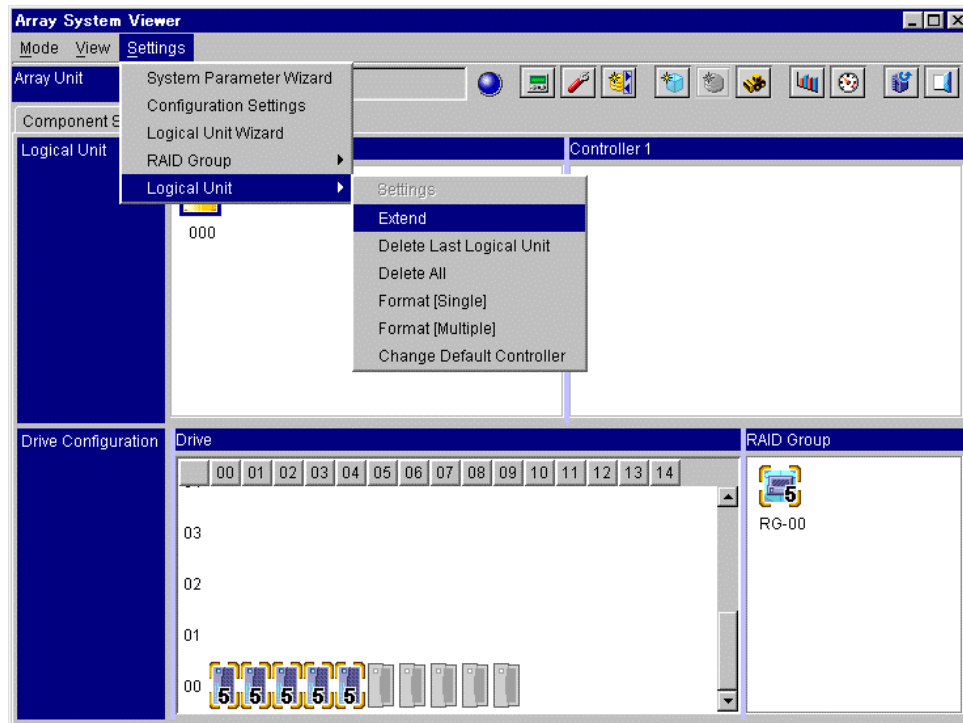
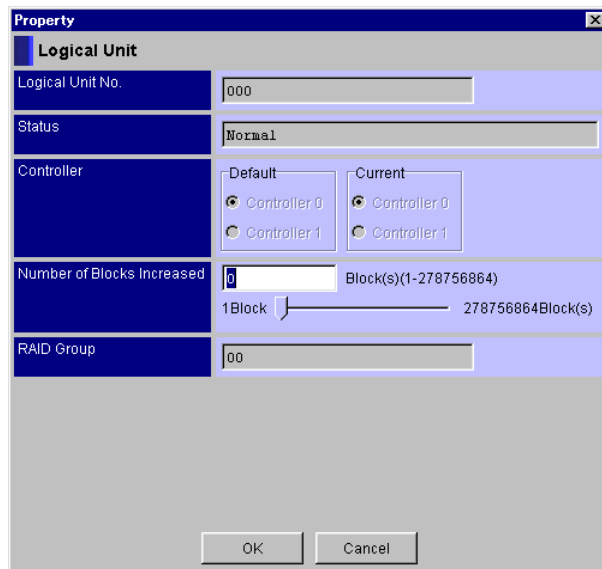


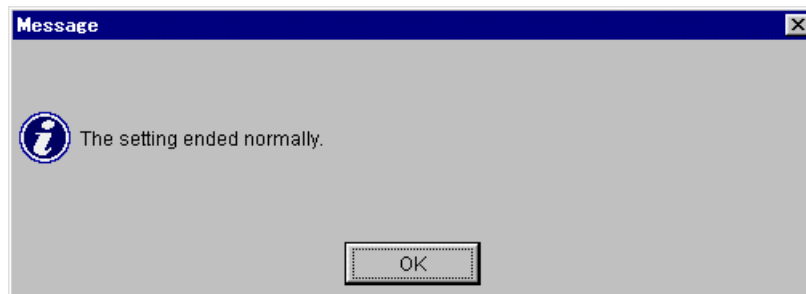
Figure 4.10 Expanding a Logical Unit

3. Specify the capacity in Number of Blocks Increased.

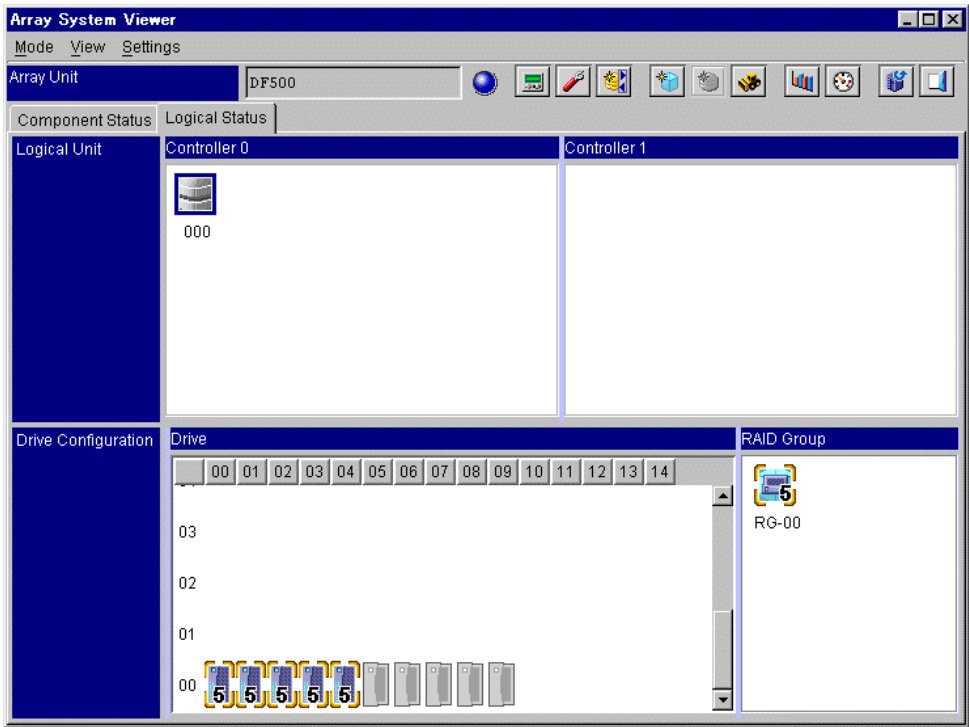


The image shows a 'Property' dialog box with a 'Logical Unit' tab. It contains several fields: 'Logical Unit No.' with the value '000', 'Status' with the value 'Normal', 'Controller' with two sub-sections 'Default' and 'Current' each containing radio buttons for 'Controller 0' and 'Controller 1', 'Number of Blocks Increased' with a value of '0' and a range from '1Block' to '278756864Block(s)', and 'RAID Group' with the value '00'. At the bottom are 'OK' and 'Cancel' buttons.

4. Complete the setting and click the **OK** button.
5. A message appears, stating that the setting is complete. Click the **OK** button.



The logical unit format is updated and the following window is displayed.



The icons of extended logical units change to unformatted icons. Though the displayed icons are unformatted, data in logical units before extension is usable. Formatting is performed only on an extended size of an area; the full-size area after extension becomes available for use.

4.9 Deleting the Last Defined Logical Unit

To delete the last defined logical unit:

1. Click the **Logical Status** tab on the Unit screen.
2. On the Settings menu, select **Logical Unit** and click **Delete Last Defined Logical Unit**.

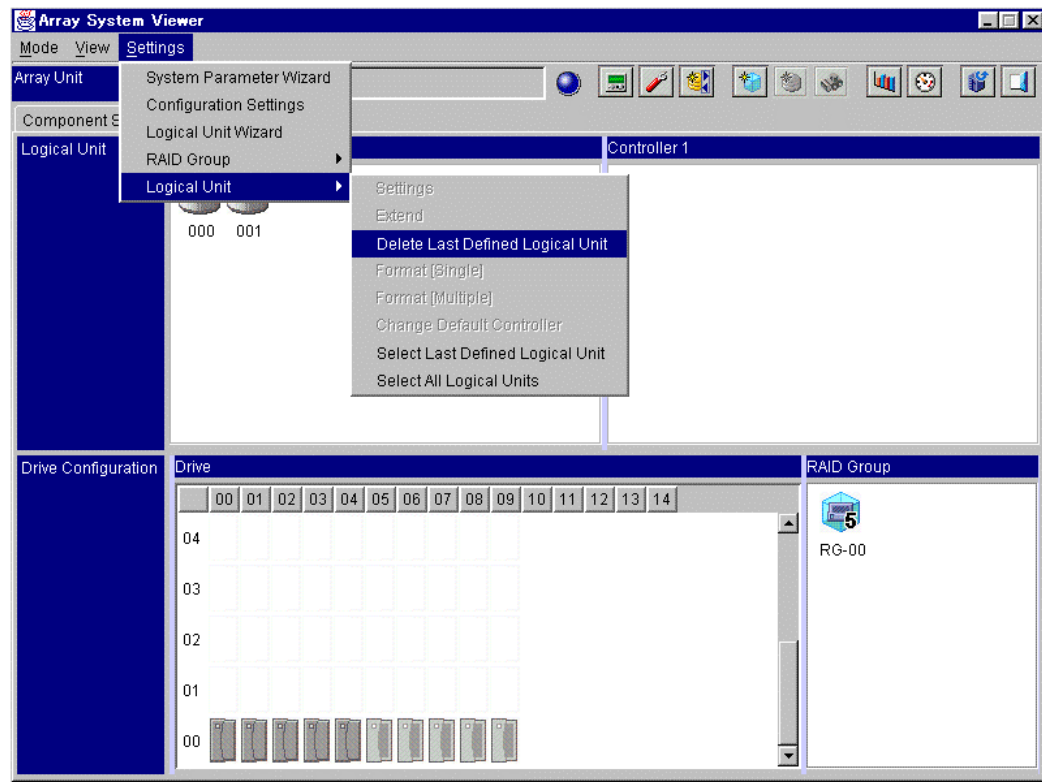
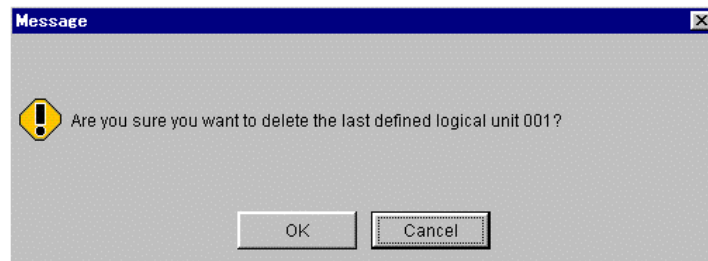


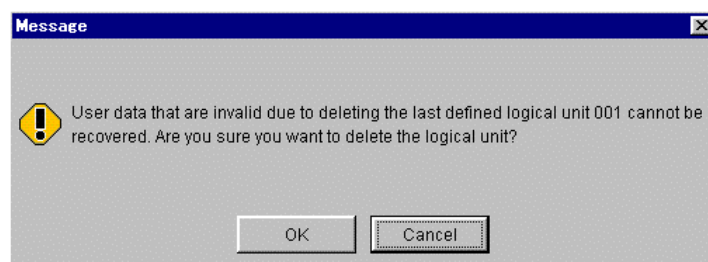
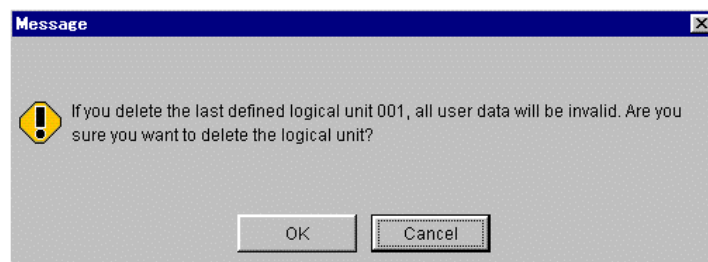
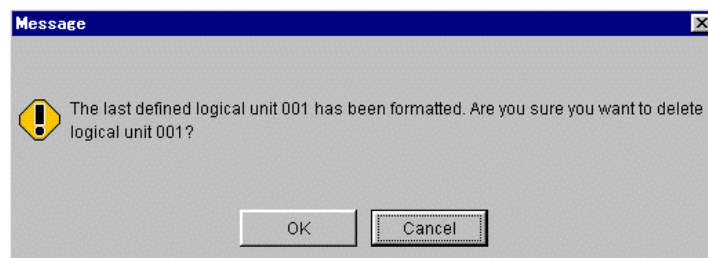
Figure 4.11 Deleting the Last Defined Logical Unit

A message appears, requesting confirmation to delete the last defined logical unit.

a) When the last defined logical unit is not formatted:

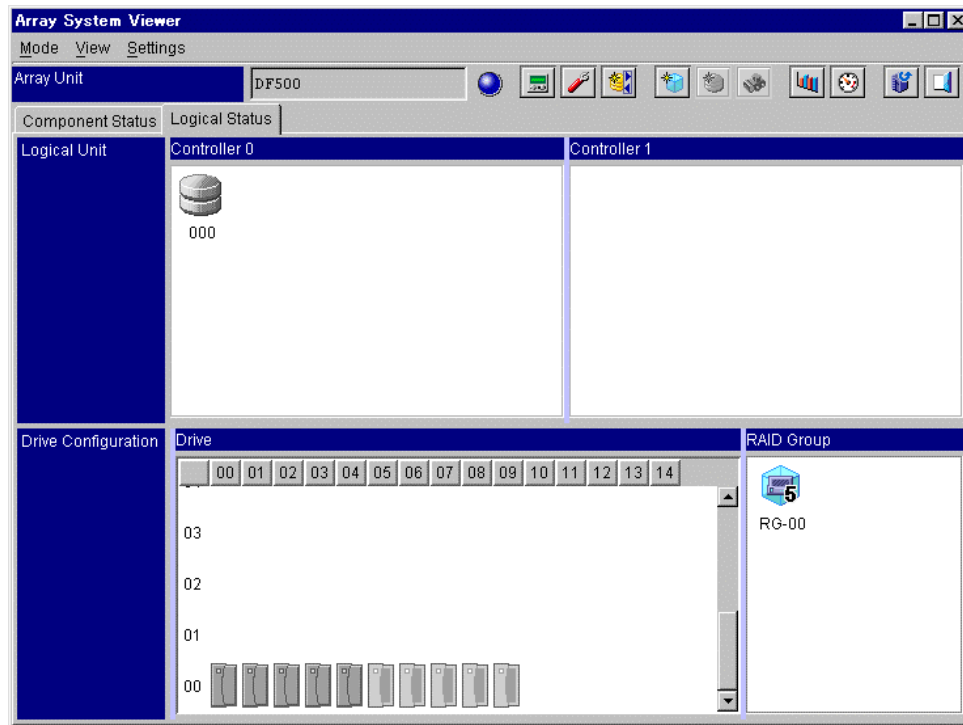


b) When the last defined logical unit is formatted:



3. Click the **OK** button, and last defined logical units will be deleted. When the last defined logical units have been deleted, the user data in the logical units will be lost.

The logical unit information in which the last defined logical unit is updated and the following window is displayed.



4.10 Changing the Default Controller in Charge of a Logical Unit

1. Click the **Logical Status** tab on the Unit screen.
2. Click the last logical unit in the Unit screen. On the Settings menu, select **Logical Unit** and click **Change Default Controller**.

This operation can be completed from the context menu of the logical unit icon.

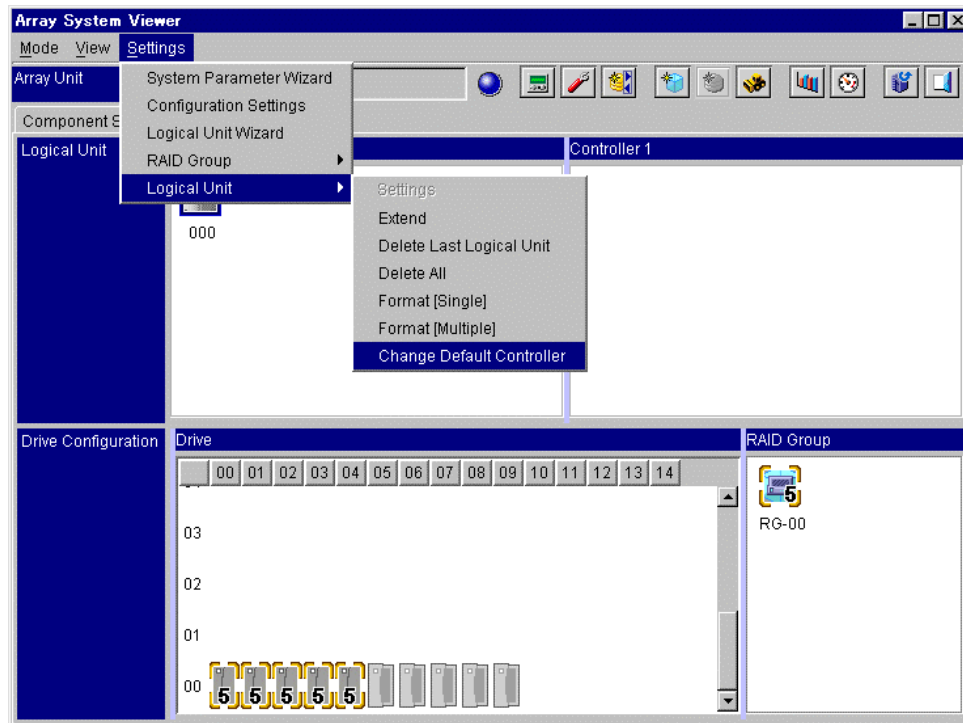
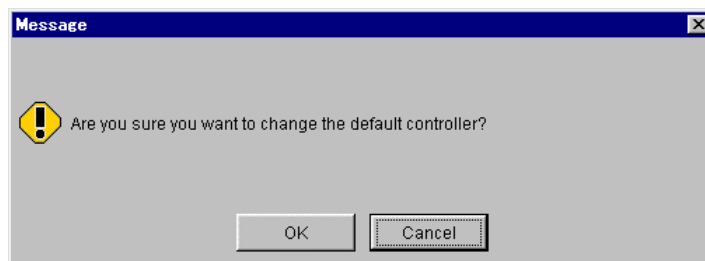


Figure 4.12 Changing the Default Controller in Charge of a Logical Unit

A message is displayed, requesting confirmation to change the default controller in charge of a logical unit.

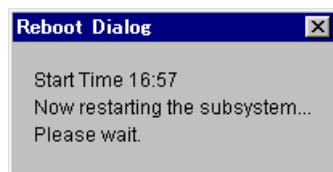


1. Click the **OK** button; the default controller in charge of the logical unit will be changed.
2. A message appears, stating that the default controller has been changed. A message is displayed, requesting confirmation to restart the subsystem. Click the **OK** button to restart.



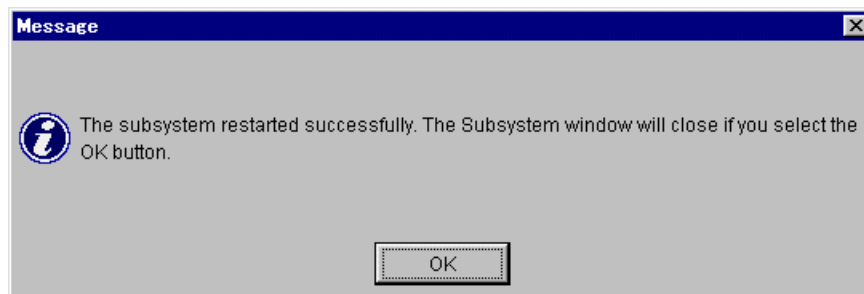
To validate the set-up default controller of a logical unit, restart the array unit. The previous setting stays valid until restarting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before beginning the restart process.

When you choose to restart the array unit, the time the restart began is displayed. This usually takes approximately two to six minutes.



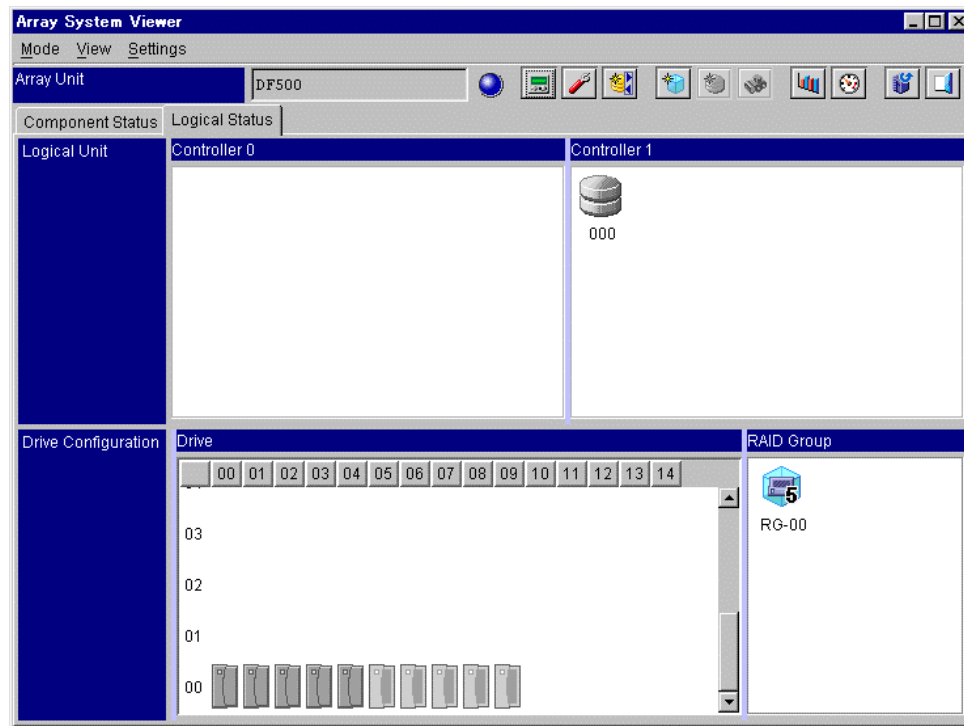
Note: It may take up to six minutes for an array unit to respond, depending on the configuration of the array unit.

A message appears, stating that the restart is successful. Click the **OK** button.



The Unit screen is closed. To perform other operations on the main window, select an array unit from the main window and open the selected Unit screen.

- When not restarting, logical unit information in which the default controller of a logical unit has been changed is displayed on the screen after being updated.




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

4.11 Logical Unit Wizard

You can set the logical unit in the wizard format using the following methods:

- Set Up a Logical Unit in an Existing RAID Group
- Create a New RAID Group and Set U Logical Units

4.11.1 Set Up a Logical Unit in an Existing RAID Group

1. Click the **Logical Status** tab on the Unit screen.
1. On the **Settings** menu, select **Logical Unit Wizard** or click : **Logical Unit Wizard** in the tool bar.

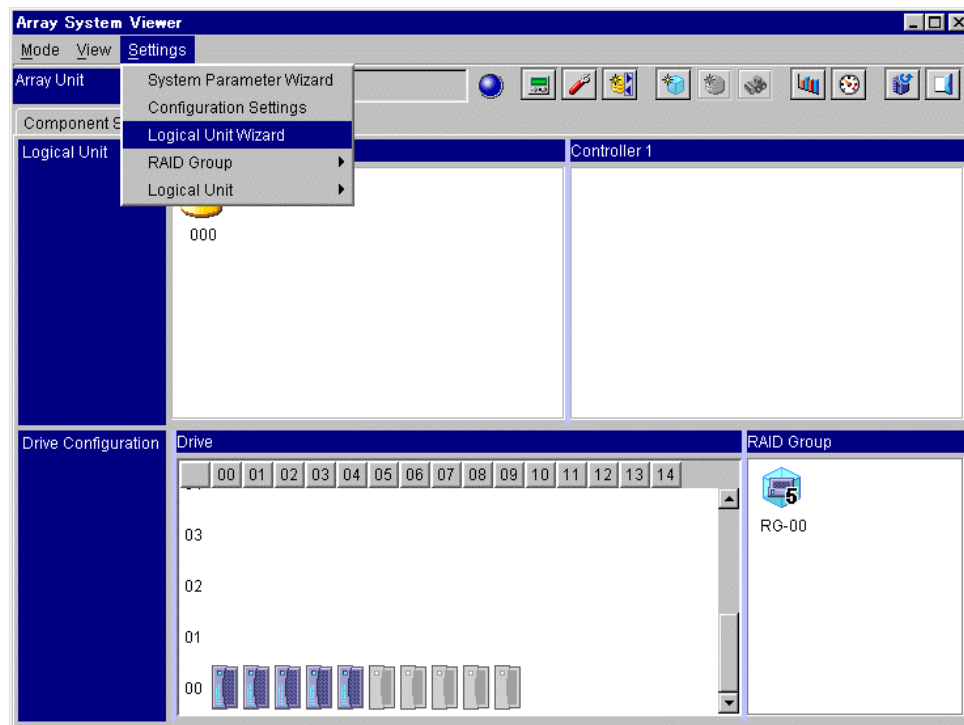
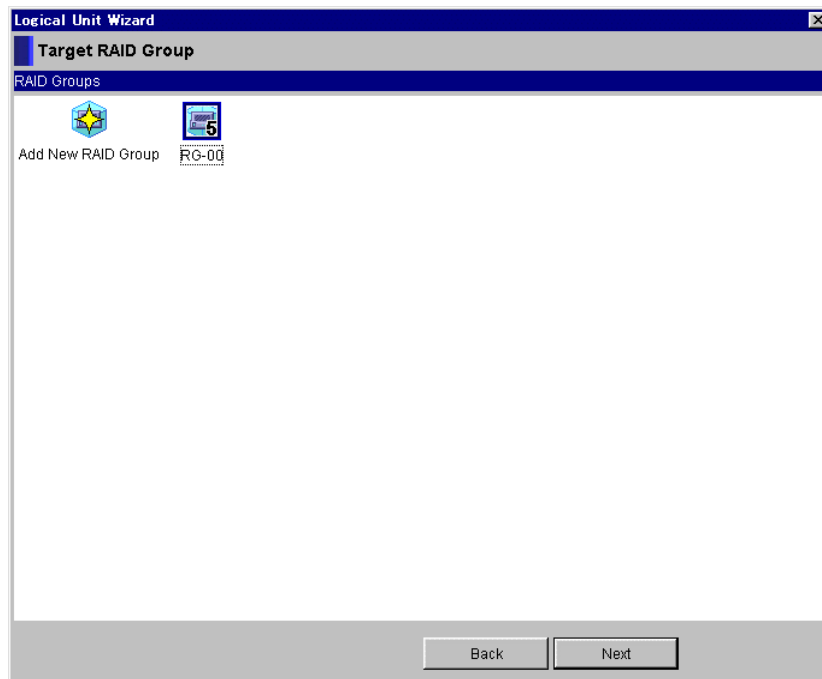


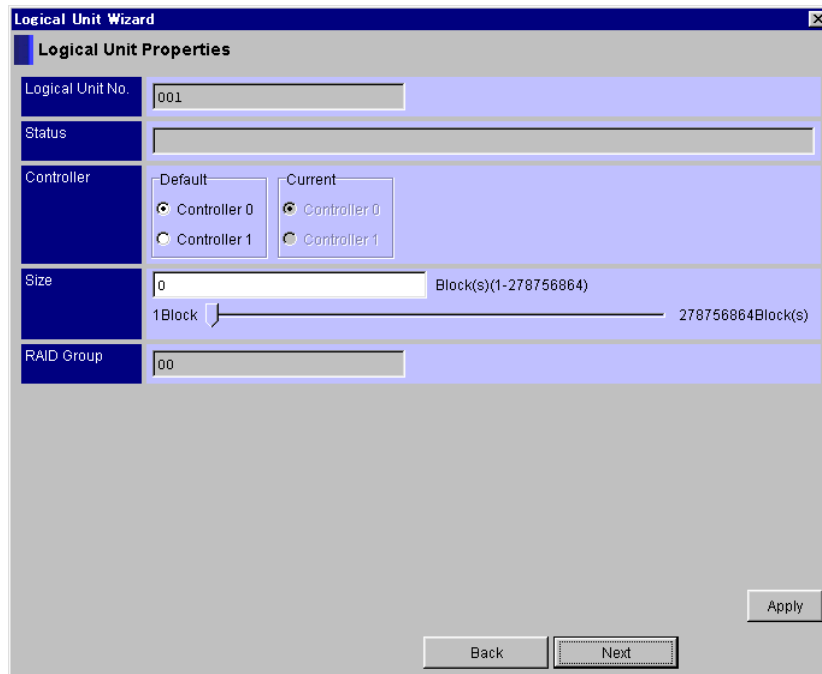
Figure 4.13 Setting the Logical Unit in the Wizard Format

2. When a **Create Logical Unit Wizard** appears, click the **Next** button.

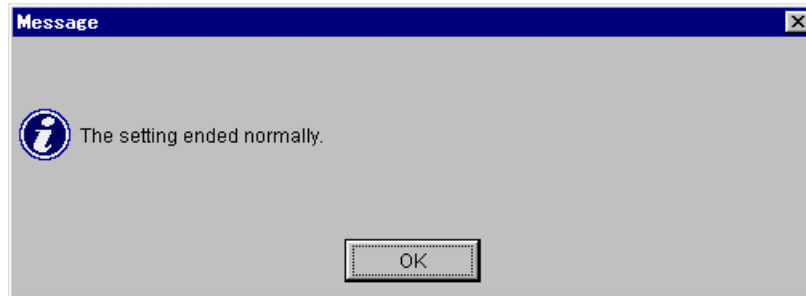
3. Select the RAID group.



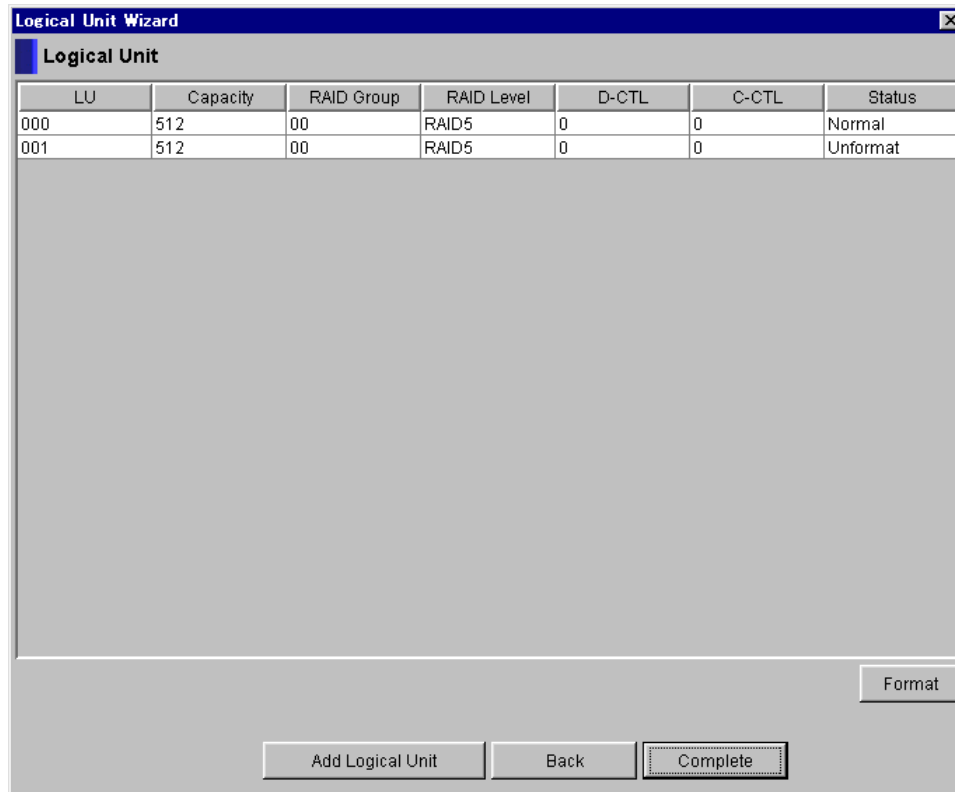
4. Click the **Next** button.
5. Select a controller from the **Controller** radio buttons and input the **Size**.



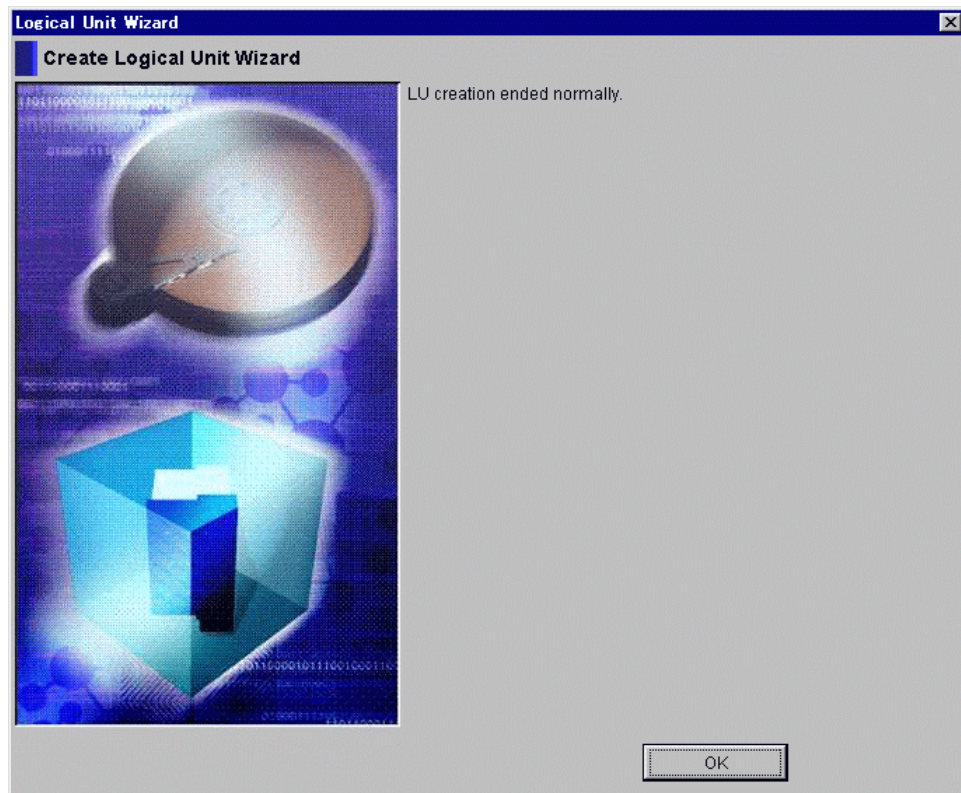
6. Click the **Apply** button to create the logical unit.
7. A message appears, stating that the setting is complete. Click the **OK** button.



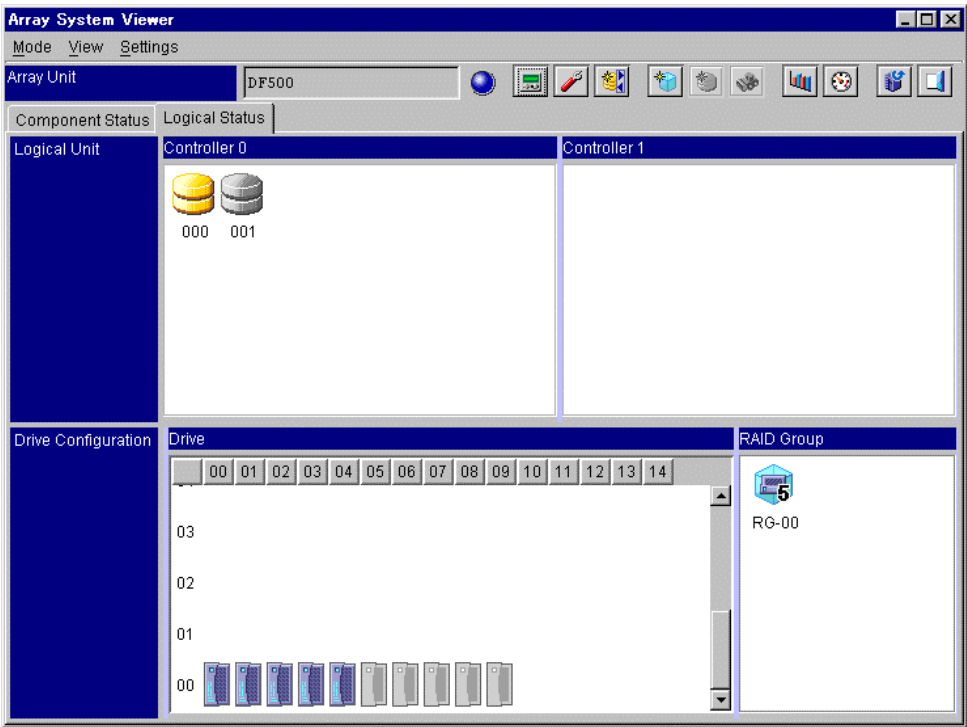
8. Click the **Next** button.
9. The setting of a set-up logical unit is displayed. Check the setting.
 To format a logical unit, specify the logical unit to format, and click the **Format** button.
 If you set up another logical unit in the same RAID group, click the **Add Logical Unit** button.
 If you set up a logical unit in another RAID group, click the **Back** button. When you are finished with the settings, click the **Complete** button.




10. When the **Create Logical Unit Wizard** window appears, click the **OK** button.

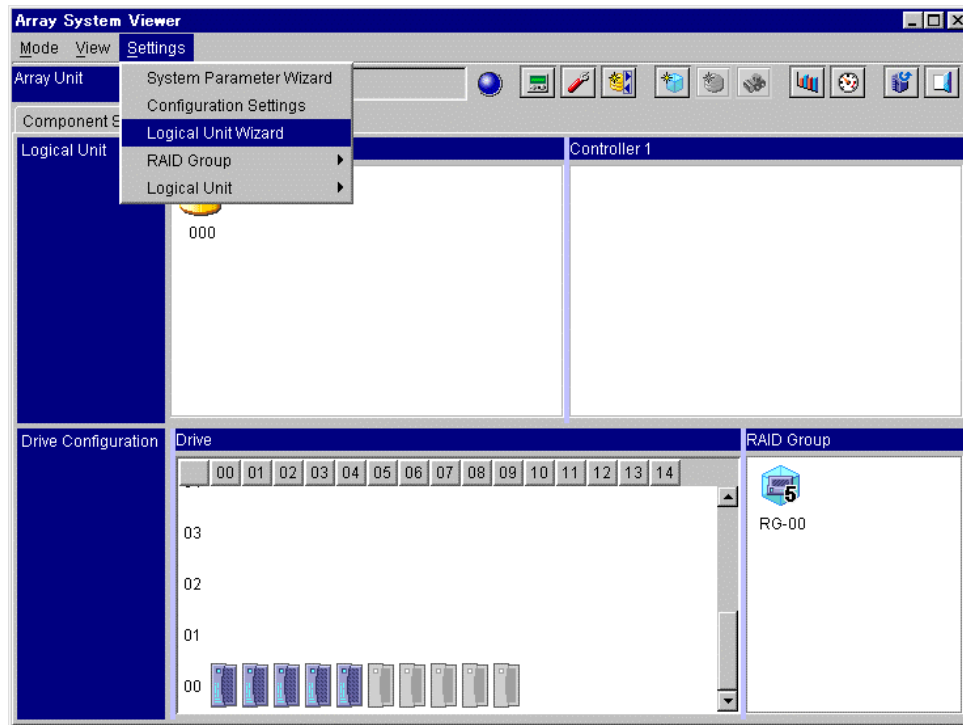


The logical unit information is updated and the window is displayed.



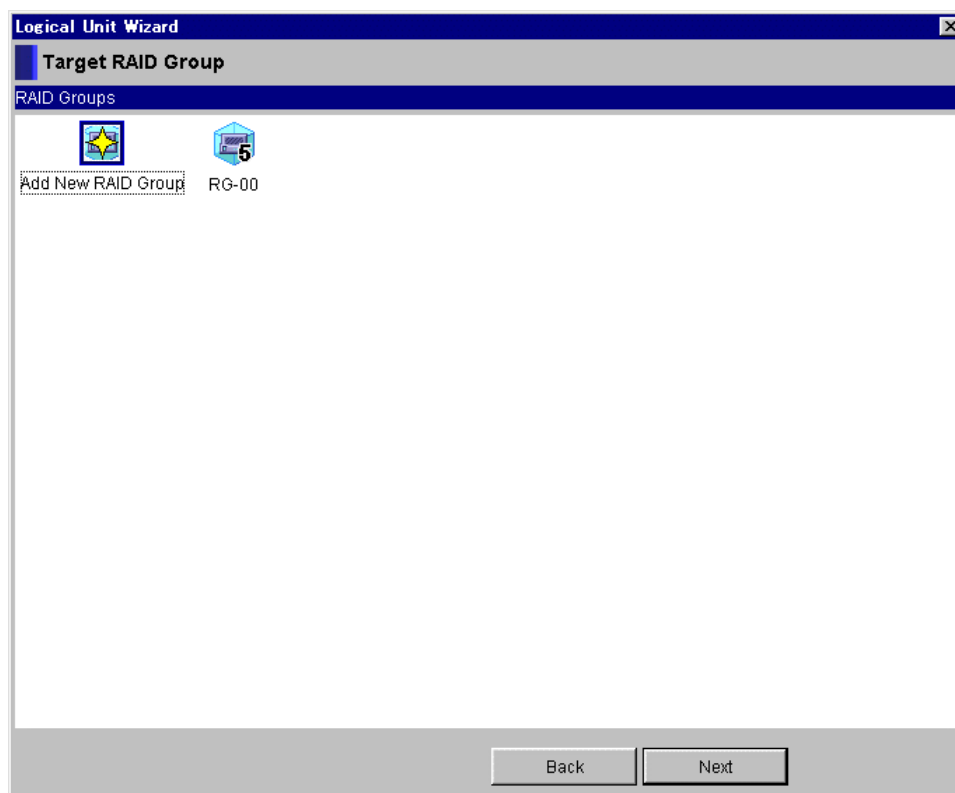
4.11.2 Create a New RAID Group and Set U Logical Units

1. Click the **Logical Status** tab on the Unit screen.
2. On the **Settings** menu, select **Logical Unit Wizard** or click : **Logical Unit Wizard** in the tool bar.

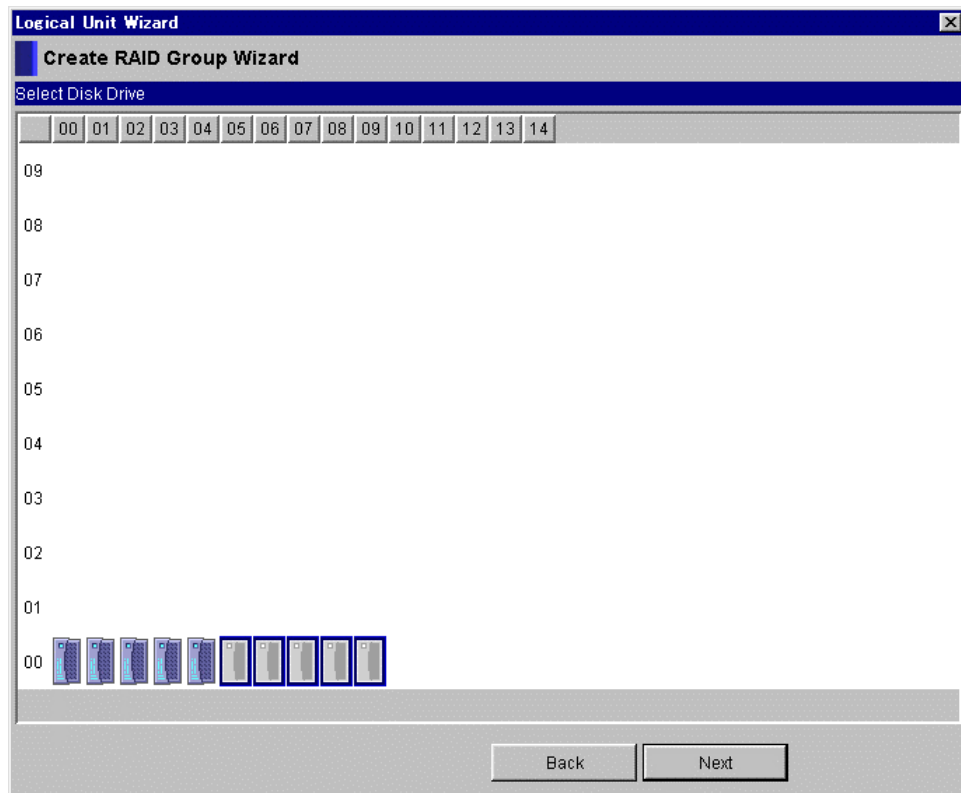


3. When the **Create Logical Unit Wizard** window appears, click the **Next** button.

4. Select the **Add New RAID Group**. Click the **Next** button.



5. Select the RAID group and click the **Next** button.



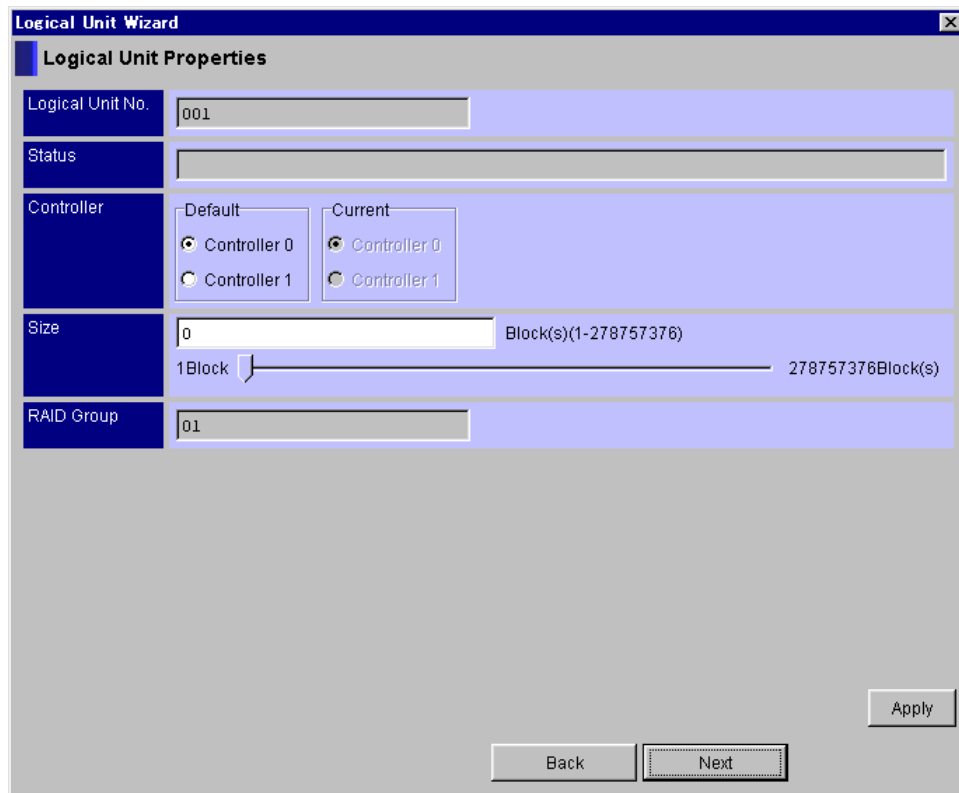
6. Select the **RAID Level** and click the **Next** button.

The screenshot shows a 'Logical Unit Wizard' window with a 'Create RAID Group Wizard' tab. The window contains several input fields for configuring a RAID group. The 'RAID Group' field is set to '01'. The 'RAID Level' dropdown is set to 'RAID 5'. The 'HDU Combination' dropdown is set to 'Manual'. The 'HDU Starting Point' section shows 'Unit No.' as '00' and 'HDU No.' as '05'. The 'Size (Number of Drives)' section shows 'HDUs in the Parity Group' as '05' and 'Parity Groups' as '01'. At the bottom right, there are 'Back' and 'Next' buttons.

RAID Group	01	
RAID Level	RAID 5	
HDU Combination	Manual	
HDU Starting Point	Unit No. 00	HDU No. 05
Size (Number of Drives)	HDUs in the Parity Group	05
	Parity Groups	01

Back Next

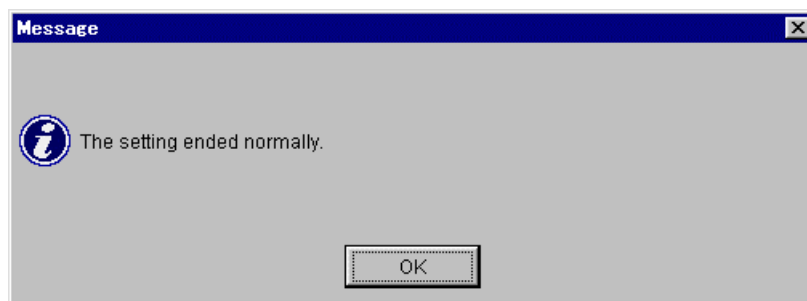
7. Select a controller from the **Controller** radio buttons and input **Size**.



The image shows the 'Logical Unit Wizard' dialog box, specifically the 'Logical Unit Properties' tab. The dialog has a blue title bar and a light gray background. It contains several fields and controls:

- Logical Unit No.:** A text box containing '001'.
- Status:** An empty text box.
- Controller:** Two groups of radio buttons. The 'Default' group has 'Controller 0' selected. The 'Current' group has 'Controller 0' selected.
- Size:** A text box containing '0' and a slider below it. The slider is labeled '1 Block' on the left and '278757376 Block(s)' on the right. The text 'Block(s)(1-278757376)' is also present.
- RAID Group:** A text box containing '01'.
- Buttons:** 'Back', 'Next', and 'Apply' buttons are located at the bottom right.

8. Click the **Apply** button.
9. A message appears, stating that the setting is complete. Click the **OK** button.



10. Click the **Next** button.

11. The setting of a logical unit is displayed; check the setting. To format a logical unit, select the logical unit to format, then click the **Format** button. If you want to set up another logical unit in the same RAID group, click **Add Logical Unit**.

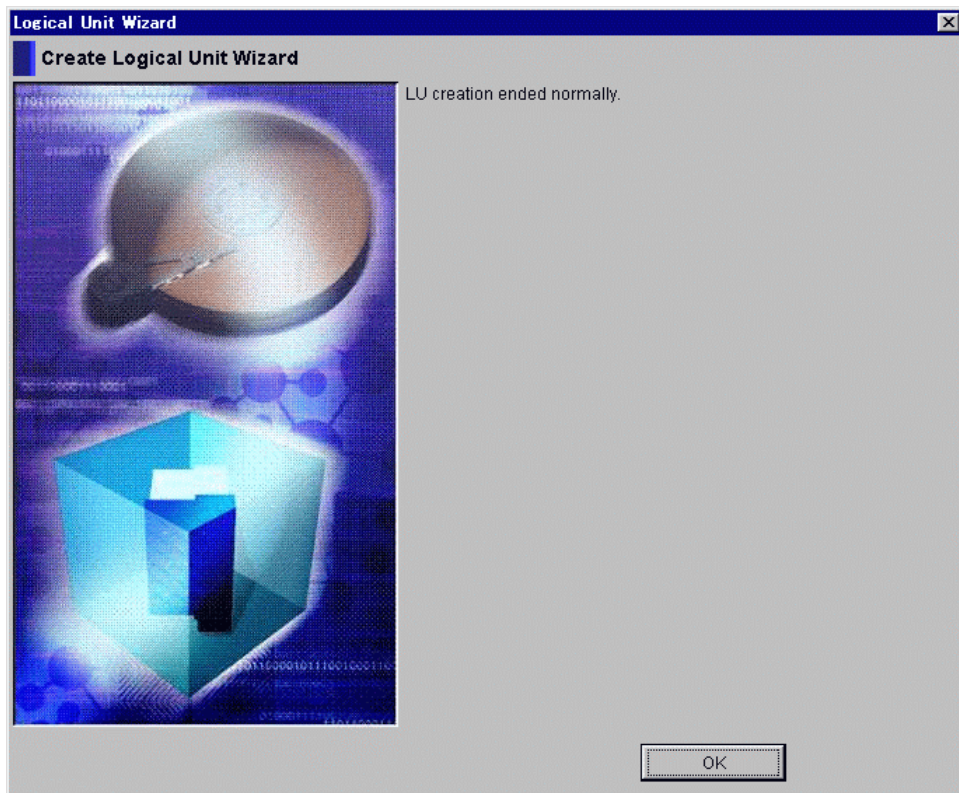
If you set up a logical unit in another RAID group, click the **Back** button. When you are finished, click the **Complete** button.

The screenshot shows a window titled "Logical Unit Wizard" with a tab labeled "Logical Unit". Inside the window is a table with the following data:

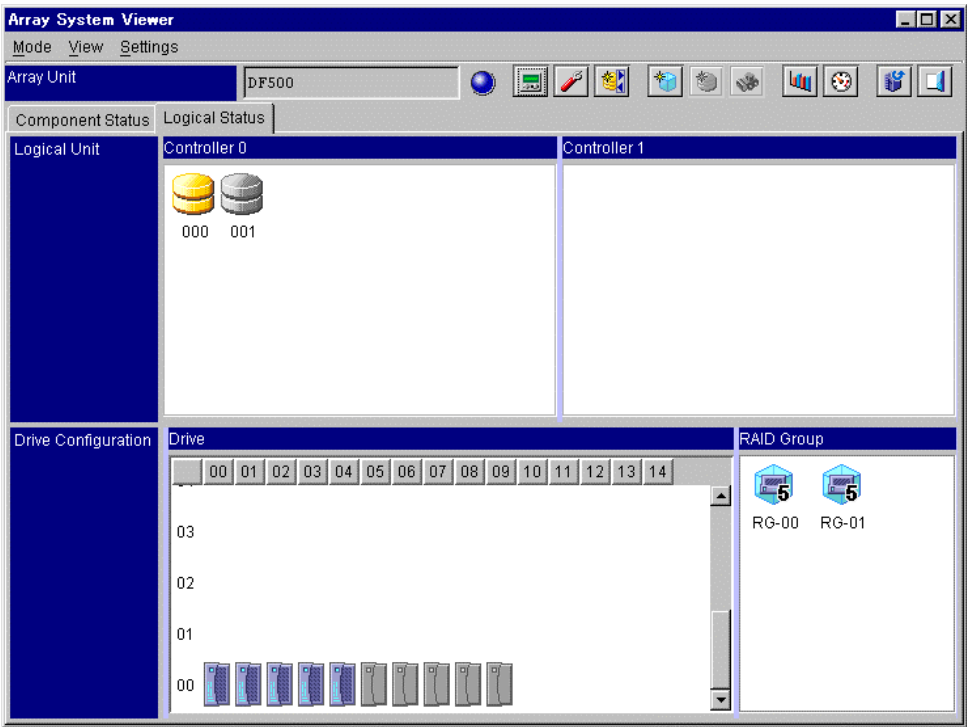
LU	Capacity	RAID Group	RAID Level	D-CTL	C-CTL	Status
000	512	00	RAID5	0	0	Normal
001	512	01	RAID5	0	0	Unformat

Below the table is a large gray area. At the bottom right of the window is a "Format" button. At the bottom center are three buttons: "Add Logical Unit", "Back", and "Complete".

12. When a **Create Logical Unit Wizard** window appears, click the **OK** button.



The logical unit information is updated and the following window is displayed.



Chapter 5 System Parameters Setting Wizard (GUI)

5.1 Setting System Parameters

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

When connected to the dual system, if the controller on one side is blocked, no setting can be made. Before starting operation, make sure that the array unit is functioning normally. When setting the dual system in the RS232C connection, set the controller 0 side first.

When the system parameters are set, the array unit cannot execute commands from the host. Subsequently, the Resource Manager 9200 Wizard can be used for setting system parameters and error monitoring; other Resource Manager 9200 functions are no longer executable. When the setting is complete, restart the array unit; connect it to the host and the Resource Manager 9200.


1. On the **Settings** menu, select **System Parameter Wizard** or click : **System Parameter Wizard** in the tool bar.
2. Click the **Basic Settings** or **Detailed Settings**. Click the **Next** button.



Figure 5.1 Setting the System Parameters in the Wizard Format

- **Basic Settings** can set the basic parameters for use of the array unit.
- **Detailed Settings** can set the detailed parameters for use of the array unit. When you select **Basic Settings**, you can also set the **Detailed Settings** items.

The parameters are displayed in 12 screens. The parameters of the items shown in each screen 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 the following tables.

Table 5.1 List of Supported Parameters at the Basic Settings

Screen No.	Screen name	Setting item	SCSI	Fibre
1	System Startup Settings	Start Attribute	<input type="radio"/>	<input type="radio"/>
		SCSI ID/Port ID Take-over Mode	<input type="radio"/>	<input type="radio"/>
		Default Controller	<input type="radio"/>	<input type="radio"/>
		Data Share Mode	<input type="radio"/>	<input type="radio"/>
		Host Connection Mode	<input type="radio"/>	<input type="radio"/>
		Host Connection Mode 1	<input type="radio"/>	<input type="radio"/>
		Standard Mode	<input type="radio"/>	<input type="radio"/>
		Open VMS Mode	<input type="radio"/>	<input type="radio"/>
		TRESPASS Mode	<input type="radio"/>	<input type="radio"/>
		Wolfpack Mode	<input type="radio"/>	<input type="radio"/>
		IBM7135 I/O path switch Mode	<input type="radio"/>	<input type="checkbox"/>
		NCR I/O path switch Mode	<input type="radio"/>	<input type="checkbox"/>
		Host Connection Mode 2	<input type="radio"/>	<input type="radio"/>
		VxVM DMP Mode	<input type="radio"/>	<input type="radio"/>
		ODE Mapper Mode	<input type="radio"/>	<input type="checkbox"/>
		HP Connection Mode	<input type="checkbox"/>	<input type="radio"/>
		Report inquiry page 83H	<input type="radio"/>	<input type="radio"/>
		UA (06/2A00) suppress Mode	<input type="radio"/>	<input type="radio"/>
		HISUP Mode	<input type="radio"/>	<input type="radio"/>
		CCHS Mode	<input type="radio"/>	<input type="radio"/>
		Standard INQUIRY data expand Mode	<input type="radio"/>	<input type="radio"/>
		HP Connection Mode 2	<input type="checkbox"/>	<input type="radio"/>
		Product ID DF400 Mode	<input type="radio"/>	<input type="radio"/>
		HBA WWN Report Mode	<input type="radio"/>	<input type="radio"/>
		NACA Mode	<input type="radio"/>	<input type="radio"/>
		SUN Cluster Connection Mode	<input type="radio"/>	<input type="radio"/>
2	Common1	Serial Number	<input type="radio"/>	<input type="radio"/>
		Delay Planned Shutdown	<input type="radio"/>	<input type="radio"/>

Table 5.1 List of Supported Parameters at the Basic Settings (Continued)

Screen No.	Screen name	Setting item	SCSI	Fibre
3	Option 1	SCSI/Fibre-Channel Common Options	○	○
		Drive Detach Mode	○	○
		SCSI Option	○	×
		Fibre-Channel Options	×	○
4	Option 2	SCSI/Fibre-Channel Common Options	○	○
		Multipath (Controller)	○	○
		PROCOM Mode	○	○
		Report Status (Normal/Warning)	○	○
		Multipath (Array Unit)	○	○
		Turbo LU Warning	○	○
		NX Mode	○	○
		Auto Reconstruction Mode	○	○
		Forced Write Through Mode	○	○
		Fibre-Channel Options	×	○
		RAID3 Mode	×	○
5	Target ID	Target ID	○	○

Table 5.2 List of Supported Parameters at the Detailed Settings

Screen No.	Screen name	Setting item	SCSI	Fibre
6	Data Striping	Data Striping Size	<input type="radio"/>	<input type="radio"/>
		Logical Unit size to be reported to the host	<input type="radio"/>	<input checked="" type="radio"/>
		Operation if the processor failure occurs	<input type="radio"/>	<input type="radio"/>
7	INQUIRY Setting	Command Queuing	<input type="radio"/>	<input type="radio"/>
		ANSI Version	<input type="radio"/>	<input checked="" type="radio"/>
		Vendor ID	<input type="radio"/>	<input type="radio"/>
		Product ID	<input type="radio"/>	<input type="radio"/>
		ROM Microprogram Version	<input type="radio"/>	<input type="radio"/>
		RAM Microprogram Version	<input type="radio"/>	<input type="radio"/>
		Web Title	<input type="radio"/>	<input type="radio"/>
		Cache Mode	<input type="radio"/>	<input type="radio"/>
		Host Connection Mode	<input checked="" type="radio"/>	<input type="radio"/>
8	Port Type	Reset/LIP Mode	<input type="radio"/>	<input type="radio"/>
		Reset/LIP Mode (Signal)	<input type="radio"/>	<input type="radio"/>
		Reset/LIP Mode (Process)	<input type="radio"/>	<input type="radio"/>
		Reset ALL LIP Port Mode	<input checked="" type="radio"/>	<input type="radio"/>
		Reset Target (Reset Bus Device) Mode	<input type="radio"/>	<input type="radio"/>
		Reserve Mode	<input type="radio"/>	<input type="radio"/>
		Reset Logical Unit Mode	<input checked="" type="radio"/>	<input type="radio"/>
		Reset Logout of Third Party Process Mode	<input checked="" type="radio"/>	<input type="radio"/>
9	ROM Response	ROM Pseudo-response command processing	<input type="radio"/>	<input checked="" type="radio"/>
		Save Data pointer response	<input type="radio"/>	<input checked="" type="radio"/>
10	Controller Option	Controller Identifier	<input type="radio"/>	<input type="radio"/>
		RS232C Error Information Outflow Mode	<input type="radio"/>	<input type="radio"/>
		Execute Write & Verify Mode	<input type="radio"/>	<input type="radio"/>
11	LAN Setting	DHCP	<input type="radio"/>	<input type="radio"/>
		Network	<input type="radio"/>	<input type="radio"/>
12	SCSI	Port	<input type="radio"/>	<input checked="" type="radio"/>
		Board Type	<input type="radio"/>	<input checked="" type="radio"/>
		Transfer Rate	<input type="radio"/>	<input checked="" type="radio"/>

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

Table 5.3 Settings when I/O Path Switching Function used in the Sequent NUMA-Q Connection

No.	Setting Item	Set Value	No. of Windows Displayed
1	Host Connection Mode	TRESPASS Mode	1
2	SCSI/Fibre-Channel Common Options	Multipath (Controller)	3
3	Controller Identifier	Enable	9
	Controller ID	DF500-00C0 (default value)	

Table 5.4 Settings when the Array Unit used in the WolfPack Mode

No.	Setting item	Set value	No. of windows displayed
1	Host Connection Mode	Wolfpack Mode	1
2	Reset/LIP Mode	Reset/LIP Mode (Signal) Reset/LIP Mode (Process) Reset ALL LIP Port Mode	7

Table 5.5 Settings when the Host uses the VxVM DMP

No.	Setting item	Set value	No. of windows displayed
1	Host Connection Mode	VxVM DMP Mode	1
2	Controller Identifier	Enable	9
	Controller ID	DF500-C000 (default value)	

3. The system parameter window is displayed starting with **System Startup Settings**. The window displays the items that are currently set. Check the displayed contents on the window and set each displayed item to the desired configuration. To perform the next setting, click the **Next** button. When you click the **Back** button, the previous window will appear.

To stop the setting, click the **Cancel** button.

The screen that appears when the Fibre version of the 9200 is connected displays the parameters available in every display screen of the Wizard.

Figure 5.2 System Startup Settings

- **Start 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/port ID.
Use: Used the SCSI ID/Port ID Take-over Mode.
Do Not Use: 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.
Use: Used in the data share mode.
Do Not Use: Not used in the data share mode.

- **Host Connection Mode:** Specifies the host connection mode of the port.
Click the button **Port xx** (xx: 0A, 1A, 0B, 1B) to specify each port.

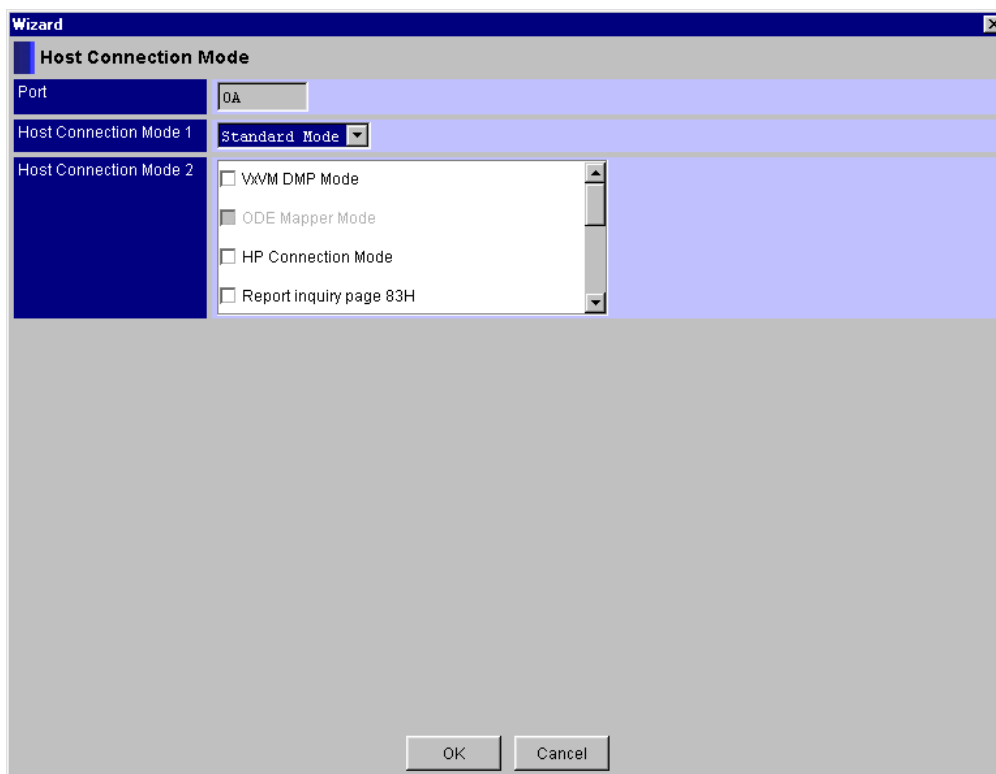


Figure 5.3 Host Connection Mode

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

Standard INQUIRY data expand Mode: Enables the Standard INQUIRY data expand Mode.

HP Connection Mode 2: Enables the HP Connection Mode 2.

Product ID DF400 Mode: Enables the Product ID DF400 Mode.

HBA WWN Report Mode: Enables the HBA WWN Report Mode.

NACA Mode: Enables the NACA Mode.

SUN Cluster Connection Mode: Enables the SUN Cluster Connection Mode.

Note 1: When the Target ID setting in controller 0 is different than the Target ID setting in controller 1, to change to **SCSI ID/Port ID Take-over Mode**, set the Target IDs of controller 0 and 1 to be the same. After the setting is enabled, change to **SCSI ID/Port ID Take-over Mode**. 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 controller 0 Target ID, change **SCSI ID/Port ID Take-over Mode**.

Note 2: A change from **Single Mode** to another configuration cannot be made for an array unit with a single controller.

Wizard

Common1

Serial Number

Delay Planned Shutdown [minute(s)] (0-60)

Back Next Cancel

Figure 5.4 Entering the Serial Number

- **Serial Number:** Enter the lower four digits of the manufacturing serial number of an array unit with alphanumeric characters.
The number is reflected in 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.
- **Delay Planned Shutdown:** Specify the time in minutes to delay the execution of the planned shutdown when the main switch has turned off. The applicable range is from 0 to 60 minutes.

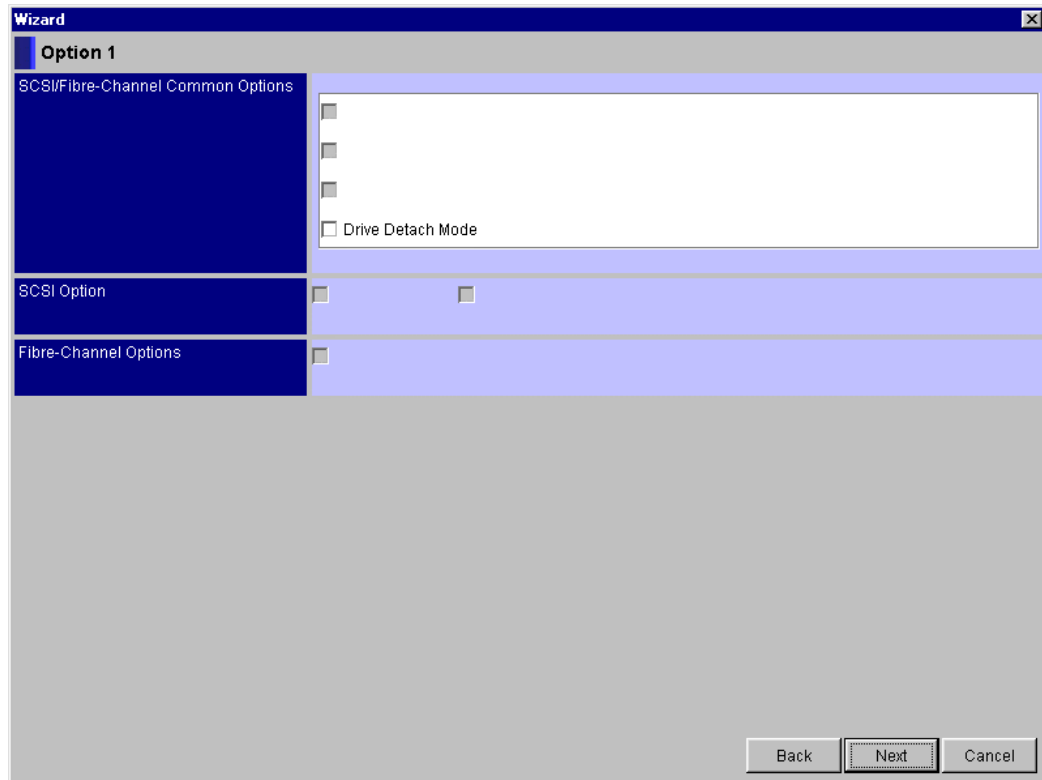


Figure 5.5 Setting the Option 1 Function

Set the Option 1 function of the array unit. Two or more optional functions can be selected.

- **SCSI/Fibre-Channel Common Options:** 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.
 - Drive Detach Mode:** Validates the drive blockade mode.
- **SCSI Option:** Options exclusive to the SCSI array unit. Set the optional function (s) according to the configuration of the array unit. When the Fibre Channel interface array unit is connected, this item is displayed in gray and cannot be set.
- **Fibre-Channel Options:** An option exclusive to the Fibre Channel interface array unit. Set the optional function according to the configuration of the array unit. When the SCSI array unit is connected, this item is displayed in gray and cannot be set.

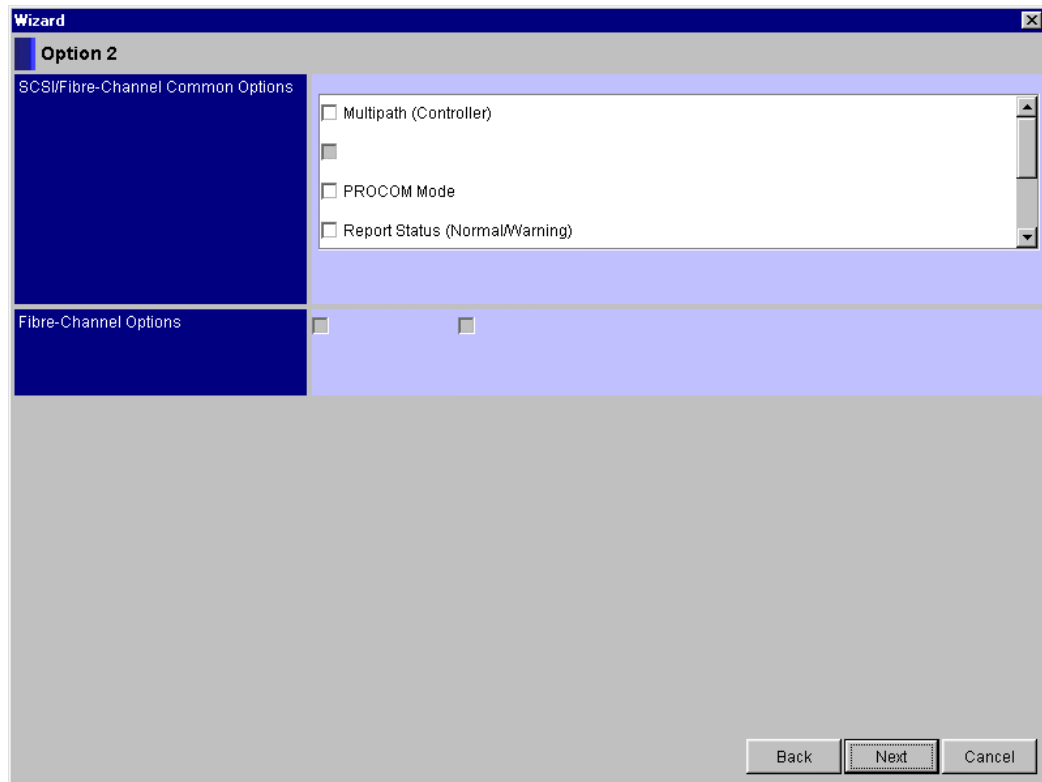


Figure 5.6 Setting the Option 2 Function

Set the Option 2 function (expanded option) of the array unit. Two or more optional functions can be selected.

- **SCSI/Fibre-Channel Common Options:** Options that 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.
 - PROCOM Mode:** Validates the PROCOM Mode.
 - Report Status:** 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.
 - NX Mode:** Validates the NX Mode.
 - Auto Reconstruction Mode:** Validates the Forced Write Through Mode.
 - Forced Write Through Mode:** Validates the Forced Write Through Mode.

- **Fibre-Channel Options:** An option exclusive to the Fibre Channel interface array unit. Set the optional function according to the configuration of the array unit. When the SCSI array unit is connected, this item is displayed in gray and cannot be set.

RAID3 Mode: Validates the RAID3 Mode.

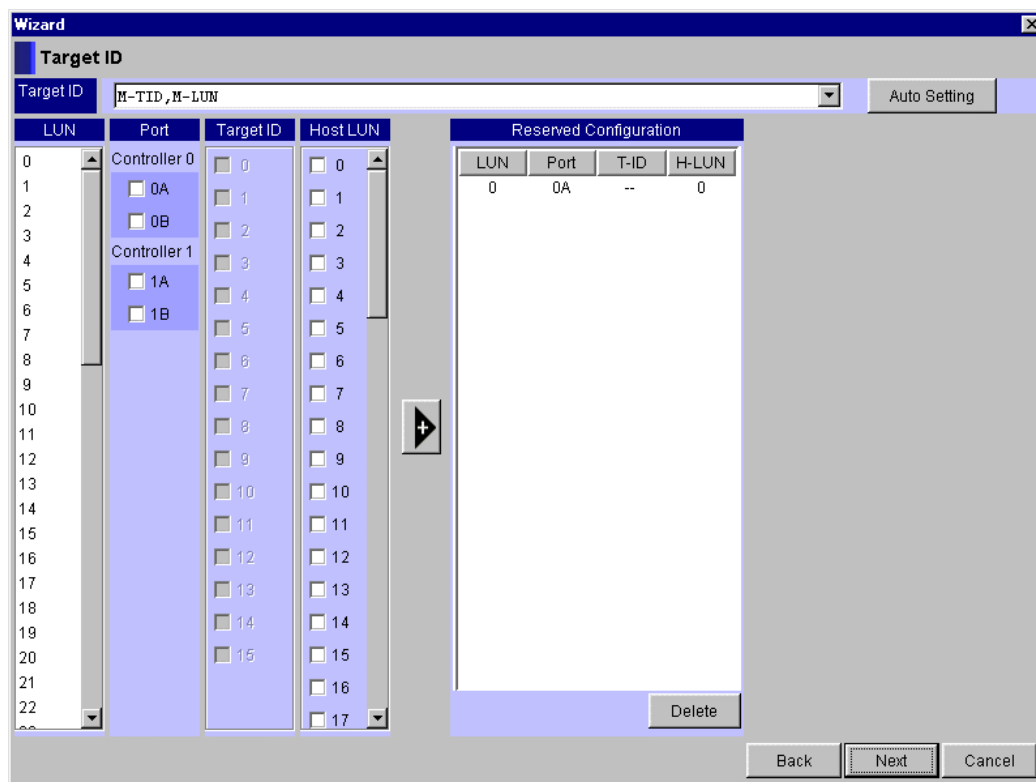




Figure 5.7 Setting the Target IDs of Controller 0/1

Set the target IDs of controller 0/1.

Note 1: If **SCSI ID/Port ID Take-over Mode** is set at **Use**, the setting of controller 0 automatically sets the Target ID for controller 1.


Note 2: The text box for the Host 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.

Note 3: If the LUN mapping is used for controller 0, LUN mapping is also used for controller 1. Otherwise, all logical units will be available through all ports of the controller that does not use LUN mapping.

- **Target ID:** Specifies configuration types of the target ID and the LUN.
 - S-TID, M-LUN:** Sets a target ID for the port and makes the LUN shared by the ports available to be used by a host with an identical LUN.
 - M-TID, S-LUN:** Sets a port and a target ID for the LUN and allows the LUN to be used with LUN = '0' and a target ID set by the host.
 - M-TID, M-LUN:** Sets a port, a target ID, and a Host LUN for the LUN in a map form and allows the LUN to 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.
- **LUN:** Specifies the LUN in the array unit.
- **Port:** Specifies a port number.
- **Target ID:** Specifies a target ID.
- **Host 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 the selection is disabled.
- **Reserved Configuration:** Displays the configuration that is set. When **S-TID, M-LUN** is set, **Host 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**
 - Select the **S-TID, M-LUN** in **Target ID**.
 - Select one **Port** to be set, select one **Target ID** to be set, and click the  button.
 - The added contents are displayed in **Reserved Configuration**.
- b) **M-TID, S-LUN mode setting**
 - Select the **M-TID, S-LUN** in **Target ID**.
 - Select one **LUN** to be set, select one **Port** and one **Target ID** to be set, and click the  button.
 - The added contents are displayed in **Reserved Configuration**.
 - For deletion, click the line to be deleted in **Reserved Configuration** and click the **Delete** button.
 - The deleted contents disappear from the **Reserved Configuration** display.

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

Select the **M-TID, M-LUN** in **Target ID**.

Select one **LUN** to be set, select **Port**, **Target ID**, and **Host LUN** to be set in the mapping setup configuration, and click the  button. The added contents are displayed in **Reserved Configuration**.

Multiple **Port**, **Target ID**, and **Host LUN** can be selected.

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

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

d) **Auto setting**

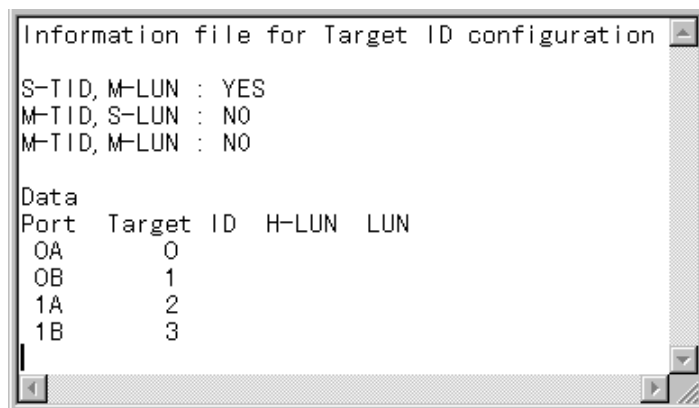
Click **Auto Setting**. The target ID configuration file is read and **LUN**, **Port**, **Target ID**, and **Host LUN** are automatically set. The read contents are displayed in **Reserved Configuration**.

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 the 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 the Fibre Channel connection is used, set '--' for the **Target ID**.

4. When **Basic Settings** is selected, the window for the **Target ID** setting is the final window. Click the **Next** button, then display **Detailed Settings**.

If you set the **Detailed Settings** items in succession, select **Yes** or select **No**, and then click the **Next** button.

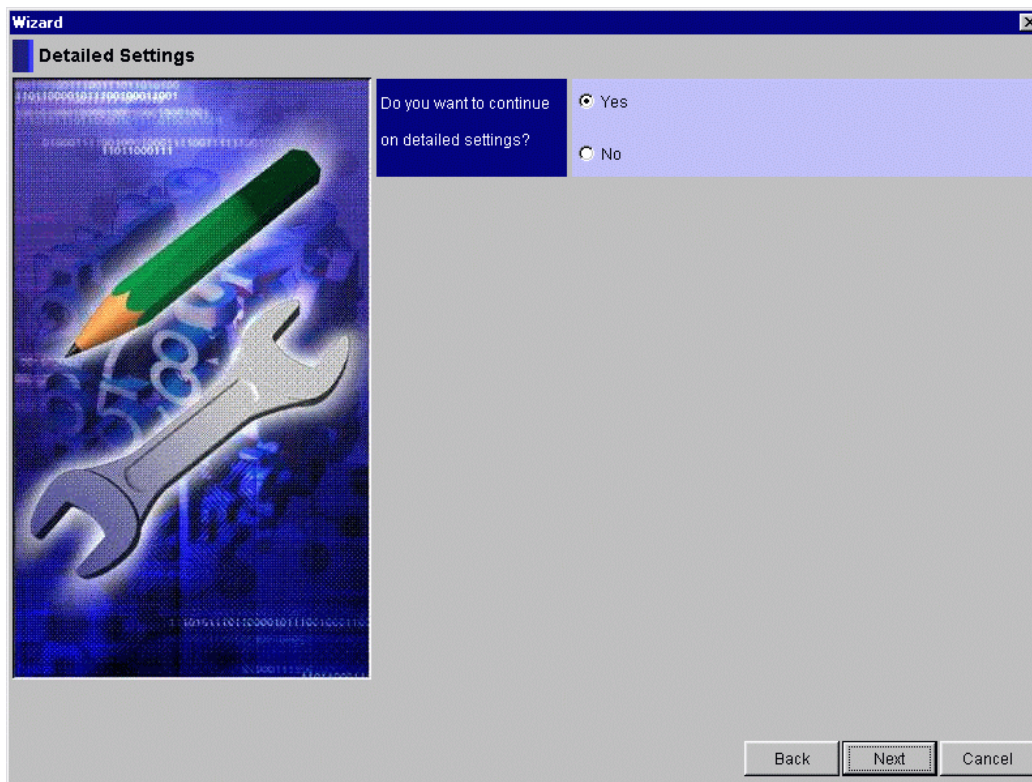


Figure 5.8 Detailed Settings

When you select **No**, the **System Parameter Setting Completed** screen will be displayed. Refer to items from '5' onward and perform a back-up operation.

The following window is displayed when **Detailed Settings** is selected:

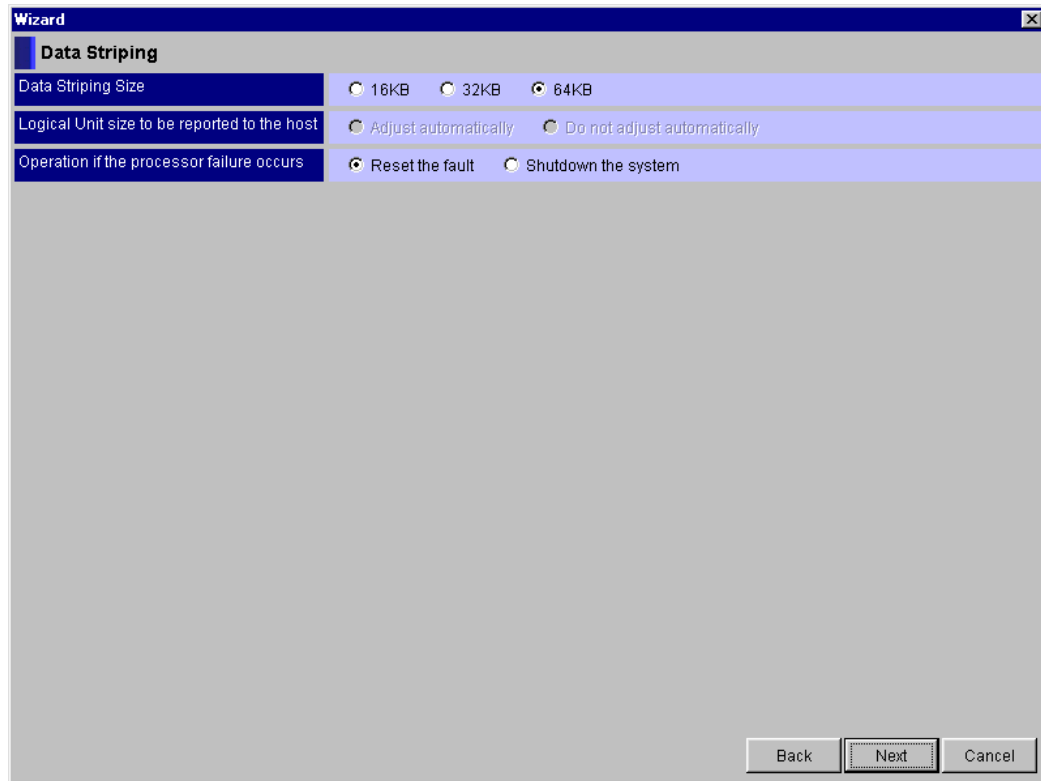


Figure 5.9 Data Striping

- **Data Striping Size:** Sets the striping size. When the RAID group is already defined, it cannot be changed. To change, do so after deleting all the RAID group.
- **Logical Unit size to be reported to the host:** Sets the logical unit 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.
 - Adjust automatically:** The logical unit size to be reported to the host is determined by the array unit automatically.
 - Do not adjust automatically:** The logical unit size to be reported to the host is set to the consistent value.
- **Operation if the processor failure occurs:** Sets the operation to be performed when a processor failure occurs.
 - Reset the fault:** Resets a failure, and restart the controller.
 - Shutdown the system:** Shuts the array unit down.

Wizard

INQUIRY Setting

Command Queuing ☒ ON ☐ OFF

ANSI Version ☒ SCSI-2 ☐ SCSI-3

Vendor ID

Product ID

ROM Microprogram Version

RAM Microprogram Version

Web Title

Cache Mode ☒ All OFF ☐ Random Mode

Host Connection Mode ☐ Link Separation

Back Next Cancel

Figure 5.10 Inquiry Setting

- **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 an eight-character entry by filling the reset with space(s). The default value set in the **Startup Attribute** setting on the **System Startup Settings** is displayed. (△ denotes a space.)
Others: HITACHI △

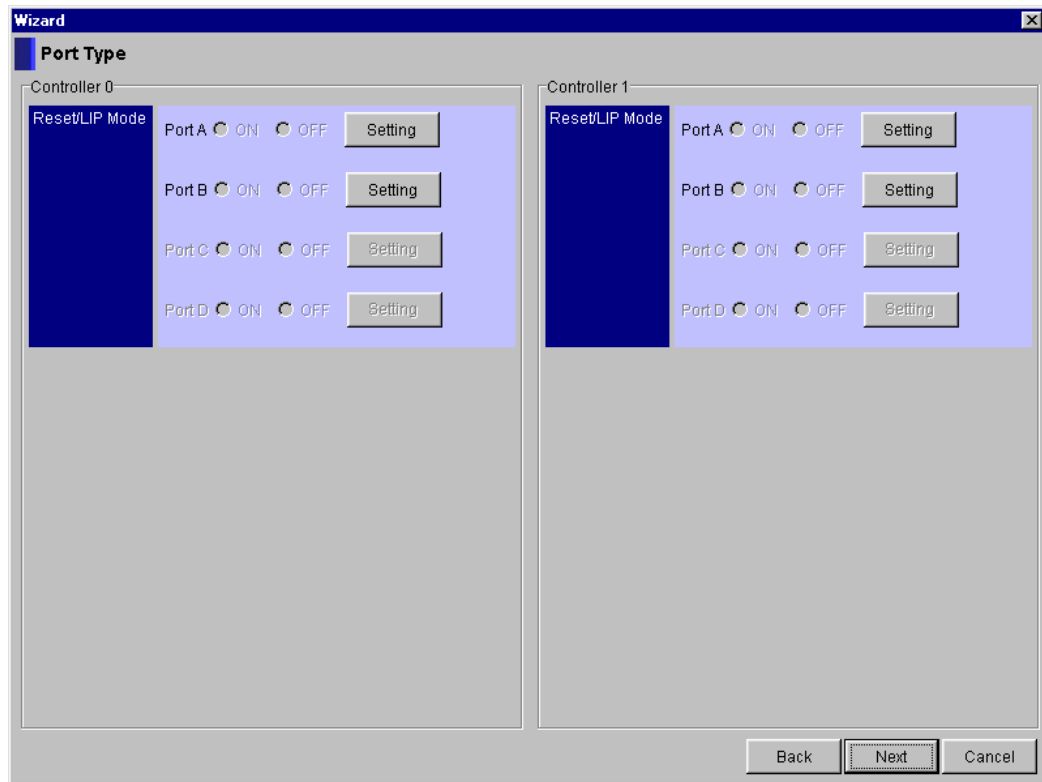


Figure 5.11 Setting the Multi-Port Expanding Function

Sets the multi-port expanding function of the controller 0/1.

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

- **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.
 - Setting:** For a connection with the Fibre version, port options can be set. Click **Setting** for each port.

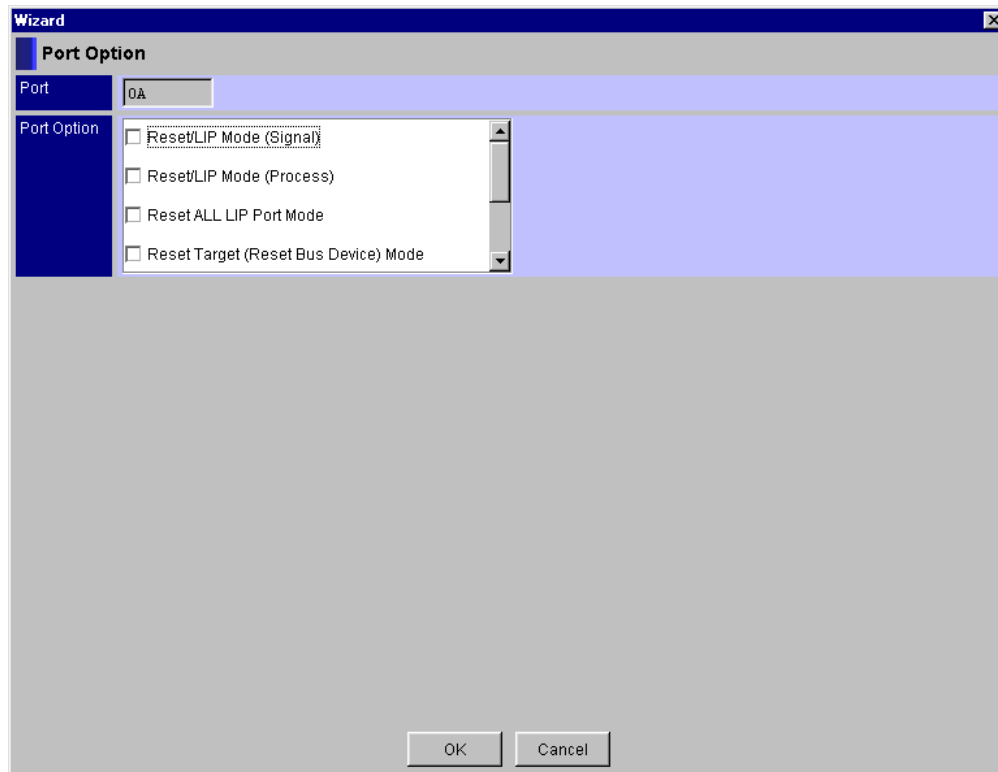


Figure 5.12 Setting Port Options

- **Port:**

- **Port Option:** Sets the port options. If the port option is set and the **OK** button 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.

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

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

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

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

Reset Logout of Third Party Process Mode: The mode to transmit Third Party Process Log-out 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.

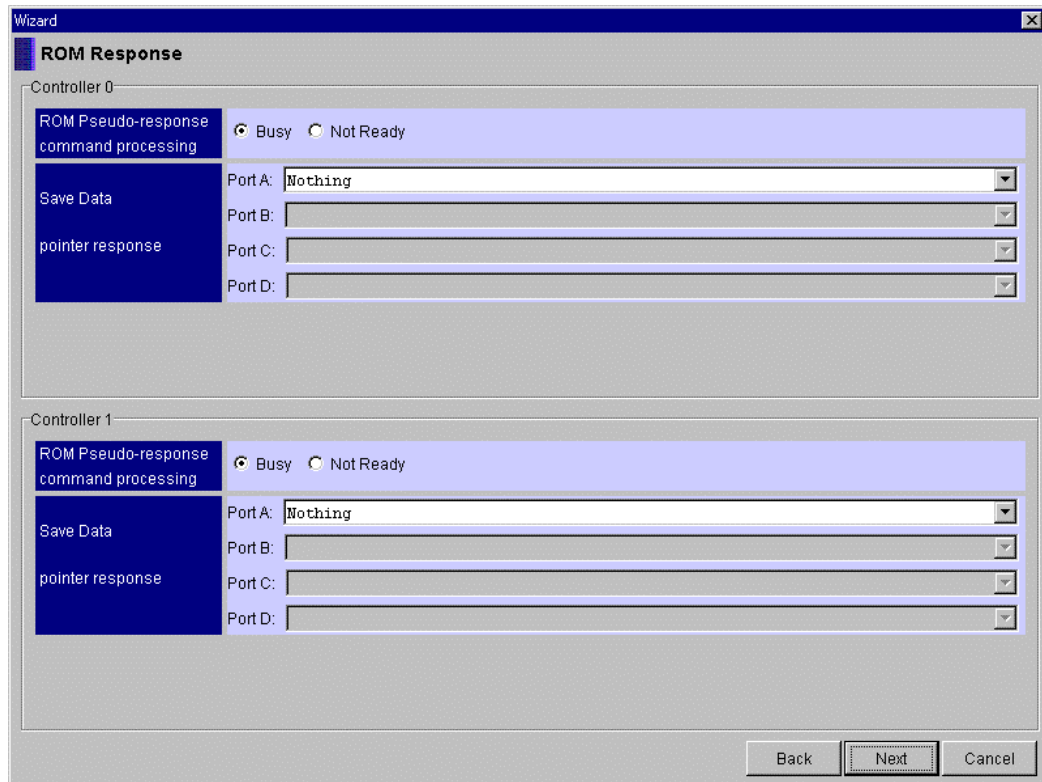


Figure 5.13 ROM Response Settings

- **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 0/1 becomes ready.
 - Busy:** Responds "BUSY".
 - Not Ready:** Responds "Not Ready".
- **Save Data pointer response:** Sets a Save Data Pointer report request to the host by the controller 0/1.
 - Nothing:** Does not report.
 - After Data:** Reports after receiving data.
 - Only After Cmd:** Reports after receiving a command.
 - After Data & Cmd:** Reports after receiving data and a command.

Wizard

Controller Option

Controller 0

Controller Identifier: ☒ Disable ☐ Enable
Controller ID: DF500-00 C0

RS232C Error Information Outflow Mode: ☐ ON (Normal) ☐ ON (HITRACK) ☒ OFF

Execute Write & Verify Mode: ☒ ON ☐ OFF

Controller 1

Controller Identifier: ☒ Disable ☐ Enable
Controller ID: DF500-00 C1

RS232C Error Information Outflow Mode: ☐ ON (Normal) ☐ ON (HITRACK) ☒ OFF

Execute Write & Verify Mode: ☒ ON ☐ OFF

Back Next Cancel

Figure 5.14 Setting Controller Options

- **Controller Identifier:** Sets the controller identifier of the controller 0/1.
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 0/1.
ON (Normal): Outputs information.
ON (HITRACK): Outputs HITRACK mode information.
OFF: Inhibits an output of information.
- **Execute Write & Verify Mode:** Sets the write & verify execution mode of the controller 0/1.
ON: Executes write and verify.
OFF: Does not execute write and verify.

The screenshot shows a 'Wizard' window titled 'LAN Setting'. It contains two side-by-side panels for 'Controller 0' and 'Controller 1'. Each panel has a 'DHCP' section with a checkbox labeled 'ON' (which is unchecked). Below this is a 'Network' section with four input fields: 'IP Address', 'Subnet Mask', 'Default Gateway', and 'Ether Address'. For Controller 0, the values are 192.168.15.203, 255.255.255.0, 192.168.15.3, and 00:00:87:70:FF:1A respectively. For Controller 1, the values are 192.168.15.204, 255.255.255.0, 192.168.15.3, and 00:00:87:F0:80:1C. At the bottom right of the window are 'Back', 'Next', and 'Cancel' buttons.

Controller	DHCP	IP Address	Subnet Mask	Default Gateway	Ether Address
Controller 0	<input type="checkbox"/> ON	192.168.15.203	255.255.255.0	192.168.15.3	00:00:87:70:FF:1A
Controller 1	<input type="checkbox"/> ON	192.168.15.204	255.255.255.0	192.168.15.3	00:00:87:F0:80:1C

Figure 5.15 LAN Settings

- **DHCP:** Sets the DHCP function.
- **Network:** Sets the LAN parameter. If enable is selected in **DHCP**, gray display will be used.

IP Address: Sets the IP address.

Subnet Mask: Sets the subnet mask.

Default Gateway: Sets the default gateway.

Ether Address: The Ethernet address (MAC address) is displayed. It cannot be changed.

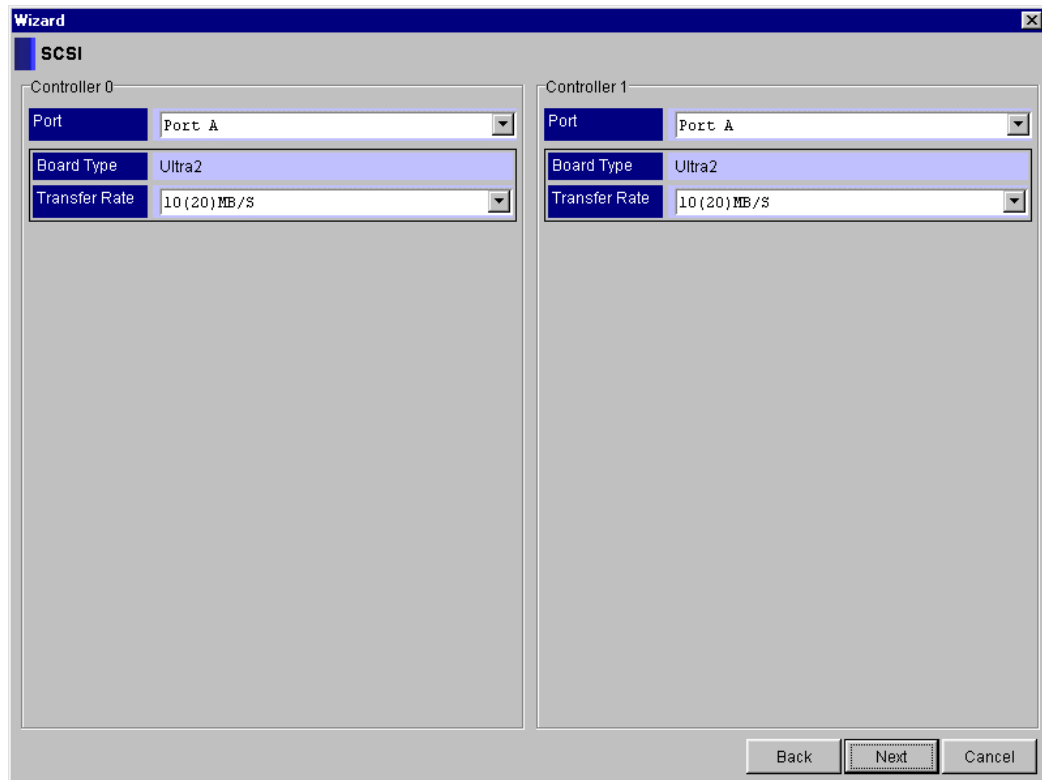


Figure 5.16 SCSI Settings

- **Port:** Selects the port to be set.
- **Board Type:** Displays types of I/F board.
 - None:** Not installed
 - Single:** Single type
 - Differential:** Differential type
 - Ultra 2:** Ultra 2 type
- **Transfer Rate:** Sets the SCSI transfer rate.
 - STANDARD:** Sets the transfer rate automatically according to the I/F board installed.
 - ASYNC:** Transfers data in the mode without using the synchronous transfer.
 - 5 (10) MB/s:** Sets the maximum transfer rate to 5 MB/s for narrow SCSI and 10 MB/s for wide SCSI.
 - 10 (20) MB/s:** Sets the maximum transfer rate to 10 MB/s for narrow SCSI and 20 MB/s for wide SCSI.
 - 20 (40) MB/s:** Sets the maximum transfer rate to 20 MB/s for narrow SCSI and 40 MB/s for wide SCSI.
 - 40 (80) MB/s:** Sets the maximum transfer rate to 40 MB/s for narrow SCSI and 80 MB/s for wide SCSI.

5. Select **Yes** of **FD Backup?**, then click the **OK** button.

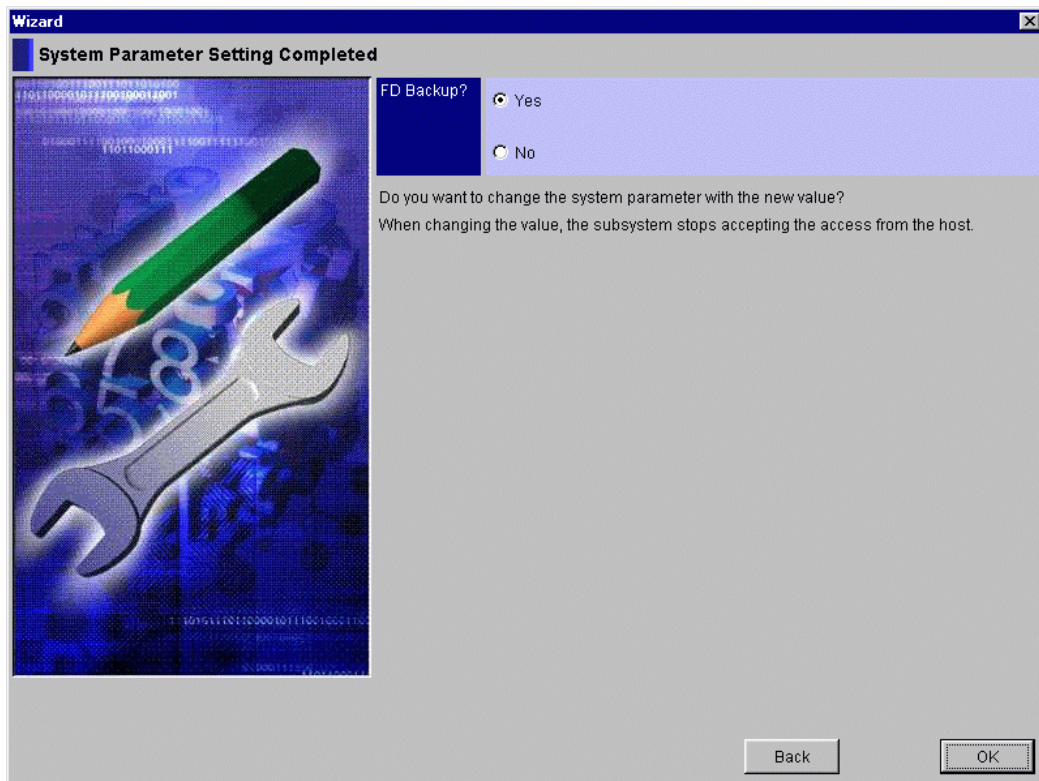
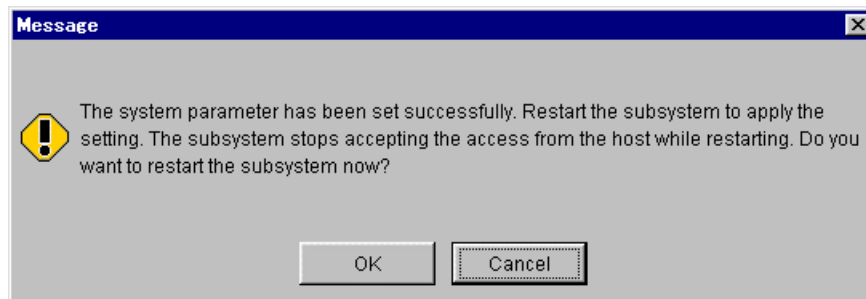


Figure 5.17 Completing System Parameter Settings

- **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".**

6. A message appears, stating that the setting is complete. A message is displayed, requesting confirmation to restart the subsystem. Click the **OK** button to restart.



Note: To validate the set system parameters, restart the array unit. 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 beginning the restart process.

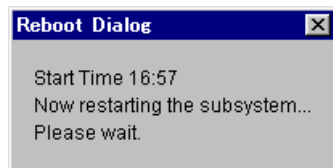
Note: If LAN configuration information is modified, an error message (Interface Error) may be displayed without displaying a restart completion message when restarting is initiated. When modifying LAN configuration information, after closing the unit window without specifying restart, restart an array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

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

When this message is displayed, writing to a FD has not been finished, but setting the system parameter may be completed.

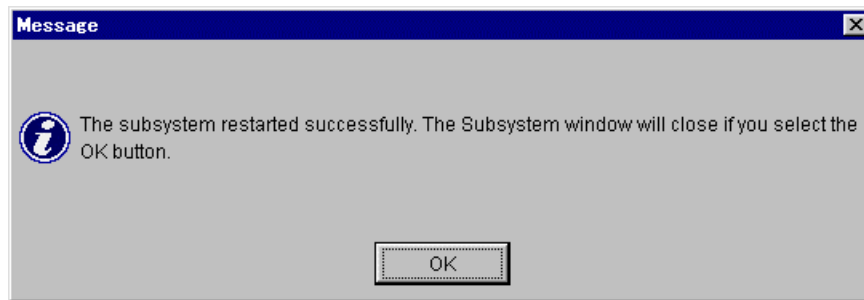
Check a FD in an array unit, re-confirm the data to set, turn on the **FD Backup?** check box, and then click the **OK** button once again.

When you choose to restart the array unit, the time the restart began is displayed. This usually 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.

A message appears, stating that the restart is successful. Click the **OK** button.



The Unit screen is closed. To perform other operations on the main window, select an array unit from the main window and open the selected Unit screen.

Chapter 6 Setting System Parameters (GUI)

Set a system configuration, such as a Target ID and the Fibre information, of an array unit. Individual items to be set are selected by switching the tab screen. Tab screens may not be displayed, depending on the connected array unit and other variables.

This chapter includes the following:


- Target ID
- LAN Configuration
- Spare Drive Setup
- Setting the Drive Restoration Control Option
- Setting Fibre Channel Information
- Outputting Configuration Information to File
- Replacing the Microprogram
- Setting the Priced Optional Features
- Setting and Outputting the SNMP Environmental Information File
- Array Unit Management by the Password Protection Function
- Setting Turbo LU
- Setting the Port Option
- Setting the Controller Identifier

6.1 Target ID

Set the configuration of the target ID and the LUN which are recognized when the array unit is connected to the host. This section includes the following:

- Adding Information
- Adding Mapping Information
- Changing Mapping Information

6.1.1 Adding Information

1. On the **Settings** menu, select **Configuration Settings** on the Unit screen or click : **Configuration Settings** in the tool bar.

- Click the **Target ID** tab. And click the **Change (After)** radio button.

Parameter

Array Unit: DF500

Restore Options | Online Verify | Constitute | Fibre Channel | Spare Drive | Options | Micro Update

Target ID | Port Option | Controller Identifier | LAN

Target ID

Controller 0: M-TID, M-LUN

Controller 1: M-TID, M-LUN

Auto Setting

Reflection

☒ Change (After)

☐ Add (Now)

☐ Change (Now)

LUN	Port	Target ID	Host LUN
0	Controller 0	0	0
1	0A	1	1
2	0B	2	2
3		3	3
4	Controller 1	4	4
5	1A	5	5
6	1B	6	6
7		7	7
8		8	8
9		9	9
10		10	10
11		11	11
12			
13			
14			

Reserved Configuration

LUN	Port	T-ID	H-LUN
0	0A	--	0

Current Configuration

LUN	Port	T-ID	H-LUN
0	0A	--	0

Delete

☒ FD Backup

Apply

Reset

Close

Figure 6.1 Adding Target ID Information

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

- **Target ID:** Specifies configuration types of the target ID and the LUN.
 - S-TID, M-LUN:** Sets a target ID of the port and makes the LUN, which is shared, by the ports available to be used by the host with an identical LUN.
 - M-TID, S-LUN:** Sets a port and a target ID for the LUN and enables the LUN to be used with LUN = '0' and a target ID set by the host.
 - M-TID, M-LUN:** Sets a port, a target ID, and a Host LUN for the LUN in a map form and enables the LUN to 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.
- **LUN:** Specifies the LUN in the array unit. When **S-TID, M-LUN** is selected for **Target ID**, the display is grayed and cannot be selected.
- **Port:** Specifies a port number.
- **Target ID:** Specifies a target ID.
- **Host 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.
- **Reserved Configuration:** Displays the configuration that is set. When **S-TID, M-LUN** is set, **Host LUN** and **LUN** are displayed as "-". When **M-TID, S-LUN** is set, **H-LUN** is displayed as "-".
- **Current Configuration:** Displays the configuration that is set. When **S-TID, M-LUN** is set, **Host LUN** and **LUN** are displayed as "-". When **M-TID, S-LUN** is set, **H-LUN** is displayed as "-".

Note: The setting of the Target ID varies with the array unit or controller to be connected. When connecting to a single-controller system, only the Controller 0 side can be set up. When connecting to both controllers of a dual-controller system, only the Controller 0 side can be set up, and the settings of the Controller 0 side are reflected on the Controller 1 side. When connecting to either of two controllers of a dual-controller system, only whichever controller side is connected can be set up.

3. Set the target ID and the LUN for each target ID according to the following procedure. When only one controller has been registered for the array unit, the setting of the **Target ID** will be valid only for the registered controller.

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

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

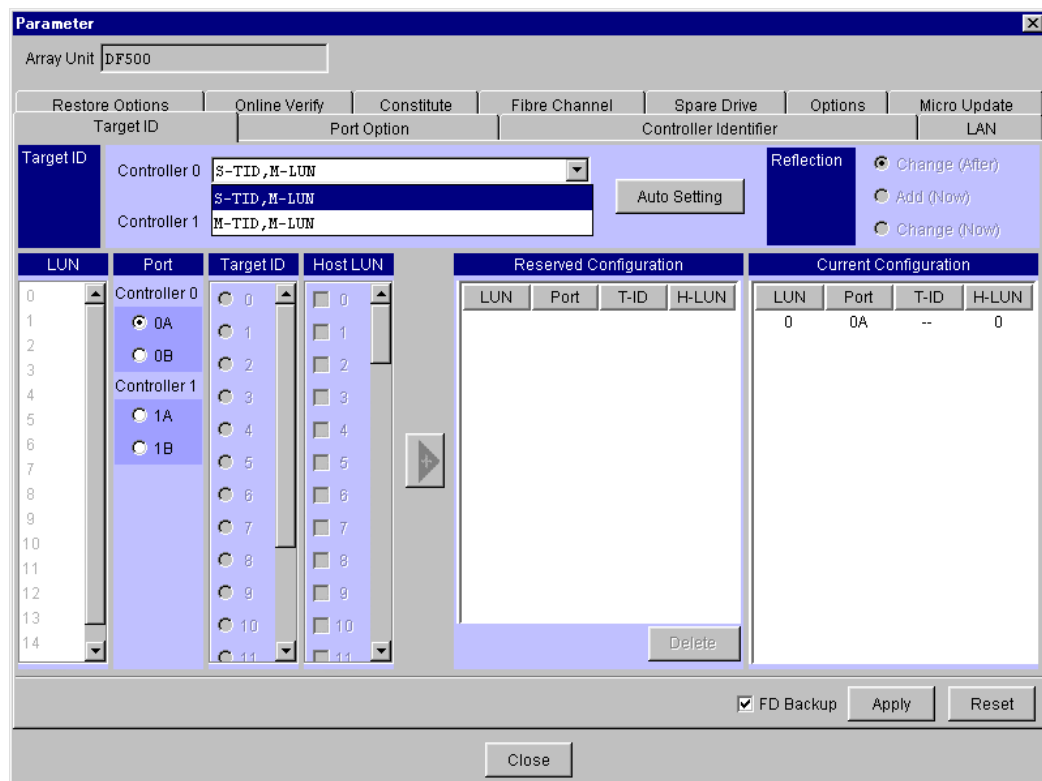



Figure 6.2 Adding S-TID, M-LUN Target ID Information

Select S-TID, M-LUN in Target ID.

For addition, select one **Port** to be added, select one **Target ID** to be set, and click the  button. The added contents are displayed in **Reserved Configuration**.

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

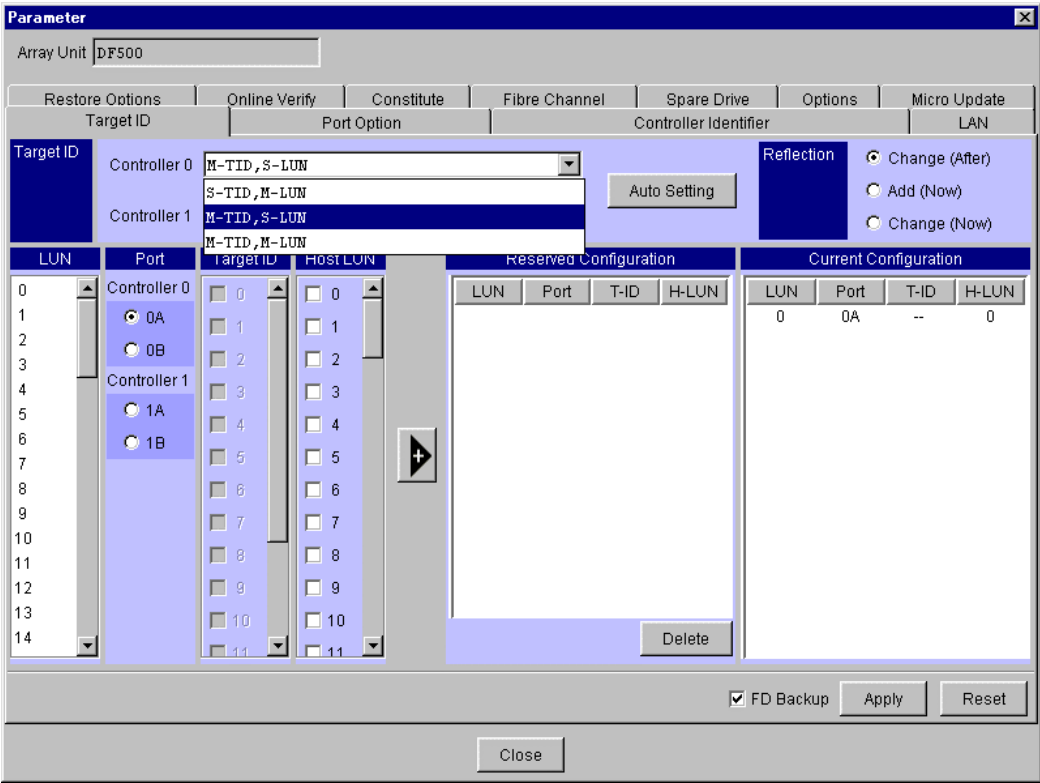



Figure 6.3 Adding M-TID, S-LUN Target ID Information

Select **M-TID, S-LUN** in the Target ID.

Select one **LUN** to be set, select one **Port** and one **Target ID** to be set, and click the  button. The added contents are displayed in **Reserved Configuration**.

Multiple **Port** and **Target 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 the **Delete** button. The deleted contents disappear from the display of **Reserved Configuration**.

c) When **M-TID, M-LUN** mode is specified:

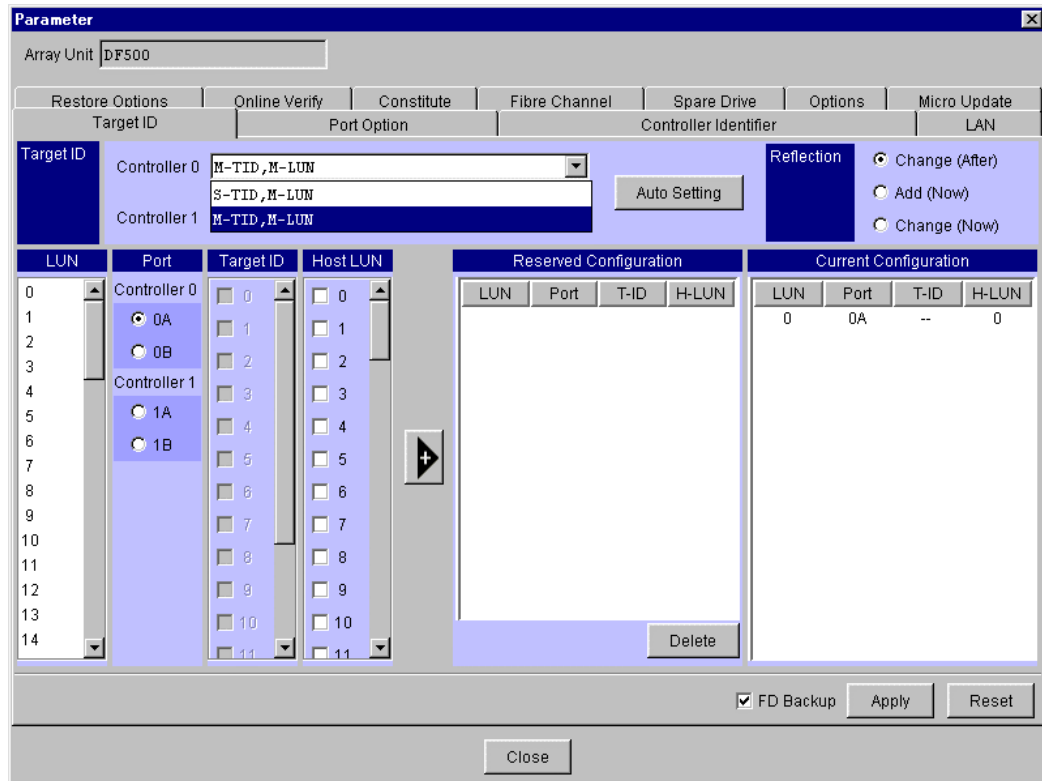



Figure 6.4 Adding M-TID, M-LUN Target ID Information

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

Select one **LUN** to be added; select **Port**, **Target ID**, and **Host LUN** in the mapping configuration, and click the  button. The added contents are displayed in **Reserved Configuration**.

Multiple **Port**, **Target ID**, and **Host LUN** can be selected.

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

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

d) Auto setting

The target ID configuration file is stored, and **Port**, **Target ID**, **Host 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 the **Auto Setting** button. A window for specifying a file to be stored appears. Specify the file and click the **OK** button, 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 the necessary data, which are the same as those entered in the setting made on the screen, for **Port**, **Target ID**, **H-LUN**, and **LUN**. Put spaces between the items. If the tabulating function is used, they are regarded as input errors and the inputs are ignored.

Example 1: M-TID, M-LUN Mode

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

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

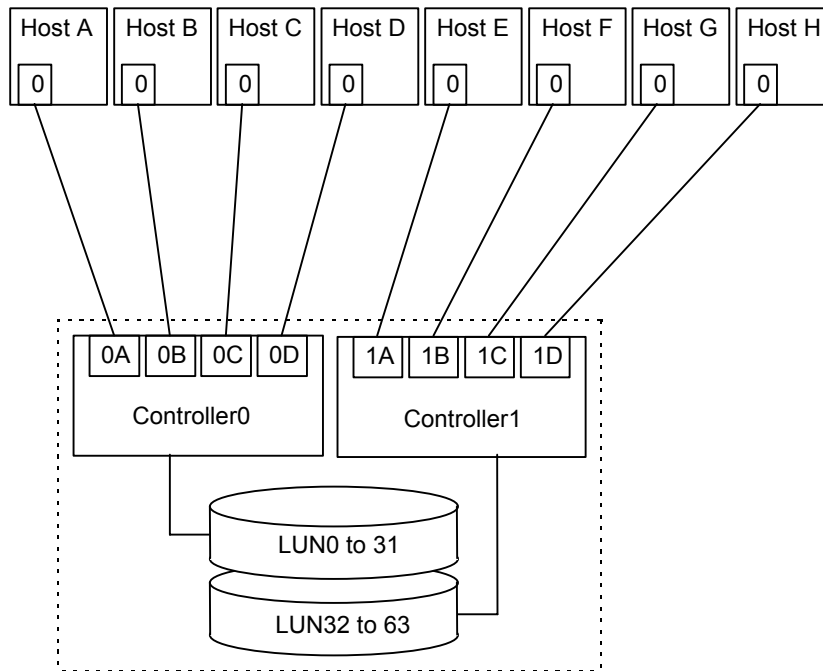
Example 2: S-TID, M-LUN Mode

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

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

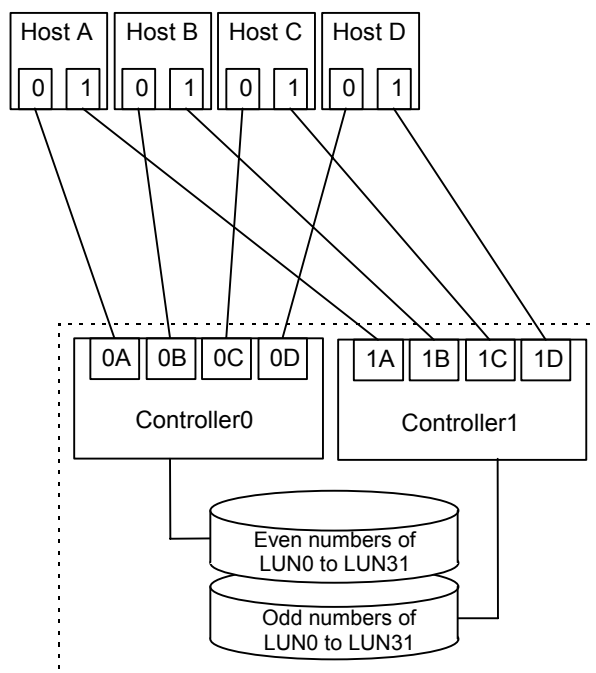
Note: When the Resource Manager 9200 is connected to the array unit with the Fibre Channel connection, set '--' for the T-ID.

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



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

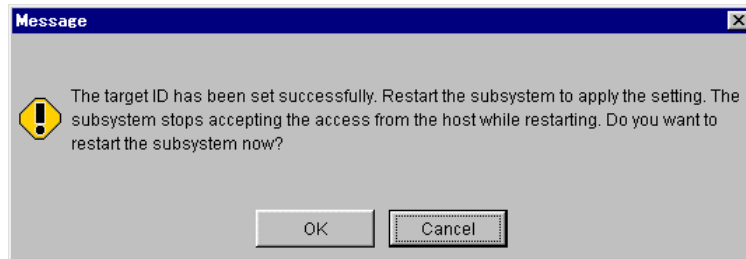
Figure 6.5 Sample File: id00.txt - - - Host LU Independent Access Type



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

Figure 6.6 Sample File: id01.txt - - Host Alternate Path Access Type

4. Click the **Apply** button.
5. A message appears, stating that the Target ID has been changed. A message is displayed, requesting confirmation to restart the subsystem. Click the **OK** button to restart.



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

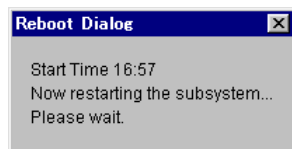
The previous setting stays valid until restarting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before beginning the restart process.

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

When this message is displayed, writing to a FD has not been finished, but setting the Target ID may be completed.

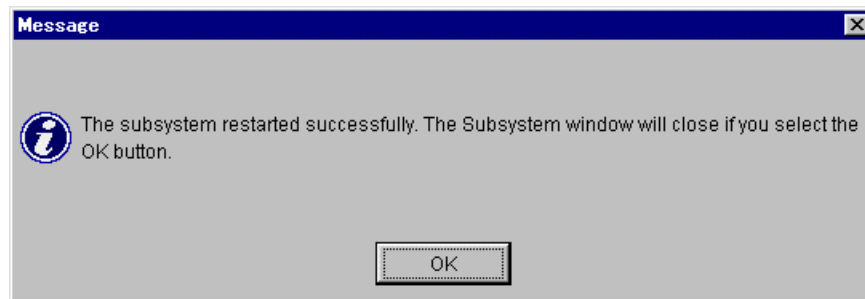
Check a FD in an array unit, re-confirm the data to set, turn on the **FD Backup** check box, and then click the **Apply** button once again.

6. When you choose to restart the array unit, the time the restart began is displayed. This usually 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.

7. A message appears, stating that the restart is successful. Click the **OK** button.




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

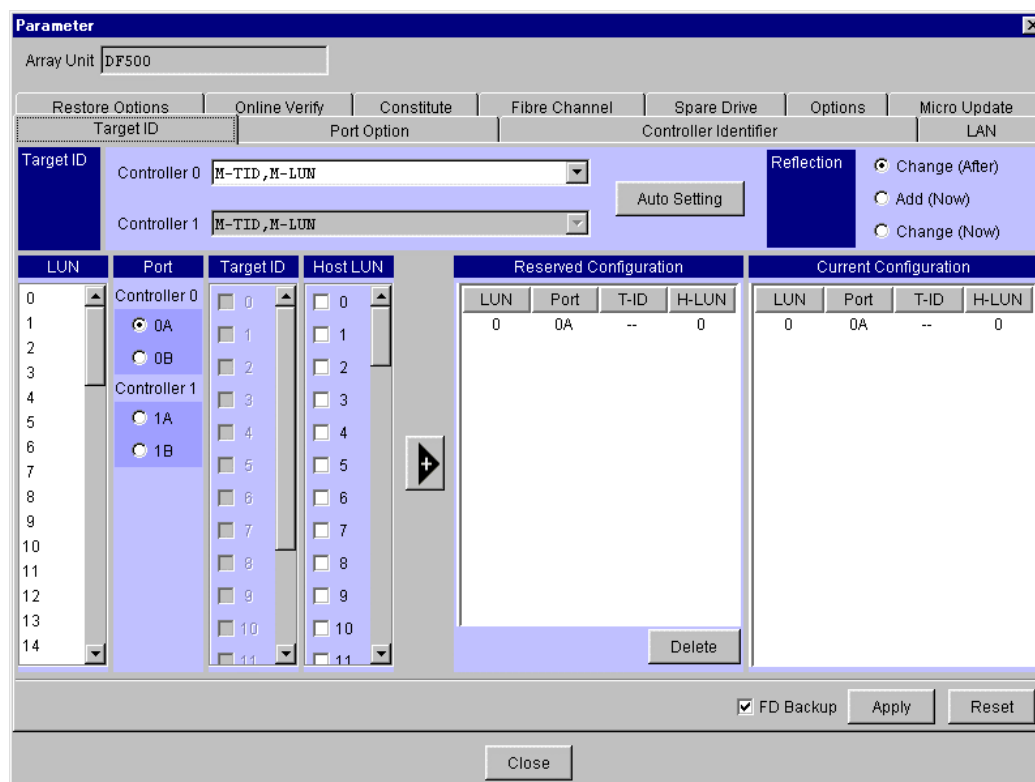
6.1.2 Adding Mapping information

Adds mapping information for a set-up Target ID. This setting is allowed only if the Target ID mode of an array unit setup has been set to **M-TID, M-LUN** (mapping).

If the Target ID has been set in advance using **Change (After)**, restart the array unit to reflect the setting, and add mapping information.

The added information becomes valid without restarting the array unit.

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **Target ID** tab.



The screenshot shows the 'Parameter' dialog box for 'Array Unit DF500'. The 'Target ID' tab is selected. The 'Controller 0' and 'Controller 1' dropdowns are both set to 'M-TID, M-LUN'. The 'Reflection' section has three radio buttons: 'Change (After)' (selected), 'Add (Now)', and 'Change (Now)'. Below these are two tables: 'Reserved Configuration' and 'Current Configuration'. Both tables have columns for LUN, Port, T-ID, and H-LUN. The 'Reserved Configuration' table shows LUN 0 mapped to Port 0A, T-ID --, and H-LUN 0. The 'Current Configuration' table shows the same mapping. At the bottom, there is a 'Delete' button and a 'Close' button. A checkbox for 'FD Backup' is checked.

LUN	Port	Target ID	Host LUN
0	0A	0	0
1	0B	1	1
2	0B	2	2
3	1A	3	3
4	1B	4	4
5		5	5
6		6	6
7		7	7
8		8	8
9		9	9
10		10	10
11		11	11

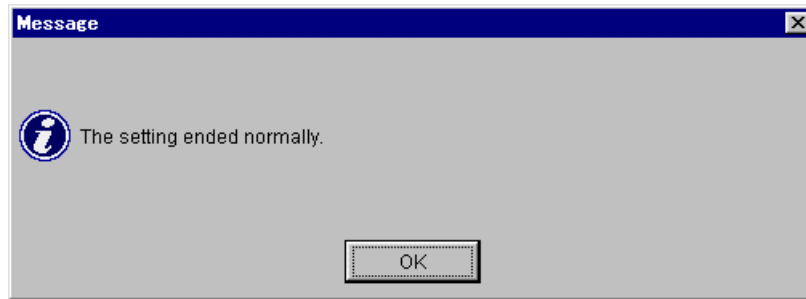
LUN	Port	T-ID	H-LUN
0	0A	--	0

LUN	Port	T-ID	H-LUN
0	0A	--	0

Figure 6.7 Adding Mapping Information

- **FD Backup:** Target ID configuration information has been saved in a backup FD in an array unit as parameter information. When the setting is modified, it is necessary to save it again, so be sure to turn on the check box.
3. Click the **Add (Now)** radio button on **Reflection** box.
 4. Add the information, and click the **Apply** button.

5. A message appears stating that the setting is complete. Click the **OK** button.



The added information is updated and displayed on **Current Configuration**.

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

When this message is displayed, writing to a FD which has not been finished, but setting the Target ID may be completed.


Check a FD in an array unit, re-confirm the data to set, turn on the **FD Backup** check box, and then click the **Apply** button once again.

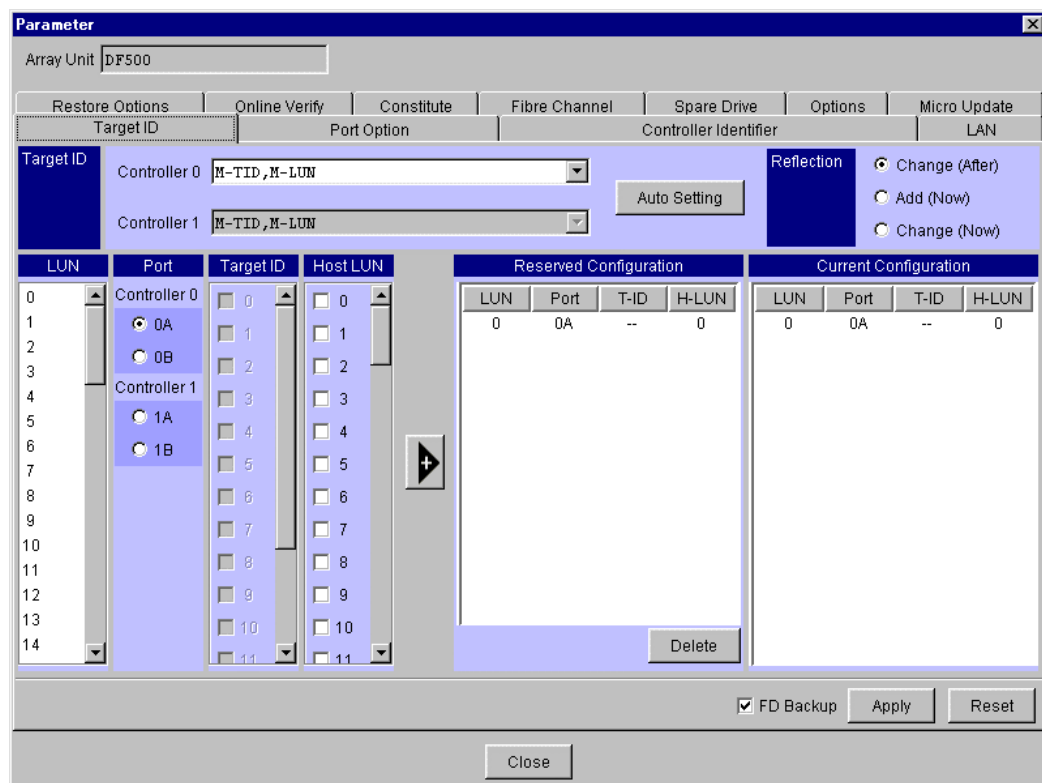
6.1.3 Changing Mapping Information

You can change mapping information for a set-up Target ID. This setting is allowed only if the Target ID mode of an array unit for setup has been set to **M-TID,M-LUN** (mapping).

If the Target ID has been set in advance using **Change (After)**, restart an array unit to reflect the setting, then add mapping information. Added information becomes valid without restarting the array unit.

Note: When executing modification, I/O operations on a set-up port may terminate abnormally. When you modify, execute modification after all I/O operations from the host to a port for which to modify settings stops.

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **Target ID** tab.



Parameter

Array Unit: DF500

Restore Options | Online Verify | Constitute | Fibre Channel | Spare Drive | Options | Micro Update

Target ID | Port Option | Controller Identifier | LAN

Target ID

Controller 0: M-TID, M-LUN

Controller 1: M-TID, M-LUN

Auto Setting

Reflection: ☒ Change (After), ☐ Add (Now), ☐ Change (Now)

LUN	Port	Target ID	Host LUN
0	Controller 0	0	0
1	0A	1	1
2	0B	2	2
3		3	3
4	Controller 1	4	4
5	1A	5	5
6	1B	6	6
7		7	7
8		8	8
9		9	9
10		10	10
11		11	11
12			
13			
14			

Reserved Configuration

LUN	Port	T-ID	H-LUN
0	0A	--	0

Current Configuration

LUN	Port	T-ID	H-LUN
0	0A	--	0

Delete

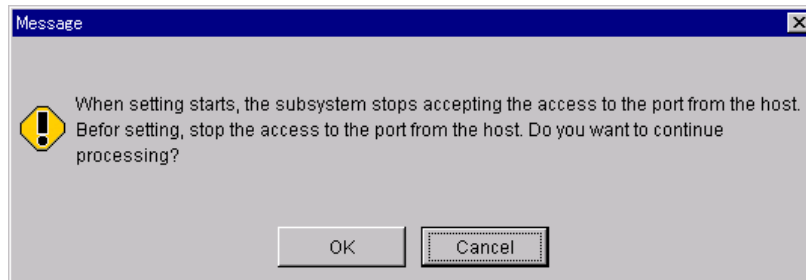
☒ FD Backup Apply Reset

Close

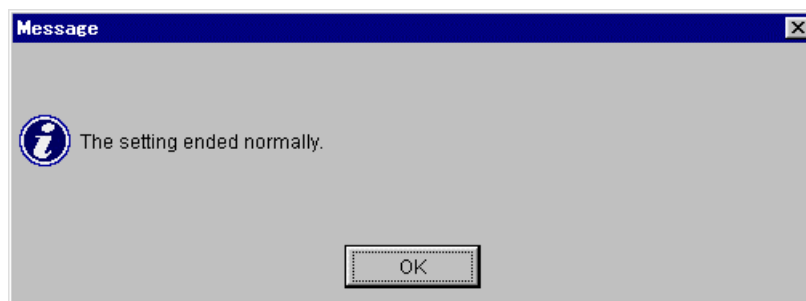
Figure 6.8 Changing Mapping Information

- **FD Backup:** Target ID configuration information has been saved in a backup FD in an array unit as parameter information. When the setting is modified, it is necessary to save it again, so be sure to turn on the check box.

3. Click the Change **(Now)** radio button on **Reflection** box.
4. Add the information, and click the **Apply** button.
5. A confirmation message appears. After making sure that I/O operation initiated by the host has stopped, click the **OK** button.



6. A message indicating completion of setting is displayed, click the **OK** button.



The added information is updated and displayed on **Current Configuration**.


Note: When failing to write onto the FD drive, the message "DME504EB02: Backup floppy disk write error." is displayed.

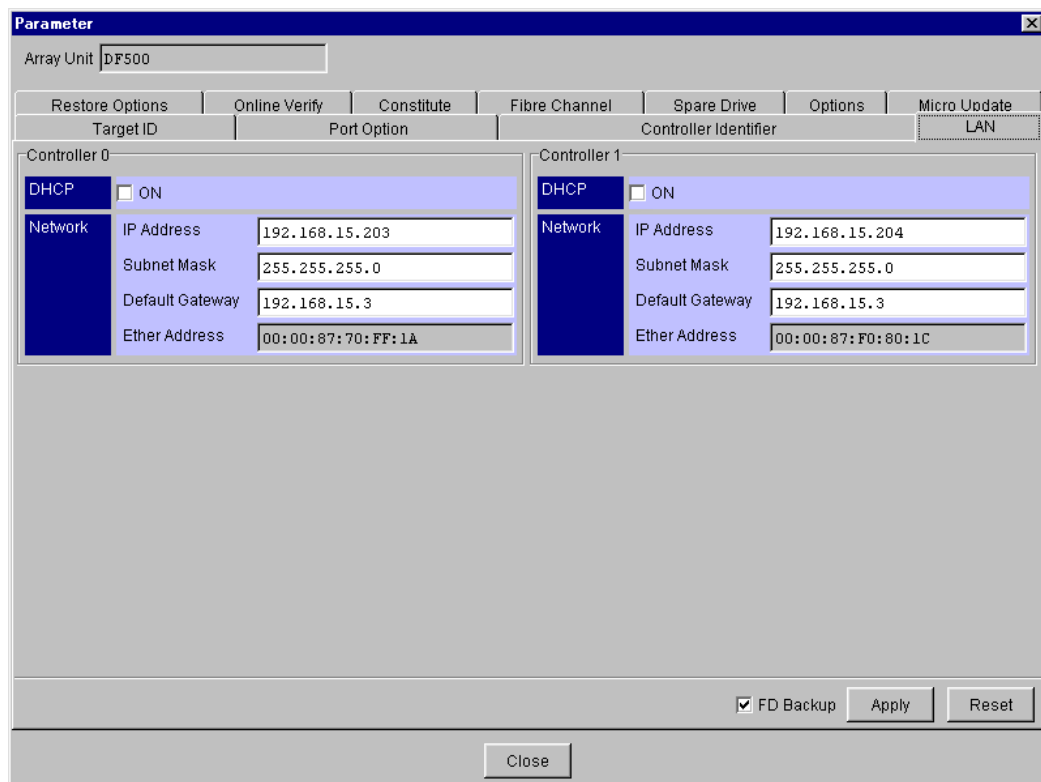
When this message is displayed, writing into a FD has not been finished, but setting the Target ID may be completed.

Check a FD in an array unit, re-confirm the data to set, turn on the **FD Backup** check box, and then click the **Apply** button once again.

6.2 LAN Configuration

To set the LAN configuration information of the array unit:

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **LAN** tab.



The screenshot shows the 'Parameter' dialog box with the 'LAN' tab selected. The 'Array Unit' is set to 'DF500'. The dialog is divided into two sections for 'Controller 0' and 'Controller 1'. Each section has a 'DHCP' checkbox (currently unchecked) and a 'Network' section with fields for 'IP Address', 'Subnet Mask', 'Default Gateway', and 'Ether Address'. The 'Ether Address' fields are grayed out. At the bottom right, there is a checked 'FD Backup' checkbox and 'Apply' and 'Reset' buttons. A 'Close' button is at the bottom center.

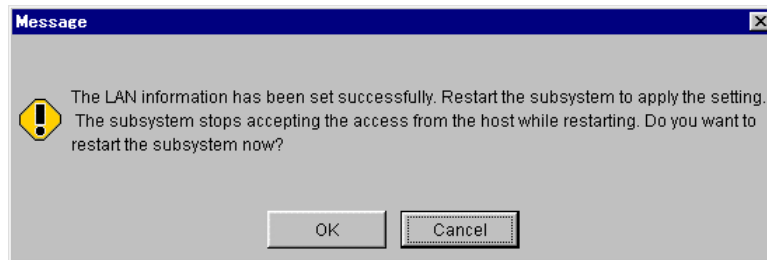
Controller	DHCP	IP Address	Subnet Mask	Default Gateway	Ether Address
Controller 0	<input type="checkbox"/>	192.168.15.203	255.255.255.0	192.168.15.3	00:00:87:70:FF:1A
Controller 1	<input type="checkbox"/>	192.168.15.204	255.255.255.0	192.168.15.3	00:00:87:F0:80:1C

Figure 6.9 Setting LAN Configuration Information

- **DHCP:** Specifies whether the DHCP mode will be valid or invalid.
- **Network:** Specifies IP Address, Subnet Mask, or Default Gateway, which is part of the LAN information. Ether Address is displayed but cannot be changed.
- **FD Backup:** LAN configuration information is saved onto the backup FD in the array unit as part of the system parameter information. **Check the check box;** if the setting is changed, it will need to be saved again.

Note 1: When **ON** is selected in **DHCP**, **LAN Parameter** is displayed in gray and cannot be selected.

3. Click the **Apply** button.
4. A message appears, stating that the setting is complete. A message is displayed, requesting confirmation to restart the subsystem. Click the **OK** button when restarting.



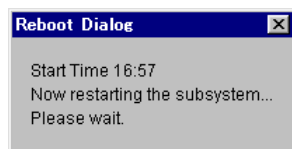
Note: To validate the LAN information, restart the array unit. The previous settings stay valid until restarting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before beginning the restart process.

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

When this message is displayed, writing to a FD has not been finished, but setting the LAN configuration information may be completed.

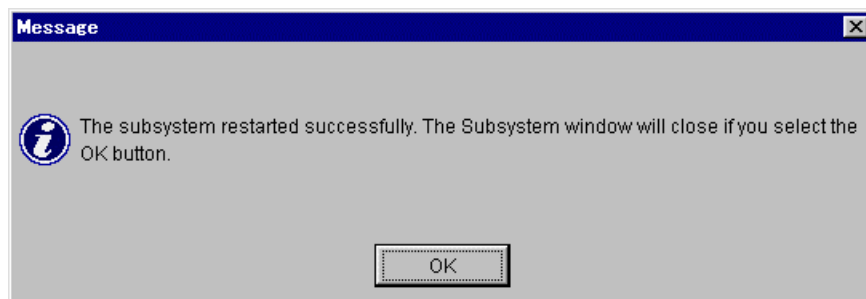
Check the FD in an array unit, re-confirm the data to set, turn on the **FD Backup** check box, and click the **Apply** button again.

5. When you choose to restart the array unit, the time the restart began is displayed. This usually 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.


6. A message appears, stating that the restart is successful. Click the **OK** button.



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

6.3 Setting SCSI Transfer Rate

To set the transfer rate for each port of the array unit:

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **SCSI** tab.

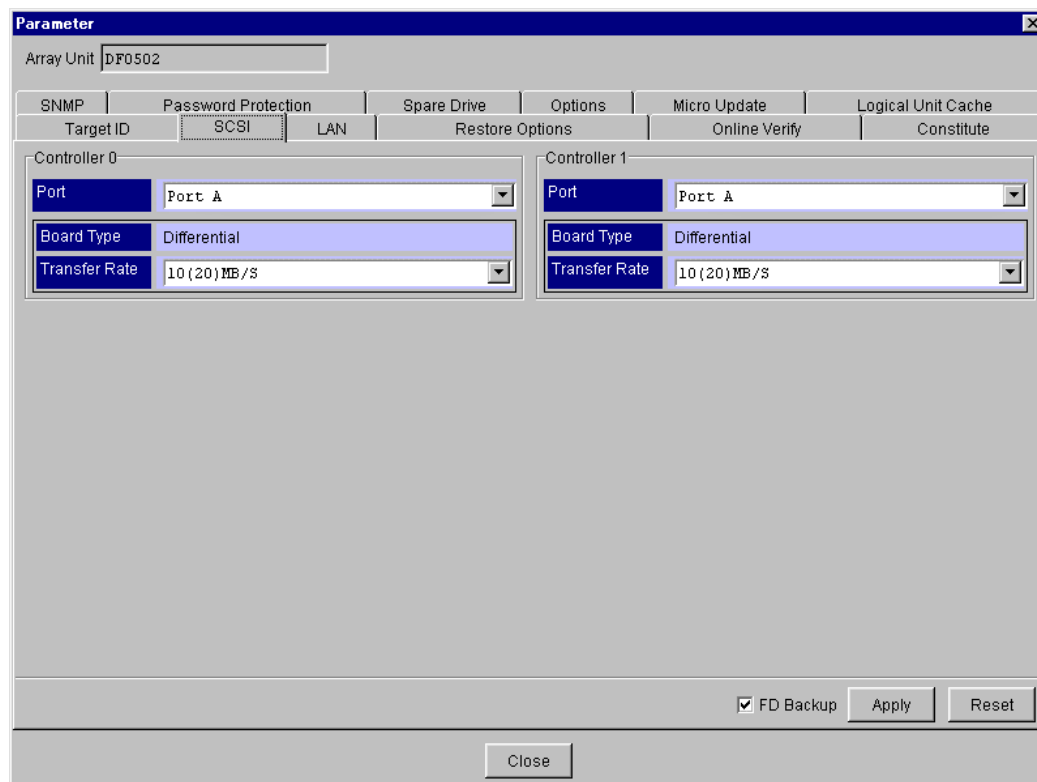


Figure 6.10 Setting the SCSI Transfer Rate

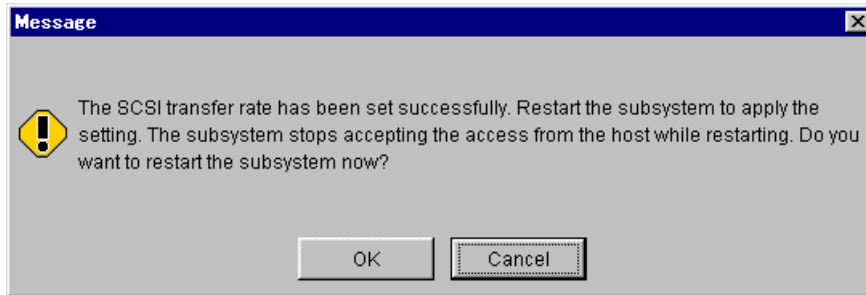
- **Port:** Selects the port number to be set.
- **Board Type:** The IF board type installed is displayed.
 - None:** Not installed
 - Single:** Single type
 - Differential:** Differential type
 - Ultra2:** Ultra2 type
- **Transfer Rate:** Selects the port transfer rate.
 - STANDARD:** Transfers data 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 MB/s for narrow SCSI and 10 MB/s for wide SCSI.
 - 10(20) MB/s:** Sets the maximum transfer rate to 10 MB/s for narrow SCSI and 20 MB/s for wide SCSI.

20(40) MB/s: Sets the maximum transfer rate to 20 MB/s for narrow SCSI and 40 MB/s for wide SCSI.

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

Note: When the **Board Type** displays **None**, it is displayed in gray and cannot be set. When the **Board Type** displays **Single** or **Differential**, **40(80) MB/s** is displayed in gray 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 check the check box;** it is necessary to save it again when the setting is changed.
3. Click the **Apply** button.
 4. A message appears, stating that the setting is complete. A message is displayed, requesting confirmation to restart the subsystem. Click the **OK** button when restarting.



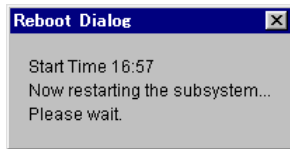
Note: To validate the LAN information, restart the array unit. The previous settings stay valid until restarting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before beginning the restart process.

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

When this message is displayed, writing to a FD has not been finished, but setting the LAN configuration information may be completed.

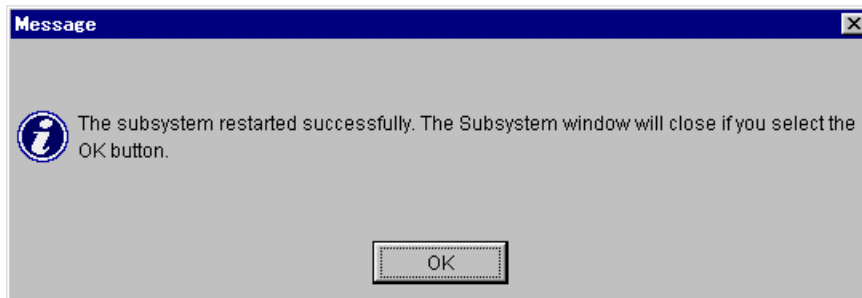
Check the FD in an array unit, re-confirm the data to set, turn on the **FD Backup** check box, and click the **Apply** button again.

5. When you choose to restart the array unit, the time the restart began is displayed. This usually 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.


A message appears, stating that the restart is successful. Click the **OK** button.

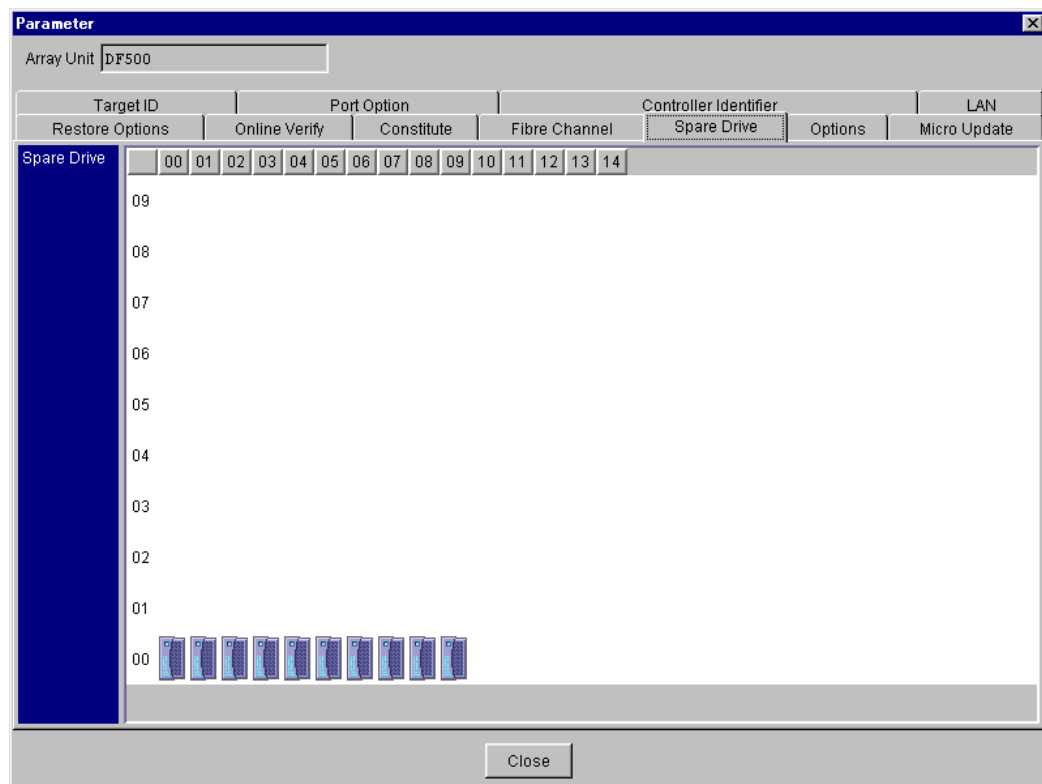


The Unit screen closes. To perform other operations on the main window, select an array unit from the main window and open the selected Unit screen.

6.4 Spare Drive Setup

To set up and cancel the spare disk:

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **Spare Drive** tab.



Data disk



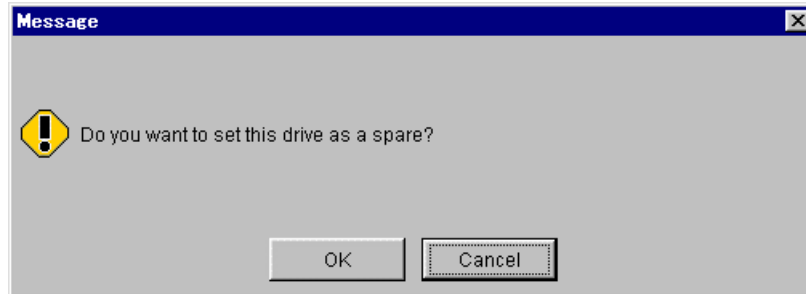
Spare disk

Figure 6.11 Setting Up the Spare Drive

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

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

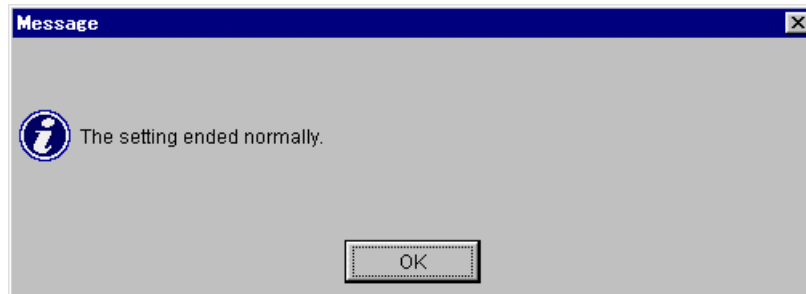
4. A message appears, requesting confirmation to set this drive as a spare. Click the **OK** button.
 - a) When a spare disk is setup



- b) When a spare disk is canceled:




5. A message appears, stating that the setting is complete. Click the **OK** button.

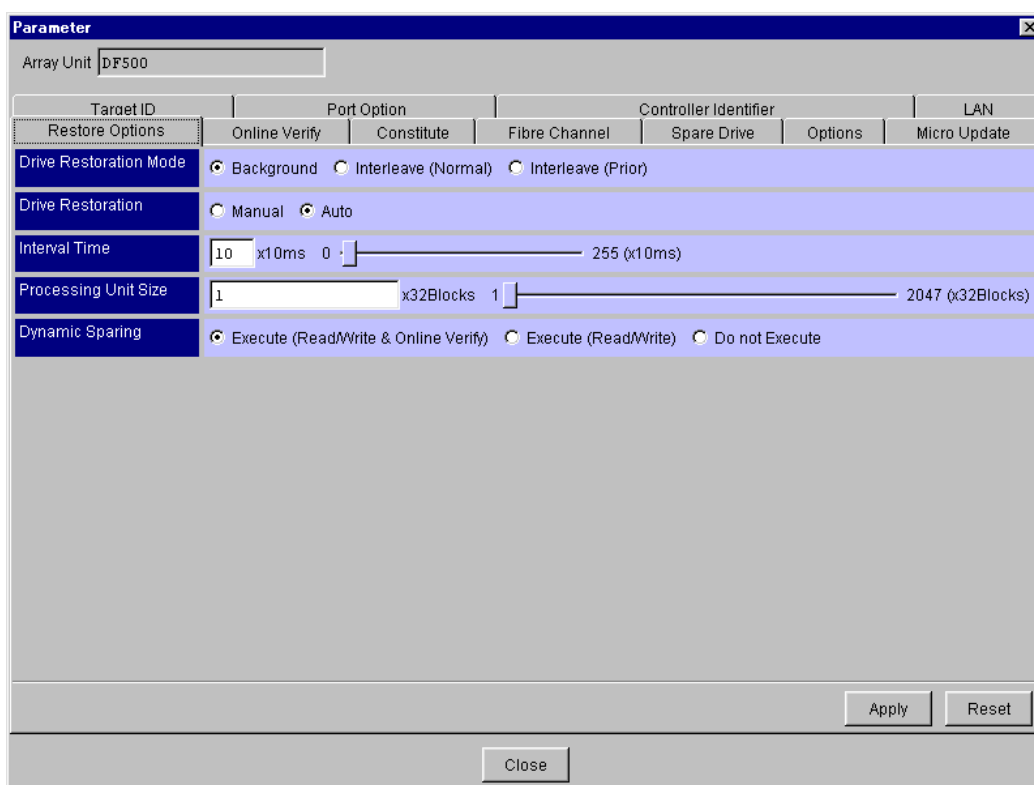


The icon of the HDU, which is setup or canceled is updated and displayed.

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 certain that the drive is not being restored when changing the option setting.

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
1. Click the **Restore Options** tab.



Target ID	Port Option	Controller Identifier	LAN
Restore Options	Online Verify	Constitute	Fibre Channel
Drive Restoration Mode	<input checked="" type="radio"/> Background <input type="radio"/> Interleave (Normal) <input type="radio"/> Interleave (Prior)		
Drive Restoration	<input type="radio"/> Manual <input checked="" type="radio"/> Auto		
Interval Time	10 x10ms 0 255 (x10ms)		
Processing Unit Size	1 x32Blocks 1 2047 (x32Blocks)		
Dynamic Sparing	<input checked="" type="radio"/> Execute (Read/Write & Online Verify) <input type="radio"/> Execute (Read/Write) <input type="radio"/> Do not Execute		

Apply Reset Close

Figure 6.12 Setting the Drive Restoration Control Option

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 (Prior):** 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.

Manual: Starts restoring data and copying by manual operations.

Auto: Automatically starts restoration of data and copying.

Note: Use **Auto**, as the Resource Manager 9200 does not support a manual operation.

- **Interval Time:** Specify a time interval of drive restoration. The default interval time is 10×10 ms and drive restoration is executed at intervals of 100 ms. Specify a multiplication factor 0 to 255 in a unit of 10 ms.
- **Processing Unit Size:** Specify the size of the data block to be restored. The default processing unit size is 32 blocks and data of 16 k byte is restored at a time. When Interleave mode is specified, the function restores data of a processing unit size specified here, waits for a time interval specified here, then starts the next data restoration. Specify a multiplication factor 1 to 2,047 in a unit of 512 bytes.
- **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.


Execute (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.

Execute (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.

Do not Execute: 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 the setting is complete, click the **Apply** button.

6.6 Online Verify Mode

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **Online Verify** tab.

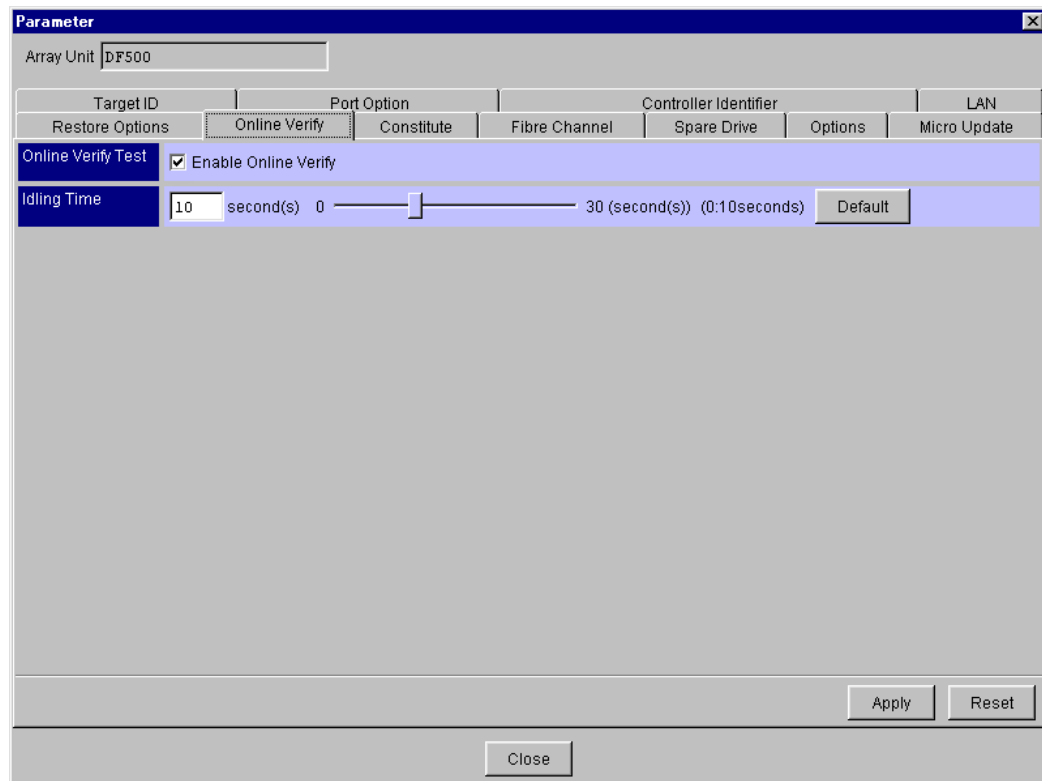


Figure 6.13 Online Verify Mode


3. Select whether or not to execute **Online Verify Test** and specify **Idling Time**.
 - **Online Verify Test:** Specifies whether or not to execute **Online Verify Test**.
 - **Idling Time:** Specifies an interval from the end of an I/O operation instructed by the host to the start of the online verify. If "0" is specified, the time is set to 10 [seconds], and hence an online verify operation begins 10 [seconds] after an I/O operation from the host terminates. Specify a value within a range between 1 and 30 seconds in units of seconds.
4. After the setting is complete, click the **Apply** button.

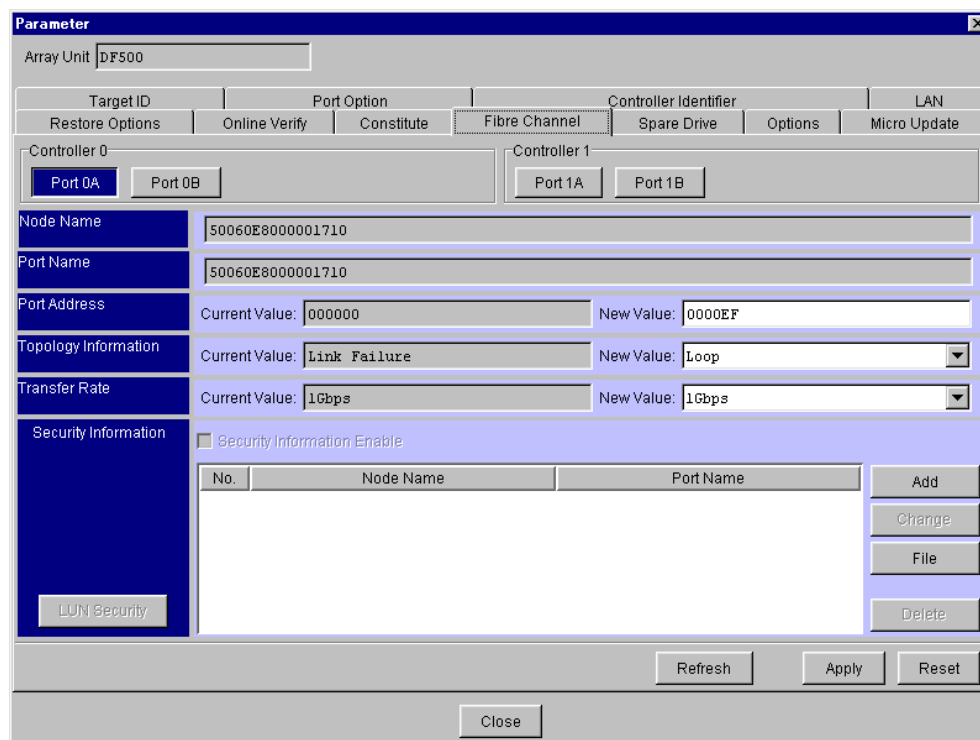
6.7 Setting Fibre Channel Information

This section includes the following:

- Topology Setup
- Setting the Port Address
- Setting the Transfer Rate
- Setting Port Security
- Setting LUN Security

To set and display fibre channel information:

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **Fibre Channel** tab.



Parameter

Array Unit: DF500

Target ID | Port Option | Controller Identifier | LAN

Restore Options | Online Verify | Constitute | Fibre Channel | Spare Drive | Options | Micro Update

Controller 0 | Controller 1

Port 0A | Port 0B | Port 1A | Port 1B

Node Name: 50060E8000001710

Port Name: 50060E8000001710

Port Address: Current Value: 000000 New Value: 0000EF

Topology Information: Current Value: Link Failure New Value: Loop

Transfer Rate: Current Value: 1Gbps New Value: 1Gbps

Security Information: ☐ Security Information Enable

No.	Node Name	Port Name
-----	-----------	-----------

Add Change File Delete

Refresh Apply Reset Close


Figure 6.14 Setting Fibre Channel Information

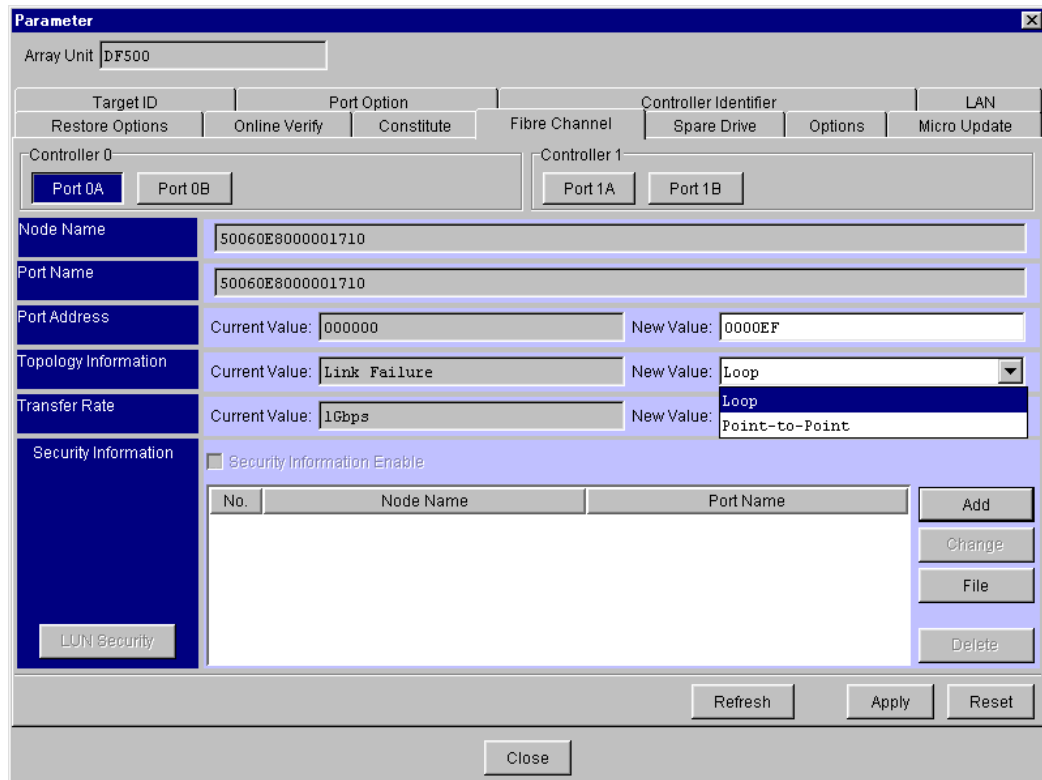
- **Node Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **Port Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **Port Address:** Port address is displayed as a hexadecimal number.
- **Topology Information:** Indicates the topology status.

- **Transfer Rate:** Indicates the fibre transfer rate.
- **Security Information:** Setting and displaying LUN security information.

6.7.1 Topology Setup

Use the following procedure to set up the topology. The topology is set up on a port basis.

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **Fibre Channel** tab.
3. Select the **New Value** in the **Topology Information**.



The screenshot shows the 'Parameter' dialog box with the 'Fibre Channel' tab selected. The 'Array Unit' is set to 'DF500'. The 'Controller 0' section shows 'Port 0A' and 'Port 0B' buttons. The 'Controller 1' section shows 'Port 1A' and 'Port 1B' buttons. The 'Node Name' and 'Port Name' fields are both set to '50060E8000001710'. The 'Port Address' field has a 'Current Value' of '000000' and a 'New Value' of '0000EF'. The 'Topology Information' field has a 'Current Value' of 'Link Failure' and a 'New Value' of 'Loop'. The 'Transfer Rate' field has a 'Current Value' of '1Gbps' and a 'New Value' of 'Loop'. The 'Security Information' section has a checkbox for 'Security Information Enable' which is unchecked. Below this is a table with columns 'No.', 'Node Name', and 'Port Name', and buttons 'Add', 'Change', 'File', and 'Delete'. At the bottom are 'Refresh', 'Apply', 'Reset', and 'Close' buttons.

Target ID	Port Option	Controller Identifier	LAN
Restore Options	Online Verify	Constitute	Micro Update

Controller 0: Port 0A, Port 0B

Controller 1: Port 1A, Port 1B

Node Name: 50060E8000001710

Port Name: 50060E8000001710

Port Address: Current Value: 000000, New Value: 0000EF

Topology Information: Current Value: Link Failure, New Value: Loop

Transfer Rate: Current Value: 1Gbps, New Value: Loop

Security Information: ☐ Security Information Enable

No.	Node Name	Port Name

Buttons: Add, Change, File, Delete, Refresh, Apply, Reset, Close

Figure 6.15 Setting Up the Topology

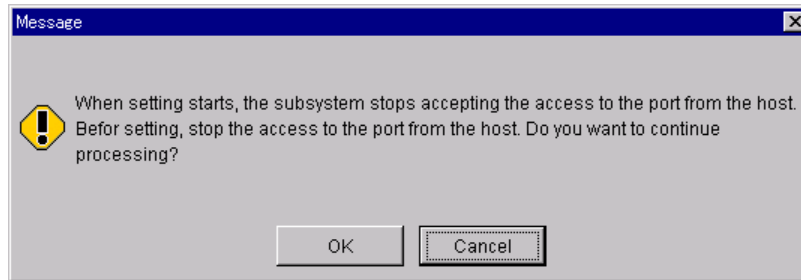
4. Click the **Apply** button.

Operations vary with the array unit being set up. These include:

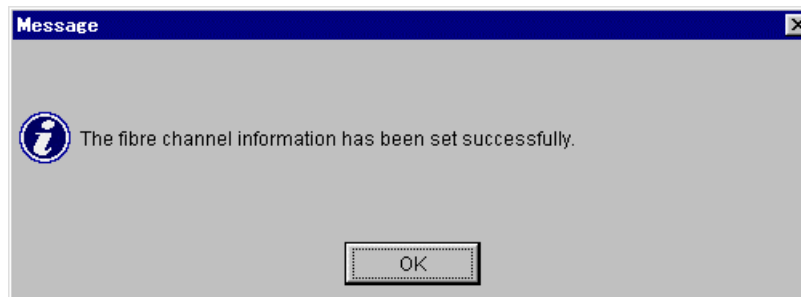
- When an Array Unit Supports a Setup Without Restarting
- When an Array Unit Does Not Support a Setup Without Restarting

6.7.1.1 When an Array Unit Supports a Setup Without Restarting

- a) The following message appears. After making sure that I/O operation initiated by the host has stopped, click the **OK** button.



- b) A message indicating completion of setting is displayed, click the **OK** button.



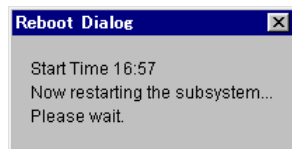
Note: It may take time to complete the setting. Click the **Refresh** button to verify that the correct settings have been made.

6.7.1.2 When an Array Unit Does Not Supports a Setup Without Restarting

- a) A message appears, stating that the setting is complete. To validate the topology, restart the array unit. Click the **OK** button to restart.

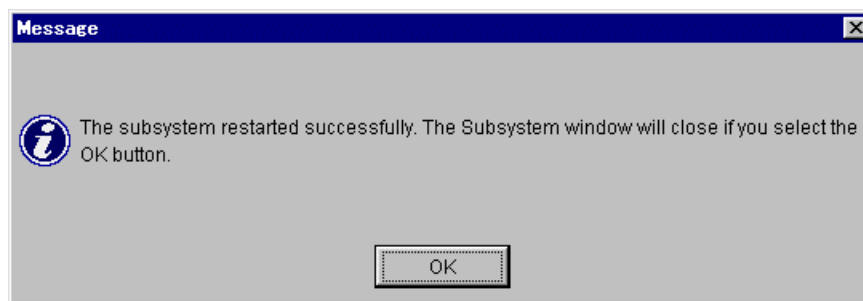
Note: To validate the LAN information, restart the array unit. The previous settings stay valid until restarting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before beginning the restart process.

- b) When you choose to restart the array unit, the time the restart began is displayed. This usually 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.


- c) A message appears, stating that the restart is successful. Click the **OK** button.

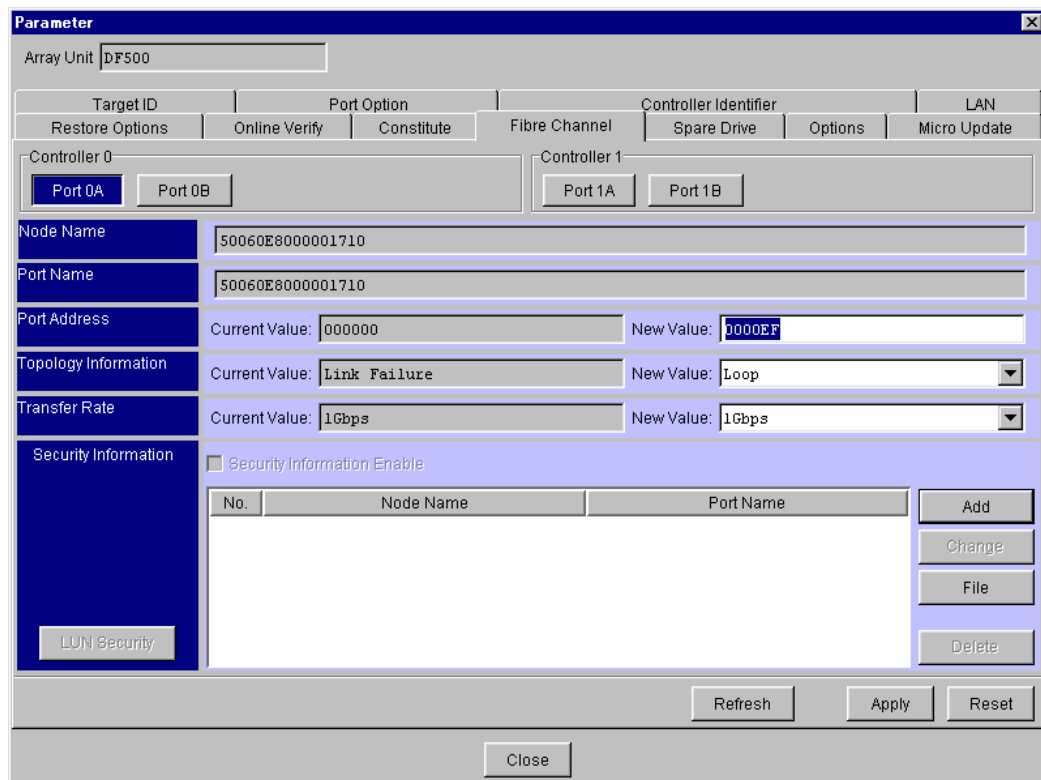


The Unit screen closes. To perform other operations on the main window, select an array unit from the main window and open the selected Unit screen.

6.7.2 Setting the Port Address

To set the port address of the Fibre Port:

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **Fibre Channel** tab.
3. Select the **New Value** in the **Port Address**.



The screenshot shows the 'Parameter' configuration window for an array unit. The 'Fibre Channel' tab is selected. The 'Port Address' field is highlighted, showing a 'Current Value' of 000000 and a 'New Value' of 0000EF. Other fields include 'Node Name' and 'Port Name' (both 50060E8000001710), 'Topology Information' (Current Value: Link Failure, New Value: Loop), and 'Transfer Rate' (Current Value: 1Gbps, New Value: 1Gbps). The 'Security Information' section is expanded, showing a table with columns 'No.', 'Node Name', and 'Port Name'. The 'LUN Security' button is visible. At the bottom, there are 'Refresh', 'Apply', 'Reset', and 'Close' buttons.

Figure 6.16 Setting the Port Address

4. Click the **Apply** button.

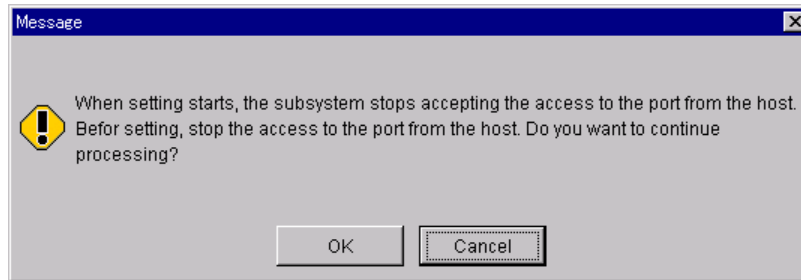
Operations vary with the array unit to set up. Refer to individual ways for operations so as to meet their respective array units.

Operations vary with the array unit being set up. These include:

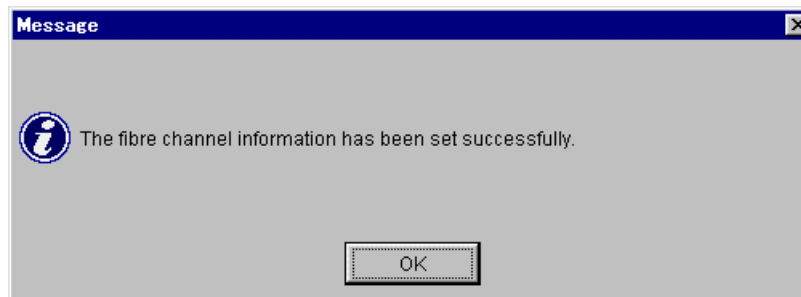
- When an Array Unit Supports a Setup Without Restarting
- When an Array Unit Does Not Support a Setup Without Restarting

6.7.2.1 When an Array Unit Supports a Setup Without Restarting

- a) The following message appears. After making sure that I/O operation initiated by the host has stopped, click the **OK** button.



- b) A message indicating completion of setting is displayed, click the **OK** button.



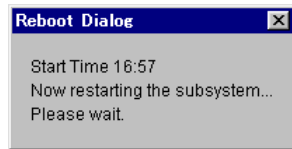
Note: It may take time to complete the setting. Click the **Refresh** button to verify that the correct settings have been made.

6.7.2.2 When an Array Unit Does Not Supports a Setup Without Restarting

- a) A message appears, stating that the setting is complete. To validate the topology, restart the array unit. Click the **OK** button to restart.

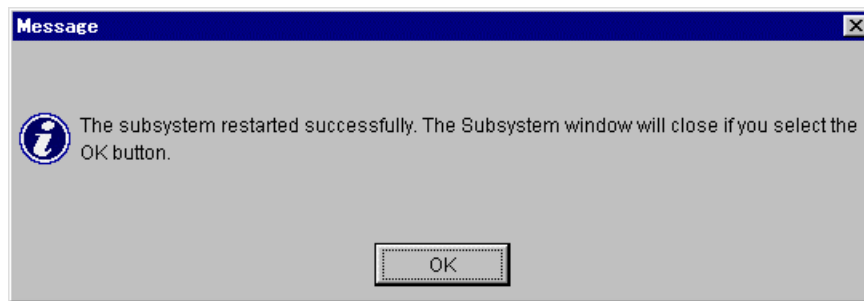
Note: To validate the LAN information, restart the array unit. The previous settings stay valid until restarting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before beginning the restart process.

- b) When you choose to restart the array unit, the time the restart began is displayed. This usually 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.


- c) A message appears, stating that the restart is successful. Click the **OK** button.

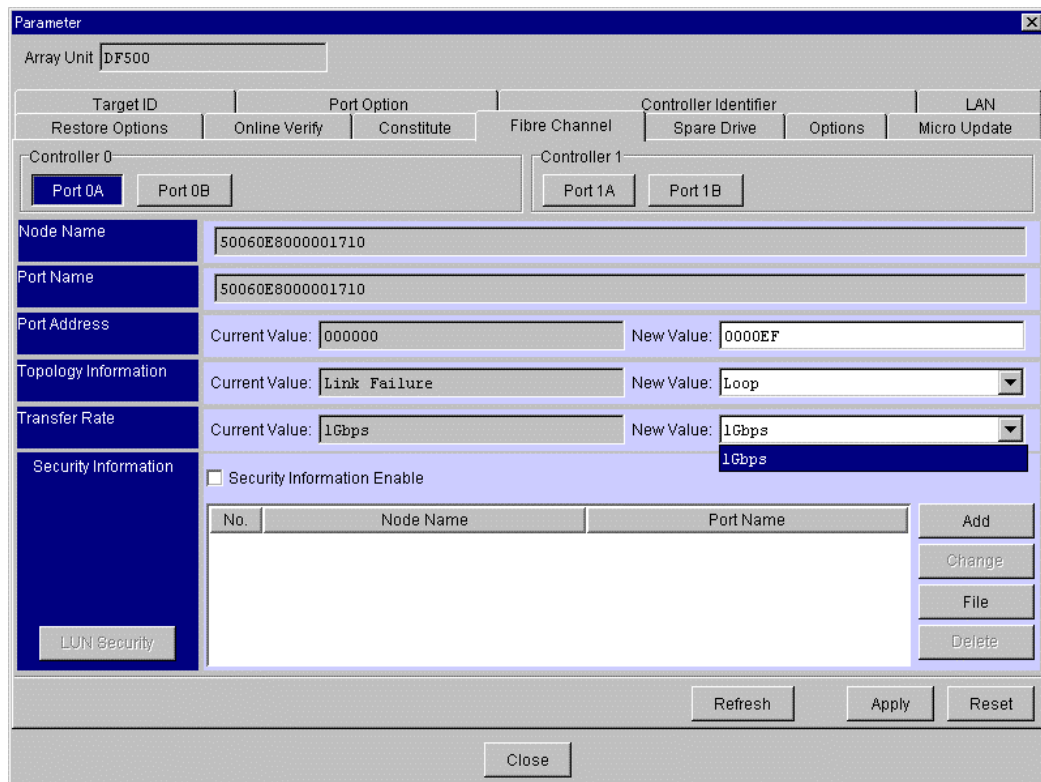


The Unit screen closes. To perform other operations on the main window, select an array unit from the main window and open the selected Unit screen.

6.7.3 Setting the Transfer Rate

To set the transfer rate of the Fibre Port:

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
1. Click the **Fibre Channel** tab.
2. Select **New Value** in the **Transfer Rate**.



The screenshot shows the 'Parameter' configuration window for Array Unit DF500. The 'Fibre Channel' tab is selected. Under 'Controller 0', 'Port 0A' is selected. The 'Transfer Rate' field shows 'Current Value: 1Gbps' and 'New Value: 1Gbps'. The 'Security Information' section has 'Security Information Enable' unchecked. At the bottom, there are 'Refresh', 'Apply', 'Reset', and 'Close' buttons.

Target ID	Port Option	Controller Identifier	LAN
Restore Options	Online Verify	Constitute	Micro Update

Controller 0: Port 0A, Port 0B

Controller 1: Port 1A, Port 1B

Node Name: 50060E8000001710

Port Name: 50060E8000001710

Port Address: Current Value: 000000, New Value: 0000EF

Topology Information: Current Value: Link Failure, New Value: Loop

Transfer Rate: Current Value: 1Gbps, New Value: 1Gbps

Security Information: ☐ Security Information Enable

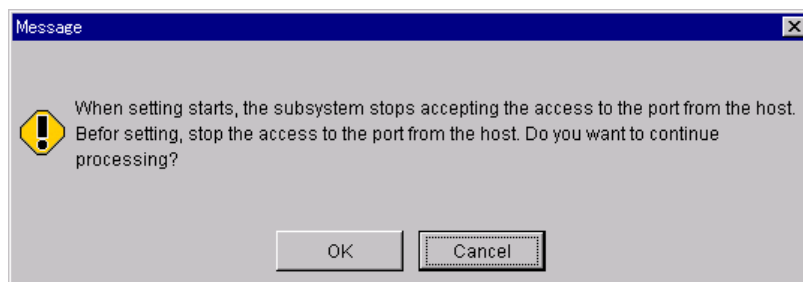
No.	Node Name	Port Name
-----	-----------	-----------

Buttons: Add, Change, File, Delete, Refresh, Apply, Reset, Close

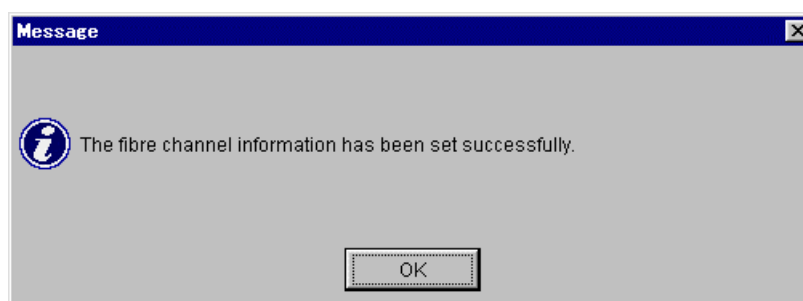
Figure 6.17 Setting the Transfer Rate

3. Click the **Apply** button.

4. The following message appears. After verifying that the I/O operation initiated by the host has stopped, click the **OK** button.




5. A message appears, stating that the setting is complete. Click the **OK** button.

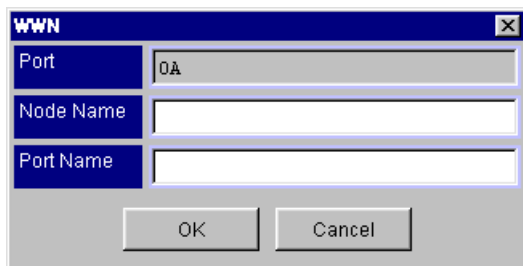


Note: It may take time to complete the setting. Click the **Refresh** button to verify that the correct settings have been made.

6.7.4 Setting Port Security

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

1. On the Settings menu, select Configuration Settings or click : Configuration Settings in the tool bar.
 2. Click the **Fibre Channel** tab.
 3. Setting the **WWN**.
 - **LUN Security**: Specify whether the LUN security is to be used or not.
 - **WWN**: When using the port security and LUN security, set the host WWN. Specify **Node Name** and **Port Name** using a 16-digit hexadecimal.
- a) For addition, click the **Add** button.

A dialog box titled "WWN" with a close button (X) in the top right corner. It contains three input fields: "Port" with the value "0A", "Node Name" (empty), and "Port Name" (empty). At the bottom are "OK" and "Cancel" buttons.

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

- b) For deletion, click the **WWN** to be deleted in the **Security Information** box and click the **Delete** button.

The **Parameter** window is updated according to the deleted WWN.

- c) For a change, click the **WWN** to be deleted in the **Security Information** box and click the **Change** button.

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

- d) When settings are made by using File, click the **File** button.

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 the file to be used and click the **OK** button. The **Parameter** 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 when settings are performed by using "File". Input the 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.

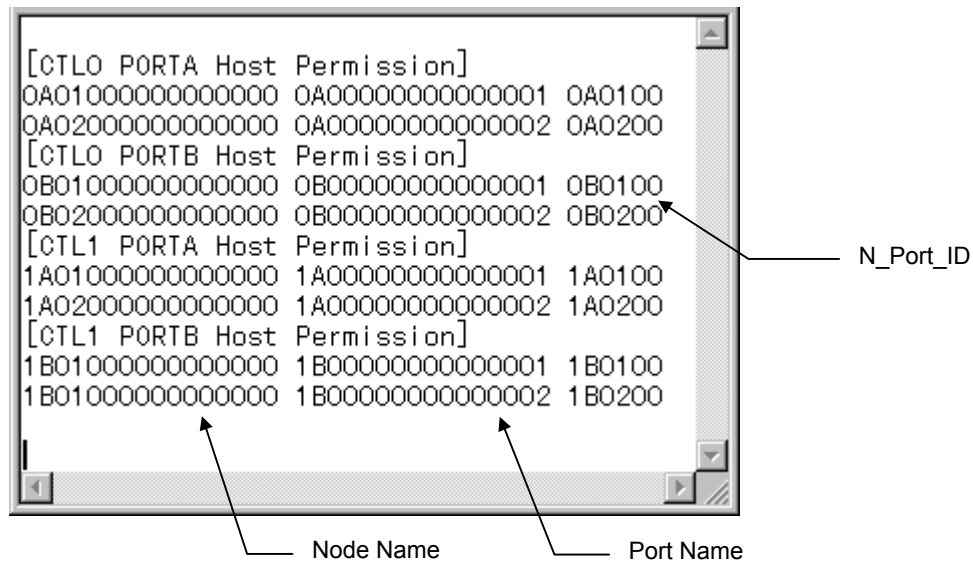
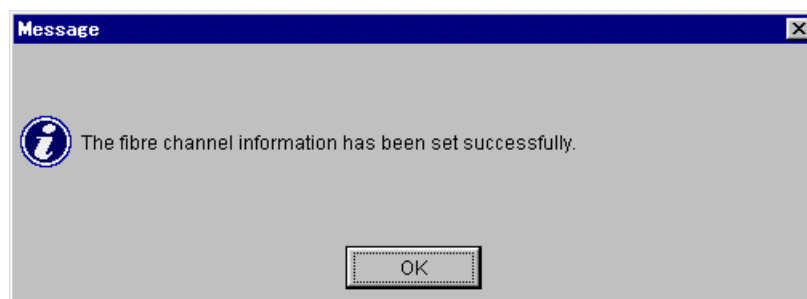


Figure 6.18 Setting Port Security Settings Using File

- **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.

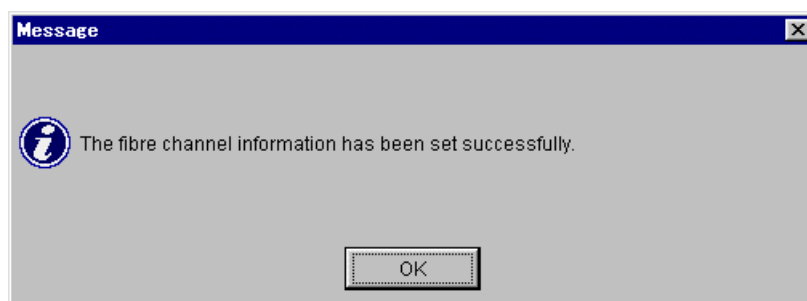
4. Click the **Apply** button on the **Parameter** window.
5. A message appears, stating that the setting is complete. Click the **OK** button.



6. Select Check INQUIRY or Check All Commands on the Security Check Level box.
7. Select the **Logical Unit No.** and a logical unit No. to set. The logical unit No. is displayed in the **Logical Unit No.** and WWN information in the logical unit No. is displayed.

For Addition, click the WWN to be added in the **WWN** box and click the **Add** button. For Deletion, click the WWN to be deleted in the **Accessible WWN** box and click **Delete**. The WWN to be set is displayed in the **Access Enable WWN** box.

To setup the security for all logical units, specify **ALL** for **Logical Unit No.**
8. Click the **OK** button, and then click the **OK** button on the **Parameter** screen.
9. A message appears, stating that the setting is complete. Click the **OK** button.



6.8 Outputting Configuration Information to File

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

The configuration information output in a text file includes the status of the system parameters, RAID group/logical unit and the constituent parts of the array unit. The configuration to be set includes the system parameters and RAID group/logical unit. 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 group/logical unit.

Copying configuration information between array units can be executed by outputting a text file of the configuration from an array unit, then using the output text file to set another array unit.

Editing a text file to set an array unit can be done, but it is recommended that this function be used for the configuration of the same array unit. To change the configuration, use individual functions.

6.8.1 File Output of the Configuration: System Parameters

To output the settings of the system parameters for an array unit in text form to a specified file:

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **Constitute** tab.

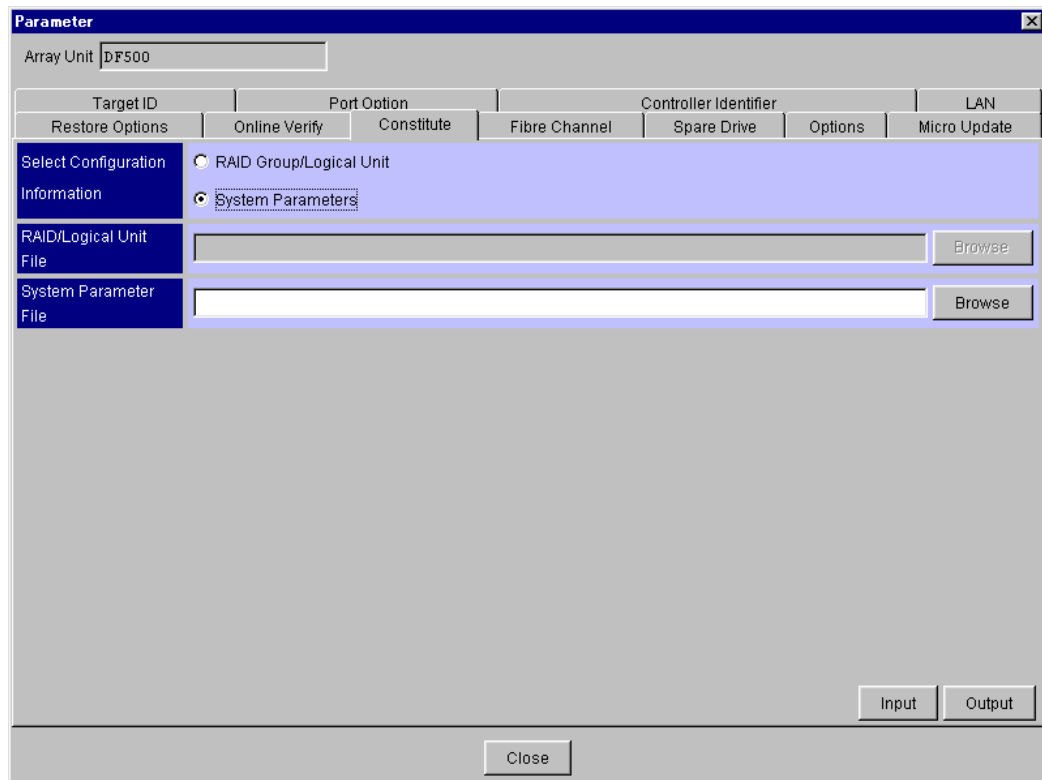
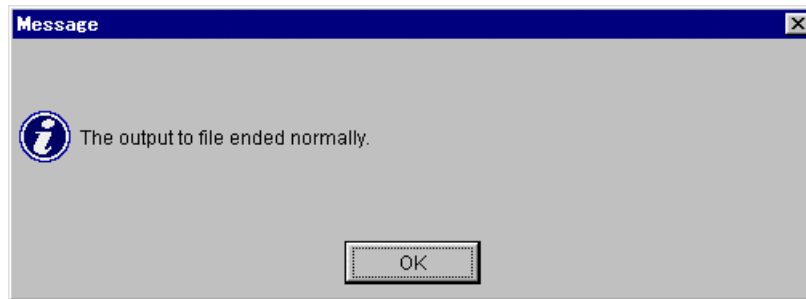


Figure 6.19 Outputting the Setting Content of System Parameters to a Specified File

3. Check the **System Parameters** in the **Select Configuration Information** box.
4. Click the **Browse** button Specify the directory and file name to which the configuration file will be output.
5. Click the **Output** button.

6. When a message appears, confirming that the system parameter information is output with the specified file name, 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 the following figure.

- 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

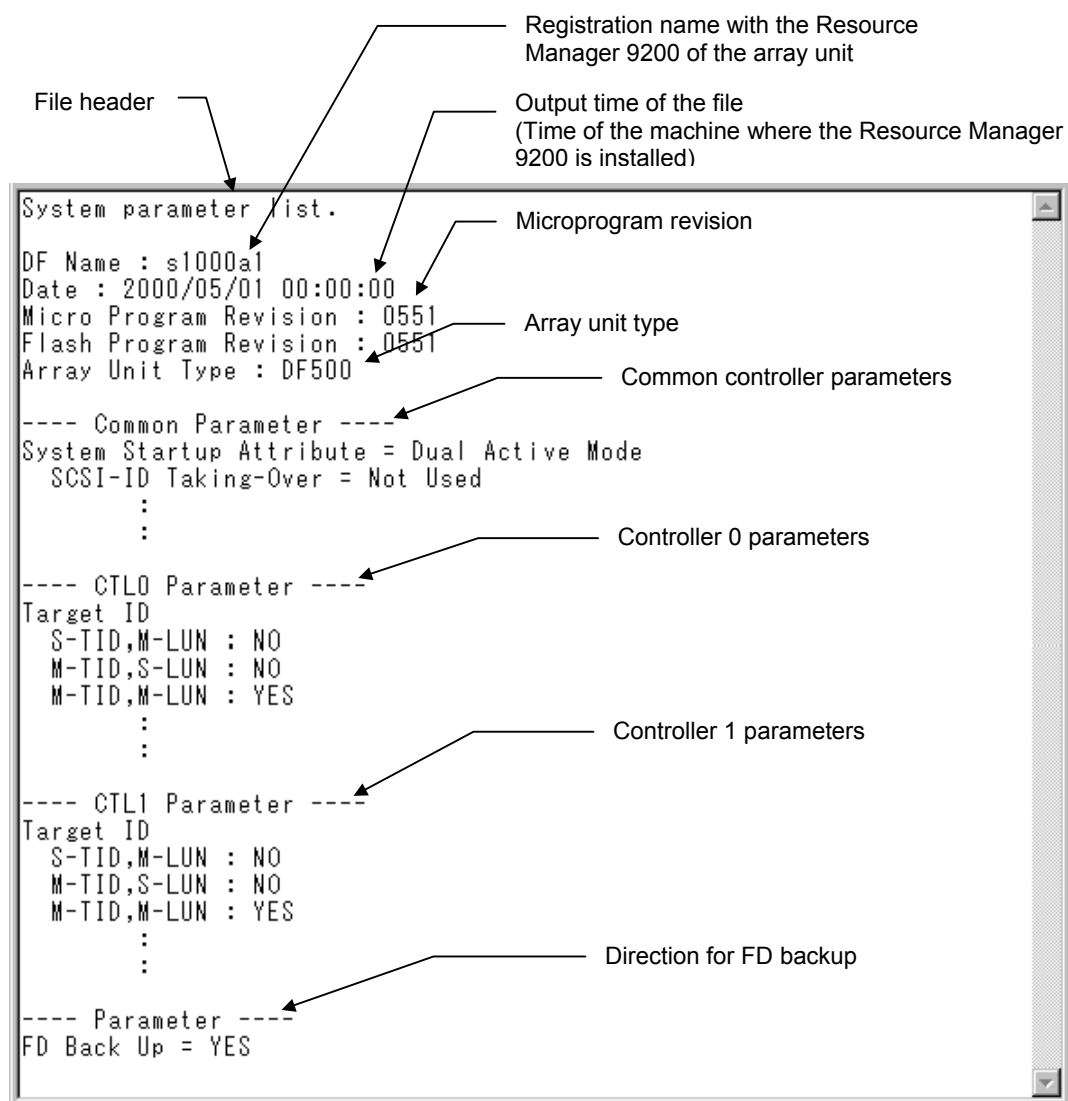


Figure 6.20 Format of the System Parameter Output File

a) Common Controller Parameters

The common system parameters of the array unit are output. An output example of the system parameters of the 9200 is shown in the following figure.

```
---- 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 6.21 System Parameters: Output Example of Common Parameters

The common parameters are the items shown in the following table.

Table 6.1 List of Common Parameters

Item	Setting Item	Wizard Window Title
1	Start Attribute	System Startup Settings
2	Host Connection Mode	System Startup Settings
3	Serial Number	System Startup Settings
4	Option 1	Option 1
5	Option 2	Option 2
6	Data Striping Size	Data Striping
7	Reset ALL LIP Port Mode	Port Type
8	Operation if the processor failure occurs	Data Striping
9	Command Queuing	INQUIRY Setting
10	Cache Mode	INQUIRY Setting

Depending on the array unit in the connection, there are items that do not need to be set; these items will not be output in the file. 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 are output.

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

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

Figure 6.22 System Parameters: Output Example of Controller 0 Parameters

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

Table 6.2 Parameters of Controller 0

Item	Setting Item	Wizard Window Title
1	Target ID	Target ID
2	Port Type	Port Type
3	Controller Identifier	Controller Option
4	RS232C Error Information Outflow Mode	Controller Option
5	Execute Write & Verify Mode	Controller Option
6	LAN Configuration	LAN Setting

Depending on the array unit in the connection, there are items that do not need to be set, and these items will not be output in the file. 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 are output.

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

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

Figure 6.23 System Parameters: Output Example of the Parameters of Controller 1

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

Table 6.3 Parameters of Controller 1

Item	Setting item	Wizard window title
1	Target ID	Target ID
2	Port Type	Port Type
3	Controller Identifier	Controller Option
4	RS232C Error Information Outflow Mode	Controller Option
5	Execute Write & Verify Mode	Controller Option
6	LAN Configuration	LAN Setting

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. 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 6.24 Output Example for FD Backup Specification

6.8.2 Outputting Configuration Information to a File: RAID Group/Logical Unit and Component Status

To output RAID group/logical unit definition information already set in an array unit to a specified file in a text format:

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **Constitute** tab.

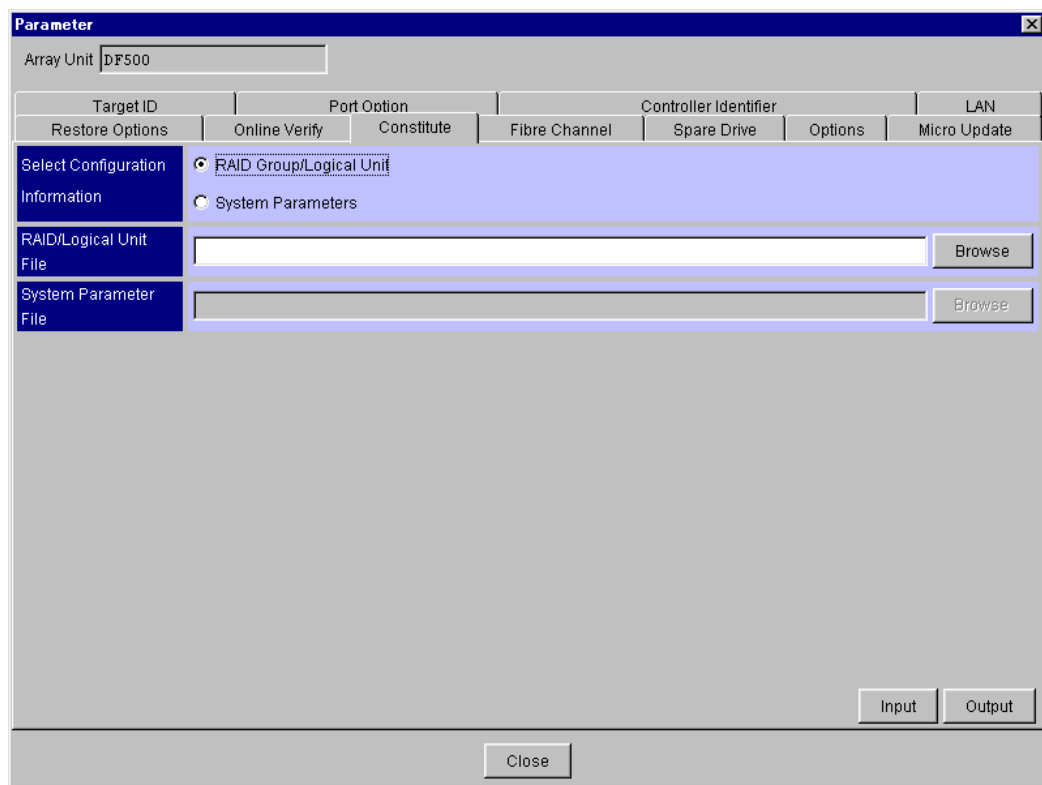
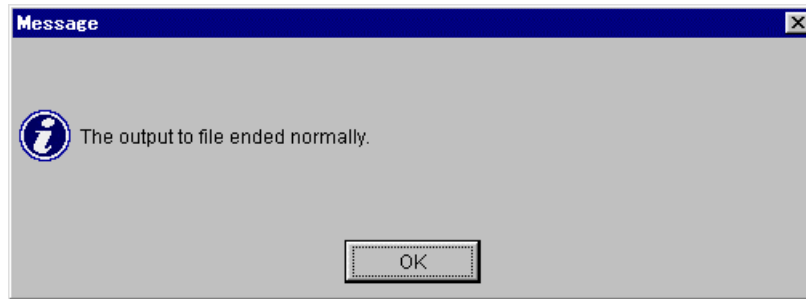


Figure 6.25 Outputting Configuration Information to File

3. Check the **System Parameters** in the **Select Configuration Information** box.
4. Click the **Browse** button, and specify the directory and file name to output the file of the configuration.
5. Click the **Output** button.

6. A message appears, confirming that the system parameter information is output with the specified file name. 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 the following figure. This figure outlines the layout of the output file for the case of 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 group/logical unit configuration
- Status of constituent parts

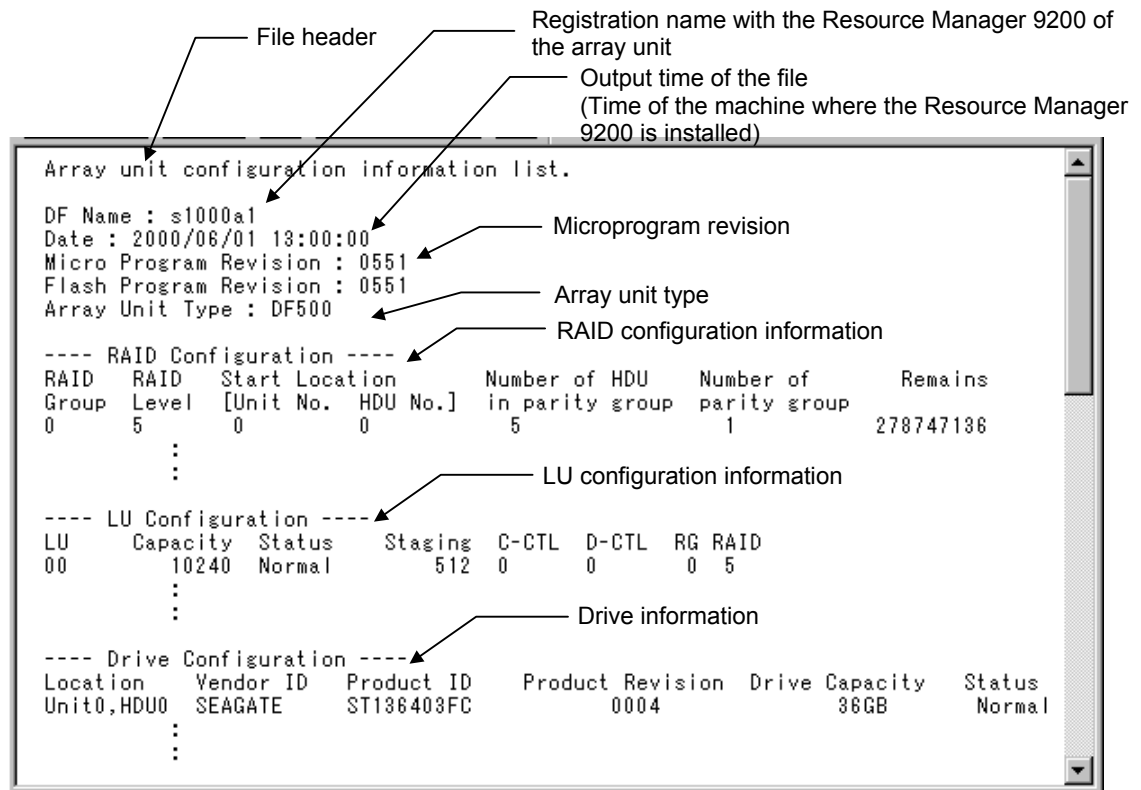


Figure 6.26 Format of RAID Group/Logical Unit Configuration Information Output File

Cache Information			Controller 0		Controller 1	
Slot	Capacity	Status	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					
	:					
	:					
Enclosure Information						
ENC Information						
Location	Status					
Unit0,ENC0	Normal					
	:					
	:					

Figure 6.27 Format of RAID Group/Logical Unit Configuration Information Output File

a) Format of RAID Configuration Information

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

Example:

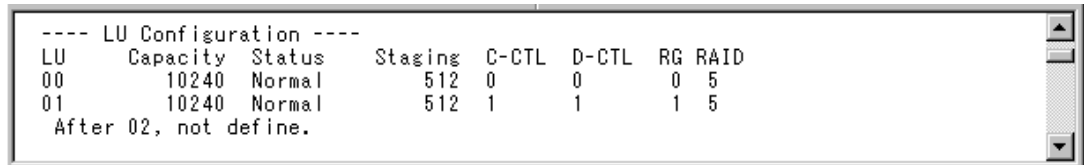
---- RAID Configuration ----						
RAID Group	RAID Level	Start Location [Unit No. HDU No.]		Number of HDU in parity group	Number of parity group	Remains
0	5	0	0	5	1	278747136
1	5	0	5	5	1	278747136
	:					
	:					
18	-					
19	-					

- **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 (in units of block) that can be defined by logical unit of the RAID group

b) Formatting Logical Unit Configuration Information

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

Example:



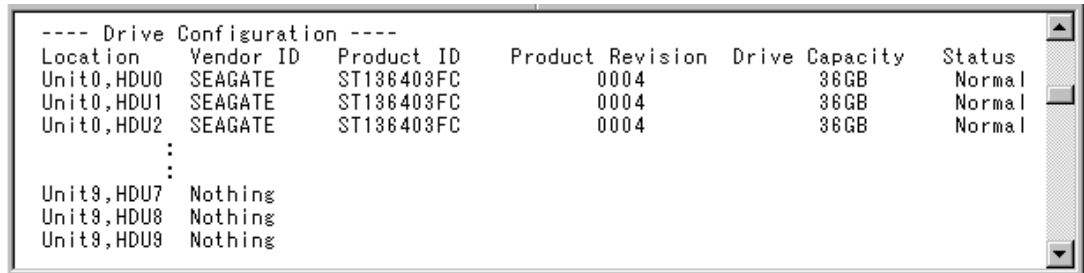
```
---- LU Configuration ----
LU      Capacity  Status   Staging  C-CTL  D-CTL  RG RAID
00      10240    Normal    512     0      0      0  5
01      10240    Normal    512     1      1      1  5
After 02, not define.
```

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

c) Format for Drive Information

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

Example:

A screenshot of a terminal window displaying drive configuration information. The window has a title bar and a scroll bar on the right. The text inside is as follows:

```
---- 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
```

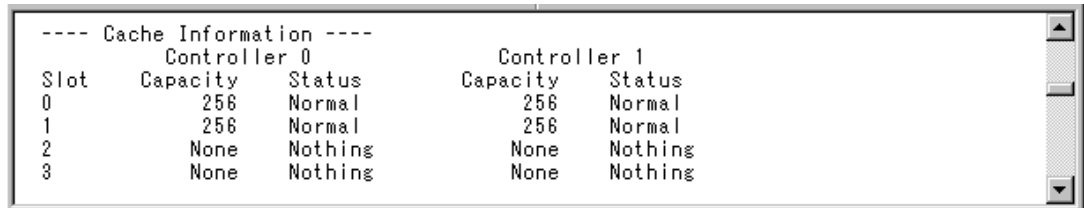
- **Location:** The installation location of the drive
- **Vendor ID:** The vendor ID of the drive
- **Product ID:** The product ID of the drive
- **Product Revision:** Firmware revision of the drive
- **Drive Capacity:** The capacity of the drive
- **Status:** The status of the drive
 - Normal:** Normal (RAID group, logical unit defined)
 - Detached:** Detached
 - Standby:** Normal (Logical unit undefined)
 - Undefine:** Normal (RAID group undefined)
 - Recon.:** Reconfiguring (copying from collection or backup)

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

d) Format for Cache Information

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

Example:



```
---- 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 MB) of the cache of controller 0
- **Status:** The status of the cache of controller 0

Normal: Normal

Detached: Detached

Nothing: Not installed

---: Slot not supported

Controller 1

- **Capacity:** The capacity (in units of MB) 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.

Example:

A screenshot of a terminal window with a grey border and a scrollbar on the right. The text inside the terminal is as follows:

```
---- 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.

Example:

A screenshot of a window titled "Battery Information". It contains a table with two columns: "Location" and "Status". The first row shows "0" under "Location" and "Normal" under "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 AC power Information.

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

Example:

A screenshot of a window titled "AC Power Information". It contains a table with two columns: "Location" and "Status". The first two rows show "Unit0,AC0" and "Unit0,AC1" both with "Normal" status. There are three vertical dots between "Unit0,AC1" and "Unit9,AC0". The last two rows show "Unit9,AC0" and "Unit9,AC1" both with "Nothing" status.

Location	Status
Unit0,AC0	Normal
Unit0,AC1	Normal
:	:
Unit9,AC0	Nothing
Unit9,AC1	Nothing

– **Location:** The installation location of the AC power supply

– **Status:** The status of the AC power supply

Normal: Normal

Alarm: Abnormal

Nothing: Not installed

h) Format for Battery Backup Status Information.

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

Example:

A screenshot of a terminal window with a title bar. The terminal displays the following text:

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

The terminal has a scrollbar on the right side.

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

i) Format for Loop Information.

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

Example:



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

j) Format for Enclosure Information.

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

Example:



```
---- 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

6.8.3 Setting the Configuration with a File: System Parameters

Set the system parameters in the array unit with the information described in the file. If you set the system parameters using a file that was output when a priced optional feature is in an unlocked state, the setting may terminate abnormally. To set system parameters, use a file that was output when all priced optional features are in a locked state.

For a dual system, setting cannot be executed if one of the controllers is detached. Please confirm that the array unit is operating normally. If the setting of the dual system is executed through an RS232C connection, do it without fail at Controller 0.

When system parameters are set, the array unit cannot execute commands from the host; the functions of the Resource Manager 9200 can no longer work except the Wizard for setting the system parameters and failure monitoring. After setting, restart the array unit. Confirm that it is operating successfully, then it connects to the host and the 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. Refer to the following sections of this manual for the format and parameters of the file respectively.
 - For the format of the file: **File Output of Configuration: System Parameters**
 - For the parameters: **Setting system parameters**

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

2. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.

3. Click the **Constitute** tab.

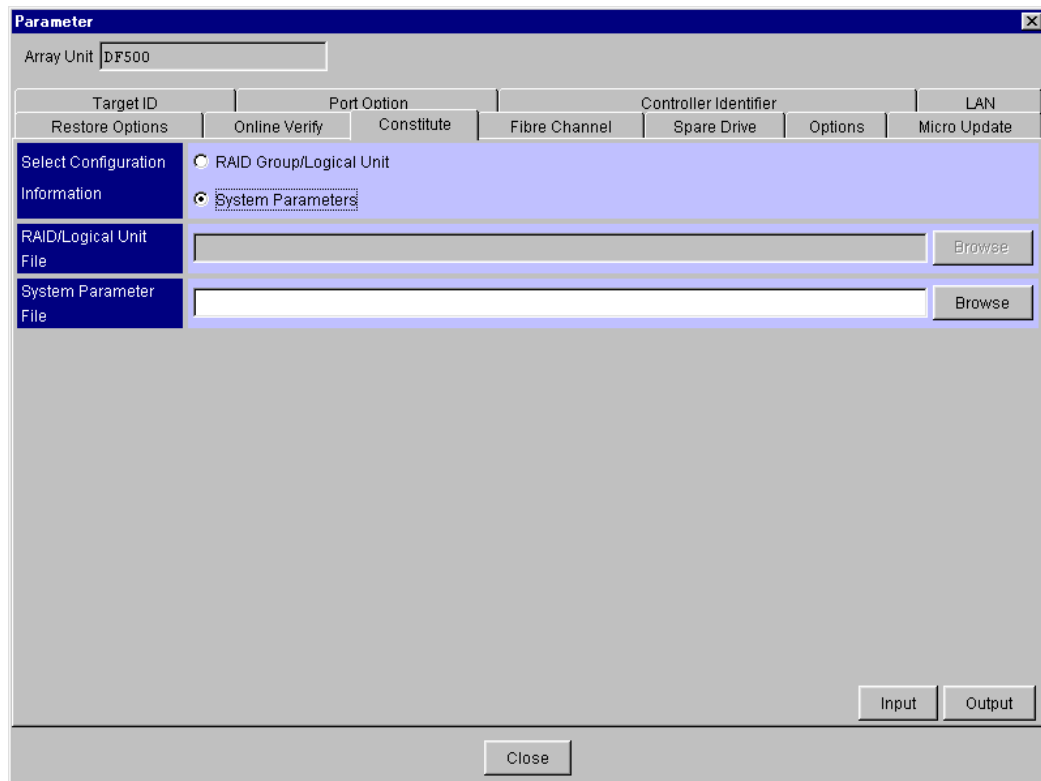
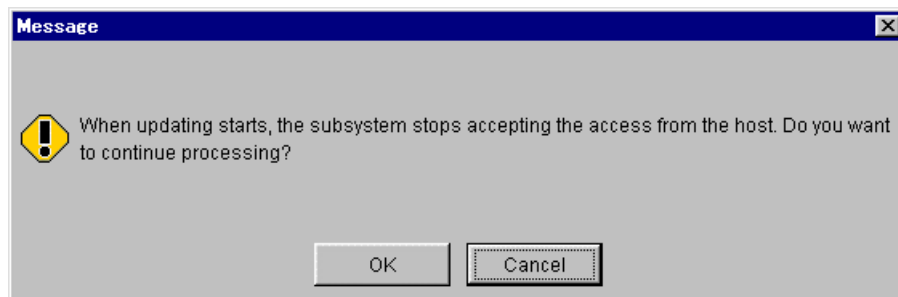
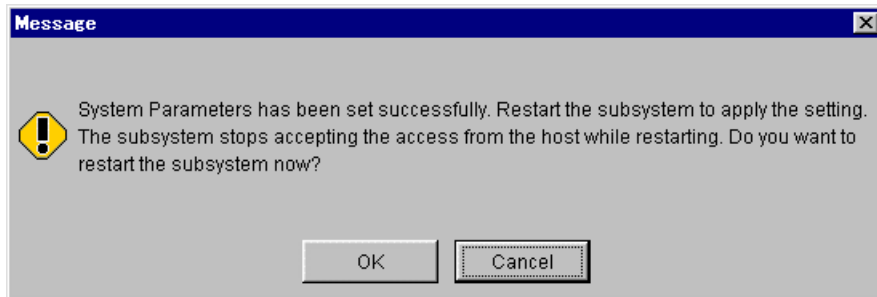


Figure 6.28 Setting the Configuration with a File: System Parameters

4. Click the **System Parameter** radio button.
5. Click the **Browse** 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.
6. Click the **Input** button.
7. The following confirmation screen is displayed. Click the **OK** button.



8. A message appears, stating that the system parameter information from a file with specified name has been set. A message is displayed, requesting confirmation to restart the subsystem. Click the **OK** button.



Using the Wizard for setting system parameters verify the configuration parameters.

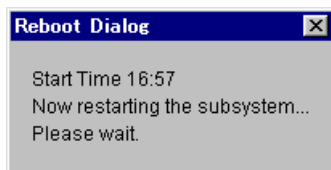
Note: To validate the set system parameters, restart the array unit. The previous settings stay valid until restarting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before beginning the restart process.

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

When this message is displayed, writing to a FD has not been finished, but setting the system parameter may be completed.

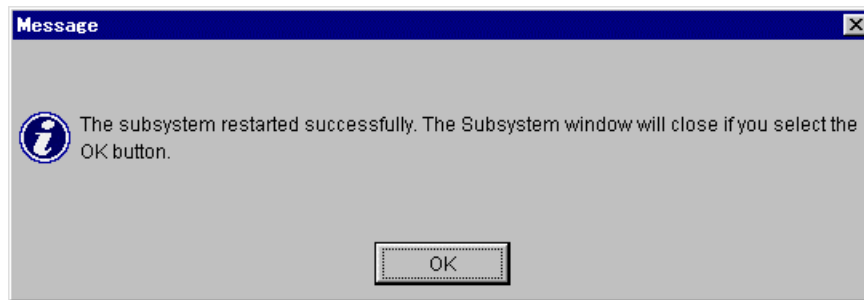
Check a FD in an array unit, re-confirm the data to set, turn on the **FD Backup?** check box, and then click the **OK** button once again.

When you choose to restart the array unit, the time the restart began is displayed. This usually 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.

A message appears, stating that the restart is successful. Click the **OK** button.



The Unit screen is closed. To perform other operations on the main window, select an array unit from the main window and open the selected Unit screen.

6.8.4 Setting the Configuration With a File: RAID Group/Logical unit Definition

Set the array unit according to the RAID group/logical unit setting information described in a file. If the setup of RAID group/logical unit is configured and completed, all user data previous data will be lost; RAID group/logical unit configuration as specified in the file will be set after deleting the current RAID group/logical unit. If user data is needed, configure the setting after backing up the system.

1. Edit the file to set the RAID group/logical unit information in 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. Refer to the following section in this manual for the format of the file:

- **Outputting Configuration Information to a File: RAID Group/Logical Unit and Component Status**

The parameters in the file are three items: **RAID configuration information**, **LU configuration information**, and **Drive information** in the format of the output file. In the output file, there are items, which give the status of constituent parts, but ignore these 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 the RAID group is not set, “-” is shown after **Level**, and no other parameters are set.

- b) **LU configuration information:** Sets logical unit configuration.

Specifies logical unit number, logical unit capacity, pre-read capacity, number of controllers in current use, number of controllers in default use, RAID group number and RAID level, and logical unit status.

In logical unit status, for cases where formatting is to be executed, specify “Normal”. Formatting cannot be executed if another status is specified.


In cases where the full capacity of the RAID group is allocated to one logical unit, specify “All” in **Capacity**.

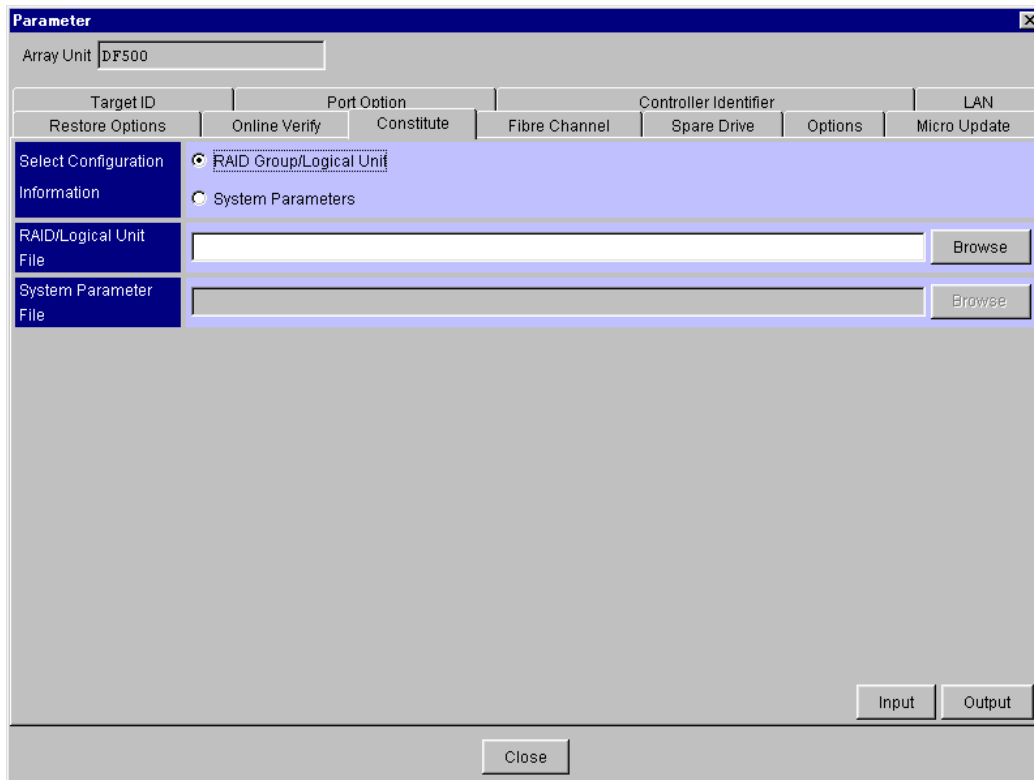
Even if the number of the controller in current use is specified as “0” or “1”, it will become the same as the number of the controller in default use.

A maximum of 64 LUs can be created. In cases where logical units of less than the maximum logical unit number are created, specify at the end that “After nn, not define” (nn: the last logical unit number + 1).

- c) **Drive information:** Sets the configuration of the HDU installed in the array unit. For an HDU not installed, specify “Nothing”.

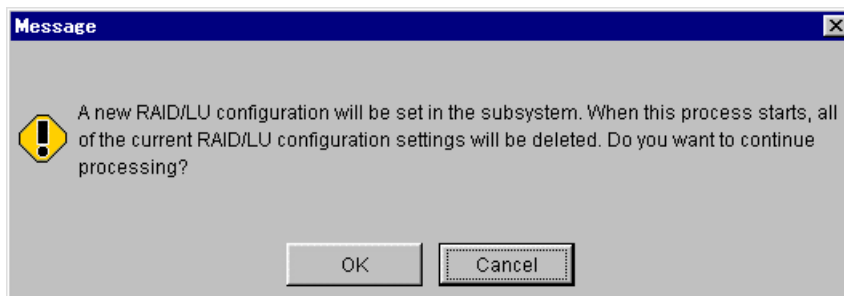
In the case that a capacity bigger than that of the installed HDU is specified, it is regarded as an error and not set.

2. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
3. Click the **Constitute** tab.



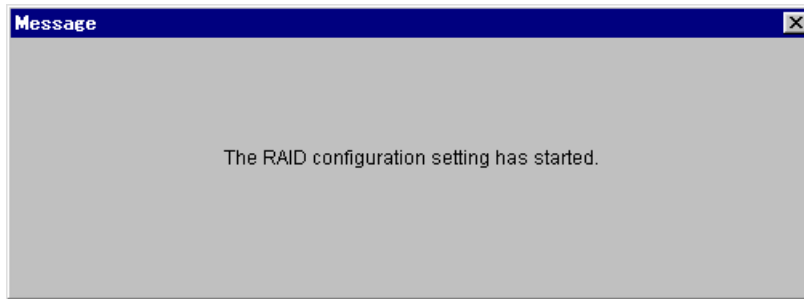
The **Parameter** dialog box is shown with the **Constitute** tab selected. The **Array Unit** is set to **DF500**. The **Select Configuration** section has two radio buttons: **RAID Group/Logical Unit** (selected) and **System Parameters**. Below these are two text boxes for file selection, each with a **Browse** button. The **RAID/Logical Unit File** box is empty, and the **System Parameter File** box is also empty. At the bottom right are **Input** and **Output** buttons, and at the bottom center is a **Close** button.

4. Click the **RAID Group/Logical Unit** radio button.
5. Click the **Browse** button, and specify the directory and name of the file that describes the RAID group definition and logical unit definition edited in 1. The specified file name will be shown in the text box.
6. Click the **Input** button.
7. The following message appears, stating that a new RAID/LU configuration will be set. This message requests confirmation to restart the subsystem. Click the **OK** button. All current user data and RAID Group/Logical Unit configuration will be destroyed.



The **Message** dialog box displays a warning icon (yellow triangle with an exclamation mark) and the following text: "A new RAID/LU configuration will be set in the subsystem. When this process starts, all of the current RAID/LU configuration settings will be deleted. Do you want to continue processing?". At the bottom are **OK** and **Cancel** buttons.

A message appears, stating that the RAID configuration setting has started.

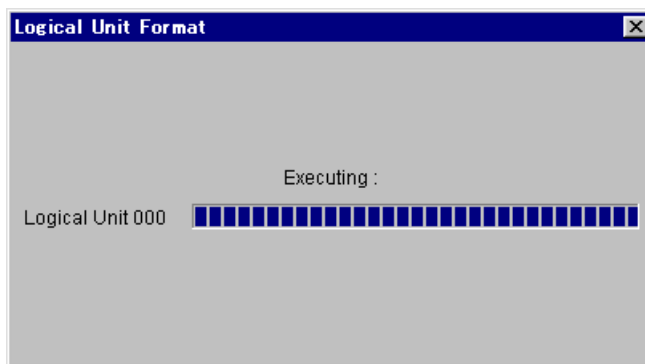


When the setting of the RAID group ends abnormally, an error message will be shown and the processing will be interrupted.

If the setting of the RAID group ends normally, a message that the setting of logical unit has started is shown, and the logical unit setting is executed.

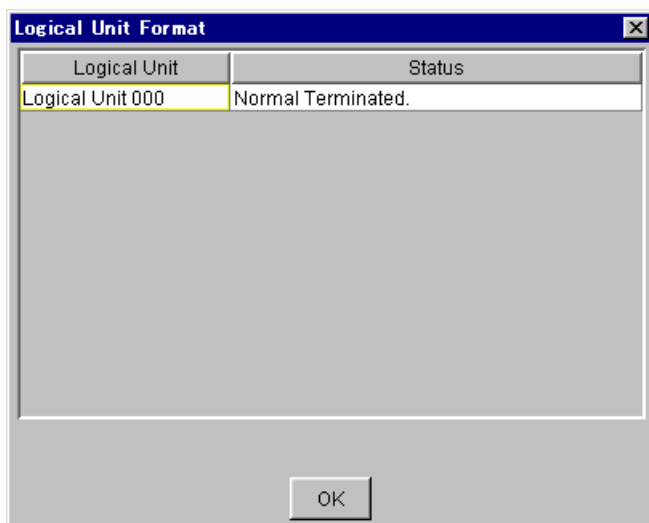
When the logical unit setting ends abnormally, an error message will be shown and processing will be interrupted.

If the logical unit setting ends normally, formatting of the set logical unit will begin. The process of formatting execution will be shown.

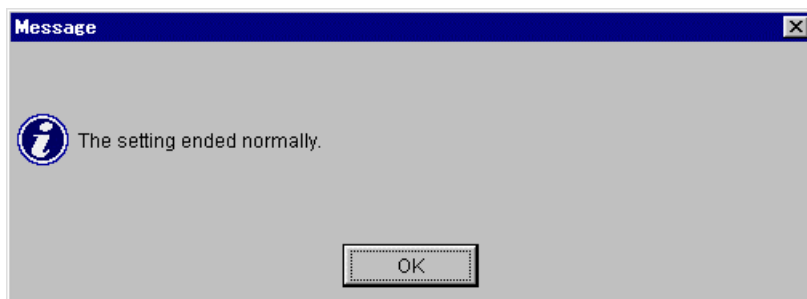


When the RAID group setting ends abnormally, an error message will be shown and the processing will be interrupted.

8. When a message appears, indicating that the specified logical unit has been formatted, click the **OK** button.



9. A message appears, stating that the setting is complete. Click the **OK** button.



To check the configuration, select the **Logical Status** tab.

6.9 Replacing the Microprogram

The function downloads and replaces the microprogram in the array unit. When replacing the microprogram, download it, and then replace it.

This section includes the following:

- Microprogram Download
- Replacing the Microprogram

6.9.1 Microprogram Download


Download the microprogram from the FD into the array unit. In the download, the microprogram is stored in the array unit; the microprogram of the array unit is not replaced.

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

When using Windows, the microprogram can be stored from the FD; the microprogram is not copied when it is stored from the FD.

When using Solaris, the microprogram is copied. There are multiple floppy disks of the microprogram; each floppy disk is copied to the hard disk using a different directory.

Note: For a directory where the Resource Manager 9200 is installed, do not copy the microprogram directly to the FD. Create a sub-directory and copy it under this sub-directory. Specify the name of a directory in the hard disk drive to which the microprogram is copied, with a one-byte coded alphanumeric.

2. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.

3. Click the **Micro Update** tab.

The screenshot shows the 'Parameter' dialog box with the 'Micro Update' tab selected. The 'Array Unit' is set to 'DF500'. The 'Target ID' is '0555'. The 'Port Option' is 'Online Verify'. The 'Controller Identifier' is 'Controller 0'. The 'LAN' is 'Micro Update'. The 'Download Microprogram' section has 'Current Revision' set to '0555', 'New Revision' is empty, 'Interval Time' is '3 second(s)', and 'Revision Check' is 'Yes'. The 'Replace Microprogram' section has 'Replace Controller with:' set to 'Controller 0'. The 'Download', 'Read', and 'Delete' buttons are grayed out, while the 'Replace' button is active.

- **Current Revision:** Microprogram revision of each controller of the array unit.
- **New Revision:** A microprogram revision stored in the system in which the 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. For the LAN connection, when the interval time is specified as 3 seconds, the download requires approximately 9 minutes. The time required for the execution varies with the network status and depends 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.

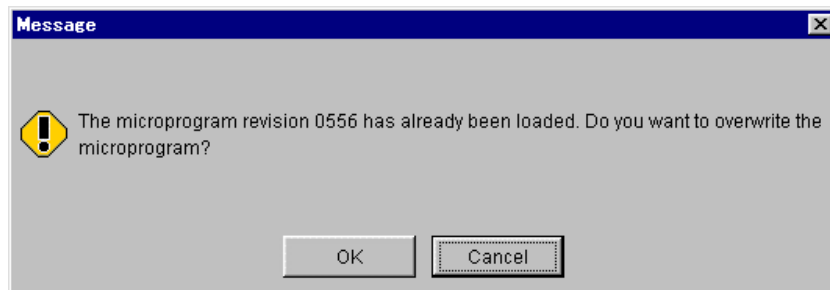
For the RS232C connection, when the interval time is specified as 3 seconds, the download requires about 4 hours. The time required for the execution varies depending on the I/Os issued by the host. When the interval time is specified as one second longer, the time required for the download is prolonged by 40 minutes. This function can be used during execution of the I/O instructed by the host. However, when the download function is executed, I/O performance of the host is reduced. To enhance performance, specify a longer interval time.

- **Revision Check:** Instructs the revision check of the microprogram to be downloaded. When the download instruction is specified, whether or not a hot replacement is applicable to the microprogram is checked. Select Yes.

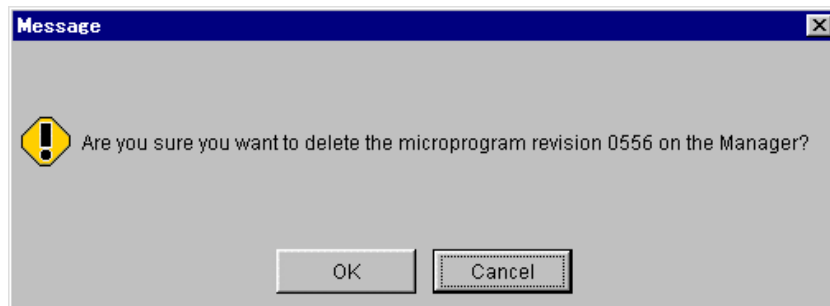
When no microprogram is read, the **Download** and **Delete** buttons are displayed in gray and cannot be selected.

4. The microprogram is read into the PC or SUN server/workstation in which the Resource Manager 9200 is installed. Click the **Read** button. When a revision is displayed in **New Revision**, the microprogram is already read. To download the microprogram that is already read, execute Download.
5. When a confirmation message appears, asking whether or not to read the microprogram appears, click the **OK** button.

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



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



6. When a window for specifying a directory in which the read microprogram exits appears, enter this directory. When the **OK** button is clicked, reading the microprogram is started.

A path-input example is shown below.

When using Windows: a:

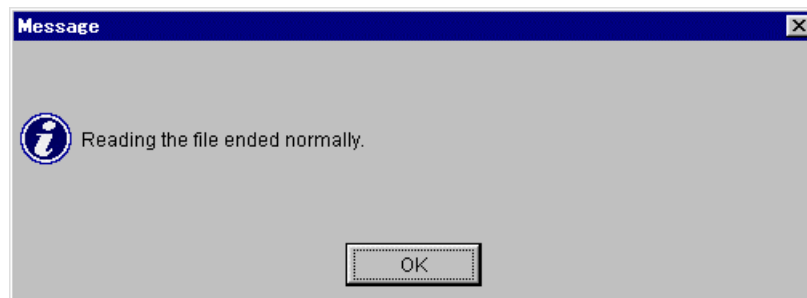
c:\manager2\mp0557\disk1

When using Solaris or IRIX: /home/usr/manager2/mp0557/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 5 reappears. In the message, the "No." of the floppy disk to be read is displayed. Read the microprogram according to the display.

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



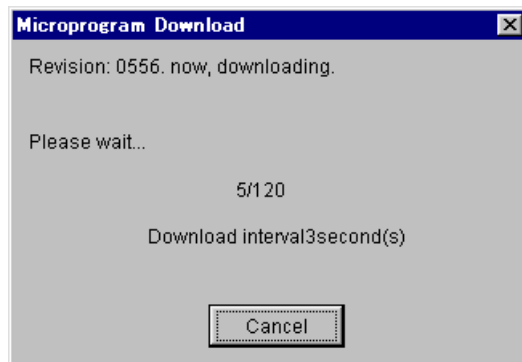
The revision of the read microprogram is displayed in the **New Revision** field.

The **Parameter** dialog box is used for managing microprograms. It features a title bar with a close button. Below the title bar is a text field for **Array Unit** set to **DF500**. A tabbed interface follows, with tabs for **Target ID**, **Port Option**, **Controller Identifier**, and **LAN**. Under the **Controller Identifier** tab, there are sub-tabs: **Restore Options**, **Online Verify**, **Constitute**, **Fibre Channel**, **Spare Drive**, **Options**, and **Micro Update**. The **Micro Update** sub-tab is active, showing two main sections: **Download Microprogram** and **Replace Microprogram**. The **Download Microprogram** section includes fields for **Current Revision** (Controller 0: 0555, Controller 1: 0555), **New Revision** (0556), **Interval Time** (3 second(s)), and **Revision Check** (radio buttons for Yes and No, with Yes selected). Below these are **Download**, **Read**, and **Delete** buttons. The **Replace Microprogram** section has a **Replace Controller with :** label and two radio buttons for **Controller 0** (selected) and **Controller 1**. A **Replace** button is at the bottom right of this section. A **Close** button is located at the bottom center of the dialog box.

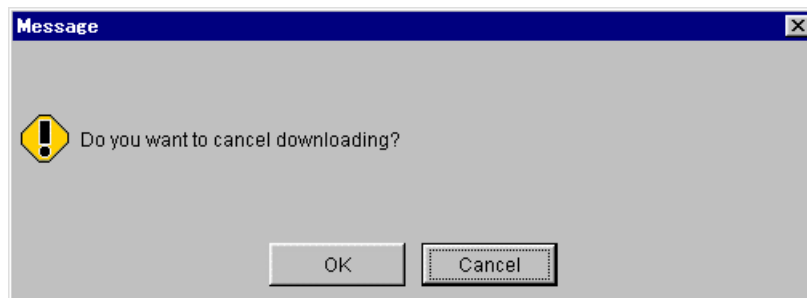
8. To download the microprogram, click the **Download** button.
9. When a confirmation message appears, requesting confirmation to download the microprogram appears, click the **OK** button.

The **Message** dialog box displays a warning icon (yellow triangle with an exclamation mark) and the text: "Are you sure you want to download the microprogram revision 0556 to the subsystem?". At the bottom, there are **OK** and **Cancel** buttons.

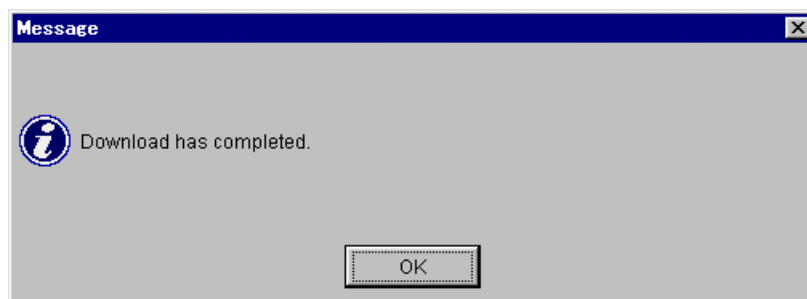
A message appears, stating that the download is being executed. This message displays the revision of the program being downloaded, interval time, and progress.



The download can be aborted. To abort the download halfway, click **Cancel**. A confirmation message is displayed. When the **OK** button is clicked, the download is aborted. When the **Cancel** button is clicked, the download is continued.




10. When the microprogram is normally downloaded, a confirmation message appears. Click the **OK** button.



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

6.9.2 Replacing the Microprogram

Replace the microprogram of the controller with the microprogram downloaded in the array unit. When replacing the microprogram, replace both controller 0 and controller 1 microprograms.

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
1. Click the **Micro Update** tab.

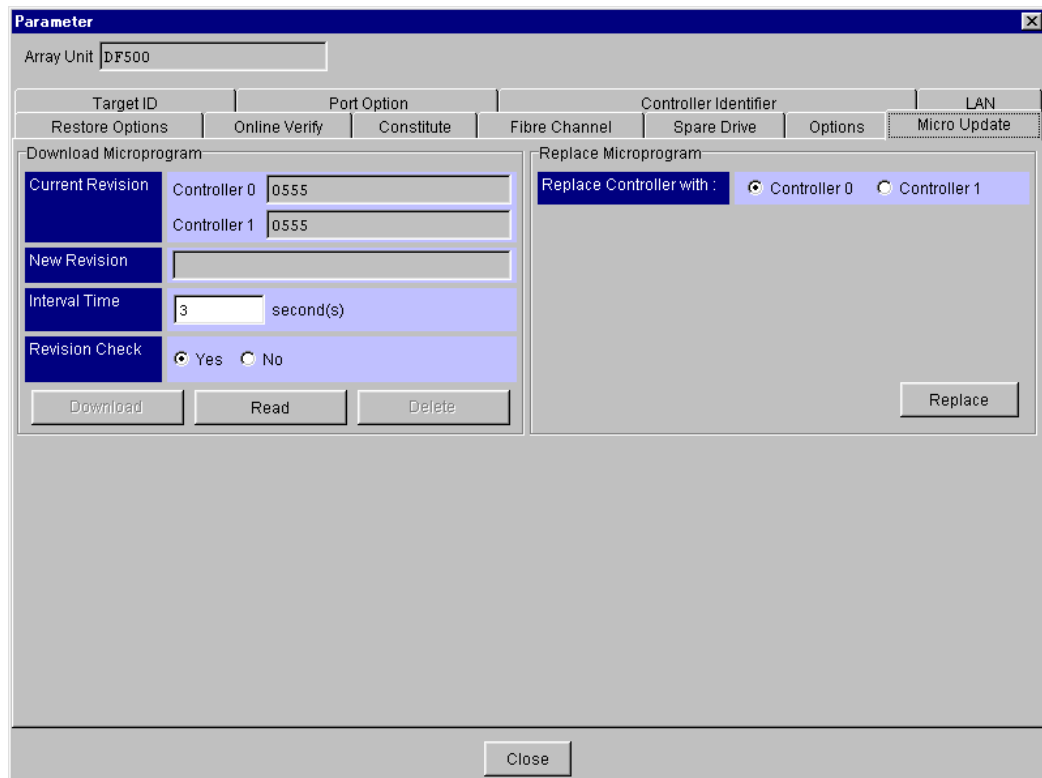
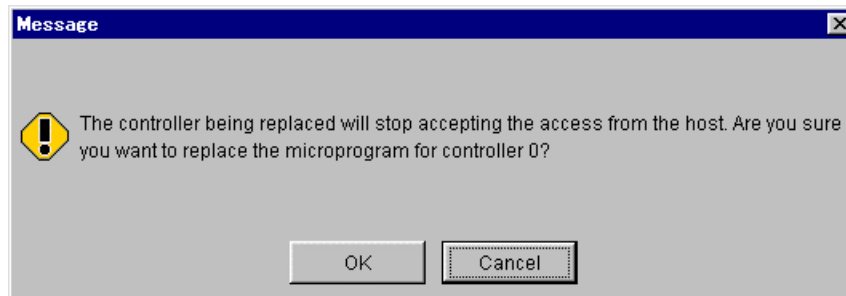


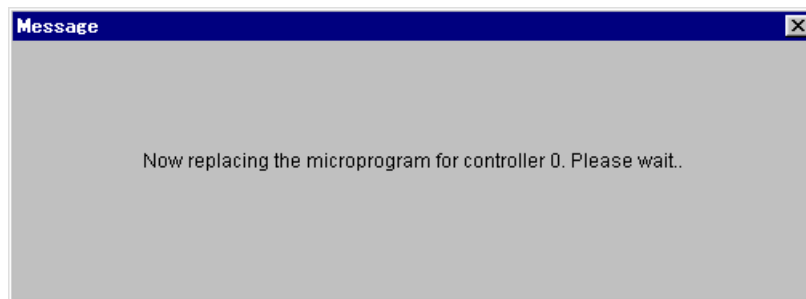
Figure 6.29 Replacing the Microprogram

2. Select the controller whose microprogram is to be replaced and click the **Replace** button.

3. A message is displayed, requesting confirmation to replace the microprogram. The message displays the number of the selected controller. When the **OK** button is clicked, replacement of the microprogram starts.



The following message, stating that the replacement of the microprogram is being executed, is displayed.



4. When the replacement of the microprogram terminates normally, a completion message is displayed. When the **OK** button is clicked, the revision of the replaced microprogram is updated and the window is displayed.



If the downloaded microprogram cannot be replaced, a failure message is displayed. To validate the downloaded microprogram, restart the array unit.

5. Replace the microprogram of the other controller using the procedure from step 3. When the replacements for both controllers terminate normally, replacement of the array unit microprograms is complete.

Note: When the microprograms are replaced, if the microprogram of only one of the controllers is replaced, the array unit is placed in a warning state. When the microprogram of the other controller is replaced, the array unit recovers from the warning state. When replacing the microprograms, replace the microprograms for both controllers.


6.10 Setting Priced Optional Features

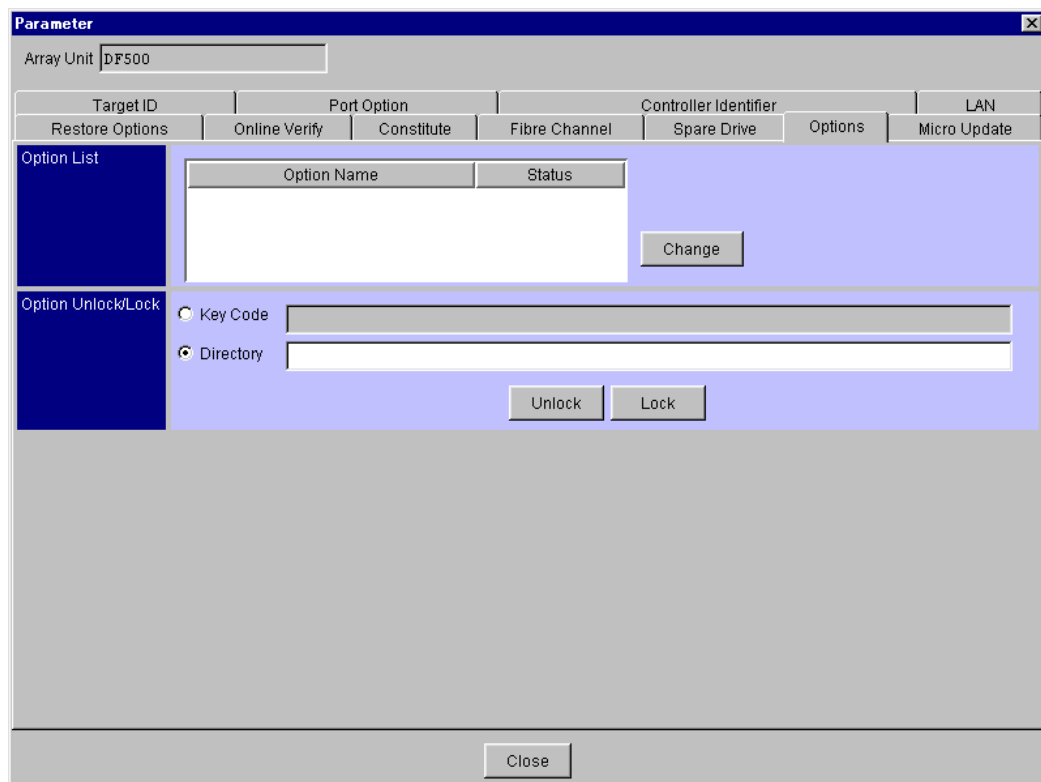
This section includes the following:

- Unlock Priced Optional Features
- Lock Priced Optional Features
- Setting up Priced Optional Features

6.10.1 Unlock Priced Optional Features

The following procedure unlocks the key of priced optional features:

1. On the Settings menu, select Configuration Settings or click : Configuration Settings in the tool bar.
2. Click the Options tab.



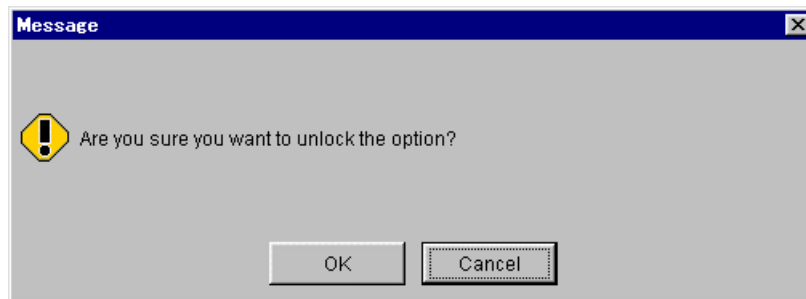
The screenshot shows a software window titled "Parameter" with a close button in the top right corner. At the top, there is a text field labeled "Array Unit" containing the value "DF500". Below this is a tabbed interface with several tabs: "Target ID", "Port Option", "Controller Identifier", "LAN", "Restore Options", "Online Verify", "Constitute", "Fibre Channel", "Spare Drive", "Options" (which is currently selected), and "Micro Update". The "Options" tab is active, displaying a section titled "Option List" on the left and a table with two columns: "Option Name" and "Status". The table is currently empty. To the right of the table is a "Change" button. Below the "Option List" section is a section titled "Option Unlock/Lock". It contains two radio buttons: "Key Code" (unselected) and "Directory" (selected). Each radio button is followed by a text input field. Below these fields are "Unlock" and "Lock" buttons. At the bottom of the window is a "Close" button.

Figure 6.30 Unlocking Priced Optional Features

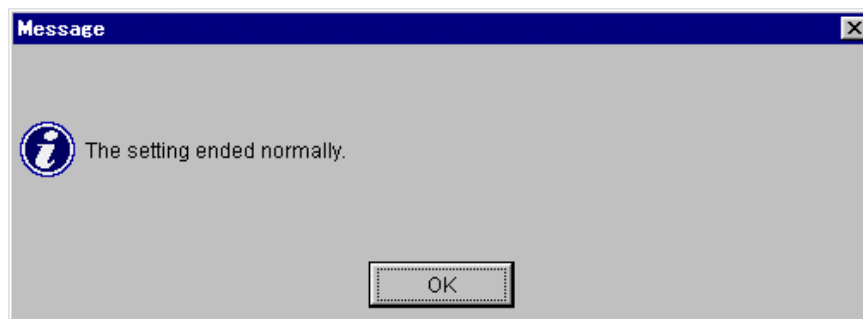
3. Specify whether you will unlock the priced optional features using the FD with the priced optional features or the key code. Set up the directory path or key code, and then click the **Unlock** button.

When you unlock the option using the key code, click the **Key Code** radio button, then set up the key code. For the key code of the priced optional features, refer to the priced optional features manual. When you unlock the option using the FD, click the **Directory** radio button, then set up the path for the FD.

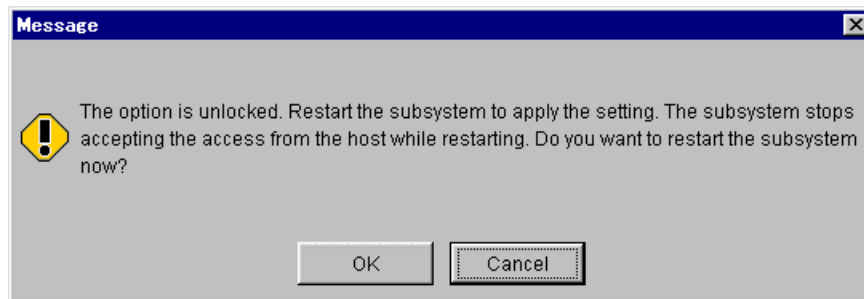
4. When a screen appears, requesting confirmation for unlocking priced optional features, click the **OK** button.



5. A screen confirming that the priced optional features have been unlocked appears. Depending on the option, an array unit may need to be restarted in order to set the unlocking feature effective. Check the manual for the option to be unlocked. All 9200 features need to be unlocked.
 - a) When restarting the array unit, and you do not need to set unlocking effective, the following screen is displayed:

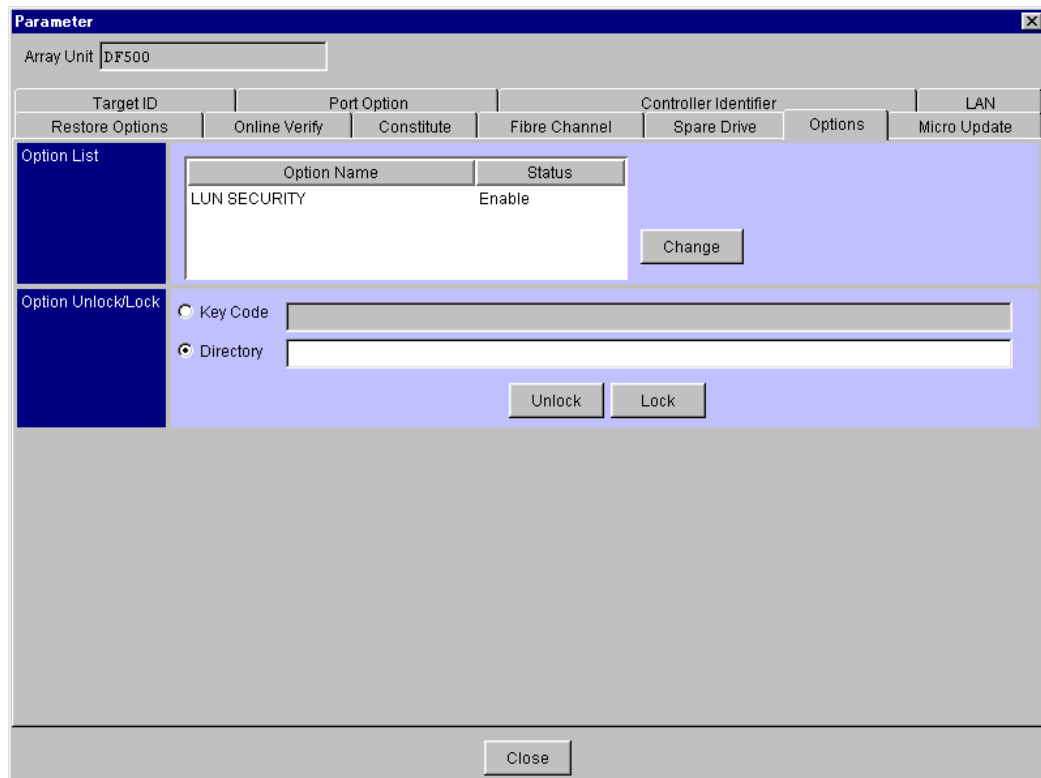


- b) When restarting the array unit is required to set the unlocking feature effective, the following screen is displayed:

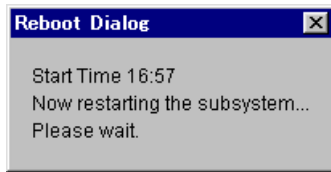


Note: To set effective the unlocking of the option that you have operated, restart the array unit. The feature is not yet closed until restarting. The array unit cannot access the host until the reboot is completed and the system restarts. Therefore, be certain the host has stopped accessing data before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

After an array unit restarts, the unlocked priced optional features is displayed and Enabled.

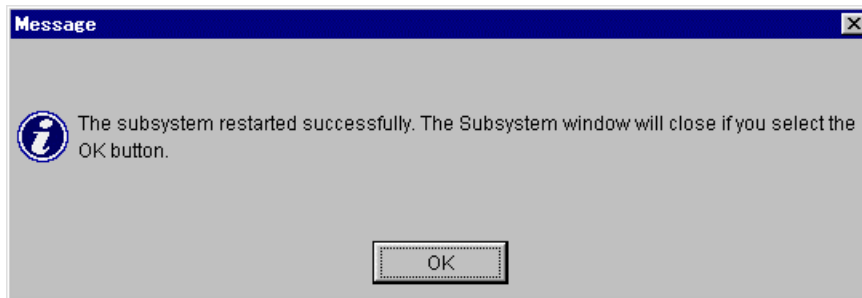


When you choose to restart the array unit, the time the restart began is displayed. This usually takes approximately two to six minutes.



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

6. A message appears, stating that the restart is successful. Click the **OK** button.




The Unit screen is closed. To perform other operations on the main window, select an array unit from the main window and open the selected Unit screen.

Note: For additional information on priced optional features, refer to the corresponding manual of each feature.

6.10.2 Lock Priced Optional Features

The following procedure locks the key of the priced optional features:

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **Options** tab.

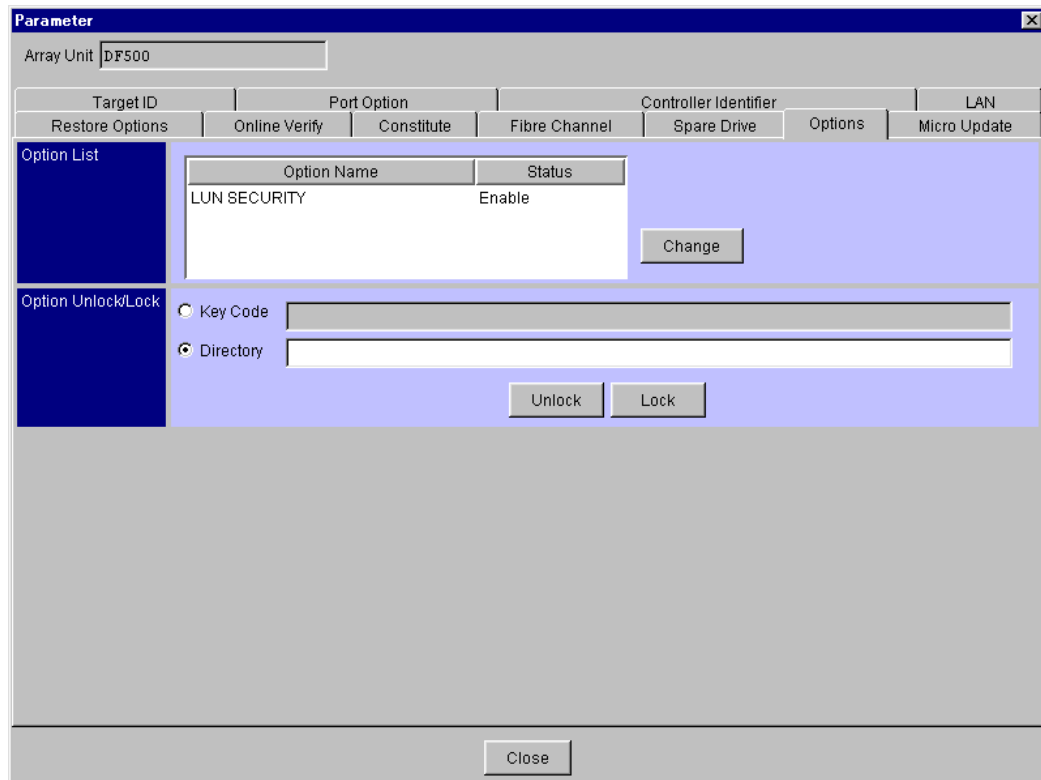
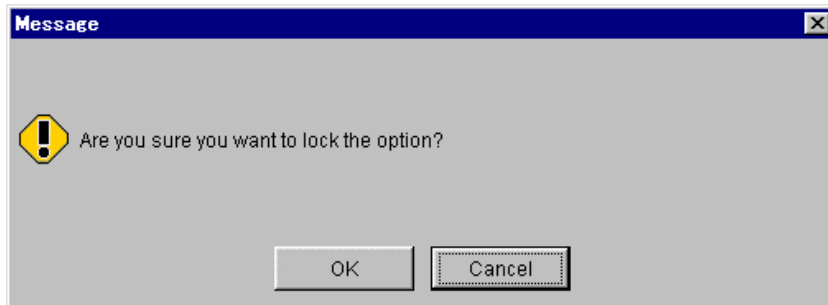


Figure 6.31 Locking Priced Optional Features

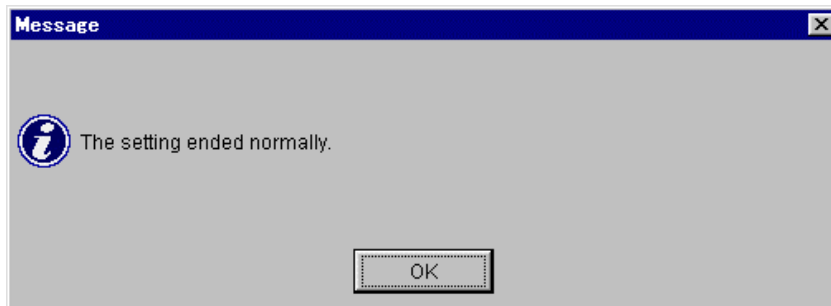
3. Specify whether you are locking the priced optional features using the FD with the priced optional features, or if you are using the key code. Set up the directory path or key code, and then click the **Lock** button.

When you lock the option using the key code, click the **Key Code** radio button, then set up the key code. For the key code of the priced optional features, refer to the manual of the priced optional features. When you lock the option using the FD, click the **Directory** radio button and then setup the path for the FD.

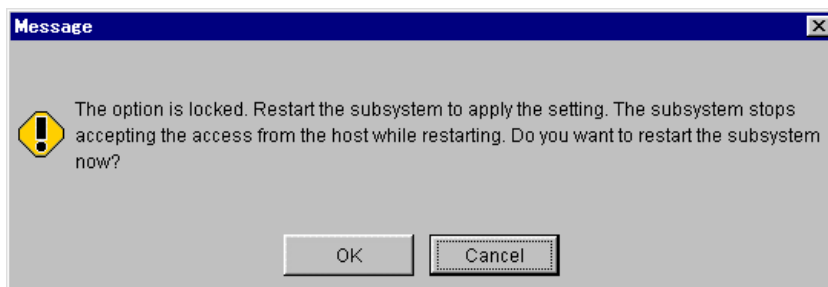
4. When the confirmation screen for priced optional features locking is displayed, click the OK button.



5. A screen, confirming that the priced optional features have been locked, appears. Depending on the option, the array unit needs to be restarted in order to set the locking effective. Check the manual of the option to be unlocked.
 - a) When restarting the array unit, the following screen is displayed:



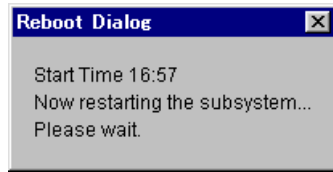
- b) When restarting the array unit, and you do need to set unlocking effective, the following screen is displayed:



Note: To set the locking of the option that you have operated effective, restart the array unit. The feature is not opened 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 beginning the restart process.

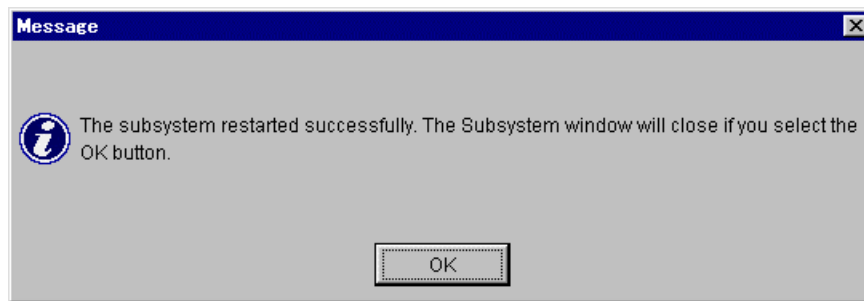
After an array unit restarts, the locked priced optional features is Disabled.

When you choose to restart the array unit, the time the restart began is displayed. This usually 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.


A message appears, stating that the restart is successful. Click the **OK** button.



The Unit screen is closed. To perform other operations on the main window, select an array unit from the main window and open the selected Unit screen.

6.10.3 Setting Up Priced Optional Features

After releasing the key of the priced optional feature, set enable or disable for this feature.

1. On the **Settings** menu, select **Configuration Settings** or click the : **Configuration Settings** in the tool bar.
2. Click the **Options** tab.

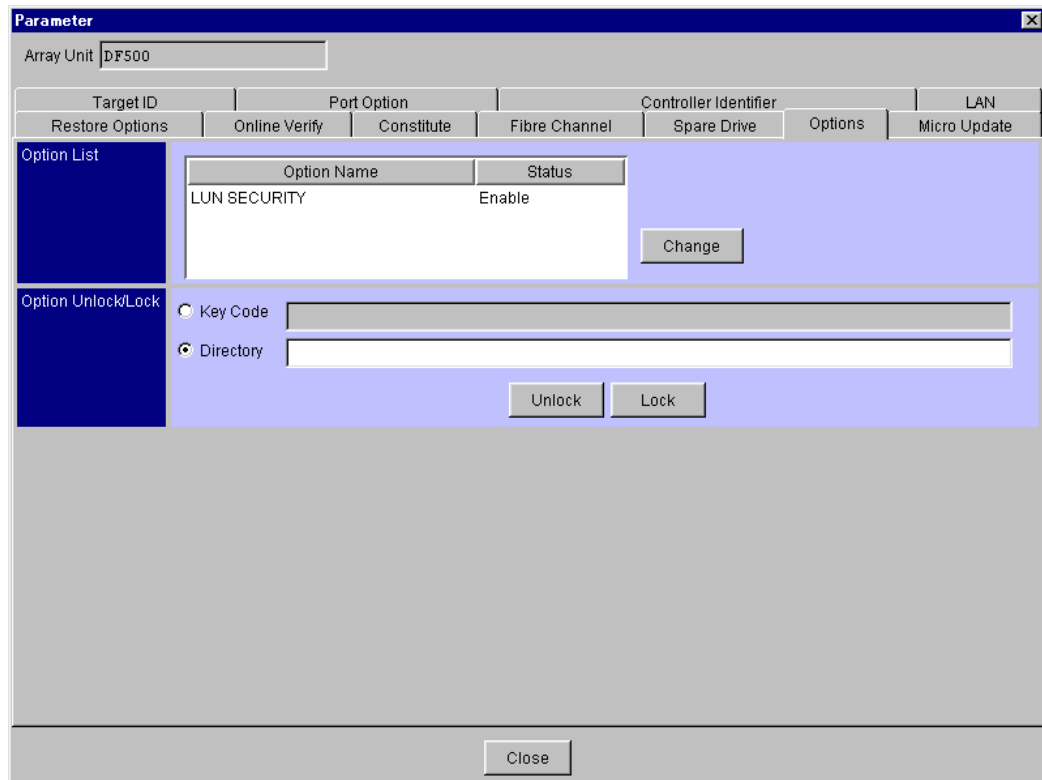
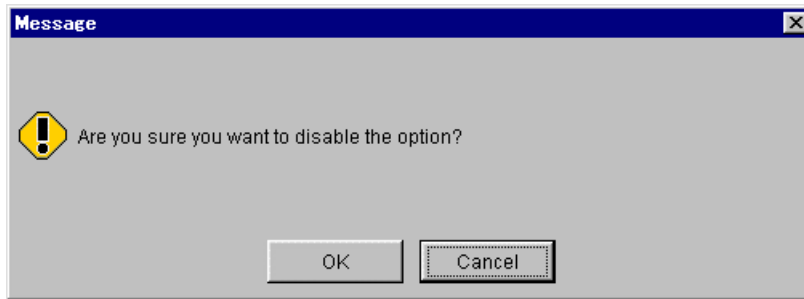


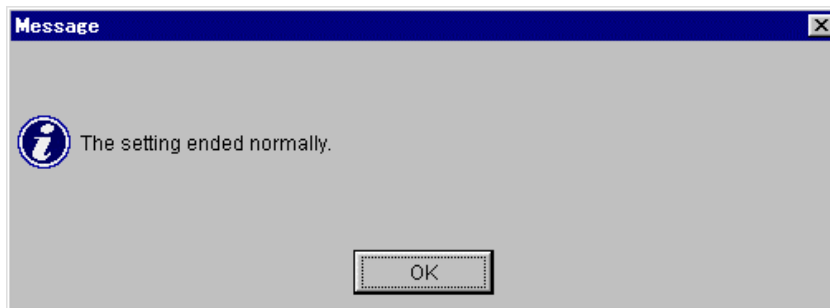
Figure 6.32 Setting Up Priced Optional Features

3. Select the priced optional features to be set up, then click the **Change** button.

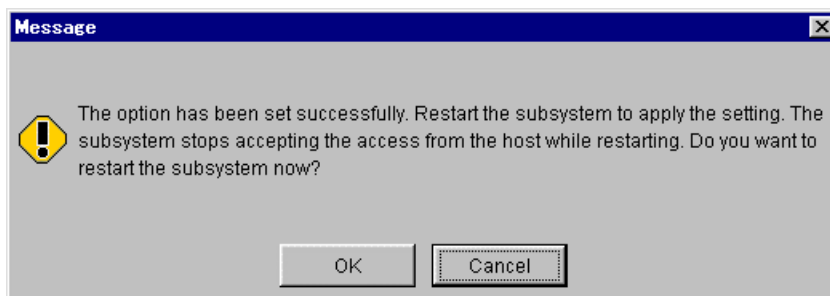
4. When the confirmation screen for priced optional features changing is displayed, click the **OK** button.



5. A screen appears, confirming that the priced optional features have been set up. Depending on the option, an array unit needs to be restarted in order to validate the setup. If an array unit supports restarting, a message confirming a restart request will be displayed. Click the **OK** button to restart.
 - a) When restarting the array unit, and you do not need to set unlocking effective, the following screen is displayed:



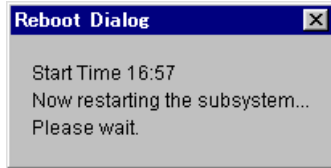
- b) When restarting the array unit, and you do need to set unlocking effective, the following screen is displayed:



Note: To set the locking of the option that you have operated effective, restart the array unit. The feature is not opened 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 beginning the restart process.

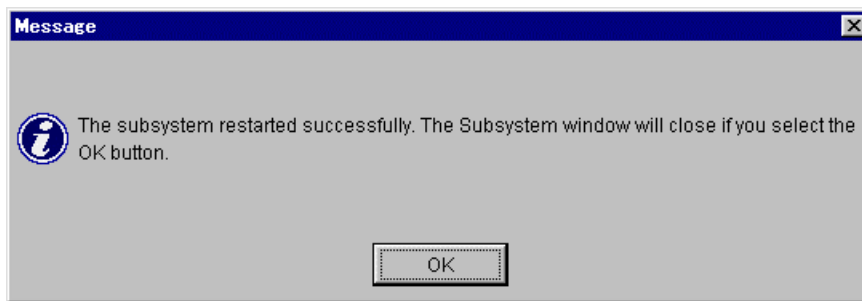
After an array unit restarts, the locked priced optional features is Disabled.

When you choose to restart the array unit, the time the restart began is displayed. This usually 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.


A message appears, stating that the restart is successful. Click the **OK** button.



The Unit screen is closed. To perform other operations on the main window, select an array unit from the main window and open the selected Unit screen.

6.11 Setting the Port Option

Sets the port option of the system parameter. This setting is allowed only if the Target ID mode of an array unit to be set up has been set to **M-TID,M-LUN** (mapping). And not setting mapping information. Confirm the target ID of the setting port. The setting information becomes valid without restarting an array unit.

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **Port Option** tab.

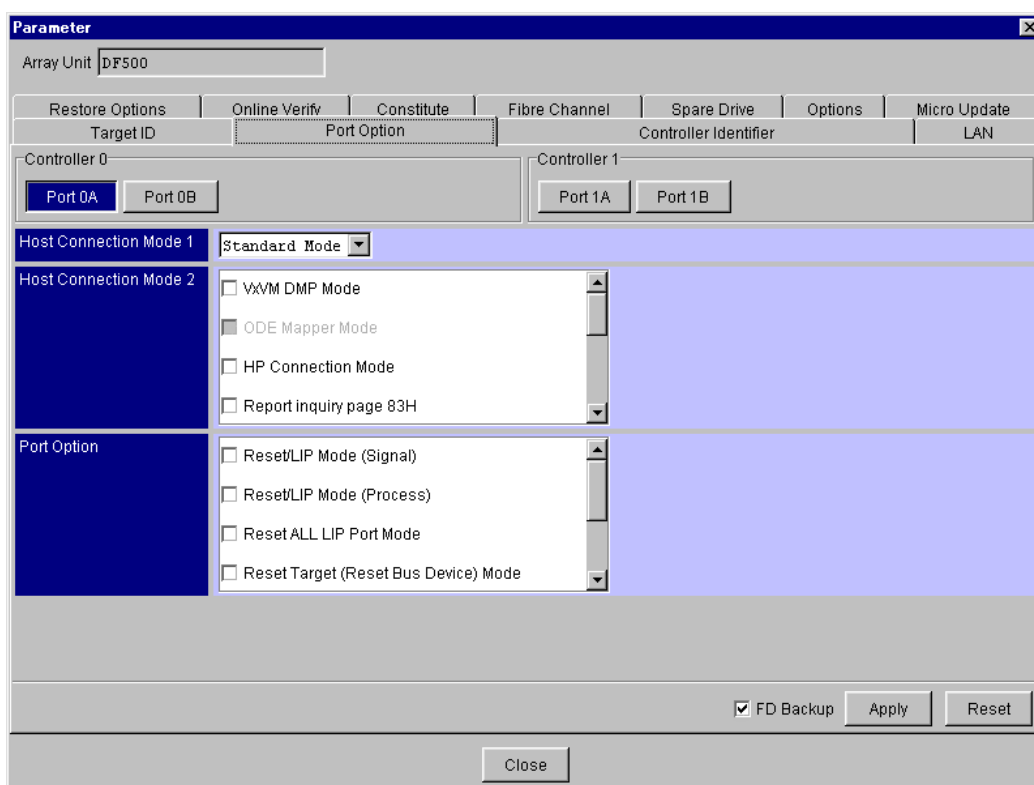


Figure 6.33 Setting the Port Option

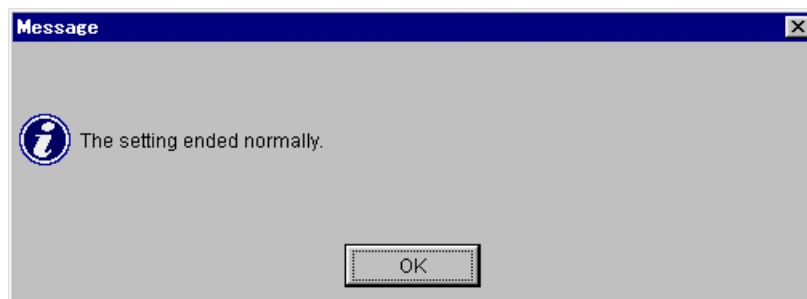
3. Select a port to set up. Select **Host Connection Mode 1** to set, then specify **Host Connection Mode 2** and the **Port Option**.
 - **Host Connection Mode 1**
 - Standard Mode:** Open system emulation mode
 - Open VMS Mode:** Open VMS mode
 - TRESPASS Mode:** TRESPASS mode
 - Wolfpack Mode:** Wolfpack 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:** VxVM mode
 - ODE Mapper Mode:** ODE Mapper mode
 - HP Connection Mode:** HP connection mode
 - Report inquiry page 83H:** Enables the report of Inquiry Page: 83_H.
 - UA(60/2A00) suppress Mode:** Suppresses the unit attention (06/2A00).
 - HISUP Mode:** Enables the HISUP
 - CCHS Mode:** Enables the CCHS convert
 - Standard INQUIRY data expand Mode:** Enables the Standard INQUIRY data expand Mode.
 - HP Connection Mode 2:** Enables the HP Connection Mode 2.
 - Product ID DF400 Mode:** Setting the product ID is DF400.
 - HBA WWN Report Mode:** Enables the HBA WWN Report Mode.
 - NACA Mode:** Enables the CCHS convert.
 - SUN Cluster Connection Mode:** Enables the SUN Cluster Connection Mode.
- **Port Option:** Sets the port options.
 - If the port 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.
 - Reset ALL LIP Port Mode:** The mode to execute reset on receiving LIP.
 - Reset Target (Reset Bus Device) Mode:** The mode to transmit Target Reset to other ports.
 - Reserve Mode:** The mode to reserve logical unit in a dual system.
 - Reset Logical Unit Mode:** When the Logical Unit Reset command is issued for an logical unit, all other commands received by that logical unit will be reset, regardless of the port.
 - Reset Logout of Third Party Process Mode:** The mode to transmit Third Party Process Log-out to other ports.
 - FD Backup:** Port option information has been saved in a backup FD in an array unit as parameter information. When the setting is modified, it is necessary to save it again, so be sure to turn on the check box.

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.

4. A message indicating completion of setting is displayed, click the **OK** button.




Note: When failing to write onto the FD drive, the message “DMES04EB02: Backup floppy disk write error.” is displayed. When this message is displayed, writing to a FD has not been finished, but setting the port option may be completed. Check a FD in an array unit, re-confirm the data to set, turn on the **FD Backup** check box, and then click the **Apply** button.

6.12 Setting the Controller Identifier

Sets the controller identifier of the system parameter. This setting is allowed only if the Target ID mode of an array unit, which is set, has been set to **M-TID,M-LUN** (mapping). Mapping information is not set. Confirm the target ID of the port set.

Setting information becomes valid without restarting an array unit.

1. Select **Settings—Configuration Settings** on the Unit screen. Or click : **Configuration Settings** in the tool bar.
2. Click the **Controller Identifier** tab.

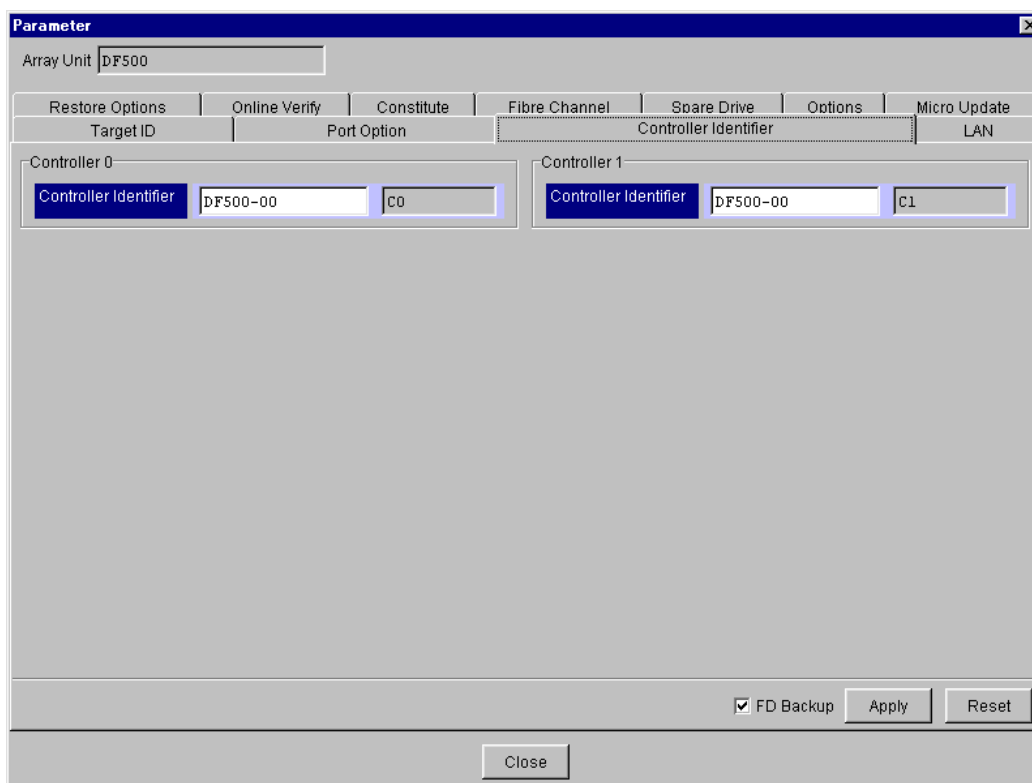
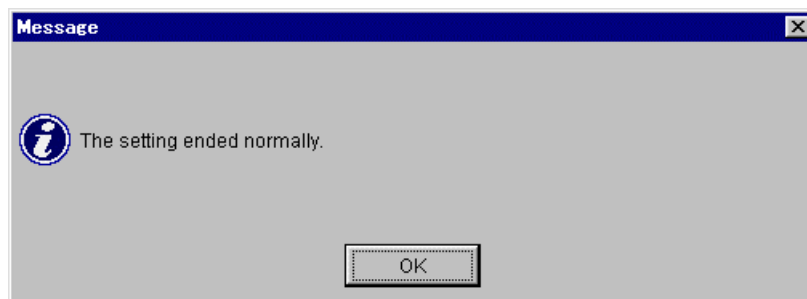


Figure 6.34 Setting the Controller Identifier

3. Set the controller identifier.
 - **Controller Identifier:** 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.
 - **FD Backup:** Controller identifier has been saved in a backup FD in an array unit as parameter information. When the setting is modified, it is necessary to save it again, so turn on the check box.

4. A message appears, stating that the setting is complete. Click the **OK** button.




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

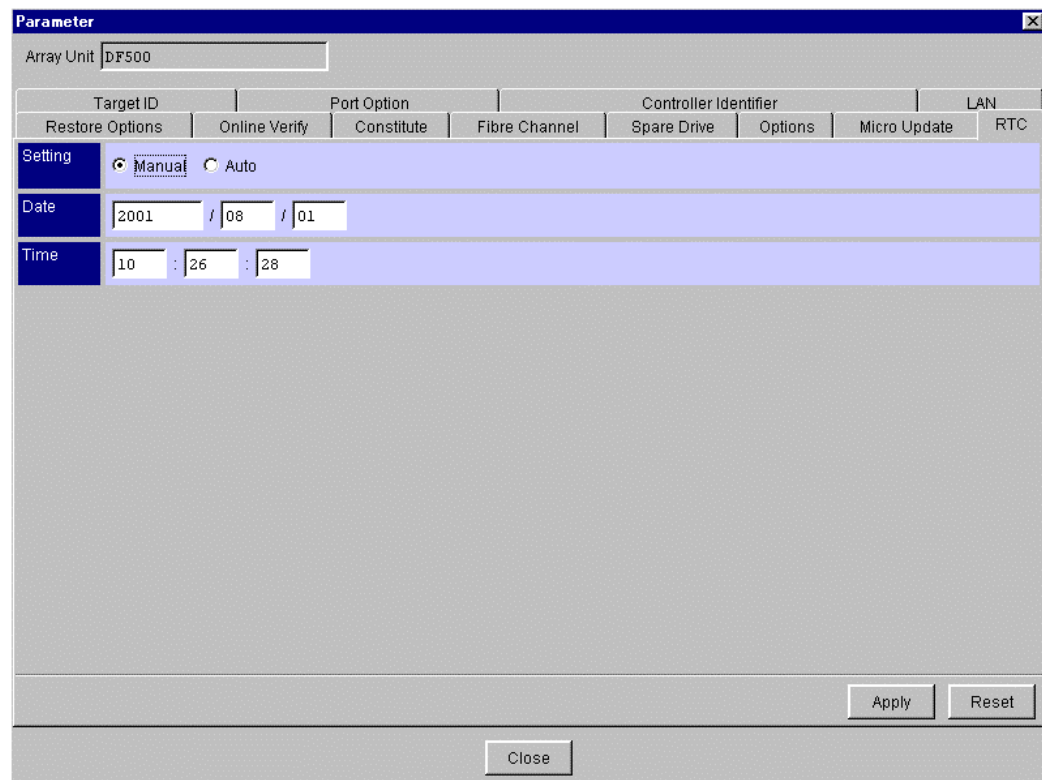
When this message is displayed, writing to a FD has not been finished, but setting the LAN configuration information may be completed.

Check the FD in an array unit, re-confirm the data to set, turn on the **FD Backup** check box, and click the **Apply** button again.

6.13 Setting RTC

This setting information becomes valid without restarting an array unit.

1. On the **Settings** menu, select **Configuration Settings** or click : **Configuration Settings** in the tool bar.
2. Click the **RTC** tab.

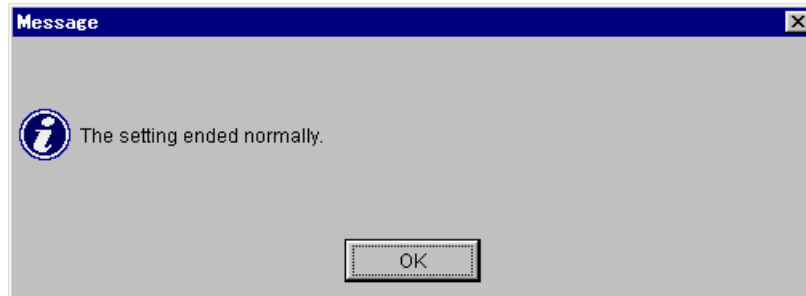


The screenshot shows a window titled "Parameter" with a close button in the top right corner. Below the title bar, there is a text field for "Array Unit" containing the value "DF500". A tabbed interface follows, with tabs for "Target ID", "Port Option", "Controller Identifier", and "LAN". The "RTC" tab is selected and active. Inside the "RTC" tab, there is a "Setting" section with two radio buttons: "Manual" (selected) and "Auto". Below this, there is a "Date" section with three input fields showing "2001", "08", and "01". Below that is a "Time" section with three input fields showing "10", "26", and "28". At the bottom right of the dialog are "Apply" and "Reset" buttons, and at the very bottom center is a "Close" button.

Figure 6.35 Setting RTC


3. Set the RTC.
 - **Setting:** Select Manual or Auto.
Manual: Sets the date and time.
Auto: Sets the time of the PC or SUN server/workstation executing the Resource Manager 9200.
 - **Date:** Displays the date.
 - **Time:** Displays the time.

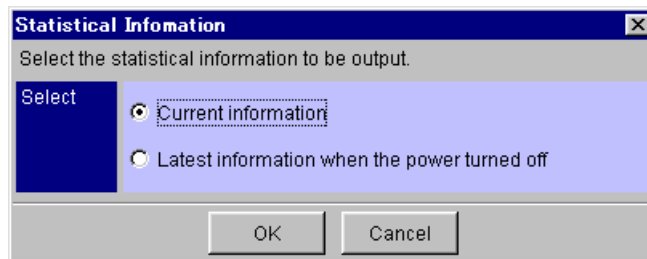
4. Click the **Apply** button.
5. A message appears, stating t stating that the setting is complete. Click the **OK** button.



Chapter 7 Displaying Statistical Information (GUI)

To display the statistical information in the array unit:

1. On the **View** menu, select **Statistical Information** or click : **Statistical Information** in the tool bar.
2. Specify statistical information by **Select**. Click the **OK** button.



- **Select:** Statistical information to be displayed

Current Information: Current information

Latest Information when the power turned off: Information when starting an array unit

7.1 Displaying the Controller Use Condition

1. Click the **Controller** tab.

The screenshot shows a window titled "Statistical Information" with a close button in the top right corner. Inside the window, there is a tabbed interface with three tabs: "Controller" (selected), "Host Commands", and "Cache Load". Below the tabs, the "Array Unit" is set to "DF500". Under the "Array Time" section, two fields are displayed: "Controller being active for (Integrated):" with a value of 8124 [minute(s)] and "Power on for (Work):" with a value of 1473711 [ms]. Below this, the "Controller" section contains a table with two columns: "Controller 0" and "Controller 1". The table has two rows: "Powered on counts" and "H-SCSI reset counts". The values for "Powered on counts" are 22 for both controllers, and the values for "H-SCSI reset counts" are 0 for both controllers. A "Close" button is located at the bottom right of the window.

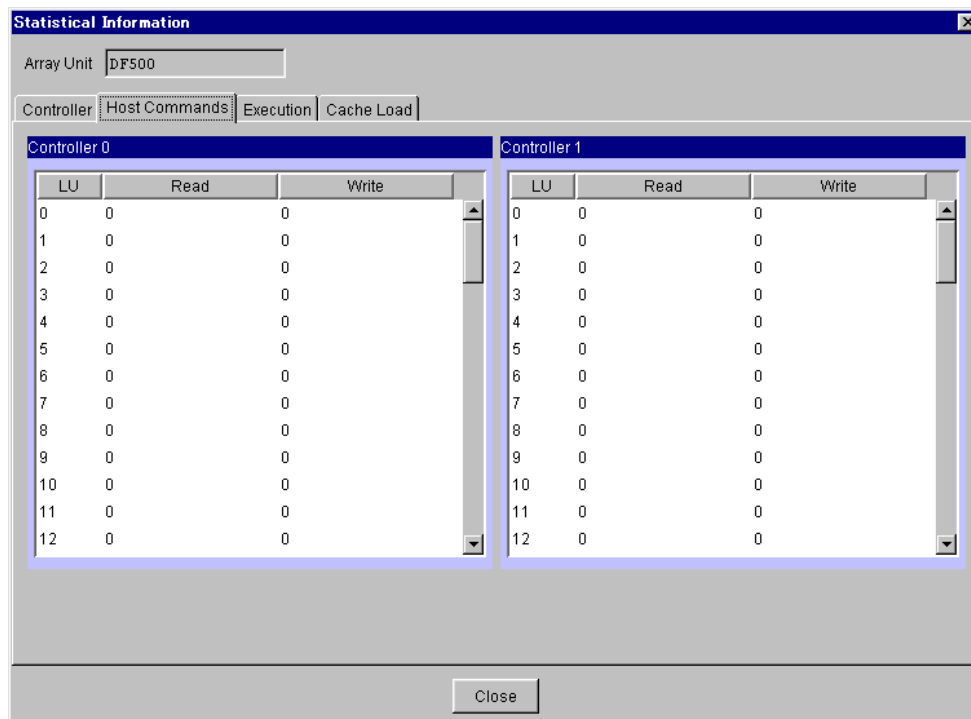
	Controller 0	Controller 1
Powered on counts	22	22
H-SCSI reset counts	0	0

Figure 7.1 Displaying the Controller Use Condition

- **Array Time:**
 - Controller being active for (Integrated):** Integrated acting time of the array unit (minute)
 - Power on for (Work):** Power ON time of the array unit (PS/ON to PS/OFF) time (ms)
- **Controller:**
 - Powered on counts:** Integrated number of power ON times (at interruption) of the controller
 - H-SCSI reset counts:** Integrated number of host bus SCSI reset times (total of interruptions and messages) of the controller

7.2 Displaying the Numbers of Host Commands Received

1. Click the **Host Commands** tab.



The screenshot shows a window titled "Statistical Information" with a close button in the top right. Below the title bar, there is a text field for "Array Unit" containing "DF500". Below this are three tabs: "Controller", "Host Commands" (which is selected), "Execution", and "Cache Load". The main area is divided into two panels, "Controller 0" and "Controller 1". Each panel contains a table with three columns: "LU", "Read", and "Write".

Controller 0			Controller 1		
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

At the bottom center of the window is a "Close" button.

Figure 7.2 Displaying the Number of Host Command Received

- **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

7.3 Displaying the Command Execution Condition

1. Click the Execution tab.

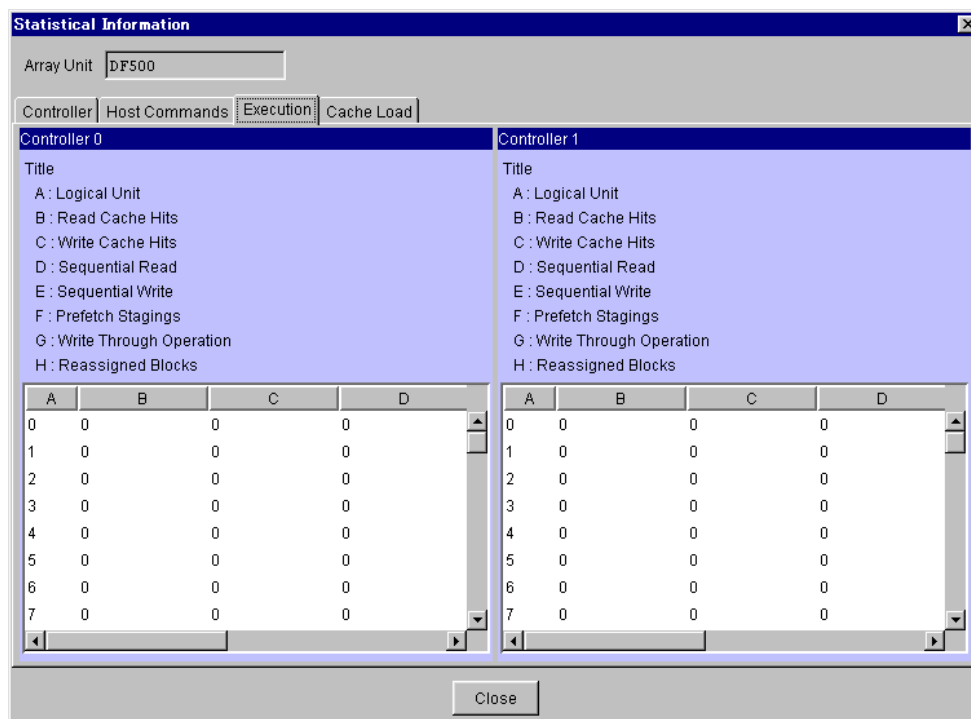


Figure 7.3 Displaying the Command Execution Condition

- **A:Logical Unit:** Logical unit number
- **B:Read Cache Hits:** Total of READ commands (hitting cache or partially hitting cache)
- **C:Write Cache Hits:** Total of WRITE commands (cache read hits)
- **D:Sequential Read:** Total of READ commands (recognized as sequential reading)
- **E:Sequential Write:** Total of WRITE commands (recognized as sequential writing)
- **F:Prefetch Strings:** Total of prefetch jobs executed
- **G:Write Through Operation:** Total of WRITE or WRITE & VERIFY commands (substituted by Write-Through operations)
- **H:Reassigned Blocks:** Number of re-assigned blocks (Not supported)

7.4 Displaying the Cache Load Condition

1. Click the **Cache Load** tab.

The screenshot shows a window titled "Statistical Information" with a close button in the top right corner. Below the title bar, there is a text field for "Array Unit" containing the value "DF500". Below this, there are four tabs: "Controller", "Host Commands", "Execution", and "Cache Load". The "Cache Load" tab is currently selected. Below the tabs, there is a table with two columns: "Controller 0" and "Controller 1". The table has one row with the label "Number of Inflow Threshold Reached" and two data cells, both containing the value "0". At the bottom right of the window, there is a "Close" button.

	Controller 0	Controller 1
Number of Inflow Threshold Reached	0	0

Figure 7.4 Displaying the Cache Load Condition

- **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 waits until part of write data is transferred to the drive.

Chapter 8 Acquiring Performance Information (GUI)

The command operation state is output 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.

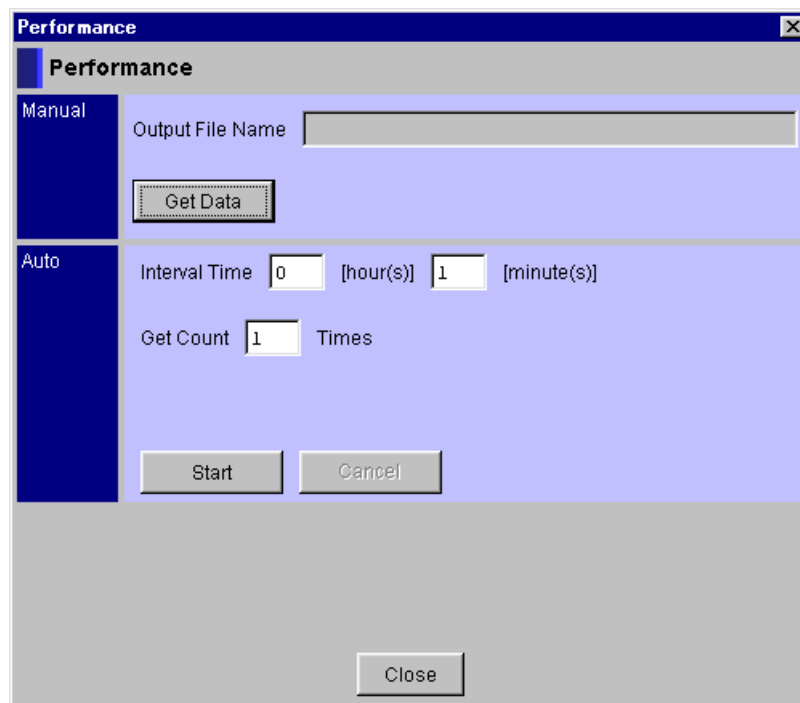
This section includes:

- Outputting Performance Information Manually to a Text File
- Outputting Performance Information Automatically to a Text File

8.1 Outputting Performance Information Manually to a 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. On the **View** menu, select **Performance** or click : **Performance** in the tool bar.



Note: Specify the file name with alphanumeric characters.

2. Click the **Get Data** button.

The file names for getting performance information are displayed in the **Output File Name**.

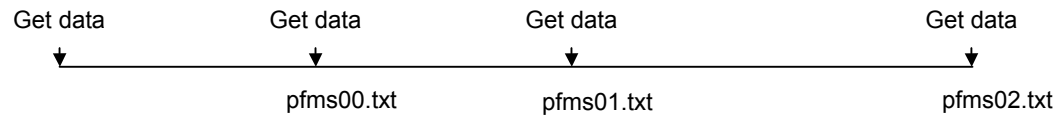
3. These files are output to the directory installing the Resource Manager 9200 in the text file format.

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

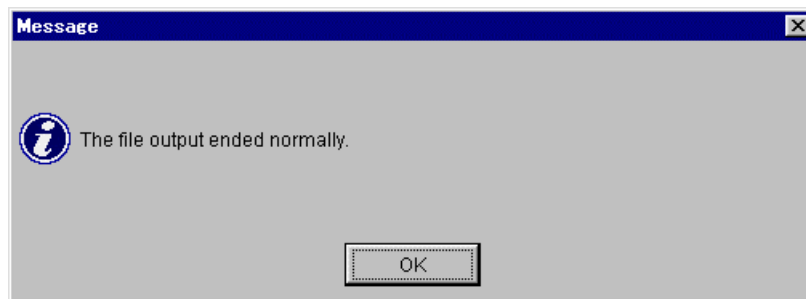
Dual system: pfmd\$\$\$.txt (\$\$: serial number from 00 to 99)

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.

The information is got according to the following timing.



4. After the file processed is terminated, a confirmation message appears. Click the **OK** button.



Refer to the created text file by Excel using "SAMPLEPM.xls" on the supplied FD. The text file is created in the format shown below when it is opened on Excel by using a delimiter ",". For signal connection, only information on the controller 0 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												

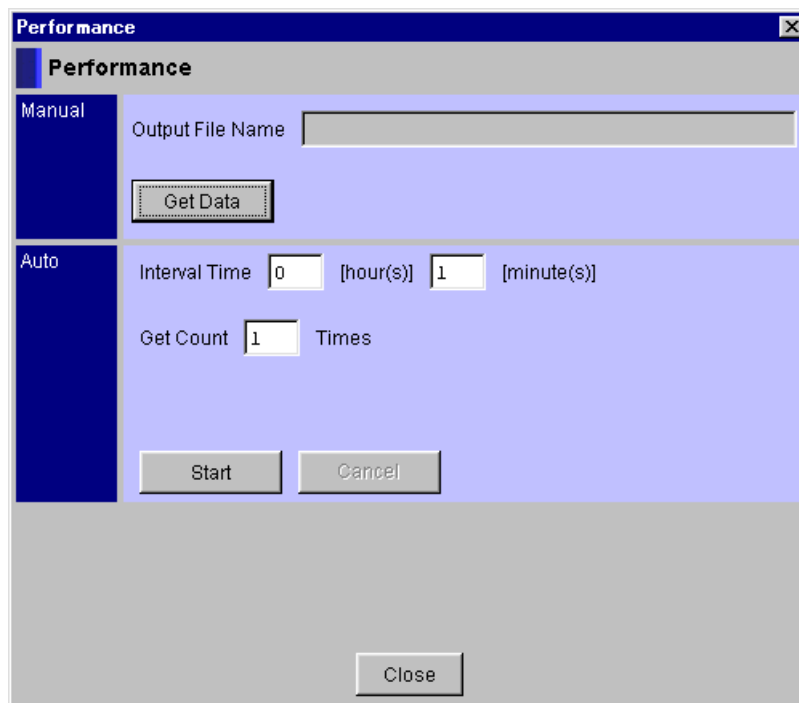
- **CTL0 and CTL1:** Controller number
- **LU0 to LU15:** Logical unit number
- **Total:** Entire controller
- **Read:** Number of received Read commands
- **Read Hit:** Number of cache-hit Read commands to received Read commands
- **Read Hit Rate:** Rate (%) of cache-hit Read commands to received Read 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, the higher the performance becomes.

8.2 Outputting Performance Information Automatically to Text File

Command operation state for each logical unit in the array unit is output at the specified intervals by the specified times.

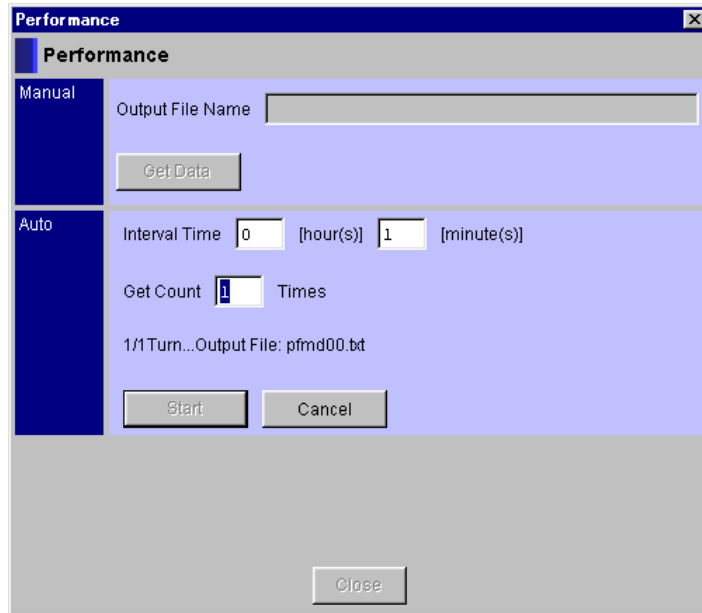
1. On the **View** menu, select **Performance** or click : **Performance** in the tool bar.



- **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 the **OK** button.

During file output, the file name for getting performance information is displayed above the **Start** button.

The image shows a Windows-style dialog box titled "Performance". It has a dark blue title bar with a close button (X) in the top right corner. The dialog is divided into two main sections: "Manual" and "Auto". The "Manual" section is currently selected and highlighted in blue. It contains a text input field labeled "Output File Name" and a "Get Data" button. The "Auto" section is below it and contains two input fields: "Interval Time" with a value of "0" and "[hour(s)]", and "Get Count" with a value of "1" and "Times". Below these fields, it says "1/1 Turn... Output File: pfmd00.txt". At the bottom of the "Auto" section are "Start" and "Cancel" buttons. At the very bottom of the dialog is a "Close" button.

Files are output with the following file names. The designated files are output to the directory installing the Resource Manager 9200 in the text file format.

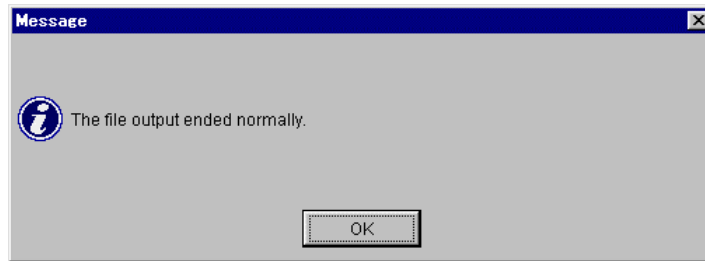
Single system: pfms\$.txt (\$\$: serial number from 00 to 98)

Dual system: pfmd\$.txt (\$\$: serial number from 00 to 98)

Note: Files are output with the names of pfms00.txt/pfmd00.txt to pfms98.txt/pfmd98.txt. When re-executing, the information is overwritten by the same file name (names from pfms00.txt/pfmd00.txt up to pfms98.txt/pfmd98.txt in accordance with the number of times of acquisition). Move the necessary information to another directory.

To stop the file output halfway, click the **Cancel** button.

3. When the file processing is terminated, a confirmation message is displayed. Click the **OK** button.



Refer to created text files on Excel by using 'SAMPLEPM.xls' in the supplied FD. Test files are created in the following format when they are opened by ',' on Excel. When the single system is connected, only the information of the Controller 0 side is collected.

Chapter 9 Error Monitoring (GUI)

This section includes the following:

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

9.1 Setting Error Monitoring Options

During error monitoring, when a failure is detected on the monitored array unit, E-Mail Report or one specified application can be started.

In **Error Alert**, click the **E-Mail Error Report** check box and the **Execute Application** check box to enable them.

1. On the **Settings** menu, select **Monitoring Options** or click : **Monitoring Options** in the tool bar.

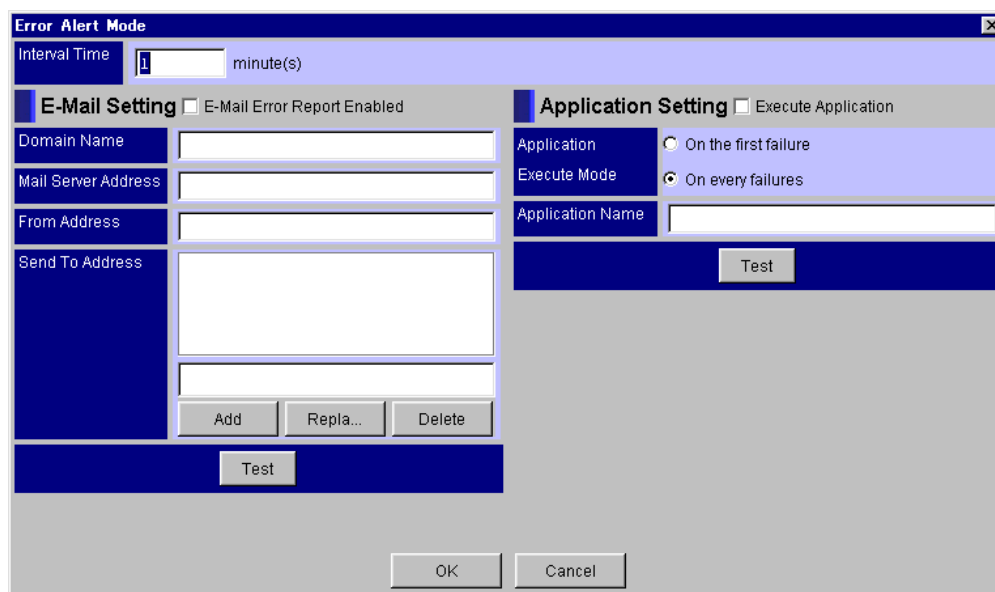


Figure 9.1 Setting Error Monitoring Options

9.1.1 Interval Time

1. Specify the interval time for error monitoring.

Specify **Interval Time** in the range of 1 minute to 720 minutes (12 hours). The interval means the time from an end of all target array unit monitoring until the start of the next monitoring.

2. Click the **OK** button.

The setting is validated without rebooting the Resource Manager 9200.

9.1.2 E-Mail Report

When an error is detected by error monitoring, the contents of the error are reported.

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 the E-Mail is transmitted.

- E-Mail Subject
- E-Mail Message Text

9.1.2.1 E-Mail Subject

For E-Mail, the failed part can be judged by the subject, so the failed part is appended to the subject as a matter of format. The subject format is shown below. Table 9.1 shows a list of subjects.

Manager/Obstruction (failed part)

Table 9.1 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 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.

9.1.2.2 E-Mail Message Text

When using E-Mail, the failed part is reported using message text in the subject. The format of the message text is shown below. A list of messages is shown in Table 9.2.

Day, Mon.dd hh:mm:ss yyyy/DF Name/message text

Day: Day of the week **hh:mm:ss:** Hours, minutes, and seconds

Mon: Month **yyyy:** Year

dd: Date

Table 9.2 List of E-Mail Message Texts

No.	Message text	Meaning of message
1	ARRAY Drive Detached. ARRAY Detached Drive Position Unit No.X HDU No.Y.	A drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and a HDU 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 occurs.
10	ARRAY LoopAlarm.	A loop error occurs.
11	ARRAY Warning.	The array unit entered the warning state.
12	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 the E-Mail Report.

- **E-Mail Error Report Enabled:** Specifies whether or not to execute E-Mail Report when an error is detected by error monitoring. When this item is checked off, E-Mail Report will be executed. ON/OFF is displayed on the right side depending on whether a check mark exists or not.
- **Domain Name:** Specifies a domain name. Specify it in 39 or less alphanumeric characters or a code.
- **Mail Server Address:** Specifies the IP address or host name of the mail server. Specify the host name in 99 or less alphanumeric characters.
- **From Address:** Specifies the mail address of the E-Mail sender. Specify it in 99 or less alphanumeric characters or a code.
- **Send To Address:** Specifies the mail address of the E-Mail receiver. Specify it in 99 or less alphanumeric characters or a code.
Up to 20 addresses can be set as receivers.

Add: 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.

Replace: 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.

Delete: 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.

2. To verify the setting, click the **Test** button.

When the mail has been normally transmitted, a confirmation message appears. Click the **OK** button.

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

3. Click the **Close** button.

The setting is validated without rebooting the Resource Manager 9200.

9.1.3 Setting Additional Information on E-mail

When registering or changing the properties of an array unit, you can add unique information on the e-mail header or on the unit trace information header.

1. In the **Properties** window of the array unit, click the **Mail Additional Information** button.

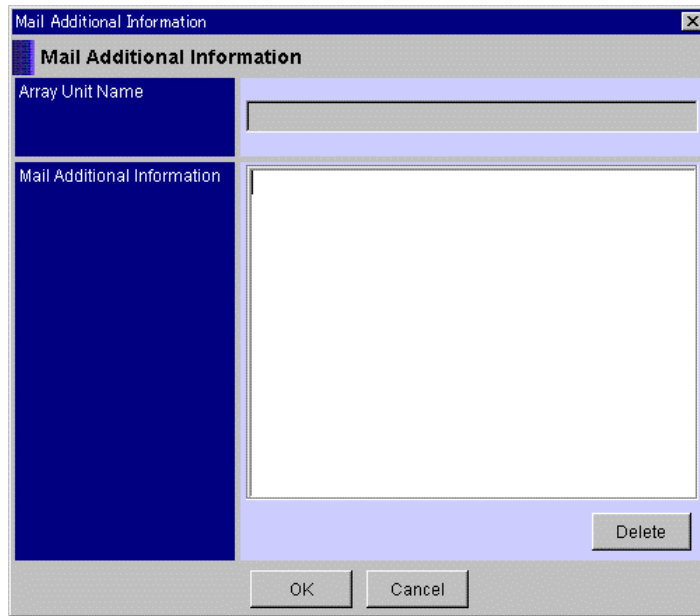


Figure 9.2 Setting Additional Information on E-Mail

2. In the **Mail Additional Information** text box, enter the information in less than or equal to 64-byte characters.

The information set on E-Mail is added to the E-Mail attribute. The format is as follows:

Day, Mon. dd hh:mm:ss yyyy/DF Name/Additional Information/message text

To delete the information, click the **Delete** button.

9.1.4 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 activates the window; it displays the current size and position.

1. Set the necessary items to start 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 clicked. 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 failure: 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 and the system may hang-up. 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 or IRIX

Example 1: /home/use/damp/go

Data file name of the application

1. To check the setting, click the **Test** button.
Verify that the specified application is started.
2. Click the **OK** button. The setting will be validated without rebooting the Resource Manager 9200.

9.2 Outputting failure information to log file

When a failure is detected in the array unit when error monitoring is executed, the function outputs the failure information to a log file.

The log file is output in the text file format with a file name of `errlog.txt` to the same directory in which the Resource Manager 9200 execution file is located. 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. A list of message texts is shown in Table 9.3.

Day, Mon. dd hh:mm:ss yyyy/DF Name/message text

Day: Day of the week

hh:mm:ss: Hours, minutes, and seconds

Mon: Month

yyyy: Year

dd: Date

Table 9.3 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 Unit No.X HDU No.Y.	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 Loop Alarm.	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.
14	ARRAY Manager Interface error occurred. Error Code (nnnn).	When connecting to a LAN, an array unit connection error occurs. nnnn: Winsock error code
15	ARRAY Manager Interface error occurred.	When connecting to an RS232C interface, an array unit connection error occurs.
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


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 system installing the Resource Manager 9200.

9.3 Error Monitoring

Error monitoring checks the component status of the array unit. This including drives, controller, battery, fan, power supply, and cache. Placing a check in the **Error Watch** box in registered array unit information enables error monitoring at an interval specified for the interval time.

Note: When you perform error monitoring, be sure to close the Unit screen before starting the monitoring. If error monitoring is performed with the Unit screen open, array units may not be monitored normally.

1. Click : **Error Watch** on the Main screen.

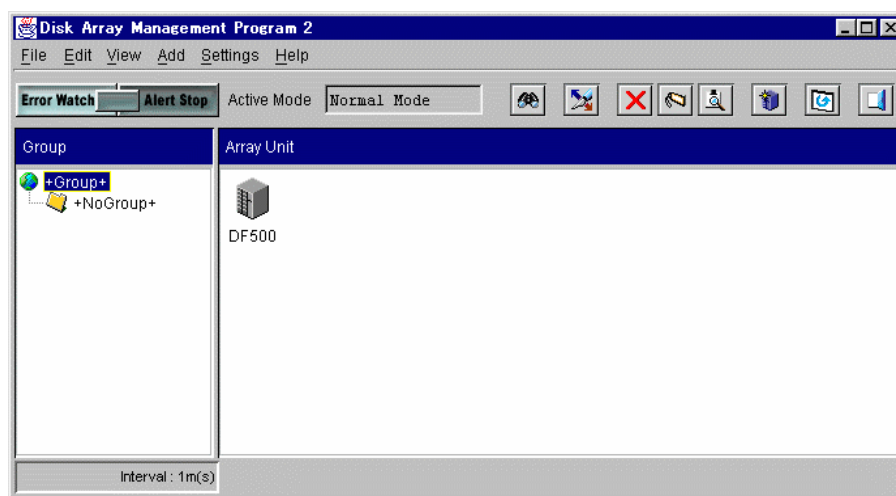








Figure 9.3 Starting Error Monitoring

Monitoring is started for the array unit for which "Error Alert" is specified. The **Error Watch** button on the Main screen displays .

After the start of error monitoring, the monitoring status is displayed in the status bar. The icon displays a monitoring result of the array unit.





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 error monitoring status is displayed on the left side of the scroll bar in the following three states. In addition, the monitoring result of all the array units subject to monitoring is displayed with icons.





Monitoring status	Display characters	Character color	Array unit status
Stop	Stop	 Gray	Error monitoring is not executed.
Monitoring	Monitoring	 Blue	Error monitoring is executed and the all the target array units are normal.
	Monitoring	 Red	Error monitoring is executed and errors are detected in some of the target array units.
Waiting	Waiting	 Blue	Error monitoring is at the interval time and all the target array units that were previously monitored are normal.
	Waiting	 Red	Error monitoring is at the interval time and errors are detected in some of the target array units that were previously monitored.

As an error monitoring result, the status is displayed with the icon color of the array unit in the Main screen.

Array units in the dual system


 Gray	<ul style="list-style-type: none"> • Not monitored
 Gray + Blue	<ul style="list-style-type: none"> • Normal
 Gray + 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.


Array units in the single system

 Gray	<ul style="list-style-type: none"> • Not monitored
 Gray + Blue	<ul style="list-style-type: none"> • Normal
 Gray + Yellow	<ul style="list-style-type: none"> • An error is detected.
 Red	<ul style="list-style-type: none"> • A power OFF or a failure of the array unit occurred. • A communication error occurred.

2. To display the detail information of the array unit, stop error monitoring, click an array unit to be displayed, and click : **Alert Stop**. The contents of display may be different depending on the relationship between **Error Alert** result and “Time” because polling is performed.

When the icon has a Caution symbol displayed, this represents a communication disable status with the array unit; detailed information cannot be displayed.

3. Click : **Alert 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 an array unit on the Main screen, and then click the “: **Display Details**” in the tool bar.

Note: When the icon has a Caution symbol displayed 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 as follows:

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 logical unit 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.

4. Check all of the above. After making sure that connection with the array unit displayed in Caution symbol 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 Caution symbol icon may be provided.

If error monitoring is performed, though the icon of the array unit is displayed with a Caution symbol, the icon of the normal array unit may be displayed with a Caution symbol. 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 blue in **Unit Status** in the Unit screen (a drive that is not logical unit-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 maintenance personnel.

9.4 Checking Status

Check the status of array unit components: drives, controllers, batteries, fans, power supply and cache. A status check is done on an array unit for which the check box of the **Error Alert Flag** in "Array Unit Define" is selected.

1.

1. On the **View** menu, select **Refresh** or click : **Refresh** in the tool bar.

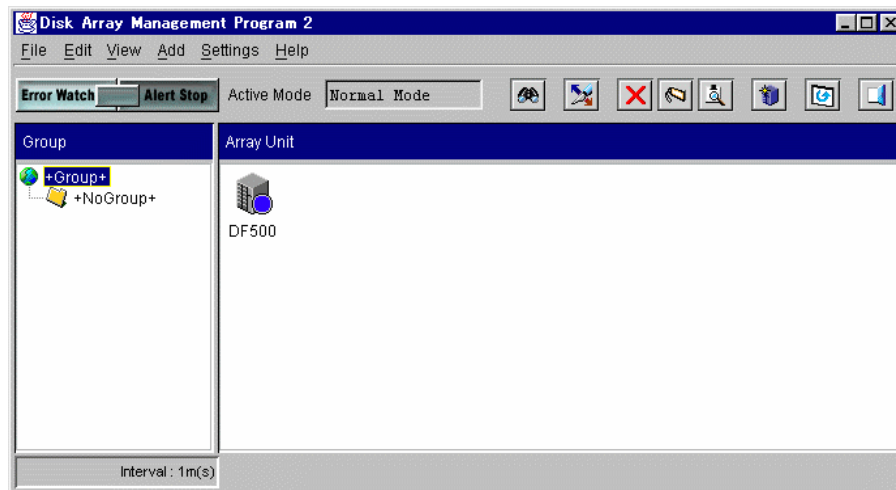


Figure 9.4 Checking the Status of Array Unit Components

The status of an array unit for which error monitoring is specified is checked. When checking begins, 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, output of a log, sending of an E-Mail, and restarting of a specified application are performed in accordance with the settings of the monitor options.

Chapter 10 Automatic Start of Error Monitoring (GUI)

10.1 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 Resource Manager 9200 startup file.

The error monitoring function is the same as that provided by clicking the **Error Watch** button.


The automatic start is available only for Windows.

10.1.1 Automatic Start of Windows

Error monitoring is started when Windows is booted up if the error monitoring is set to "startup".

1. Open the bat file to boot the Resource Manager 9200.
2. Specify an option in the execution file in the bat file.

```
java -classpath .\CONFMNG2.JARjp.co.hitachi.str.diskarray.gui.ConmanFrame -check >>  
exclog
```

Parameter for error monitoring 

3. Prepare a shortcut to the Resource Manager 9200 startup bat file for the "Startup".
4. When Windows is rebooted, the Resource Manager 9200 is started in an error monitoring executing status.

Chapter 11 Detailed Screen Display (GUI)

11.1 Detailed Screen Display

The detailed display of the array unit is made by specifying options in the execution file in the Resource Manager 9200 startup file.

The detailed display is available only for Windows.

11.1.1 Detailed screen display on Windows

The detailed display of the array unit is made by specifying options in the bat file.

1. When the Resource Manager 9200 is started, 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

For the RS232C connection, specify "-unit".

- Example with "-unit" option

```
java -classpath .\CONFMNG2.JAR jp.co.hitachi.str.diskarray.gui.ConmanFrame -unit  
DF500
```

Parameter for screen display →

← DF name of the array unit to be display

- Example with "-ip" option

```
java -classpath .\CONFMNG2.JAR jp.co.hitachi.str.diskarray.gui.ConmanFrame -ip  
192.168.1.100
```

Parameter for screen display →

← IP address of the array unit to be display

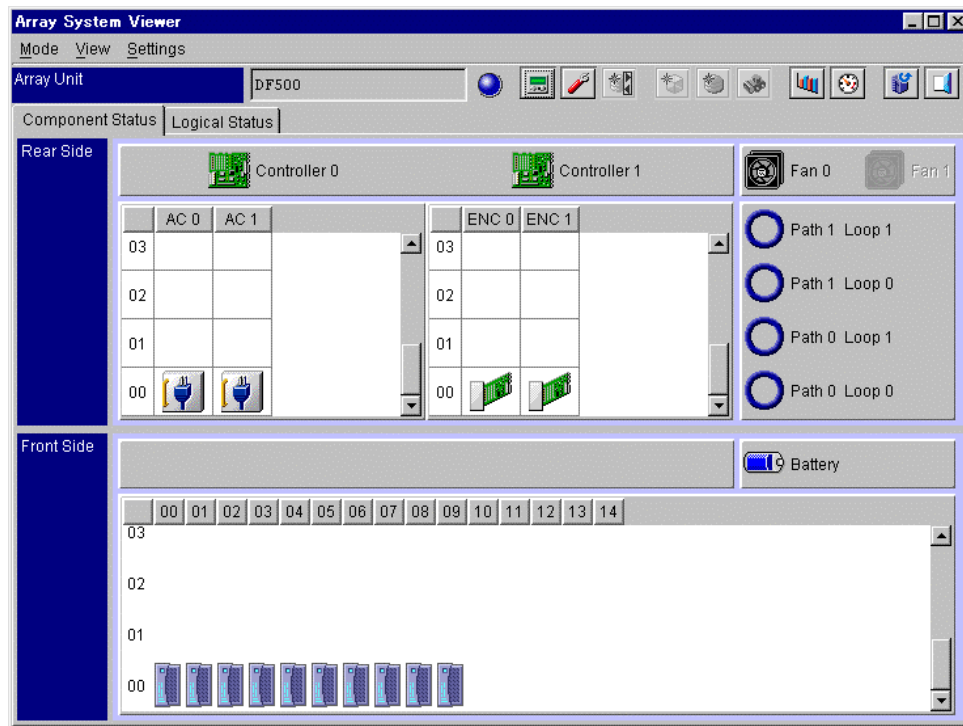
- Example with "-host" option

```
java -classpath .\CONFMNG2.JAR jp.co.hitachi.str.diskarray.gui.ConmanFrame -host  
DF500
```

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 normal mode.



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. Start Resource Manager 9200 when you have finished other applications.

- If the Resource Manager 9200 is used together with other programs for one array unit, the following restrictions apply.

Table 1.1 Restrictions when Multiple Programs are used Concurrently for One Array Unit

No.	Program name	1	2	3	4	5	6	7
1	Disk Array management program (LAN)	×	Δ	×	Δ	×	○	○
2	Disk Array management program (RS232C connection)	Δ	×	Δ	×	Δ	○	○
3	Disk Array utility (LAN)	×	Δ	×	Δ	×	○	○
4	Disk Array utility (RS232C connection)	Δ	×	Δ	×	Δ	○	○
5	Disk Array utility for Web	×	Δ	×	Δ	×	○	○
6	SNMP Agent Support Function	○	○	○	○	○	○	○
7	9200-built-in Web Server Function	○	○	○	○	○	○	○

○: Concurrent use is allowed.

×: Concurrent use is not allowed (operations performed with a program terminate abnormally).

Δ: Configuration in which concurrent use is allowed, but is not recommended.

If you run a combination of programs when concurrent use is not allowed, if a program with a usage restriction placed on it has been started, start another program of the combination after terminating the running program. To operate other programs, refer to their respective user's guides provided with the program products.

- 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, HP server/workstation, or IBM 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, Windows 2000, or Windows NT 4.0
 - CPU: Pentium
 - Memory: 16 MB or more is recommended
 - Disk capacity: 8 MB max.
 - Network adapter
- SUN server/workstation
 - Solaris 2.6, 2.7, 2.8
 - CPU: UltraSPARC or more is recommended.
 - Memory: 16 MB
 - Disk capacity: product version 15.5 MB max, bundle version 9 MB max.
 - Network adapter
- SGI server/workstation
 - IRIX 6.4, 6.5
 - CPU: R10000 or more is recommended.
 - Memory: 16 MB
 - Disk capacity: product version 26.5 MB max, bundle version 14.5 MB max.
 - Network adapter
- HP server/workstation
 - HP-UX 10.20, 11.0
 - CPU: HA8000 or more is recommended.
 - Memory: 16 MB
 - Disk capacity: product version 17 MB max, bundle version 10 MB max.
 - Network adapter

- IBM server/workstation
 - AIX 4.3.3, 5L
 - CPU: PowerPC/RS64 II or more is recommended.
 - Memory: 16MB
 - Disk capacity: product version 19.5 MB max, bundle version 11 MB 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.

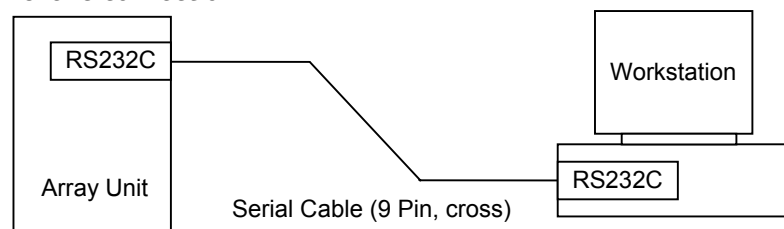
1.3 Connecting

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

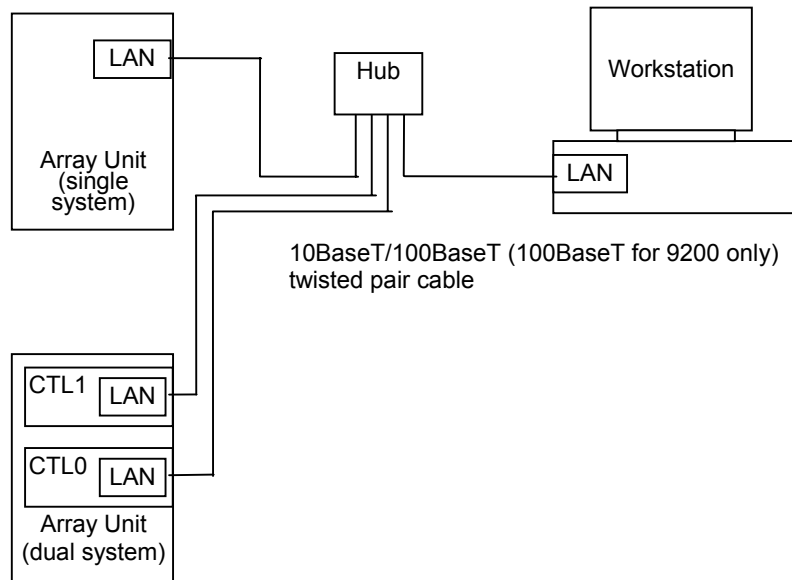
The following diagram is an example of a connection between a workstation in which Resource Manager 9200 is installed and an array unit.

- RS232C connection



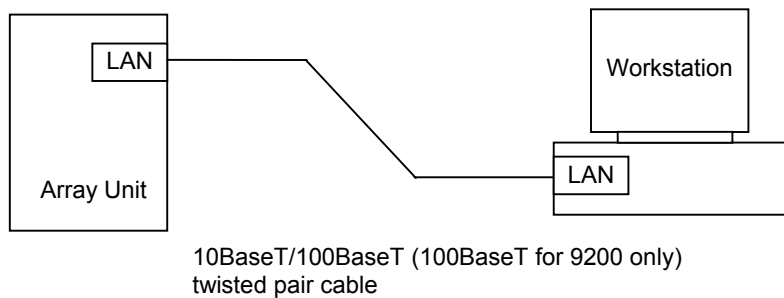
Note: In the dual system where two RS232C ports are in the workstation, connect the RS232C to both of controller 0 and controller 1.

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_ROOT_DIR_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_ROOT_DIR_PATH environment variable of the startmgr.bat in the developed file. Set up the install directory of the Resource Manager 9200 in the CMDF_ROOT_DIR_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:\damp:

```
set CMDF_ROOT_DIR_PATH=C:\damp
set LANG=en
command.com
```

1.4.2 Solaris

1. Start the SUN server/workstation.
2. Create a new directory (example: /usr/damp) for installing the Resource Manager 9200. Copy the ArrayManage-xSxxx-CLI.tar file in the supplied CD-R to the directory created in the hard disk. (The portion xSxxx of file names varies with the version of the Resource Manager 9200, etc.)
3. The ArrayManage-xSxxx-CLI.tar file is a Tar format file. Expand the file referring to the following example. If the directory described below is present, create another directory.

Example:

```
tar xvf ArrayManage-xSxxx-CLI.tar
```

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

```
/usr/damp/           : 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 CMDR_ROOT_DIR_PATH environment variable.

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

```
% setenv CMDR_ROOT_DIR_PATH ${DFHOME}
```

It is recommended that environment variables be defined in the login shell of users who access the Resource Manager 9200.

6. Log in again.

1.4.3 IRIX

1. Start the SGI server/workstation.
2. Create a new directory (example: /usr/damp) for installing the Resource Manager 9200. Copy the ArrayManage-xIxxx-CLI file in the supplied CD-R to the directory created in the hard disk. (The portion xIxxx of file names varies with the version of the Resource Manager 9200, etc.)

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

3. The ArrayManage-xIxxx-CLI.tar file is a Tar format file. Expand the file referring to the example. If the directory described below is present, create a new directory.

Example:

```
tar xvf ArrayManage-xIxxx-CLI.tar
```

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

```
/usr/damp/           : Execute and message files of Resource Manager 9200
|
└── /lib/            : Common library used when running Resource Manager 9200
```

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_ROOT_DIR_PATH environment variable.

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

```
% setenv CMDF_ROOT_DIR_PATH ${DFHOME}
```

It is recommended that statements 4 and 5 be defined in the initial setting file (for C shell: log in) of the login shell for users who access Resource Manager 9200.

6. Log in again.

1.4.4 HP-UX

1. Start the HP server/workstation.
2. Create a new directory (example: /usr/damp) for installing Resource Manager 9200. Copy the ArrayManage-xHxxx-CLI.tar file in the supplied CD-R to the directory created in the hard disk. (The portion xHxxx of file names varies with the version of the Resource Manager 9200, etc.)
3. The ArrayManage-xHxxx-CLI.tar file is a Tar format file. Expand the file referring to the following example. If the directory described below is present, create another directory.

Example:

```
tar xvf ArrayManage-xHxxx-CLI.tar
```

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

```
/usr/damp/          :Command and message file of Resource Manager 9200
|
|_ /lib/           :Common library used when running Resource Manager 9200
```

4. Add 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_ROOT_DIR_PATH environment variable.

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

```
% setenv CMDF_ROOT_DIR_PATH ${DFHOME}
```

It is recommended that statements 4 and 5 be defined in the initial setting file (for C shell: log in) of the login shell for users who access Resource Manager 9200.

6. Log in again.

1.4.5 AIX

1. Start the IBM server/workstation.
2. Create a new directory (example: /usr/damp) for installing Resource Manager 9200. Copy the ArrayManage-xAxxx-CLI.tar file in the supplied CD-R to the directory created in the hard disk. (The portion xAxxx of file names varies with the version of the Resource Manager 9200, etc.)
3. The ArrayManage-xAxxx-CLI.tar file is a Tar format file. Expand the file referring to the following example. If the directory described below is present, create another directory.

Example:

```
tar xvf ArrayManage-xAxxx-CLI.tar
```

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

```
/usr/damp/      :Command and message file of Resource Manager 9200
|
|_ /lib/        :Common library used when running Resource Manager 9200
```

4. Add 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_ROOT_DIR_PATH environment variable.

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

```
% setenv CMDF_ROOT_DIR_PATH ${DFHOME}
```

It is recommended that statements 4 and 5 be defined in the initial setting file (for C shell: log in) of the login shell for users who access 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
- AIX

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-xSxxx-CLI.tar` file in the attached CD-R to the hard disk.
2. The `ArrayManage-xSxxx-CLI.tar` file is a Tar type file. Open the file as described in the following example. (The `xSxxx` portion of the file name varies with the version of Resource Manager 9200):

Example:

```
tar xvf ArrayManage-xSxxx-CLI.tar
```

The updated new version of Resource Manager 9200 will be installed. Solaris does not need to be restarted.

1.5.3 IRIX

1. Copy the `ArrayManage-xIxxx-CLI.tar` file in the attached CD-R to the hard disk.
2. The `ArrayManage-xIxxx-CLI.tar` file is a Tar type file. Open the file as described in the following example. (The `xSxxx` portion of the file name varies with the version of Resource Manager 9200):

Example:

```
tar xvf ArrayManage-xIxxx-CLI.tar
```

The new version of Resource Manager 9200 will be installed. IRIX does not need to be restarted.

1.5.4 HP-UX

1. Copy the `ArrayManage-xHxxx-CLI.tar` file in the attached CD-R to the hard disk.
2. The `ArrayManage-xHxxx-CLI.tar` file is a Tar type file. Open the file as described in the following example. (The `xSxxx` portion of the file name varies with the version of Resource Manager 9200):

Example:

```
tar xvf ArrayManage-xHxxx-CLI.tar
```

The new version of Resource Manager 9200 will be installed. HP-UX does not need to be restarted.

1.5.5 AIX

1. Copy the `ArrayManage-xHxxx-CLI.tar` file in the attached CD-R to the hard disk.
2. Execute the `slibclean` command. You must have root permission to execute the `slibclean` command. If this command is executed without root permission, delete the library file `libdau.a..`
3. The `ArrayManage-xHxxx-CLI.tar` file is a Tar type file. Open the file as described in the following example. (The `xSxxx` portion of the file name varies with the version of Resource Manager 9200):

Example:

```
tar xvf ArrayManage-xHxxx-CLI.tar
```

The new version of Resource Manager 9200 will be installed. AIX does not need to be restarted.

1.6 Uninstalling

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

- Windows
- Solaris, IRIX, HP-UX, and AIX

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 environment variable.
3. Delete the reference to the `CMDF_ROOT_DIR_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 "○" 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 "○" marked in the online use column in Table 2.1.)

Additionally, when the optional Password Protection function 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 "○" 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	○	x	x
	Adding array unit information	auunitadd	○	x	x
	Changing array unit information	auunitchg	○	x	x
	Deleting array unit information	auunitdel	○	x	x
	Setting password	aupasswd	○	○	x
Array unit management by user ID	Setting user ID	auuidadd	○	○	○
	Changing user ID	auuidchg	○	○	○
	Deleting user ID	auuiddel	○	○	○
	Changing password	aupwdchg	○	○	○
	Logging into array unit	aulogin	○	○	x
	Logging out from array unit	aulogout	○	○	○
	Checking login	auchkuid	○	x	○

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	aucrln	○	x	x
	Displaying the information messages	auinfomsg	○	○	○
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	○	○	○
	Referencing unified LU	aumluref	○	x	x
	Unifying LU	aulumrg	○	○	○
	Dividing LU	aumludiv	○	○	○
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	○	○	○

Table 2.1 List of Resource Manager Commands (Continued)

Classification	Function	Command	Online use	Password	Login
System parameters (continued)	Referencing/setting SCSI transfer rate (See Note 1.)	ausync	○	○	○
	Referencing/setting port option	auportop	○	○	○
	Referencing/setting target information during on-line	auontarget	○	○	○
Setting up configuration	Referencing/setting fibre channel information	aufibre aufibre1	x	○	○
	Spare HDU setup	auspare	○	○	○
	Referencing/setting Fee-Basis option	auopt	○	○	○
	Referencing/setting drive restoration control information	audrecopt	x	○	○
	Referencing/setting online verify information	auonlineverify	x	○	○
	Referencing/setting MRCF-Lite information	aumrcfdev	○	○	○
	Displaying coupled- LU of the MRCF-Lite	aumrcfluc	○	○	○
Rebooting	Rebooting array unit	aureboot	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/○	○	○
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

Table 2.1 List of Resource Manager Commands (Continued)

Classification	Function	Command	Online use	Password	Login
Monitoring errors	Setting up E-Mail reports	aumail	○	x	x
	Setting additional information on E-Mail	auunitmsg	○	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. However, when connecting the Resource Manager 9200, restarting is not necessary.

Note 2: For information on password protection, refer to the *Hitachi Thunder 9200™ Password Protection User's Guide* (MK-90DF528).

For Commands that require login, if the reference is specified by the option, they can be executed without logging in.

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 the type of commands.

Command Option1 Option2 Option3

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 Option1 Option2 Option3
Result
%
```

Figure 3.2 Format of Standard Command (when terminating normally)

```
%Command Option1 Option2 Option3
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 Option1 Option2 Option3 ....
Password: (Enter an already-set password)
%
```

Figure 3.4 Format 1 of Administration Command

```
%Command Option1 Option2 Option3 ....
Are you executing? (y/n [n])
Password: (Enter an 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 descriptions displayed in Usage are the same as those described in **Format** of each command.

```
% auunitadd -help
Disk Array management program
Version 5.50
Copyright (C) 2000, 2001, Hitachi, Ltd.

Usage:
auunitadd  -unit unit_name [ -group group_name ]  -DF350 | -DF400 | -DF500
           -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

- Format

auunitref [-unit unit_name]

- Description

This command displays the registration information of an array unit that is registered in the Resource Manager 9200. Omitting an array unit name, displays a list of information registered in the Resource Manager 9200. When an array unit name is specified, information is displayed about the specified array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose registration information is to be referenced. Specify the array unit in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_" (underline)".

- Examples:

The following example references all registered information.

% auunitref					
Array Unit Name	Group Name	Array Unit Type	Error Alert	Connection Mode	IP Address/Host
Name/Device Name					
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					
%					

The following example references registration information of array unit df500a1.

% auunitref -unit df500a1						
Array Unit Name	Group Name	Array Unit Type	Error Alert	Connection Mode	IP Address/Host	
Name/Device Name						
df500a1	hsp1	DF500 Dual	on	LAN	192.168.0.100	
192.168.0.101						
%						

3.2.2 Registering

- Command name

auunitadd

- Format

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

- Description

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

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose registration information to set up. Specifies with one-byte coded alphanumeric 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 alphanumeric 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/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:

The following example 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

- Format

```
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

This command changes the registration information (array unit name, group name, type, configuration, connection interface, and device) of an already-registered array unit. However, omitted items will not be changed.

■ Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of a registered array unit. Specifies with one-byte coded alphanumeric and special symbols “- (minus)” and “_(underline)” of up to 16 characters long.
<code>-newunit unit_name</code>	Specifies the array unit name to change. Specifies an array unit name after change, with one-byte coded alphanumeric and special symbols “- (minus)” and “_(underline)” of up to 16 characters long.
<code>-group group_name</code>	Specifies the group name to change. Specifies with one-byte coded alphanumeric and special symbols “- (minus)” and “_(underline)” of up to 16 characters long.
<code>-DF350 -DF400 -DF500</code>	Specifies the type of an array unit to change.
<code>-single -dual</code>	Specifies the configuration (single system or dual system) of an array unit to change.
<code>-RS232C -LAN</code>	Specifies the connection interface (RS232C or LAN) of an array unit to change.
<code>-ctl0 device address</code>	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)
<code>-ctl1 device address</code>	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.
<code>-watch</code>	Specifies that an array unit is monitored for errors.
<code>-ignore</code>	Specifies that an array unit is not monitored for errors.
<code>-f</code>	The confirmation message at command execution is omitted.

- **Examples:**

The following example shows the procedure for changing registration information. The user executes the reference command to display the registration information of array unit df500a1, then executes the `auunitchg` command to change the information. After changing the information, the user executes the reference command again to check whether the changes have been made.

```
% auunitref -unit df500a1
Array Unit Name   Group Name   Array Unit Type   Error Alert   Connection Mode   IP
Address/Host Name/Device Name
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
Array Unit Name   Group Name   Array Unit Type   Error Alert   Connection Mode   IP
Address/Host Name/Device Name
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 : The specified subsystem name is not registered.
%
```

3.2.4 Deleting Registration Information

- Command name

`auunitdel`

- Format

`auunitdel -unit unit_name [-f]`

- Description

This command deletes the registration information of an already-registered array unit.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of a registered array unit whose registration information is to be deleted. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-", or "_" (underline).
<code>-f</code>	Omits the confirmation message when the command is executed.

- **Examples:**

The following example deletes registration information of already-registered array unit `df500a1`.

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

The following example checks the information registered about an array unit name that has been deleted.

```
% auunitdel -unit df500b1
DMEA001003 : The specified subsystem name is not registered.
%
```


3.2.5 Setting a Password in Administration Mode

- Command name

aupasswd

- Format

aupasswd

- Description

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

When setting a new password, enter the new password twice. When changing the password, enter an already-set password and then enter a new password.

- **Examples:**

The following example 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.)
%
```

The following example 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

- Format

auuidadd -unit unit_name [-num]

- Description

This command registers a user ID and its password into an array unit. 20 users can be registered at maximum. Specify the user ID and the password from 4 to 12 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.

After the registration, the number of the users that are registered will be displayed.

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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.
-num	Displays the number of registered user IDs.

- **Examples:**

The following example adds a user ID into array unit df400a1.

```
% auuidadd -unit df400a1
Password:
User ID for array unit: (User ID to set)
Password for array unit: (Password of a user ID to set)
Retype Password for array unit: (Same password as that of a user ID to set)
Number of registered User ID: n
%
```

The following example displays the number of user IDs already-registered in array unit df400a1.

```
% auuidadd -unit df400a1 -num
Password:
Number of registered User ID: n
%
```

3.3.2 Changing a User ID

- Command name

auuidchg

- Format

auuidchg -unit unit_name

- Description

This command changes a user ID that has been set up in an array unit.

After changing the user ID, the number of user IDs that are set up in the array unit will be displayed.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which the user ID is to be changed. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).

- **Examples:**

The following example changes a user ID that has been registered in array unit df400a1.

```
% auuidchg -unit df400a1
Password:
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`

- Format

`auuidel -unit unit_name`

- Description

This command deletes a user ID that has been set up in an array unit. After deleting the user ID, the number of user IDs are set in the array unit will be displayed.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit in which the user ID is to be deleted. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_" (underline)".

- Examples:

The following example deletes a user ID that has been registered in array unit df400a1.

```
% auuidel -unit df400a1
Password:
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

- Format

aupwdchg -unit unit_name

- Description

This command changes the password of a user ID that has been set up in an array unit. After changing the password, the number of user IDs that are set in the array unit will be displayed.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which the password of a user ID is to be changed. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).

- Examples:

The following example changes the password of a user ID that has been registered in array unit df400a1.

```
% aupwdchg -unit df400a1
Password:
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`

- Format

`aulogin -unit unit_name [-discon]`

- Description

This command declares an intention to log into an array unit with a user ID registered in the array unit. Using this command disables any other user ID to log in. When you want to log in forcibly to an array unit which other user has already been logged in, specify the `-discon` option. When forcibly logged in, an already logged-in user will be logged out.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit to which to log in. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.
<code>-discon</code>	Specify this option when forcibly logging into an array unit to which another user has already logged in.

- Examples:

The following example logs into array unit `df400a1`, using an already registered user ID.

```
% aulogin -unit df400a1
Password:
User ID for array unit: (Already-set user ID)
Password for array unit: (Password of an already-set user ID)
%
```

The following example logs in with a registered user ID to array unit df400a1 and to which another user has logged in.

```
% aulogin -unit df400a1 -discon
Password:
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]): y
%
```

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)*. xxx indicates the IP address for connection via LAN, and the destination of connection is indicated as *Connected with (RS232C)* for the connection via RS232C.

3.3.6 Logging Out from an Array Unit

- Command name

`aulogout`

- Format

`aulogout -unit unit_name`

- Description

This command 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 the user ID is to be logged out. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).

- Examples:

The following example logs out a user ID with which a user has logged into array unit `df400a1`.

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


3.3.7 Checking Login

- Command name

auchkuid

- Format

auchkuid -unit unit_name

- Description

This command checks to see who (user ID) is logging into the array unit and the connected destination. The connected destination is an IP address for LAN connection, and "RS232C" for RS232C connection.

This command can be used and information can be referred by users that have not logged in yet. If an already logged in user executes this command, the user information cannot be referenced.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose login status to check. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).

- Examples:

The following example checks the user ID who has logged into array unit df400a1.

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

Note: The destination of connection is indicated as *Connected with (xxx.xxx.xxx.xxx)*. xxx indicates the IP address for connection via LAN, and the destination of connection is indicated as *Connected with (RS232C)* for the connection via RS232C.

3.4 Displaying Array Unit Status

3.4.1 Displaying a Microprogram Revision

- Command name

aurev

- Format

aurev -unit unit_name [-ctl0 | -ctl1]

- Description

This command 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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_" (underline)".
-ctl0 -ctl1	Specifies the controller number of a specified array unit.

- Examples:

The following example displays the microprogram revision of array unit df500a1.

```
% aurev -unit df500a1
Serial Number: 0777
Microprogram Revision: 0557
%
```

3.4.2 Displaying Drive Configuration Information

- Command name

`audrive`

- Format

– 9200:

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

– 9200:

`audrive -unit unit_name -vendor`

- Description

This command 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>	This command specifies the name of an array unit which its drive configuration information is to be displayed. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.
<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.

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:

The following example displays the status of drives in array unit df400a1.

```
% audrive -unit df400a1 -status
```

Port	Row	Type	Physics	Status
0	0	Data	Mounted	Normal
1	0	Data	Mounted	Normal
2	0	Data	Mounted	Normal
3	0	Data	Mounted	Normal
4	0	Data	Mounted	Normal
5	0	Spare	Mounted	Standby
0	1	Data	Mounted	Normal
1	1	Data	Mounted	Standby
2	1	Undefined	Mounted	Out of RG
3	1	Undefined	Mounted	Out of RG
4	1	Undefined	Mounted	Out of RG

```
%
```

The following example displays the status of drives in array unit df500a1.

```
% audrive -unit df500a1 -status
```

Unit No.	HDU No.	Type	Physics	Status
0	0	Data	Mounted	Normal
0	1	Data	Mounted	Normal
0	2	Data	Mounted	Normal
	:			
	:			
0	8	Data	Mounted	Normal
0	9	Spare	Mounted	Standby
1	0	Undefined	Mounted	Out of RG
1	1	Undefined	Mounted	Out of RG
	:			
	:			
1	8	Undefined	Mounted	Out of RG
1	9	Undefined	Mounted	Out of RG
	:			
	:			

```
%
```

The following example displays the status of drive HDU No. 7 in UNIT No. 0 of array unit df500a1.

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

The following example displays the drive information of array unit df400a1.

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

The following example displays the drive information of array unit df500a1.

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

3.4.3 Displaying Cache Configuration Information

- Command name

`aucache`

- Format

`aucache -unit unit_name`

- Description

This command displays the status and capacity of cache memory.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit for which to display cache configuration information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.

- Examples:

The following example displays the cache memory configuration information of array unit df400a1:

```
% aucache -unit df400a1
Ctl  Slot  Status      Size (MB)
0    0     Normal      32
0    1     Detached    -----
0    2     Normal      -----
0    3     Not installed -----
0    4     Not installed -----
0    5     Not installed -----
0    6     Not installed -----
0    7     Not installed -----
0    8     Not installed -----
0    9     Not installed -----
0   10     Not installed -----
0   11     Not installed -----
0   12     Not installed -----
0   13     Not installed -----
0   14     Not installed -----
0   15     Not installed -----
1    0     Normal      32
1    1     Detached    -----
1    2     Normal      -----
1    3     Not installed -----
1    4     Not installed -----
1    5     Not installed -----
1    6     Not installed -----
1    7     Not installed -----
1    8     Not installed -----
1    9     Not installed -----
1   10     Not installed -----
1   11     Not installed -----
1   12     Not installed -----
1   13     Not installed -----
1   14     Not installed -----
1   15     Not installed -----
%
```

3.4.4 Displaying the Status of Power Supply/Fan/Battery/Loop/ENC

- Command name

ausupply

- Format

ausupply -unit unit_name

- Description

This command displays the status of AC power supplies, fans, batteries, battery backup circuits, loop, and ENC.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to display information. Specify the name in less than or equal to 16 characters using alphanumeric characters and special symbols "-" (minus) and "_" (underline)".

- Examples of using commands:

This example displays the status of power supplies, batteries, fans, backup circuits, loop, and ENC of array unit df400a1 individually.

```
% ausupply -unit df400a1
AC PS Information
Unit AC Status
0 0 Normal
0 1 Normal
1 0 Nothing
1 1 Nothing
2 0 Nothing
2 1 Nothing
:
:
9 0 Nothing
9 1 Nothing

FAN Information
No. Status
0 Normal
1 Normal
```



```

Battery Information
No.      Status
0        Normal
1        Normal
Battery Backup Information
No.      Status
0        Normal
1        Normal

Loop Information
Path  Loop  Status
0     0     Normal
0     1     Normal
1     0     Normal
1     1     Normal

ENC Information
Unit  ENC  Status
0     0     Normal
0     1     Normal
1     0     Nothing
1     1     Nothing
2     0     Nothing
2     1     Nothing
:
:
9     0     Nothing
9     1     Nothing
%
```

3.4.5 Displaying the Current IP Address

- Command name

aucrlan

- Format

aucrlan -unit unit_name

- Description

This command displays the enabled LAN information of the array unit. For the 9200, the IP address, the subnet mask, and the default gateway address are displayed.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to display LAN information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline)".

- Examples:

The following example displays the enabled LAN information of array unit df400a1.

```
% aucrlan -unit df400a1
CTL   IP Address      Subnet Mask
0     125.0.9.98       255.255.255.0
1     125.0.9.99       255.255.255.0
%
```

The following example displays the enabled LAN information of array unit df500a1.

```
% aucrlan -unit df500a1
CTL   IP Address      Subnet 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
%
```

3.4.6 Displaying the Information Messages

- Command name

auinfoMSG

- Format

auinfoMSG -unit unit_name

- Description

This command obtains and displays the Information Messages of the specified array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of the array unit in which the Information Messages are to be obtained. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).

- Examples:

The following example obtains and displays the Information Messages on array unit df500a1.

```
% auinfoMSG -unit df500a1
Controller 0/1 Common
06/27/2001 21:18:37 C0 I12203 LU format completed(LU-03)
06/27/2001 21:18:36 C0 I12204 LU format completed(LU-04)
06/27/2001 21:18:36 C0 I12201 LU format completed(LU-01)
06/27/2001 21:18:35 C0 I12202 LU format completed(LU-02)
06/27/2001 21:18:37 C0 I12200 LU format completed(LU-00)
06/27/2001 21:17:34 C0 I12404 LU format start(LU-00)
06/27/2001 21:17:34 C0 I12403 LU format start(LU-03)
06/27/2001 21:17:33 C0 I12402 LU format start(LU-02)
06/27/2001 21:17:33 C0 I12401 LU format start(LU-01)
06/27/2001 21:17:33 C0 I12400 LU format start(LU-00)
06/27/2001 21:15:30 C0 I11000 All RAID group initialized
06/27/2001 21:13:17 C0 I12100 LU deleted(LU-00)
06/27/2001 21:12:57 C0 I12100 LU deleted(LU-00)
06/27/2001 21:12:16 C0 I12100 LU deleted(LU-00)
06/27/2001 21:11:20 C0 I12100 LU deleted(LU-00)
06/27/2001 21:10:45 C0 I12100 LU deleted(LU-00)
06/27/2001 21:10:04 C0 I12100 LU deleted(LU-00)
06/27/2001 21:06:02 C0 I10000 Subsystem is ready

Controller 0
06/27/2001 21:03:55 C0 RBE301 Flash program update end
06/27/2001 21:03:55 C0 RBE300 Flash program update start

Controller 1
%
```

When there is no information, the header will be displayed

3.5 RAID/LU

3.5.1 Referencing a RAID Group

- Command name

`aurgref`

- Format

`aurgref -unit unit_name`

- Description

This command displays a list of definition of the RAID groups set to the array unit. The displayed contents include the RAID group number, RAID level, and the definition frame of the RAID group.

- Options

Options	Description
<code>-unit unit_name</code>	Specify the name of the array unit which references the definition of the RAID group. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.
<code>-m</code>	Specify this option when expressing the residual capacity in Mbytes. When the specification is omitted, the capacity is expressed in blocks.

- Examples:

The following example references the definition of the RAID group of array unit 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
%
```

The following example references the definition of the RAID group of array unit df500a1.

```
% aurgref -unit df500a1 -m
RAID   RAID   Start Location   Number of HDU   Number of   Remains
Group  Level   [Unit No, HDU No.] in parity group parity group [Mbyte]
0      5       0      5       0           1       135563
%
```

3.5.2 Setting Up a RAID Group

- Command name

aurgadd

- Format

– 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

This command 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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.
-rg rg_no	Specifies the RAID group number.
-RAID0, -RAID1, -RAID5, -RAID01, -RAIDB, -RAIDC	Specifies the RAID level.

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:

The following example sets up a RAID group in array unit 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:
%
```

The following example sets up the RAID group of array unit 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:
%
```

3.5.3 Expanding a RAID Group

- Command name

`aurgexp`

- Format

– 9200:

`aurgexp -unit unit_name -rg rg_no -pnum pty_num`

- Description

This command expands the already-defined size of a RAID group.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit in which a RAID group whose size to expand has been defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.
<code>-rg rg_no</code>	Specifies the RAID group number of a RAID group which is to be expanded.

9200:

Options	Description
<code>-pnum pty_num</code>	Specifies the number of parity groups after expansion.

- Examples:

The following example expands the depth of RAID group 2 (from 1 to 3), which has been set up in array unit df400a1.

```
% aurgref -unit df400a1
RG Level Port Width Row Depth
2 5 0 5 0 1
%
% aurgexp -unit df400a1 -rg 2 -depth 3
Password:
%
% aurgref -unit df400a1
RG Level Port Width Row Depth
2 5 0 5 0 3
%
```

The following example expands the number of parity groups of RAID group 0 (from 1 to 3), which number has been set in array unit df500a1.

```
% aurgref -unit df500a1
RAID RAID Start Location Number of HDU Number of Remains
Group Level [Unit No. HDU No.] in parity group parity group [block]
0 5 0 5 0 1 10000000
%
% aurgexp -unit df500a1 -rg 0 -pnum 3
Password:
%
% aurgref -unit df500a1
RAID RAID Start Location Number of HDU Number of Remains
Group Level [Unit No. HDU No.] in parity group parity group [block]
0 5 0 5 0 3 30000000
%
```


3.5.4 Deleting a RAID Group

- Command name

aurgdel

- Format

aurgdel -unit unit_name -rg rg_no [-f]

aurgdel -unit unit_name -ALL [-f]

- Description

This command 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 the RAID group to be deleted is defined. Specify less than or equal to 16 characters using alphanumeric characters, special symbols "-", (minus), or "_" (underline).
-rg rg_no	Specifies the RAID group number of a RAID group which is to be deleted.
-ALL	Deletes all RAID groups.
-f	Omits the confirmation message when the command is executed.

- Examples:

The following example deletes RAID group 1 that has been defined in array unit df400a1.

```
% aurgdel -unit df400a1 -rg 1
Logical unit exists in the RAID group.
Are you sure you want to delete the specified RAID group? (y/n [n]): y
If you delete the RAID group, all logical units will be deleted and the user data will
also be invalid.
Are you sure you want to delete the RAID group? (y/n [n]): y
User data that are invalid due to deleting a RAID group cannot be recovered.
Are you sure you want to delete the RAID group? (y/n [n]): y
Password:
%
```

The following shows an example of attempting to delete all RAID groups that are defined in array unit df400a1, but the deletion was canceled.

```
% aurgdel -unit df400a1 -ALL
Logical unit exists in the RAID groups.
Are you sure you want to delete the all RAID groups? (y/n [n]): y
If you delete the RAID groups, all logical units will be deleted and the user data
will also be invalid.
Are you sure you want to delete all RAID groups? (y/n [n]): y
User data that are invalid due to deleting all RAID groups cannot be recovered.
Are you sure you want to delete all RAID groups? (y/n [n]): n
Terminate execution.
%
```

3.5.5 Referencing an LU

- Command name

auluref

- Format

auluref -unit unit_name [-lu lun ...]

- Description

This command 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 which you want to reference the LU information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-", or "_" (underline).
-m	Expresses the LU capacity in Mbytes. When the specification is omitted, the capacity is expressed in blocks.
-last	References the last defined LU.
-lu lun ...	Specifies an LU number to reference the LU information. If omitted, all LU information that is already defined will be displayed.

- Examples:

The following example displays all LU information in array unit df400a1.

```
% auluref -unit df400a1
      Capacity
LU  [block]  Status  Staging  C-CTL  D-CTL  RAID  RAID
      Group  Level
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
%
```

The following example displays information about LU 0 in array unit df400a1.

```
% auluref -unit df400a1 -lu 0 -m
      Capacity
LU  [Mbyte]  Status  Staging  C-CTL  D-CTL  RAID  RAID
      Group  Level
0   778352   Normal  512     0      0      0      5
%
```

3.5.6 Setting Up an LU

- **Command name**

`au luadd`

- **Format**

- **Dual system**

```
au luadd -unit unit_name [ -lu lun ] -rg rg_no -size num | lest
          -ctl0 | -ctl1
```

- **Single system:**

```
au luadd -unit unit_name [ -lu lun ] -rg rg_no -size num | lest
```

- **Description**

This command sets up an LU.

- **Options**

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit which an LU is to be added. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
<code>-lu lun</code>	Specifies the LU number of an LU to be added. The LU number to be specified must be the next number to the last of an already-set number. If omitted, the Manager will automatically applies an LU number.
<code>-rg rg_no</code>	Specifies the RAID group number of a RAID group which an LU is to be added.
<code>-size num lest</code>	Specifies the capacity (number of blocks) of an LU. When specifying the capacity in Mbytes, add "m" or "M" to the command option. If "lest" is specified for the capacity, all remaining capacity of the RAID group will be assigned.
<code>-ctl0 -ctl1</code>	Specifies the default controller number of an LU. Specify this option when the array unit is a dual system.

- **Example:**

The following example 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 is 0.

```
% au luadd -unit df400a1 -lu 3 -size 1024000 -ctl0 -rg 2
Password:
%
```

3.5.7 Formatting an LU

- Command name

auformat

- Format

auformat -unit unit_name -N | -I | -Im [-f] -lu lun ...

- Description

This command formats a specified LU.

If multiple LUs are specified, LUs are formatted in the ascending order of LUNs regardless of formatting method.

- 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 alphanumeric characters 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:

This example formats LU 3 in an array unit, whose name is df400a1, in Normal mode.

```
% auformat -unit df400a1 -N -lu 3
The logical unit(s) has already been formatted.
Are you sure you want to format the logical unit(s) again? (y/n [n]): y
User data in the logical unit(s) will be invalid.
Are you sure you want to format the logical unit(s)? (y/n [n]): y
User data that are invalid due to formatting the logical unit(s) cannot be recovered.
Are you sure you want to format the logical unit(s)? (y/n [n]): y
Password:
LU3 format start
LU3 format end: Normal Terminated
%
```

The following example formats LUs 4 to 7 in array unit df400a1, in Immediate mode. The confirmation messages is omitted using the -f option.

```
% auformat -unit df400a1 -I -lu 4-7 -f
Password:
LU4 format start
LU4 format end: Normal Terminated
LU5 format start
LU5 format end: Normal Terminated
LU6 format start
LU6 format end: Normal Terminated
LU7 format start
LU format end: Normal Terminated
%
```

3.5.8 Displaying Progress of LU Formatting

- Command name

auformatst

- Format

auformatst -unit unit_name -lu lun

- Description

This command 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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.
-lu lun	Specifies the LU No. of an LU for which to check the progress.

- Examples:

The following example confirms the progress after specifying to format LU 4 in array unit df400a1, in Immediate mode.

```
% auformat -unit df400a1 -lu 4 -I -f
Password:
LU4 format start
LU4 format end: Normal Terminated
%
% 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

- Format

auluexp -unit unit_name -lu lun -incr size | lest

- Description

This command 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
-unit unit_name	Specifies the name of an array unit in which the LU whose size is to be expanded is defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus)", or "_" (underline)".
-lu lun	Specifies the LU number of an LU which its size is to be expanded.
-incr size [-m] lest	Specifies the increment (in the number of blocks) of the size to expand. When specifying it in Mbytes, add "m" or "M" to the command option. If "lest" is specified for the increment, all remaining capacity of the RAID group to which LU belongs is assigned.

- Examples:

The following example expands the capacity of LU 3 in array unit df400a1 by an increment of 3072 blocks.

```
% auluexp -unit df400a1 -lu 3 -incr 3072
Password:
%
```

The following example assigns to LU 3 in array unit df400a1, all remaining capacity of a RAID group to which this LU belongs.

```
% auluexp -unit df400a1 -lu 3 -incr lest
Password:
%
```


3.5.10 Deleting an LU

- Command name

auludel

- Format

auludel -unit unit_name -last [-f]

- Description

This command deletes the last defined LU.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which the LUs are defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-last	Specify this option when referencing the last defined LU.
-f	The confirmation message at command execution is omitted.

- Example:

This example deletes the last LU in array unit df400a1.

```
% auludel -unit df400a1 -last
The last defined logical unit xxx has been formatted.
Are you sure you want to delete logical unit xxx? (y/n [n]): y
If you delete the last defined logical unit xxx, all user data will be invalid.
Are you sure you want to delete logical unit? (y/n [n]): y
User data that are invalid due to deleting the last defined logical unit xxx cannot be
recovered.
Are you sure you want to delete the last defined logical unit? (y/n [n]): y
Password:
%
```

3.5.11 Changing the Default Controller of an LU

- Command name

auluchg

- Format

auluchg -unit unit_name -lu lun

- Description

This command changes default controller of a connected LU to another controller.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which LUs have been defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-lu lun	Specifies the LU number of an LU whose default controller is to be changed.

- Examples:

This example changes the default controller with which LU 2 is connected in array unit df400a1.

```
% auluchg -unit df400a1 -lu 2
Password:
Default controller for the LU modification completed successfully.
Please reboot Array for changes to take effect.
%
```

This example changes the default controller with which LU 2 is connected in an array unit df400a2 and which supports restarting.

```
% auluchg -unit df400a2 -lu 2
Password:
Default controller for the LU modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting the array unit. Start Time HH:MM
Reboot has been completed.
%
```

3.5.12 Setting Turbo LU

- Command name

auturbolu

- Format

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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-refer	References whether the status of the turbo LU is resident or not.
-set	Sets the turbo LU.
-ctl0_assign enable disable -ctl1_assign enable disable	Validates or invalidates the resident status of the turbo LU of Controllers 0 and 1.
-ctl0_lu lun -ctl1_lu lun	Specifies the LU No. of an LU for which turbo LU is set resident.

- Examples:

The following example references whether the status of the turbo LU of array unit df400a1 is resident or not.

```
% auturbolu -unit df400a1 -refer
Password:
Controller 0
Current Configuration
  Turbo LU Assignment      : off
  Turbo LU                 :
  Turbo LU Status          :
Reserved Configuration
  Turbo LU Assignment      : off
  Turbo LU                 :

Controller 1
Current Configuration
  Turbo LU Assignment      : off
  Turbo LU                 :
  Turbo LU Status          :
Reserved Configuration
  Turbo LU Assignment      : off
  Turbo LU                 :
%
```

The following example sets the turbo LU in array unit df400a1.

```
% auturbolu -unit df400a1 -set -ctl0_assign enable -ctl0_lu 3 \
-ctl1_assign disable -ctl1_lu 4
Password:
Turbo LU modification completed successfully.
Please reboot Array for changes to take effect.
%
```

The following example sets the turbo LU in array unit df400a2 which supports restarting.

```
% auturbolu -unit df400a2 -set -ctl0_assign enable -ctl0_lu 3 \
-ctl1_assign disable -ctl1_lu 4
Password:
Turbo LU modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting the array unit. Start Time HH:MM
Reboot has been completed.
%
```

3.5.13 Referencing the Unified LU

- Command name

aumluref

- Format

aumluref -unit unit_name [-m]

- Description

This command references the status of the unified LU.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which the LUs are defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus)", or "_" (underline)".
-m	Specify this option when expressing the LU capacity in Mbytes. When this option is omitted, the capacity is expressed in blocks.

- Example:

The following example references the status of the unified LU in array unit df500.

```
% aumluref -unit df500 -m
Capacity
LU   [Mbyte]  Status  Sub LU
1    106352   Normal   2
%
```

3.5.14 Unifying LUs

- Command name

`aulumrg`

- Format

`aulumrg -unit unit_name -lu main_lun sub_lun`

- Description

This command unifies the LUs.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit in which the LUs are defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
<code>-lu main_lun sub_lun</code>	Specifies the LU numbers (0 to 63) to be unified. The properties of the LU numbers will not be checked.

- Example:

The following example unifies LU2 as MainLU with LU3 as SubLU in array unit df500.

```
% aulumrg -unit df500 -lu 2 3
If the RAID level or the HDU combination of the unifying LUs does not match,
the performance may be degraded.
Are you sure you want to unify the LUs? (y/n [n]): y
Password:
%
```

3.5.15 Separating LUs

- Command name

aumludiv

- Format

aumludiv -unit unit_name -lu main_lun last | all

- Description

This command separates the unified LUs into individual LUs.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which the LUs are defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-lu main_lun last all	Specifies the LU number to be separated. Specify the LU number (0 to 63). The properties of the LU numbers will not be checked. last: Separates the internal LU which has been unified last. all: Separates all the internal unified LUs.

- Example:

The following example separates the LU, which has been unified last, from the unified LU (LU2) in array unit df500.

```
% aumludiv -unit df500 -lu 2 last
Are you sure you want to separate the last LU from the unified LU? (y/n [n]): y
Password:
%
```

3.6 Setting Up Configuration

3.6.1 Referencing/Setting Fibre Channel Information

- Command name

aufibre

- Format

```
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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-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. Specify the n_port_id using 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 -port option accepts security from only a host specified by -permission option). off: Invalidates port security (does not limit the host that accesses a port specified by -port option).
<code>-permission node_name port_name</code>	When the -set option is specified: When using port security, specifies access permission host information (node name, port name). node_name: Node name of the host (16 hexadecimal characters) port_name: Port name of the host (16 hexadecimal characters)
<code>-permission-lu lun ...</code>	When the -set option is specified: When using LUN security, this option specifies access permission. LUNs (multiple LUNs can be specified). When specifying -permission-lu option, host information must be specified by -permission option. If the host information specified by -permission is not yet set, the access permission host information and the LUN security information are set together at the same time. If host information specified by -permission option is already set, LUN security information will be set additionally.
<code>-file filename</code>	When setting host security all together by file input, this option specifies the host permission information file.
<code>-permission node_name port_name</code>	When the -rm option is specified: Specifies host information (node name, port name) which you want to exclude from host security. node_name: Node name of the host (16 hexadecimal characters) port_name: Port name of the host (16 hexadecimal characters)
<code>-permission-lu lun ...</code>	When the -rm option is specified: When using LUN security, this option specifies LUNs (multiple LUNs can be specified) which you want to exclude from access permission LUs. When specifying -permission-lu option, host information must be specified by -permission option.

- Examples:

The following example references the fibre channel information of array unit df400a1.

```
% aufibre -unit df400a1 -refer
Password:
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      Node name          Port name          N port_ID
Guard
0  A      disable     AAAAAAAAAAAAA0A00  0AAAAAAAAAAAAA00  000000
25 30 50 60 63
0  B      disable     0B01000000000000  0B00000000000001  0B0100
1  A      disable     AAAAAAAAAAAAA1A00  1AAAAAAAAAAAAA00  000000
6 12 34 43
1  B      disable     BBBBBBBBBBBBB1B00  1BBBBBBBBBBBBB00  000000
15 23 31 34 55
%
```

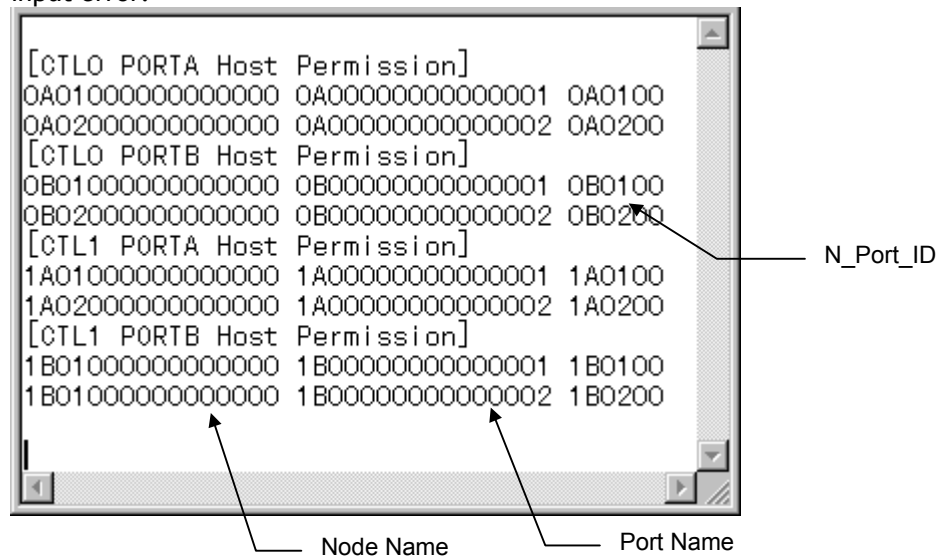
The following example sets Fabric to the topology of Port A on controller 0 of array unit df400a1.

```
% aufibre -unit df400a1 -set -ctl0 -port A -Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
%
```

The following example sets Fabric to the topology of Port A on controller 0 of array unit df400a2 which supports remote restarting.

```
% aufibre -unit df400a2 -set -ctl0 -port A -Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting 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". Enter necessary items for each port and enter a blank character 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 a line begins with ";", the line is regarded as a comment line.

- **Command name**

aufibre1

- **Format**

- **9200:**

aufibre1 -unit unit_name -refer

- **9200:**

aufibre1 -unit unit_name -set
[-topo ctl_no topology2]
[-rate ctl_no 1 | 2]
[-portaddr ctl_no port_no port_address]
[-lus ctl_no port_no on | off]
[-luschk ctl_no port_no ingc | allc]
[-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]

- **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**

This command references or 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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus)", or "_" (underline)".
-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 port_no topology1	Specifies the topology of the specified controller. ctl_no : Controller number (0 or 1) port_no : Port name (A or B) 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
-rate ctl_no port_no 1 2	Specifies the fibre channel transfer rate of the specified port. ctl_no : Controller number (0 or 1) port_no : Port name (A or B) 1 : 1 (G bps) 2 : 2 (G bps)
-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
<code>-luschk</code> <code>ctl_no port_no</code> <code>inqc allc</code>	Specifies the LUN security check level of the specified port. ctl_no: Controller number (0 or 1) port_no: Port name (A or B) inqc: Check with an INQUIRY SCSI command. allc: Check with all the SCSI commands.
<code>-perm</code> <code>ctl_no port_no</code> <code>node_name</code> <code>port_name</code>	When the -set option is specified: Specifies host information (node name and port name) that can be accessed by the specified port. When the -rm option is specified: Specifies the host information to be deleted from the host information (node name and port name) that can be accessed by the specified port. 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)
<code>-permlu</code> <code>ctl_no port_no</code> <code>node_name</code> <code>port_name lun..</code>	When the -set option is specified: 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. When the -rm option is specified: Specifies the LUNs whose access permission is to be deleted from the LUN security set by the specified port. (Multiple LUs can be specified.) 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
<code>-permluall</code> <code>ctl_no port_no</code> <code>node_name</code> <code>port_name</code>	When the -set option is specified: 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. When the -rm option is specified: Specifies the host information whose access permission is to be deleted from the LUN security set by the specified port. 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)

(Continued)

Options	Description
-file ctl_no port_no filename	When setting host security all together by file input, this option specifies the host permission information file. ctl_no : Controller No. (0 or 1) port_no : Port name (A or B) filename : File name which to input

■ Examples:

The example of referencing the fiber channel information of the array unit name df400a1:

- Same as the `aufibre` command.

The example of referencing the fiber channel information of array unit name df500a1:

- Same as the `aufibre` command.

The following example sets the topology of Port A of controller 0 of the array unit name df400a1 to Fabric.

```
% aufibre1 -unit df400a1 -set -topo 0 Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
%
```

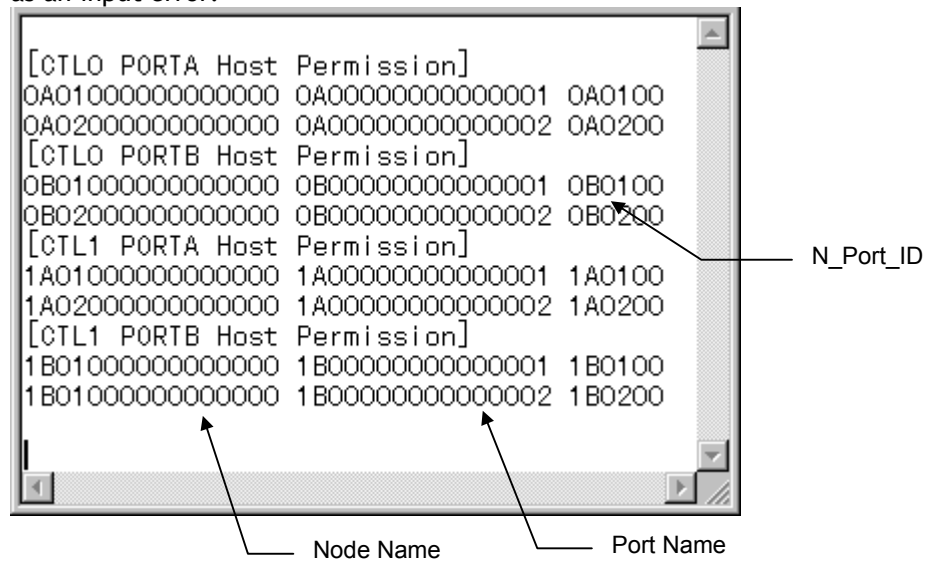
The following example sets the topology of Port A of controller 0 of array unit name df400a2 supporting re-activation, to Fabric.

```
% aufibre1 -unit df400a2 -set -topo 0 Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting the array unit. Start Time HH:MM
Reboot has been completed.
%
```

The following example sets the topology of Port A of controller 0 of array unit name df500a1 to loop.

```
% aufibre1 -unit df500a1 -set -topo 0 A loop
Password:
When setting starts, the subsystem stops accepting the access to the port from the host.
Before setting, stop the access to the port from the host.
Do you want to continue processing? (y/n [n]): y
Fibre channel information modification completed successfully.
%
```


The following figure shows a file format for the case where settings are performed by using "File". Enter necessary items for each port and enter a blank character between items. If tabs are used, the setting of the line including the "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 a line begins with ";", the line is regarded as a comment line.

3.6.2 Spare HDU Setup

- Command name

auspare

- Format

auspare -unit unit_name -set -uno unit_no -hno hdu_no

auspare -unit unit_name -rm -uno unit_no -hno hdu_no

- Description

This command sets up the specified HDU as a spare HDU and cancels the spare HDU attribute of the an already specified spare HDU.

An HDU cannot be set as a spare when the HDU is not installed.

- Options

Options	Description
-unit unit_name	Specifies the name of the array unit to set or cancel the spare HDU. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_" (underline)".
-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:

The following example sets 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:
%
```

The following example checks the setting of the spare HDU in an array unit df500a1 by using the audrive command. Spare HDUs will be indicated as "Spare" in "Type" column.

```
% audrive -unit df500a1 -status -uno 0 -hno 9
Unit No.   HDU No.  Type    Physics  Status
0          9        Spare   Mounted  Standby
%
```

3.6.3 Fee-Basis Option Reference/Setup

- Command name

auopt

- Format

auopt -unit unit_name -refer

- Key-FD:

auopt -unit unit_name -lock off | on [-keyfd fd-path]

- Key-code:

auopt -unit unit_name -lock off | on [-keycode key-code]

auopt -unit unit_name -option option_name -st enable | disable

- Description

This command locks or unlocks the specified fee-basis option. Unlocking or locking can be carried out by the key FD or the key code described in key FD which is attached to the option facility.

The fee-basis option can be enabled or disabled after it is unlocked (installed).

- Options

Options	Description
-unit unit_name	Specifies the name of the array unit to set up or reference the fee-basis option. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-", (minus), or "_" (underline)".
-refer	An unlocked fee-basis option is displayed.
-lock off on	Specifies the fee-basis option to be locked or unlocked. off: Unlocks the fee-basis option. on: Locks the fee-basis option.
-keyfd fd-path	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
-keycode key-code	Specifies the key code when used to unlock or lock the fee-basis option. key-code: Key code
-option option-name	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.
-st enable disable	Specifies whether to set the fee-basis option effective or ineffective.. enable: Enables the use of the fee-basis option. disable: Disables the use of the fee-basis option.

- **Examples:**

The following example displays the status of unlocked (installed) fee-basis option of the array unit df500a1.

```
% auopt -unit df500a1 -refer
Password:
Option name      Status
SNMP             Enable
%
```

The following example unlocks (installs) the SNMP fee-basis option that requires rebooting of array unit df500a1, using the key FD.

```
% auopt -unit df500a1 -lock off -keyfd a :
Password:
Option was opened.
Please reboot Array for changes to take effect.
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 rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

The following example enables the SNMP fee-basis option that requires rebooting of array unit df500a1.

```
% auopt -unit df500a1 -option SNMP -st enable
Password:
Option modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

The following example unlocks the LUN Security fee-basis option that does not require rebooting of array unit df500a1, using the key FD.

```
% auopt -unit df500a1 -lock off -keyfd a :
Password:
Option was opened.
%
```

3.6.4 Referencing/Setting Drive Restoration Control Information

- Command name

audrecopt

- Format

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

This command 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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-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 the copy from the spare drive (copy-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. Specify the time using a value from 0 to 255 in units of 10 ms. The default value is 10, which executes restoration at an interval of every 100 ms.
-size n	Specifies the unit of restored data per single operation in the restoration processing. Specify a value of a multiple of 32 between 32 and 65,504 in units of 512 bytes. The default value is 32, which restores 16 kbyte data in a single operation.

■ Examples:

The following example displays the drive restoration control information of array unit df400a1.

```
% audrecopt -unit df400a1 -refer
Password:
Drive restoration mode      : Background
Drive restoration          : Automatically
Sparing                    : Executing (Read/Write & Online Verify)
Interval time [10ms]       : 10
Processing Unit Size [blocks] : 32
%
```

The following example sets the drive restoration control information for array unit df400a1.

```
% audrecopt -unit df400a1 -set -restor normal -auto enable -interval 10
-size 64 -sparing rwv
Password:
%
% audrecopt -unit df400a1 -refer
Password:
Drive restoration mode      : Interleave (standard)
Drive restoration          : Automatically
Sparing                    : Execution (Read/Write & Online Verify)
Interval time [10ms]       : 10
Processing Unit size [blocks] : 64
%
```

3.6.5 Referencing/Setting Online Verify Information

- Command name

auonlineverify

- Format

auonlineverify -unit unit_name -refer

auonlineverify -unit unit_name -set
[-verify enable | disable] [-time time]

- Description

This command references and sets online verify information.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set online verify information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-refer	References online verify information.
-set	Sets online verify information.
-verify enable disable	Specifies whether or not to perform an online verify test.
-time time	Specifies the idling time (0 to 30 seconds). If "0" is specified, the idling time is set to 10 seconds.

- Examples:

The following example references the online verify information of array unit df400a1.

```
% auonlineverify -unit df400a1 -refer
Password:
Online verify test      : Yes
Idling time   [sec]    : 0
%
```

The following example sets the online verify information to array unit df400a1, then references the information.

```
% auonlineverify -unit df400a1 -set -verify enable -time 5
Password:
%
% auonlineverify -unit df400a1 -refer
Password:
Online verify test      : Yes
Idling time [sec]      : 5
%
```


3.6.6 Referencing/Setting MRCF-Lite Information

- Command name

aumrcfdev

- Format

aumrcfdev -unit unit_name -refer

aumrcfdev -unit unit_name -set [-id string] -dev n lu on | off

aumrcfdev -unit unit_name -rm -dev n

- Description

This command references and sets the command device and the serial ID of MRCF-Lite.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set MRCF-Lite information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-refer	References the command device and the serial ID.
-set	Sets the command device and the serial ID.
-rm	Deletes the command device.
-id string	Specifies the serial ID. string: One-byte coded numeral of 4 characters long.
-dev n lu on off	Specifies parameters of the command device. n: The command device number (1 or 2) lu: The logical unit number
-dev n	Specifies the command device number to delete. n: The command device number (1 or 2)

- Examples:

The following example references MRCF-Lite set-up information whose array unit name is df500a1.

```
% aumrcfdev -unit df500a1 -refer
Password:
Serial ID
    0123

Command device  LUN
1                1
2                10
%
```

The following example sets up array unit df500a1, as command device 1, with its logical number set to 0.

```
% aumrcfdev -unit df500a1 -set -dev 1 0
Password:
%
```

3.6.7 Displaying Coupled Pair LUs of the MRCF-Lite

- Command name

aumrcfluc

- Format

aumrcfluc -unit unit_name [-m]

- Description

This command displays the status of a pair LUs that are coupled in MRCF-Lite.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference MRCF-Lite information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline)".

- Examples:

The following example references the MRCF-Lite information of array unit df500a1.

```
% aumrcfluc -unit df500a1
Password:
LU   RAID   RAID   Capacity
    Group Level [block]  D-CTL  C-CTL  Status
2/3  0/1    5/5    100000000  0      0      PAIR
7/8  2/3    1/1    100000000  1      1      PAIR
%
```

3.6.8 Rebooting

- Command name

aureboot

- Format

aureboot -unit unit_name

- Description

This command reboots the subsystem.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference MRCF-Lite information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_" (underline)".

- Examples:

The following example reboots array unit df500a1.

```
% aureboot -unit df500a1
Password:
Do you want to restart the subsystem? (y/n [n]): y
When restarting the subsystem, the I/O operation that is being executed in the
subsystem will end abnormally.
Do you want to restart the subsystem? (y/n [n]): y
The subsystem stops accepting the I/O operation from the host until the restart
completes.
Also, if you are logging in, the login status will be canceled when restarting begins.
Do you want to restart the subsystem? (y/n [n]): y
Now restarting the subsystem. Start Time HH:MM
The subsystem restarted successfully.
%
```

The following example reboots array unit df500a1 whose status is stopping under pseudo-plan.

```
% aureboot -unit df500a1
Password:
The subsystem has stopped under pseudo-plan.
Do you want to restart the subsystem? (y/n [n]): y
Now restarting the subsystem. Start Time HH:MM
The subsystem restarted successfully.
%
```

3.7 System Parameters

3.7.1 Referencing/Setting System Parameters

- Command name

ausysparam

- Format

- 9200:

ausysparam -unit unit_name -refer

- 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 ]
[ -InquiryStandard ctl_no port_no enable | disable ]
[ -ProdIDDF400 ctl_no port_no enable | disable ]
[ -SUNCluster 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 ]

```

– 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 ]
[ -DelayPlannedShutdown time ]
[ -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 ]
[ -PROCUM enable | disable ]
[ -ReportStatus enable | disable ]
[ -MultipathArrayUnit enable | disable ]
[ -LuCacheWarning enable | disable ]
[ -NX enable | disable ]
[ -AutoReconst enable | disable ]
[ -ForcedWriteThrough enable | disable ]
[ -RAID3 enable | disable ]
[ -UASuppress ctl_no port_no enable | disable ]
[ -HISUP ctl_no port_no enable | disable ]
[ -CCHS ctl_no port_no enable | disable ]
[ -InquiryStandard ctl_no port_no enable | disable ]
[ -ProdidDF400 ctl_no port_no enable | disable ]
[ -HPUX2 ctl_no port_no enable | disable ]
[ -HbaWwnReport ctl_no port_no enable | disable ]
[ -NACA ctl_no port_no enable | disable ]
[ -SUNCluster 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 | TPRLO
    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	This command specifies the name of an array unit in which the system parameters are to be referenced or to be set. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-", (minus), or "_" (underline).
-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 a dual active configuration used the SCSI ID take over. 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 last 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 last four digits of the manufacturing serial number. The default setting is the last 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.

(Continued)

Options	Description
-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.
-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: Dose 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 in less than or equal to eight characters. If you want to enter NULL characters, enter "".
-inquiryProduct string	Specifies the product type of Inquiry response information in less than or equal to sixteen characters. If you want to enter NULL characters, enter "".
-inquiryRomMicro string	Specifies the ROM microprogram version of Inquiry response information in less than or equal to two characters. If you want to enter NULL characters, enter "".
-inquiryRamMicro string	Specifies the RAM microprogram version of Inquiry response information in less than or equal to two characters. If you want to enter NULL characters, enter "".
-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.

(Continued)

Options	Description
-ControllerIdentifier ctl_no enable disable	Specifies whether the controller identifier is valid or invalid. ctl: 0, 1 enable/disable: Valid/Invalid
-ControllerID ctl_string1	Specifies the controller ID. ctl: 0, 1 string1: Controller ID (less than or equal 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 to be reported will be the fixed value that has been set by the user.
-PseudoResponse ctl_no busy notReady	Sets the response mode for duration from power on until the controller gets ready (for the 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 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 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 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 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; be certain to specify on . on : Makes a backup copy. off : Does not make a backup copy.

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
-DelayPlannedShutdown	Specifies the time in minutes to delay the execution of the planned shutdown when the main switch has turned off. The applicable range is from 0 to 60 minutes.
-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.
-NX enable disable	Specifies whether to set the NX host connection mode effective or ineffective. enable : Enables the NX host connection mode. disable : Disables the NX host connection mode.
-AutoReconst enable disable	Specifies whether to set the auto reconstruction mode effective or ineffective. enable : Enables the auto reconstruction mode. disable : Disables the auto reconstruction mode.

(Continued)

Options	Description
-ForcedWriteThrough enable disable	Specifies whether to set the forced write through mode effective or ineffective. enable: Enables the forced write through mode. disable: Disables the forced write through mode.
-RAID3 enable disable	-RAID3 enable disable
-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.
-InquiryStandard ctl_no port_no enable disable	Specifies whether to set the Standard INQUIRY data expand mode effective or ineffective. ctl_no: Controller number (0, 1) port_no: Port number (A, B) enable: Enables the Standard INQUIRY data expand mode. disable: Disables the Standard INQUIRY data expand mode.
-ProdidDF400 ctl_no port_no enable disable	Specifies whether to set the Product ID DF400 mode effective or ineffective. ctl_no: Controller number (0, 1) port_no: Port number (A, B) enable: Enables the Product ID DF400 mode. disable: Disables the Product ID DF400 mode.
-HPUX2 ctl_no port_no enable disable	Specifies whether to set the HP connection mode 2 effective or ineffective. ctl_no: Controller number (0, 1). port_no: Port number (A, B). enable: Enables the HP connection mode 2. disable: Disables the HP connection mode 2.
-HbaWwnReport ctl_no port_no enable disable	Specifies whether to set the HBA WWN Report mode effective or ineffective. ctl_no: Controller number (0, 1). port_no: Port number (A, B). enable: Enables the HBA WWN Report mode. disable: Disables the HBA WWN Report mode.

(Continued)

Options	Description
-NACA ctl_no port_no enable disable	Specifies whether to set the NACA mode effective or ineffective. ctl_no : Controller number (0, 1). port_no : Port number (A, B). enable : Enables the NACA mode. disable : Disables the NACA mode.
-SUNCluster ctl_no port_no enable disable	Specifies whether to set the SUN Cluster Connection mode effective or ineffective. ctl_no : Controller number (0, 1). port_no : Port number (A, B). enable : Enables the SUN Cluster Connection mode. disable : Disables the SUN Cluster Connection mode.
-WebTitle string	If the home page of the array unit is displayed with the browser, this option specifies a character string displayed on the title bar of the browser. Enter up to 32 one-byte coded alphanumeric characters or characters (except for the ' (single quotation mark), " (double quotation mark), and \ (backslash) symbols) other than numeric.
-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 TPRLO 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 rest. Reserve : Enables the Reserve. LUReset : Enables the LU reset. TPRLO : Sets Third Party Process Logout Mode. enable : Enables the settings described above. disable : Disables the settings described above.

- Examples of using commands:

The following example references the system parameters of array unit df500a1.

```
% ausysparam -unit df500a1 -refer
Password:
System parameter list.

DF Name : df500a1
Date : 2001/09/21 13:00:00
Micro Program Revision : 055B
Flash Program Revision : 055B
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
    Standard INQUIRY data expand mode = OFF
    HP Connection mode 2 enable = OFF
    Product ID DF400 mode = OFF
    HBA WWN Report Mode = OFF
    NACA Mode = OFF
    SUN Cluster Connection Mode = 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
    Standard INQUIRY data expand mode = OFF
    HP Connection mode 2 enable = OFF
    Product ID DF400 mode = OFF
    HBA WWN Report Mode = OFF
    NACA Mode = OFF
    SUN CLuster Connection Mode = 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
  Standard INQUIRY data expand mode = OFF
  HP Connection mode 2 enable = OFF
  Product ID DF400 mode = OFF
  HBA WWN Report Mode = OFF
  NACA Mode = OFF
  SUN Cluster Connection Mose = 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
  Standard INQUIRY data expand mode = OFF
  HP Connection mode 2 enable = OFF
  Product ID DF400 mode = OFF
  HBA WWN Report Mode = OFF
  NACA Mode = OFF
  SUN Cluster Connection Mode = OFF
Serial Number =
Delay Planned Shutdown =0
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
  NX Mode = OFF
  Auto Reconstruction Mode = OFF
  Forced Write Through Mode = OFF
  RAID3 Mode = 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 = OFF

```

```

---- 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      1
0A    --        1      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
  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 = ---

```

```

---- CCTL 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      --      0    2
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 = ---
--- Parameter ---
FD Back Up = YES
%
```

The following example sets a system parameter (to suppress the mode in which to send an error information to RS232C interface) for array unit df500a1.

```
% ausysparam -unit df500a1 -set -Rs232cOutflow off
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System Parameter modification completed successfully.
Please reboot Array for changes to take effect.
%
```

The following example sets a system parameter (to set the buzzer on) for array unit df400a1, which supports restarting.

```
% ausysparam -unit df400a1 -set -Buzzer on
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System Parameter modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting the array unit. Start Time HH:MM
Reboot has been completed.
%
```

Note: When setting all the system parameter in Windows, you cannot set them on a command prompt due to the limitation on the number of characters. Create the contents of the settings in a Bat file, then execute the appropriate command.

3.7.2 Referencing/Setting RTC

- Command name

`aurtc`

- Format

`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

This command references and sets the RTC.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit for which to reference and set RTC. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
<code>-refer</code>	References RTC.
<code>-set</code>	Sets the 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:

The following example references RTC of array unit df500a1.

```
% aurtc -unit df500a1 -refer
Password:
Date 2001/05/10    Time 18:14:28
%
```

The following example automatically sets RTC of array unit df500a1.

```
% aurtc -unit df500a1 -set -auto
Password:
The RTC has been set successfully.
%
```

By specifying the date and time, the following example sets the RTC of array unit df400a1 which supports restarting.

```
% aurtc -unit df400a1 -set -manual -date 2000/01/01 -time 12:34:56
Continue (y/n [n]): y
This command will cause Array to stop communicating with all attached Hosts.
Password:
RTC modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.7.3 Referencing/Setting Target Information

- Command name

autarget

- Format

- 9200:

autarget -unit unit_name -refer

- 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]

- 9200:

autarget -unit unit_name -file filename [-fd on | off]

- Description

The following example 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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-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 a LUN shared by the port for the same LUN.) MS: Multi-target ID and single LUN (Sets the port and target ID for a LUN, and the host uses a set target ID as LUN="0".) MM: LU mapping (Sets the port, target ID, and H-LUN for a LUN by mapping, and the host uses a set configuration)
-ctl0 -ctl1	Specifies the controller number.
-port A B C D -port A B	Specifies the port number.
-tid n	Specifies the target ID for the SCSI version. This option cannot be specified to 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 configuration file of the target ID. If this option is specified, Configuration Manager 9200 reads a target ID configuration file, and sets the information according to the 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:

The following example displays the target ID information in array unit (SCSI version) df400a1. [S-TID, M-LUN]

```
% autarget -unit df400a1 -refer
Password:
Current target ID mode
    CTL0 S-TID, M-LUN
    CTL1 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
    CTL0 S-TID, M-LUN
    CTL1 S-TID, M-LUN
CTL  PORT  T-ID  H-LUN  LUN
0     A     0     --     --
0     B     0     --     --
1     A     0     --     --
1     B     0     --     --
%
```

The following example displays the target ID information in array unit (SCSI version) df400b1. [M-TID, S-LUN]

```
% autarget -unit df400b1 -refer
Password:
Current target ID mode
    CTL0 M-TID, S-LUN
    CTL0 M-TID, S-LUN
CTL  PORT  T-ID  H-LUN  LUN
0     A     0     --     0
0     A     1     --     1
0     B     2     --     2
0     B     3     --     3
1     A     0     --     4
1     A     1     --     5
1     B     2     --     6
1     B     3     --     7
Reserved target ID mode
    CTL0 M-TID, S-LUN
    CTL1 M-TID, S-LUN
CTL  PORT  T-ID  H-LUN  LUN
0     A     0     --     0
0     A     2     --     1
0     B     4     --     2
0     B     6     --     3
1     A     1     --     4
1     A     3     --     5
1     B     5     --     6
1     B     7     --     7
%
```

The following example displays the target ID information in array unit (SCSI version) df400c1. [LU mapping]

```
% autarget -unit df400c1 -refer
Password:
Current target ID mode
    CTL0  M-TID, M-LUN
    CTL1  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
    CTL0  M-TID, M-LUN
    CTL1  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
%
```

The following example displays the target ID information in array unit (Fibre version) df500a1. [LU mapping]

```
% autarget -unit df500a1 -refer
Password:
Current target ID mode
    CTL0  M-TID, M-LUN
    CTL1  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
    CTL0  M-TID, M-LUN
    CTL1  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
%
```

The following example sets the target ID information in array unit (SCSI version) df400a1. The setting for the target ID of Controller 0, for 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:
Target ID modification completed successfully.
Please reboot Array for changes to take effect.
%
```

The following example sets the target ID information in array unit (SCSI version) df400a2 and which supports restarting. The setting for the target ID of Controller 0, for 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:
Target ID modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting the array unit. Start Time HH:MM
Reboot has been completed.
%
```

The following example shows the format of the target ID configuration file when set by file input. Enter the **Target ID** by specifying "Yes" or "No". Enter necessary data for **Port**, **Target ID**, **H-LUN**, and **LUN**. Enter blank spaces between the items. If tabs are used, they are regarded as an input error and will be 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

```

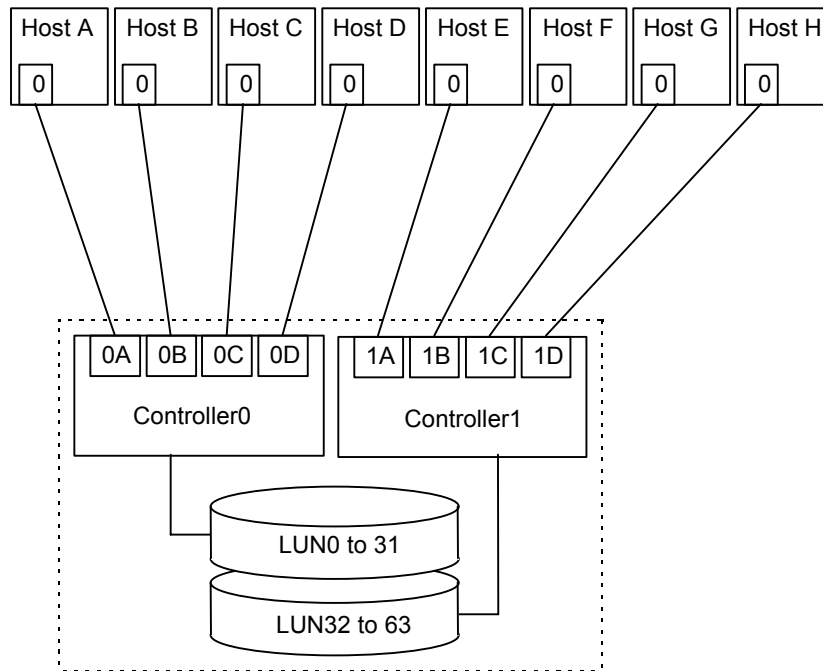
Information file for Target ID configuration
S-TID, M-LUN : YES
M-TID, S-LUN : NO
M-TID, M-LUN : NO

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

```

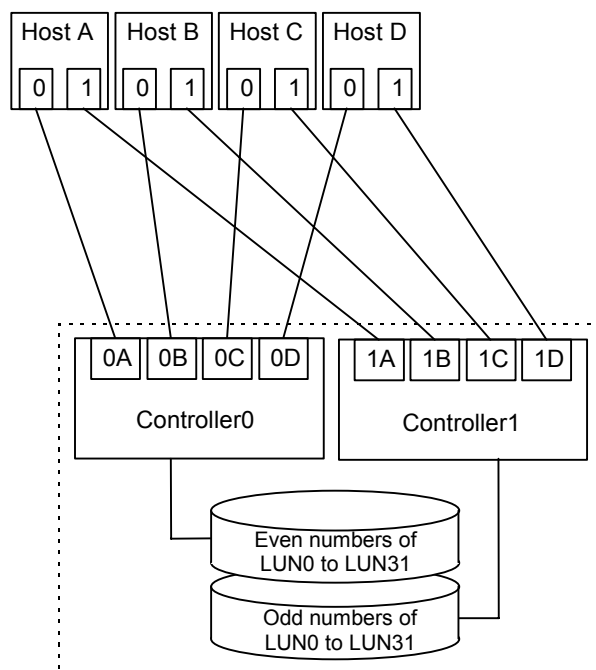
Note: When the Resource Manager 9200 is connected to array unit with the Fibre Channel connection, set '--' for the T-ID.

Two types of the sample files when setting by file input are provided. The sample file configuration is shown below.



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

Figure 3.7 Sample File: id00.txt - - - Host LU Independent 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

Figure 3.8 Sample File: id01.txt - - - Host LU Independent Access Type

3.7.4 Referencing/Setting LAN Information

- Command name

aulan

- Format

– 9200:

aulan -unit unit_name -refer

– 9200:

aulan -unit unit_name -set -ctl0 | -ctl1
[-addr inet_addr] [-mask netmask] [-gate gateway]
[-dhcp enable | disable] [-fd on | off]

- Description

This command 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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.
-refer	References LAN information.
-set	Sets LAN information.
-ctl0 -ctl1	Specifies the controller.
-addr inet_addr	Specifies the IP addresses.
-mask netmask	Specifies the 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 to set the DHCP mode to 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; be certain to specify "on".

■ Examples:

The following example references the LAN information of array unit df500a1.

```
% aulan -unit df500a1 -refer
Password:
CTL  IP Address  Subnet mask  Gateway      Ethernet address  DHCP
0    125.0.9.98   255.255.255.0 125.0.9.15   00:00:87:50:78:AF OFF
1    125.0.9.99   255.255.255.0 125.0.9.15   00:00:87:50:78:9F OFF
%
```

The following example sets LAN information for the Controller 0 side of array unit df500a1.

```
% aulan -unit df500a1 -set -ctl0
-addr 192.168.100.100 -mask 255.255.255.0 -gate 192.168.100.5
Password:
LAN information modification completed successfully.
Please reboot Array for changes to take effect.
%
```

The following example sets LAN information for the Controller 0 side of array unit 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:
LAN information modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting the array unit. Start Time HH:MM
Reboot has been completed.
%
```

3.7.5 Referencing/Setting SCSI Transfer Rate

- Command name

`ausync`

- Format

– 9200:

`ausync -unit unit_name -refer`

– 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

This command displays and sets the SCSI transfer rate of each port. When setting the SCSI transfer rate, only one command entry can be set per port.

■ Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set the SCSI transfer rate. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-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 is 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; be certain to specify "on".

- Examples:

The following example references the SCSI transfer rate information of array unit df400a1.

```
% ausync -unit df400a1 -refer
Password:
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
%
```

The following example sets SCSI transfer rate information for port A on the Controller 0 side of array unit df400a1.

```
% ausync -unit df400a1 -set -ctl0 -port A -sync standard -fd on
Password:
SYNC CONTROL modification completed successfully.
Please reboot Array for changes to take effect.
%
```

The following example sets SCSI transfer rate information for port A on the Controller 0 side of array unit df400a2 and which supports remote restarting.

```
% ausync -unit df400a2 -set -ctl0 -port A -sync standard -fd on
Password:
SYNC CONTROL modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting the array unit. Start Time HH:MM
Reboot has been completed.
%
```

3.7.6 Referencing/Setting the Port Option and Controller Identifier

- Command name

auportop

- Format

- For the 9200:

auportop -unit unit_name -refer

- SCSI version:

```
auportop -unit unit_name -set
[ -HostConnection ctl_no port_no
                                standard | OpenVMS | TRESPASS | WolfPack |
                                IBM7135 | NCR ]
[ -VxVM ctl_no port_no enable | disable ]
[ -OdeMapper ctl_no port_no enable | disable ]
[ -ReportInquiry ctl_no port_no enable | disable ]
[ -UASuppress ctl_no port_no enable | disable ]
[ -HISUP ctl_no port_no enable | disable ]
[ -CCHS ctl_no port_no enable | disable ]
[ -InquiryStandard ctl_no port_no enable | disable ]
[ -ProdidDF400 ctl_no port_no enable | disable ]
[ -SUNCluster ctl_no port_no enable | disable ]
[ -PortTypeOption ctl_no port_no
                                ResetLipSignal | ResetLipProcess |
                                TargetReset | Reserve enable | disable ]
[ -ControllerID ctl_no string ]
[ -fd on | off ]
```

– Fibre version:

```

auportop -unit unit_name -set

[ -HostConnection ctl_no port_no
    standard | OpenVMS | TRESPASS | WolfPack |
[ -VxVM ctl_no port_no enable | disable ]
[ -HPUX ctl_no port_no enable | disable ]
[ -ReportInquiry ctl_no port_no enable | disable ]
[ -UASuppress ctl_no port_no enable | disable ]
[ -HISUP ctl_no port_no enable | disable ]
[ -CCHS ctl_no port_no enable | disable ]
[ -InquiryStandard ctl_no port_no enable | disable ]
[ -HPUX2 ctl_no port_no enable | disable ]
[ -ProdidDF400 ctl_no port_no enable | disable ]
[ -HbaWwnReport ctl_no port_no enable | disable ]
[ -NACA ctl_no port_no enable | disable ]
[ - SUNCluster ctl_no port_no enable | disable ]
[ -PortTypeOption ctl_no port_no
    ResetLipSignal | ResetLipProcess |
    LipPortAllReset | TargetReset |
    Reserve | LUReset | TPRLO
    enable | disable ]
[ -ControllerID ctl_no string ]
[ -fd on | off ]

```

■ Description

This command references and sets the port option of the system parameters and controller identifier online.

The setting is allowed only if the Target ID mode of an array unit is set to [M-TID, M-LUN] (mapping). Additions to mapping information can be set for Target IDs that are not set.

■ Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set system parameters. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline)".
-refer	References system parameters.
-set	Sets system parameters.
-HostConnection ctl_no port_no standard OpenVMS TRESPASS WolfPack IBM7135 NCR	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 IBM7135 : IBM7135 mode NCR : NCR 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) 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.

(Continued)

Options	Description
<code>-ReportInquiry</code> <code>ctl_no port_no</code> <code>enable disable</code>	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.
<code>-UASuppress</code> <code>ctl_no port_no</code> <code>enable disable</code>	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.
<code>-HISUP</code> <code>ctl_no port_no</code> <code>enable disable</code>	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.
<code>-CCHS</code> <code>ctl_no port_no</code> <code>enable disable</code>	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.
<code>-InquiryStandard</code> <code>ctl_no port_no</code> <code>enable disable</code>	Specifies whether to set the Standard INQUIRY data expand mode effective or ineffective. ctl_no: Controller number (0, 1) port_no: Port number (A, B) enable: Enables the Standard INQUIRY data expand mode. disable: Disables the Standard INQUIRY data expand mode.
<code>-HPUX2</code> <code>ctl_no port_no</code> <code>enable disable</code>	Specifies whether to set the HP connection mode 2 effective or ineffective. ctl_no: Controller number (0, 1). port_no: Port number (A, B). enable: Enables the HP connection mode 2. disable: Disables the HP connection mode 2.
<code>-ProdIDDF400</code> <code>ctl_no port_no</code> <code>enable disable</code>	Specifies whether to set the Product ID DF400 mode effective or ineffective. ctl_no: Controller number (0, 1) port_no: Port number (A, B) enable: Enables the Product ID DF400 mode. disable: Disables the Product ID DF400 mode.

(Continued)

Options	Description
-HbaWwnReport ctl_no port_no enable disable	Specifies whether to set the HBA WWN Report mode effective or ineffective. ctl_no : Controller number (0, 1). port_no : Port number (A, B). enable : Enables the HBA WWN Report mode. disable : Disables the HBA WWN Report mode.
-NACA ctl_no port_no enable disable	Specifies whether to set the NACA mode effective or ineffective. ctl_no : Controller number (0, 1). port_no : Port number (A, B). enable : Enables the NACA mode. disable : Disables the NACA mode.
-SUNCluster ctl_no port_no enable disable	Specifies whether to set the SUN Cluster Connection mode effective or ineffective. ctl_no : Controller number (0, 1). port_no : Port number (A, B). enable : Enables the SUN Cluster Connection mode. disable : Disables the SUN Cluster Connection mode.
-PortTypeOption ctl_no port_no ResetLipSignal ResetLipProcess LipPortAllReset TargetReset Reserve LUReset TPRLO enable disable	Sets options for individual ports for the Fibre Channel version of array units. 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 rest. Reserve : Enables the Reserve. LUReset : Enables the LU reset. TPRLO : Sets Third Party Process Logout Mode. enable : Enables the settings described above. disable : Disables the settings described above.
-ControllerID ctl string1	Specifies the controller ID. ctl : 0, 1 string1 : Controller ID (up to eight characters)
-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; be certain to specify "on". on : Makes a backup copy. off : Does not make a backup copy.

■ Examples:

The following example references the system parameters of array unit df500a1.

```
% auportop -unit df500a1 -refer
Password:
Host Connection Mode 1
  Port 0A = Standard Mode
  Port 0B = Standard Mode
  Port 1A = Standard Mode
  Port 1B = Standard Mode

Host Connection Mode 2
VxVM DMP Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
HP Connection Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Report inquiry page 83H
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
UA(06/2A00) suppress Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
HISUP Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
CCHS Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Standard INQUIRY data expand Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
HP Connection Mode 2
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Product ID DF400 Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
HBA WWN Report Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
```

```

NACA Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
SUN Cluster Connection Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Port Option
Reset/LIP Mode (Signal)
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reset/LIP Mode (Process)
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reset All LIP Port Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reset Target (Reset Bus Device) Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reserve Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reset Logical Unit Mode
  0A = disable
  0B = disable
  1A = disable
  1B = disable
Reset Logout of Third Party Process Mode
  0A = disable
  0B = disable
  1A = disable
  1B = disable

Controller Identifier
  CTL0 = DF500-00 C0
  CTL1 = DF500-00 C1

```

The following example sets the unit attention option “UA(06/2A00) suppress mode” by the system parameter for port A on the controller 0 side of array unit df500a1.

```

% auportop -unit df500a1 -set -UASuppress 0 A enable
Password:
%

```

3.7.7 Setting Target Information Online

- Command name

auontarget

- Format

- SCSI version:

auontarget -unit unit_name -add ctl_no port_no tid hlu lu [-fd on | off]

auontarget -unit unit_name -chg ctl_no port_no tid hlu lu [-fd on | off]

auontarget -unit unit_name -rm ctl_no port_no tid hlu lu [-fd on | off]

- Fibre version:

auontarget -unit unit_name -add ctl_no port_no hlu lu [-fd on | off]

auontarget -unit unit_name -chg ctl_no port_no hlu lu [-fd on | off]

auontarget -unit unit_name -rm ctl_no port_no hlu lu [-fd on | off]

- Description

This command sets mapping information online.

The setting is allowed only if the Target ID mode of an array unit is set to [M-TID, M-LUN] (mapping). Additions to mapping information can only be set for Target IDs that are already set.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set system parameters. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-", (minus)", or "_" (underline)".
-add ctl_no port_no tid hlu lu	Adds the mapping information. ctl_no : Controller number (0, 1) port_no : Port number (A, B) tid : Target ID (Fibre version is unnecessary) hlu : LU number recognized by the host lu : LU number of the array unit
-chg ctl_no port_no tid hlu lu	Changes the mapping information. ctl_no : Controller number (0, 1) port_no : Port number (A, B) tid : Target ID (Fibre version is unnecessary) hlu : LU number recognized by the host lu : LU number of the array unit
-rm ctl_no port_no tid hlu lu	Deletes the mapping information. ctl_no : Controller number (0, 1) port_no : Port number (A, B) tid : Target ID (Fibre version is unnecessary) hlu : LU number recognized by the host lu : LU number of the array unit

- Examples:

The following example sets up an LU with an internal LUN 3 of array unit df500a1, as Controller 0, Port A, Target ID 1, and Host LUN 2.

```
% auontarget -unit df500a1 -add 0 A 1 2 3
Password:
%
```

The following example changes the setup of an LU with an internal LUN 0 of array unit df500a1, to Controller 0, Port A, Target ID 1, and Host LUN 3.

```
% auontarget -unit df500a1 -chg 0 A 1 3 0
Password:
%
```

The following example deletes the setup, as Controller 0, Port A, Target ID 1, and Host LUN 2, of an LU with an internal LUN 0 of array unit df500a1.

```
% auontarget -unit df500a1 -rm 0 A 1 2 0
Password:
%
```

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`

- Format

`ausyspout -unit unit_name -file file_name`

- Description

This command outputs the contents of the setting for the system parameters set in the array unit in a specified file, in a text format.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit whose system parameters are to be output into the file. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-", or "_" (underline).
<code>-file file_name</code>	Specifies the name the file (path) to output the system parameters.

- Example:

The following example outputs the setting information of the system parameters of array unit 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:
%
```

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

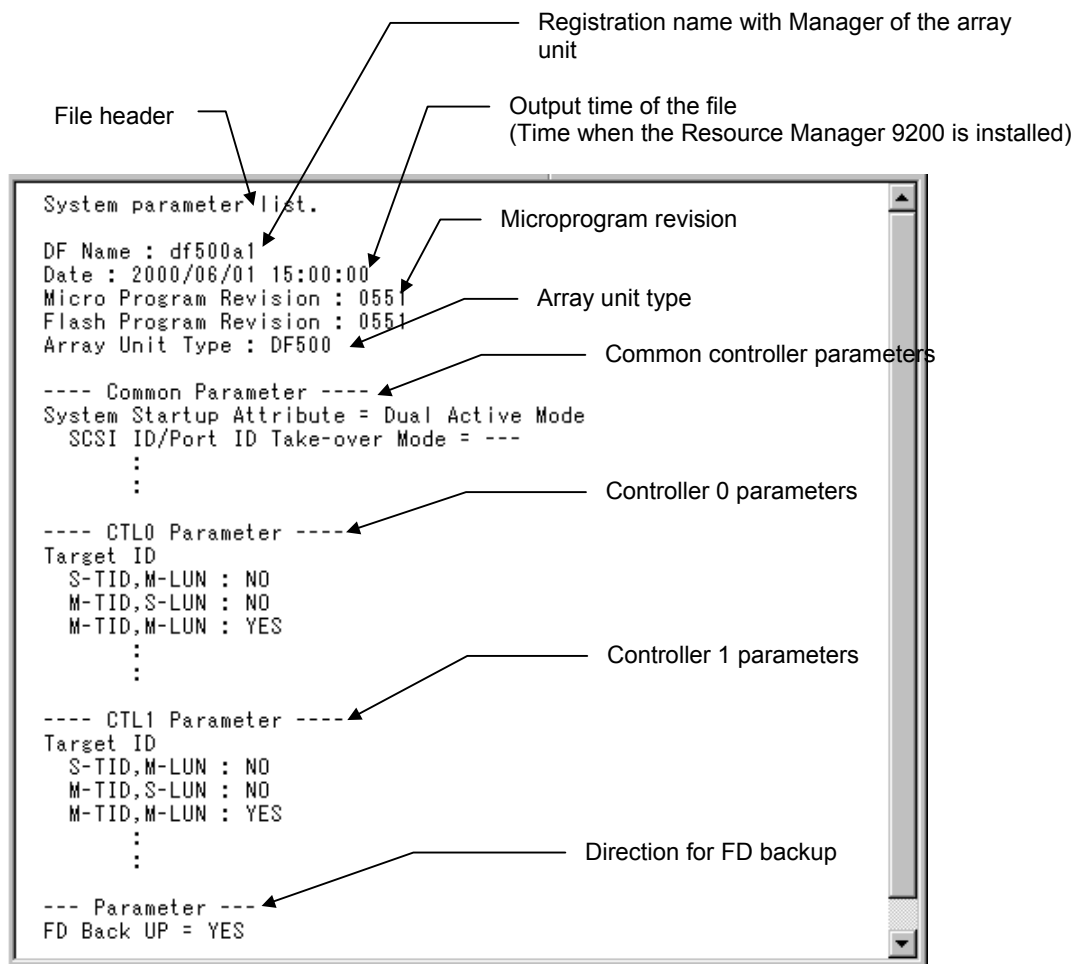


Figure 3.9 Outline of the Format of the System Parameter Output File

- 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 3.10 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 Standard INQUIRY data expand mode HP Connection mode 2 enable Product ID DF400 mode HBA WWN Report mode NACA mode SUN Cluster Connection Mode	-VxVM -OdeMappar -HPUX -ReportInquiry -UASuppress -HISUP -CCHS -InquiryStandard -HPUX2 -ProdidDF400 -HbaWwnReport -NACA -SUNCluster
5	Serial Number	-SerialNumber
	Delay Planned Shutdown	-DelayPlannedShutdown
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 NX mode enable Auto Reconstruction mode enable Forced Write Through mode enable RAID3 Mode UA (06/2A00) suppress mode enable SGI mode enable Port-ID Taking-over enable	-MultipathController -ReportInquiry -PROCOM -ResetStatus -MultipathArrayUnit -LuCacheWarning -NX -AutoReconst -ForcedWriteThrough -RAID3 -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

Table 3.1 List of Common Parameters (Continued)

No.	Parameter	Option
15	Cache Mode All OFF Random mode Sequential mode Random & Sequential mode	-CacheMode off random sequential randseq
16	Web Title	-WebTitle
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      0
0B      0         1      1
Port Type
Port Option
Reset/LIP Mode(Signal)
Port A = OFF
Port B = OFF
Reset/LIP Mode(Process)
Port A = OFF
Port B = OFF
LIP Port All Reset Mode
Port A = OFF
Port B = OFF
Target Reset (Bus Device Reset) Mode
Port A = OFF
Port B = OFF
Reserve Mode
Port A = OFF
Port B = OFF
Logical Unit Reset Mode
Port A = OFF
Port B = OFF
Third Party Process Logout Mode
Port A = OFF
Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
Port A = ---
Port B = ---
Controller Identifier = Disable
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
DHCP = OFF
IP Address = 0.0.0.0
Subnet Mask = 0.0.0.0
Default Gateway = 0.0.0.0
Ether Address = 00:00:00:00:00:00
SCSI transfer rate
Port A = ---
Port A = ---

```

Figure 3.11 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
0A      0         0      0
0B      0         1      1
Port Type
Port Option
  Reset/LIP Mode(Signal)
    Port A = OFF
    Port B = OFF
  Reset/LIP Mode(Process)
    Port A = OFF
    Port B = OFF
  LIP Port All Reset Mode
    Port A = OFF
    Port B = OFF
  Target Reset (Bus Device Reset) Mode
    Port A = OFF
    Port B = OFF
  Reserve Mode
    Port A = OFF
    Port B = OFF
  Logical Unit Reset Mode
    Port A = OFF
    Port B = OFF
  Third Party Process Logout Mode
    Port A = OFF
    Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
  Port A = ---
  Port B = ---
Controller Identifier = Disable
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
  DHCP = OFF
  IP Address = 0.0.0.0
  Subnet Mask = 0.0.0.0
  Default Gateway = 0.0.0.0
  Ether Address = 00:00:00:00:00:00
SCSI transfer rate
  Port A = ---
  Port B = ---

```

Figure 3.12 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 3.13 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`

- Format

`auconfigout -unit unit_name -file file_name`

- Description

This command outputs the RAID/LU configuration information already set in an array unit in 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 alphanumeric characters 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:

The following example outputs RAID/LU configuration information of array unit `df500a1`, by the file name: `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

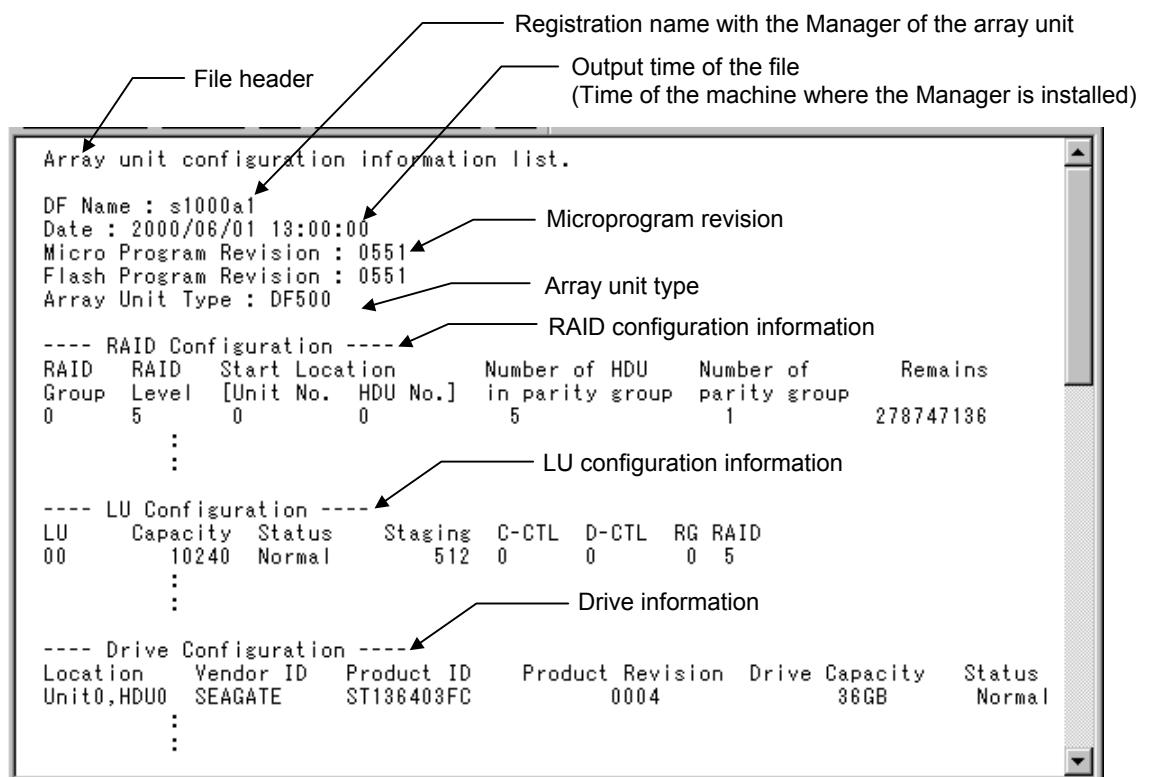


Figure 3.14 The Outline of the Format of RAID/LU Configuration Information Output File

Cache information

Fan information

Battery information

AC power information

Battery backup information

Loop information

Enclosure information

```

---- Cache Information ----
      Controller 0          Controller 1
Slot   Capacity   Status   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
:
:

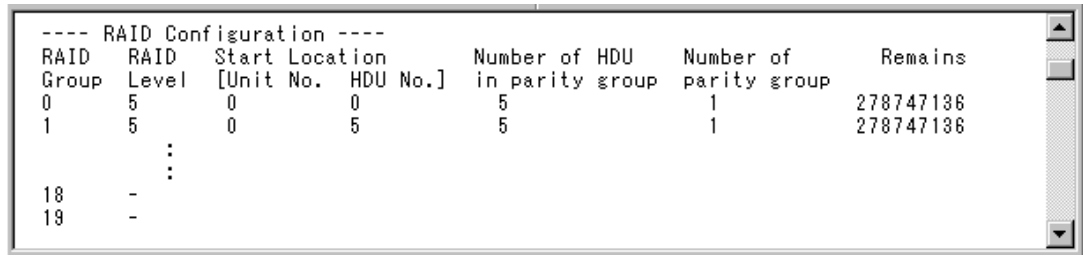
```

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 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 [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:** Pre-read 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 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.

A screenshot of a terminal window showing the output of a command. The output is titled "---- Battery Information ----" and contains a table with two columns: "Location" and "Status". The first row shows "0" under "Location" and "Normal" under "Status".

```
---- 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 AC Power Information: for connection with the 9200:**

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

For the 9200:

A screenshot of a terminal window showing the output of a command. The output is titled "---- AC Power Information ----" and contains a table with two columns: "Location" and "Status". The first two rows show "Unit0,AC0" and "Unit0,AC1" under "Location", both with "Normal" under "Status". There are three vertical dots between "Unit0,AC1" and "Unit9,AC0". The last two rows show "Unit9,AC0" and "Unit9,AC1" under "Location", both with "Nothing" under "Status".

```
---- 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 the 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`

- Format

`ausyspset -unit unit_name -file file_name`

- Description

This command sets the contents of the system parameters described in a file to the array unit.

If you set the file that was output under the condition in which any fee-based optional feature is in an unlocked (installed) status, the setting may terminate abnormally. Use a file that was output under the condition in which all fee-based optional features are in a locked (de-installed) status.

The files have a standard format. The format of the files is the same as those that are output from an array unit. For the file format and the contents of the settings in the files, see the following individually. When specifying individual items of a file, enter a blank space after “=”.

- 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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline)".
-file file_name	Specifies the name of the file (path) to output the configuration information.

■ Examples:

The following example sets array unit df400a1 according to the configuration system parameters described in the text file: sysprm.txt.

```
% ausyspset -unit df400a1 -file sysprm.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System parameter modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting the array unit. Start Time HH:MM
Reboot has been completed.
%
```

The following example sets array unit df500a1 according to the configuration system parameters described in text file: sysprm.txt.

```
% ausyspset -unit df500a1 -file sysprm.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System parameter modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting the array unit. Start Time HH:MM
Reboot has been completed.
%
```

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

- Command name

`auconfigset`

- Format

`auconfigset -unit unit_name -file file_name`

- Description

This command sets the RAID/LU setting information described in the file to the array unit.

When setting the RAID/LU, all the current RAID/LU will be deleted so that all the user data before the setting will be lost. If the user data is required, please perform the setting after taking a backup.

The files have a standard format. The format of the files is the same as those 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.

The items to be set in the files are the “RAID configuration information”, “LU configuration information”, and the “drive information” of the 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 the set 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 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 unit_name	Specifies the name of the array unit to be set with the RAID/LU configuration. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-", (minus)", or "_" (underline)".
-file file_name	Specifies the name of the file (path) to output the configuration information.

■ Example:

The following example sets array unit df500a1 according to the RAID/LU configuration described in text file: 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:
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 : Normal Terminated
LUz format start
LUx format end : CHECK CONDITION : xx-xxxx
:
:
%
```

3.9 Microprogram Replacement

3.9.1 Downloading/Replacing Microprogram

- Command name

aumicro

- Format

– 9200:

aumicro -unit unit_name -read -path disk01 disk02 disk03 ...

aumicro -revision

aumicro -clean

– 9200:

aumicro -unit unit_name -upload -time time -check on | off

aumicro -unit unit_name -change -ctl0 | -ctl1

- Description

This command downloads a microprogram into the array unit. Additionally, it 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 alphanumeric characters 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 is to be replaced.
-revision	Displays the revision of a microprogram which is to be replaced.
-clean	Deletes the read-in microprogram read.

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:

The following example downloads a microprogram into array unit df500a1 and afterward performs the microprogram replacement.

This example checks the revision of a microprogram of array unit df500a1 when downloading it.

```
% aurev -unit df500a1
Serial Number : 0777
Microprogram Revision : 0500
%
```

This example first reads in a microprogram to be downloaded. The microprogram is stored in several floppy disks. This example shows that the contents of the floppy disk are stored in directories disk01, disk02, disk03, disk04, and disk05.

```
% aumicro -unit df500a1 -read -path disk01 disk02 disk03 disk04 disk05
Password:
Read disk : disk01 disk02 disk03 disk04 disk05
%
```

This example checks the revision of the read-in microprogram.

```
% aumicro -revision
Password:
New Revision : 0501
%
```

This example downloads the read-in microprogram into array unit df500a1. It sets the time interval to 3 seconds, and specifies the checking of the microprogram revision. While downloading, the number of files that are already downloaded: *mmm*, and the total number of files to be downloaded: *nnn* are will be displayed.

```
% aumicro -unit df500a1 -upload -time 3 -check on
Password:
df500a1 : mmm/nnn done.
%
```

This example replaces the current microprogram with the downloaded microprogram. Replacing takes place in the order of controller 0 and then controller 1.

```
% aumicro -unit df500a1 -change -ctl0
The controller being replaced will stop accepting the access from the host.
Are you sure you want to replace the microprogram for controller 0?
Password:
%
% aumicro -unit df500a1 -change -ctl1
The controller being replaced will stop accepting the access from the host.
Are you sure you want to replace the microprogram for controller 1?
Password:
%
```

When downloading and replacing the microprogram has completed, the read-in microprogram in the Manager will be removed.

```
% aumicro -clean
Password:
%
```


3.10 SNMP Environment Information

3.10.1 Setting SNMP Environment Information and Outputting Its File

- Command name

ausnmp

- Format

```
ausnmp -unit unit_name -get [ -config config.txt ] [ -name name.txt ]
```

```
ausnmp -unit unit_name -set [ -config config.txt ] [ -name name.txt ]
```

- Description

This command 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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-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 configuration information.
-name name.txt	Specifies the file name of SNMP name information.

- Examples:

The following example obtains the `config.txt` information and the `name.txt` information from array unit `df500a1`.

```
% ausnmp -unit df500a1 -refer -config config.txt -name name.txt
%
```

The following example sets the `config.txt` and the `name.txt` information individually for array unit `df400a1`, which does not support the restart.

```
% ausnmp -unit df400a1 -set -config config.txt -name name.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
SNMP Configuration modification completed successfully.
Please reboot Array for changes to take effect.
%
```

The following example sets up the `config.txt` information and the `name.txt` information in array unit `df500a1`.

```
% ausnmp -unit df500a1 -set -config config.txt -name name.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
SNMP Configuration modification completed successfully.
Please reboot Array for changes to take effect.
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 rebooting 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`

- Format

`austatistics -unit unit_name -memory | -drive`

- Description

This command displays the statistical information that has been accumulated in the array unit. The following items will be displayed:

- 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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.
<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.

■ Example:

The following example displays the statistical information of array unit df500a1.

```
% austatistics -unit df500a1 -memory
Controller
  Array Time
    Controller Acting Time (Integrated) [minute(s)] :      4676
    Controller Acting Time (Work)           [m second] : 256969390

  CTL0
    Power On Times      :      22      22
    H-SCSI Reset Time :      4676      4676
  CTL1
    Power On Times      :      22      22
    H-SCSI Reset Time :      676      676
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
Execution
      Read      Write      Sequential  Sequential  Prefetch  Write Through
Reassigned
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
  Number of Inflow Threshold Reached
  CTL 0 :      0
  CTL 1 :      0
%
```

3.12 Obtaining Performance Information

3.12.1 Outputting Performance Information File

- Command name

`superform`

- Format

`superform -unit unit_name -manual`

`superform -unit unit_name -auto time [-count nn]`

- Description

This command 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. When displaying an output file, a warning message may be reported depending on the editor. However, the contents will be displayed correctly.

The following six items will be acquired:

- Number of Read commands received
- Number of the cache-hitting ones of Read commands received
- Rate of cache-hitting within the received Read command
- Number of Write commands received
- Number Write commands that had been cache-hit within the received Write command
- Rate of cache-hitting within the received Write command

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. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
-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, specify the number of times acquisition is repeated (1 to 99).

■ Example:

The following example acquires the performance information of array unit df500a1 only once at an interval of 10 minutes.

```
% auperform -unit df500a1 -auto 10
Day yy mm hh:mm:ss yyyy: count = n
%
```

3.13 Monitoring Errors

3.13.1 Setting Up E-Mail Reports

- Command name

aumail

- Format

aumail -refer

aumail -set [-domain domain_name] [-srv mail_server_addr]
[-from from_addr] [-add to_addr] [-rm to_addr]

aumail -test

- Description

This command sets the 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 the domain name in less than or equal to 39 alphanumeric characters or codes.
-srv mail_server_addr	Specifies the IP address or host name of a mail server. Specify the host name in less than or equal to 99 alphanumeric characters.
-from from_addr	Specifies the mail address of an E-Mail sender. Specify it the mail address in less than or equal to 99 alphanumeric characters or codes.
-add to_addr	Adds the mail address of an E-Mail receiver. Specify the mail address in less than or equal to 99 alphanumeric characters or codes. 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:

The following example displays the contents of an E-Mail information setup.

```
% aumail -refer
Domain Name      : abc.hitachi.co.jp
Mail Server Address : server1.abc.hitachi.co.jp
From Address     : sender1@str.hitachi.co.jp
Send to Address  : receiver1@abc.hitachi.co.jp
%
```

The following example sets the 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
%
```

The following example 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 Title

To determine the failure of the array unit from the E-mail title, the E-mail has a format of attaching the failure part on the title (subject). The title format is shown below. Table 3.4 shows a list of titles (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/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 Additional Information on E-Mail

- Command name

`auunitmsg`

- Format

`auunitmsg -unit unit_name -refer`

`auunitmsg -unit unit_name -set string`

`auunitmsg -unit unit_name -rm`

`auunitmsg -unit unit_name -test`

- Description

This command sets the additional information E-mail.

- Options

Options	Description
<code>-unit unit_name</code>	Specifies the name of an array unit for which to acquire performance information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-" (minus), or "_" (underline).
<code>-refer</code>	Displays the E-Mail additional information set currently.
<code>-set string</code>	Sets the E-Mail additional information. Specify the information in less than or equal to 64 alphanumeric characters. If you want to enter NULL characters, enter "".
<code>-rm</code>	Deletes the E-Mail additional information.
<code>-test</code>	Performs a test of originating an E-Mail.

The information set on E-mail is added to the E-mail attribute and the format is as follows:

`Day, Mon.dd hh:mm:ss yyyy/DF name/additional information/message text`

3.13.3 Setting the Starting of Application

- Command name

`auextprog`

- Format

`auextprog -refer`

`auextprog -set command`

`auextprog -test`

- Description

This command sets up an external program that is executed when an error is detected while monitoring errors.

- Options

Options	Description
<code>-refer</code>	Displays (references) the external program set up.
<code>-set command</code>	Sets up an external program that is started when an error is detected while monitoring errors.
<code>-test</code>	Starts an external program specified by the <code>-set</code> option.

- Examples:

The following example sets up the application “go” to be executed.

```
% auextprog -set go
%
```

The following example displays the application setup to be executed.

```
% auextprog -refer
Application Name : go
%
```

3.13.4 Monitoring Errors

- Command name

`auerroralert`

- Format

`auerroralert [-time uptime] [-mail] [-prog every | once] [-nodisp]`

- Description

This command 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.

To stop monitoring for errors, forcibly terminate the process (e.g., press the **Ctrl + c** keys).

- Options

Options	Description
<code>-time uptime</code>	Specifies the time interval at which to monitor errors. Specifies a value from 1 to 720 (minutes). If omitted, the error is monitored only once.
<code>-mail</code>	Originates an E-Mail when an error is detected.
<code>-prog every once</code>	Executes 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 will not start. After the specified application executes the first time, in order to start the application again when an error is detected, terminate the error monitoring and then restart again.
<code>-nodisp</code>	A screen display of the monitoring result is suppressed.

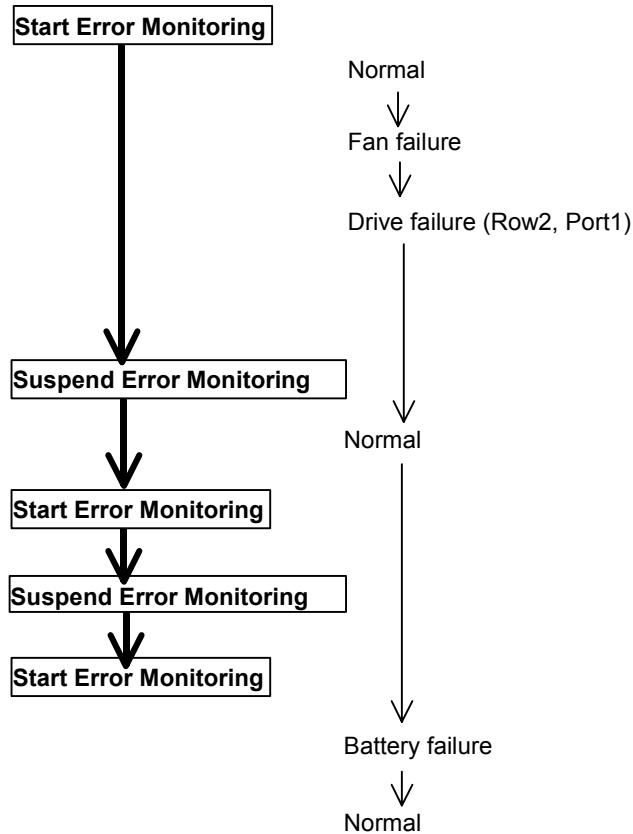
- Examples:

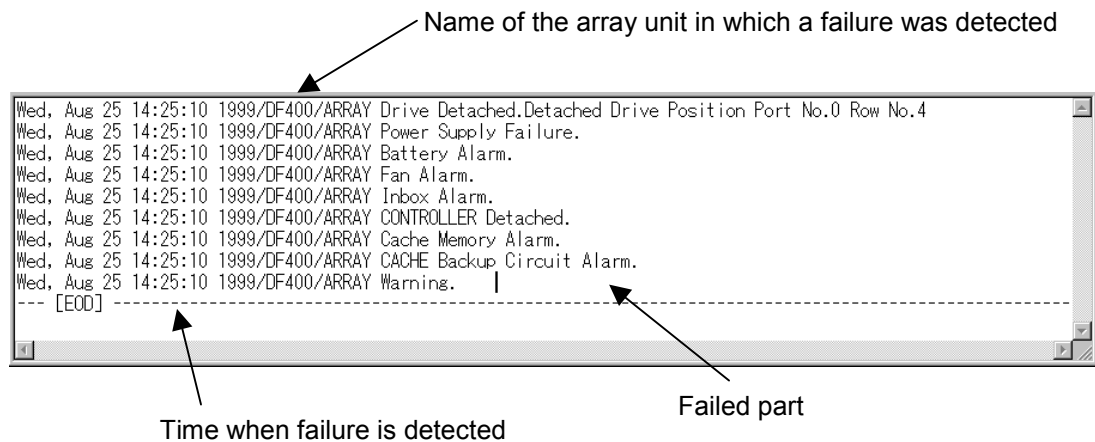
The following example monitors errors at an interval of 10 minutes. During error monitoring, a battery failure was detected in an array unit whose name is df400a1.

```
% auerroralert -time 1
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 and error monitoring is executed, the function outputs the failure information to a log file.

The log file is output with file name: `errlog.txt` and in a text file format, onto a path setup by the `DAMP_ROOT_DIR_PATH` environmental variable. The file format is shown in the following figure.





The log file is output 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 is output. "--- end ---" is output at the end of the log information; therefore, 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 to be output reports the failure 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/message text

Day: Day of the week

Mon: Month

dd: Date

hh:mm:ss: Hours, minutes, and seconds

yyyy: Year

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 performing operations, such as setting up the configuration of an array unit on the Manager, as an administrator of the array unit, a password is required. Therefore, you must firstly set a administrator password. To set a password, use the `aupasswd` command. Once the password is set, it will be saved in the workstation, so the password does not need to be set every time you perform operation.

Note: Changing a password at regular intervals is recommended. An `aupasswd` command is also used to change a password.

2. Registering an array unit

Register the array unit that you want to operate in the Resource Manager 9200. Use the `auunitadd` command to register an array unit. When registering, give a unique unit name (up to 16 alphanumeric characters) to one array unit, and register information such as the unit type (9200), a configuration (Single, Dual), and a connection interface (LAN, RS232C). The name of the array unit registered here will be used by each command of the Resource Manager 9200 as a key word to specify an array unit. Once the information of the array unit is registered, it will be kept under control of the Resource Manager 9200, so the array unit information does not need to be registered at every operation.

Additionally, use the `auunitchg` command to change the registered contents. When the registered information no longer needs to be controlled by the Resource Manager 9200, use the `auunitdel` command to delete the information.

3. Operations with various commands

After an array unit is placed under control of the Resource Manager 9200 by registering the unit, perform 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. Use an `auuidadd` command to set up a user ID.

Note: 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. Use the `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 the `aulogout` command.

Chapter 5 Examples of Using Commands (CLI)

The following shows an example of setting up one logical unit after connecting one RAID group to an array unit.

```
% aupasswd          Register a password.
New password :      Enter the password.
Retype new password : Enter 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          Check whether the registration has completed.
Array Unit Name  Group Name  Array Unit Type  Error Alert  Connection Mode  IP
Address/Host
Name/Device Name
df350a              DF400 Dual          on              LAN
192.168.33.120
192.168.33.130
%
% aurgadd -unit array01 -rg 0 -RAID5 -row 0 -port 0 -width 5 -depth 1
               Adds a RAID group with a RAID5 level.
Password:          Enter an already-registered password.
%
% auluadd -unit array01          Check whether the 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:          Enter an already-registered password.
%
% auluref -unit array01          Check whether the LU has been configured.
LU  Capacity  Status  Staging  C-CTL  D-CTL  RG  RAID
0   100352    Unformat 512    0      0      0   5
```

