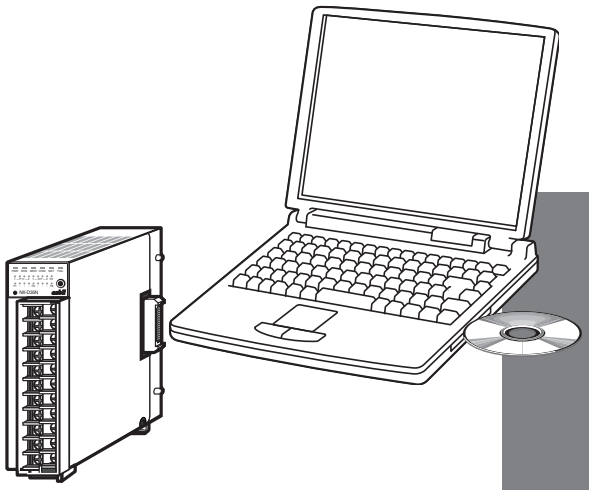
azbil

No. CP-UM-5636E

Network Instrumentation Module Smart Loader Package SLP-NX

User's Manual



Thank you for purchasing the SLP-NX.

This manual contains information for ensuring the correct use of the SLP-NX. It also provides necessary information for installation, maintenance, and troubleshooting.

This manual should be read by those who design and maintain equipment that uses the SLP-NX. Be sure to keep this manual nearby for handy reference.

Azbil Corporation

NOTICE

Be sure that the user receives this manual before the product is used.

Copying or duplicating this user's manual in part or in whole is forbidden. The information and specifications in this manual are subject to change without notice.

Considerable effort has been made to ensure that this manual is free from inaccuracies and omissions. If you should find an error or omission, please contact the azbil Group.

In no event is Azbil Corporation liable to anyone for any indirect, special or consequential damages as a result of using this product.

Modbus is a trademark and the property of Schneider Electric SE, its subsidiaries and affiliated companies.

Conventions Used in This Manual

In describing the product, this manual uses the icons and conventions listed below.

Handling Precautions:

Handling Precautions indicate items that the user should pay attention to when handling the SLP-NX.

Note: Notes indicate information that might benefit the user.

☞ This indicates the item or page that the user is requested to refer to.

[1], [2], [3]: Numbers within parentheses indicate steps in a sequence or parts of an explanation.

[Online (O)], [XX]: Square brackets indicate a window name, menu, or button shown on the PC screen.

[Ctrl] + [N]: Refers to the operation of pressing the [N] key while holding down the [Ctrl] key.

Check the following items when removing the SLP-NX (SLP-NX-J70 or SLP-NX-J71) from its package:

1. Check the model number to make sure you received the correct product.
2. Check for any obvious damage.
3. Check the contents of the package against the packing list to make sure that all items are included.

Handle the SLP-NX and its accessories with care to prevent damage or loss of parts.

If there is some problem with your order, please contact your dealer immediately.

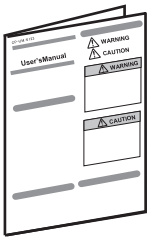
Name	Model or Document No.	Qty	Remarks
Smart Loader Package SLP-NX installation CD 	-	2	Japanese and English versions.
USB loader cable	-	1	For the SLP-NX-J70 or SLP-NX-J70PRO only.
Installation Guide 	CP-UM-5559JE	1	Please read prior to installing.
User's Manual	CP-UM-5636E	1	This manual. This manual is included in the Smart Loader Package SLP-NX installation CD as a PDF file.
Software License Agreement 	CP-UM-5603JE	1	Please read the software license agreement carefully before your installation.
USB protection key	-	1	SLP-NX-J70PRO or SLP-NX-J71PRO only.

The Role of This Manual

A total of 13 different manuals are available for the Network Instrumentation Module. Read them as necessary for your specific requirements. If a manual you require is not available, contact the azbil Group or its dealer.

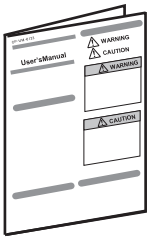
Network Instrumentation Module Smart Loader Package SLP-NX User's Manual
Manual No. CP-UM-5636E

This Manual.
This manual is included in the SLP-NX Smart Loader Package as a PDF file.
Personnel in charge of design or configuration of a system using Network Instrumentation Modules should read this manual thoroughly. The manual describes the software that is used to configure Network Instrumentation Modules with a computer. It covers the installation of the software on a personal computer, the operation of the PC, various functions, and setup procedures.



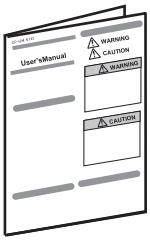
Network Instrumentation Module
NX-D15/25/35 Controller Module User's Manual for Installation
Manual No. CP-UM-5561JE

This manual is supplied with the NX-D15/25/35. Personnel in charge of design and/or manufacture of a system using the NX-D15/25/35 should thoroughly read this manual. It describes safety precautions, installation, wiring, and primary specifications.
For further information about operation, refer to the user's manual, Abridged Version.



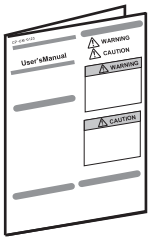
Network Instrumentation Module Communication Box NX-CB1 User's Manual for Installation **Manual No. CP-UM-5558JE**

This manual is supplied with the NX-CB1. Personnel in charge of design and/or manufacture of a system using the NX-CB1 should read this manual thoroughly. It describes safety precautions, installation, wiring, and primary specifications.



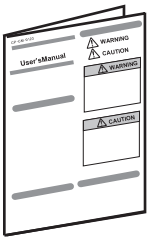
Network Instrumentation Module NX-CB2 Communication Box User's Manual for Installation
Manual No. CP-UM-5715JE

This manual is supplied with the NX-CB2. Personnel in charge of design and/or manufacture of a system using the NX-CB2 should read this manual thoroughly. It describes safety precautions, installation, wiring, and primary specifications.



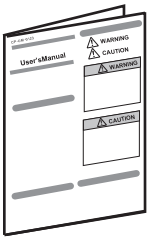
Network Instrumentation Module NX-DX1 Digital Input Module
NX-DX2 Pulse Input Module
User's Manual for Installation **Manual No. CP-UM-5560JE**

This manual is supplied with the NX-DX1/DX2.
Personnel in charge of design and/or manufacture of a system using the NX-DX1/DX2 should read this manual thoroughly. It describes safety precautions, installation, wiring, and primary specifications.



Network Instrumentation Module NX-S11/12/21 Supervisor Modules
User's Manual for Installation **Manual No. CP-UM-5557JE**

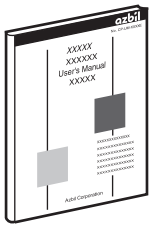
This manual is supplied with the NX-S11/12/21.
Personnel in charge of design and/or manufacture of a system using the NX-S11/12/21 should thoroughly read this manual. It describes safety precautions, installation, wiring, and primary specifications.



Network Instrument Module NX-DY1/2 Digital Output Module
User's Manual for Installation

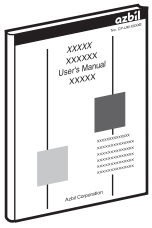
Manual No. CP-UM-5564JE

This manual is supplied with the NX-DY1/2.
Personnel in charge of design and/or manufacture of a system using the NX-DY1/2 must thoroughly read this manual. It describes safety precautions, installation, wiring, and primary specifications.



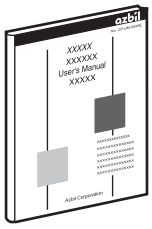
Network Instrumentation Module Controller module NX-D15/25/35
User's Manual of Function **Manual No. CP-SP-1308E**

Personnel who are using the NX-D15/25 for the first time or who are in charge of hardware design and/or maintenance of a control panel containing the NX-D15/25 should read this manual thoroughly. This manual describes the hardware, surveys the NX-D15/25 and other products used with it, explains installation, wiring, and troubleshooting, and gives hardware specifications.



Network Instrumentation Module Digital Input/Pulse Input Module
NX-DX1/DX2 User's Manual of Functions **Manual No. CP-SP-1323E**

Personnel who are using the NX-DX1/DX2 for the first time or who are in charge of hardware design and/or maintenance of a control panel containing the NX-DX1/DX2 should read this manual thoroughly. This manual describes the hardware, surveys the NX-DX1/DX2 and other products used with it, explains installation, wiring, and troubleshooting, and gives hardware specifications.



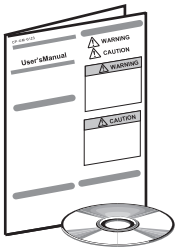
Network Instrumentation Module NX-S11/12/21 Supervisor Module
User's Manual Functions **Manual No. CP-SP-1324E**

Personnel who are using the NX-S11/12/21 for the first time or who are in charge of hardware design and/or maintenance of a control panel containing the NX-S11/12/21 should read this manual thoroughly.
This manual describes the hardware, surveys the NX-S11/12/21 and other products used with it, explains installation, wiring, and troubleshooting, and gives hardware specifications.

Network Instrumentation Module User's Manual
Network Design Version

Manual No. CP-SP-1313E

Personnel who are in charge of design of a network using the Network Instrumentation Module should read this manual thoroughly. It describes how to design a network and gives examples.



Network Instrumentation Module
SLP-NX Smart Loader Package Installation Guide

Manual No. CP-UM-5559JE

This manual is supplied with the SLP-NX Smart Loader Package and describes installation of the software on a personal computer.

Network Instrument Module NX-DY1/2 Digital Output Module
User's Manual for Function **Manual No. CP-SP-1345E**

Personnel who are using the NX-DY1/2 for the first time or who are in charge of hardware design and/or maintenance of a control panel containing the NX-DY1/2 should read this manual thoroughly.
This manual describes the hardware, surveys the NX-DY1/2 and other products used with it, explains installation, wiring, and troubleshooting, and gives hardware specifications.

Organization of This User's Manual

This manual is organized as follows:

Chapter 1. INTRODUCTION

Be sure to read this chapter before you start using the loader.
This chapter describes the required operating environment for personal computers, explains how to install the package, and briefly introduces the functions.

Chapter 2. STARTING AND QUITTING THE LOADER

This chapter describes how to start and quit the loader.

Chapter 3. LOADER WINDOW LAYOUT

This chapter explains the configuration of windows for this loader and the roles of each window.

Chapter 4. WORK FLOW

This chapter explains how to set up parameters in the modules and the work flow for operating modules.

Chapter 5. ACTUAL MODULE COMMUNICATION SETTINGS

This chapter explains the address settings and communication settings required for module communications.

Chapter 6. PARAMETER SETTING

This chapter explains how to set up parameters for operating modules.

Chapter 7. UNIVERSAL MONITOR

This chapter explains how to change settings and describes the screens for monitoring the operation status.

Chapter 8. PID Simulator

This chapter explains the PID Simulator software and tells how to use it to adjust the PID values.

Chapter 9. RESTRICTIONS AND IMPORTANT NOTES ON USE

This chapter explains restrictions and important points for use.

Appendix -1 EXPLANATION OF TERMINOLOGY

Appendix -2 VERSION HISTORY

Appendix -3 Loader Support Corresponding to Module Versions

Contents

Chapter 6. PARAMETER SETTINGS

Chapter 7. UNIVERSAL MONITOR

Chapter 8. PID Simulator

Chapter 9. RESTRICTIONS AND IMPORTANT NOTES ON USE

Appendix

Chapter 1. INTRODUCTION

1 - 1 Overview

The Smart Loader Package: SLP-NX (called the “loader” from here on) is a software package for monitoring the settings and operational status of all Network Instrumentation Modules (called “modules” from here on).

■ Loader Functions

This loader mainly performs the following operations for modules via Ethernet or when connected to a loader jack.

- Confirms/sets communication settings such as IP addresses.
  (With separate or combined modules. Combined operation is only done via Ethernet.)
- Reads/writes parameters
  (With separate or combined modules. Combined operation is only done via Ethernet.)
- Monitors online data, changes parameters, and samples data (with separate or combined modules. Combined operation is only done via Ethernet.)

1 - 2 System Requirements

The following system environment is required to use this loader.

■ System Environment

Type	Description	
Hardware	Computer	PC/AT compatibles with Pentium chip or higher Recommended: 1.5 GHz or higher Core 2, minimum 1 GHz
	Operating system	Windows 7 Professional or Home Premium 32/64-bit SP1(English) Windows 8.1/8.1 Professional 32/64-bit (except RT) Windows 10/10 Professional 32/64bit
	Memory	Recommended: 4 GB or more, minimum 2 GB
	Hard disk drive	Recommended free space: 60 GB or more, minimum 40 GB
	Display	1024 × 768 pixels or more, 16-bit or higher color recommended
	CD-ROM drive	One drive
	Ethernet port	1 port or more (if modules are connected via an Ethernet cable). Note: Do not use USB Ethernet adapter.
	USB port	1 port or more (if the dedicated cable for module connection and PID Simulator are used at the same time, each of them requires one port) Note: The above applies only if the USB loader cable or USB protection key is used.
	Pointing device	Windows-compatible mouse or equivalent device
Other	.NET Framework 4.6.2 Note. .NET Framework 4.6.2 is pre-installed on Windows 10 version 1607. Windows 10 RTM and Windows 10 version 1511 must be upgraded to version 1607 using Windows Update. SQL Server 2014 Express Local DB SP2 *1 Note: The above software is installed if needed.	

[!] Handling Precautions

*1 The loader uses SQL Server 2014 Express Local DB SP2.
Successful operation of the product cannot be guaranteed if Microsoft SQL Server 2000, 2005, 2008, 2008R2, 2012, 2016 or 2018 is used or will be used in the future.
It is recommended that you use a separate PC if you need to run older or newer versions of Microsoft SQL Server alongside Microsoft SQL Server 2014.

* Select [Control Panel] → [Regional Settings] → [Number] → [Decimal symbol] to check that "." is set. If any other symbol is set, the SLP-NX will not work properly.
Example:
For Windows 7/8.1/10, go to [Control Panel] → [Clock, Language, and Region] → [Region and Language] → [Formats] → [Additional settings...] → [Numbers] → [Decimal symbol].

* For Windows 8.1/8.1 Pro/10/10 Pro, use a REV.05/REV.06 or later USB loader cable.

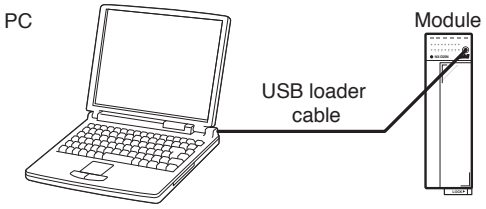
■ Connection to Modules

Handling Precautions

- Multiple SLP-NXs cannot be connected to a single module at the same time.

● Connection via dedicated cable

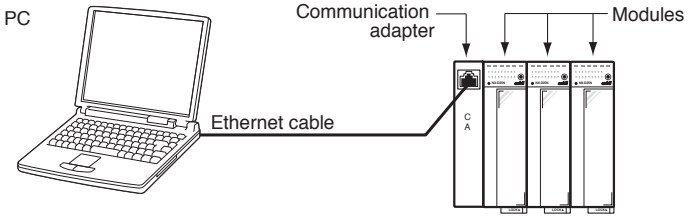
This connection method is limited to projects consisting of a single module.



Handling Precautions

- In the case of multi-loop cooperative control using the supervisor module, multiple module settings are configured at the same time. Therefore this connection method should not be used.

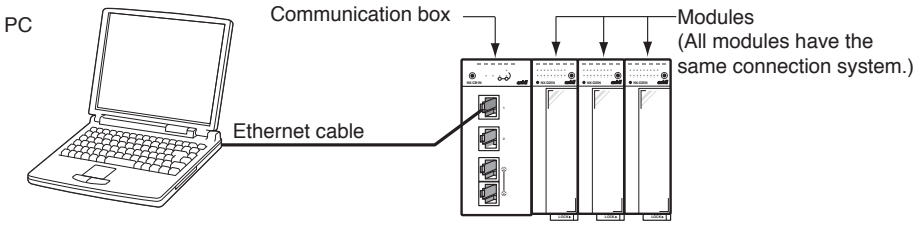
● Ethernet Connection 1 Connection Via Communication Adapter



Handling Precautions

- This connection is allowed only with non-ring communication modules.

● Ethernet Connection 2 Connection Via Communication Box



Handling Precautions

- Connection is allowed with both ring and non-ring communications. However, make sure all modules are of the same type.
- Connection is still allowed when a general-purpose switching hub is located between the PC and communication box.
- Use a UTP cable (4P) Cat 5e or higher (straight), (ANSI/TIA/EIA-568-B) for the Ethernet cable.

Note

☞ 2-5 "Configuration With External Devices ■ SLP-NX" (page 2-18) in Network Instrumentation Module User's Manual for Network Design (CP-SP-1313E)

1 - 3 Installing the USB Loader Cable Device Driver

A device driver must be installed before using the USB loader cable.
Follow the procedure below to install the device driver.

■ Installing the Device Driver

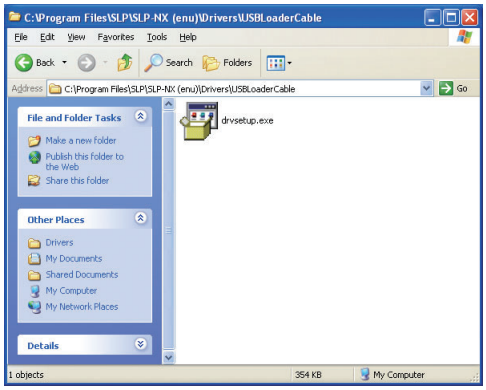
Handling Precautions

- Be sure to follow the procedure below when installing the device driver. The USB cable may not be recognized if the procedure is not followed. If the cable is not recognized, uninstall the driver and then install it again.
- Administrator privileges on the computer are required for device driver installation. Installation should be done by the administrator or by a user who belongs to the administrator group.
  The USB loader cable is compatible with Windows 7/8.1 (32-bit and 64-bit versions).
- If there are multiple USB ports, connect the USB loader cable to the same port every time. If it is connected to a different port, driver installation may be required again.

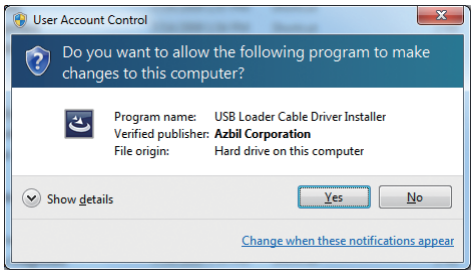
1. Install the USB loader cable driver.

>>Open the loader destination folder “USBLoaderCable” in Windows Explorer.
If the installation destination was not changed, the folder is located as follows.

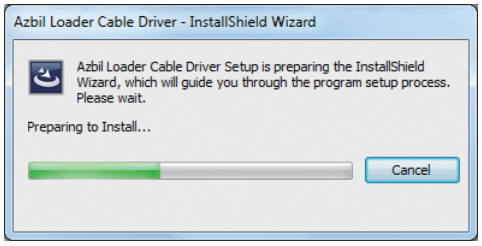
- For Windows 7/8.1 (32-bit version)
  C:\Program Files\SLP\SLP-NX (enu)\Drivers\USBLoaderCable
- For Windows 7/8.1 (64-bit version)
  C:\Program Files(x86)\SLP\SLP-NX (enu)\Drivers\USBLoaderCable



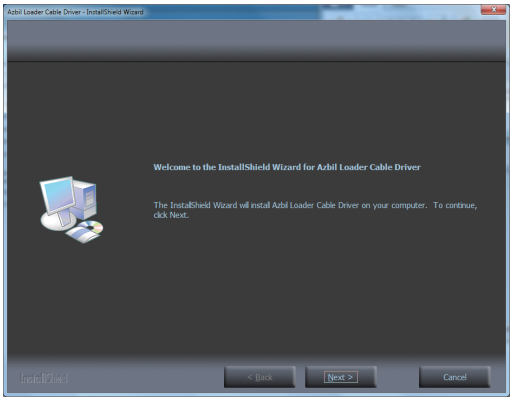
[1] Double-click [drvsetup.exe].
>> The following screen appears:



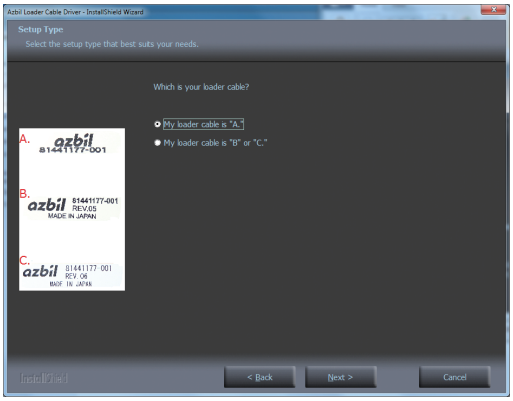
[2] Click the [Yes] button.
>> Installation preparation begins, and the following screen appears:



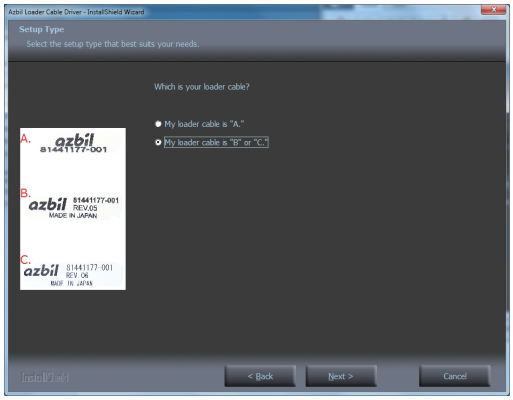
[3] When installation preparation is complete, the following screen appears:



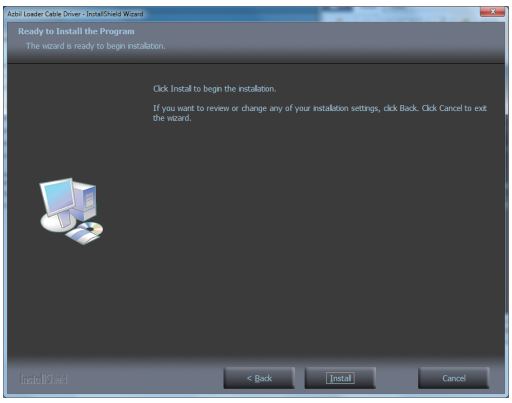
[4] Click the [Next >] button.
>> The following screen appears:



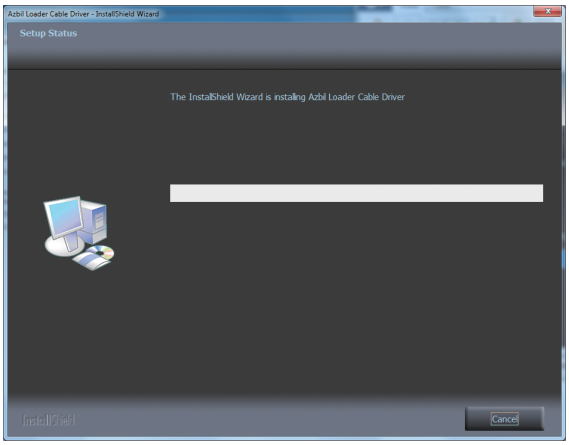
[5] Select a seal of your loader cable.

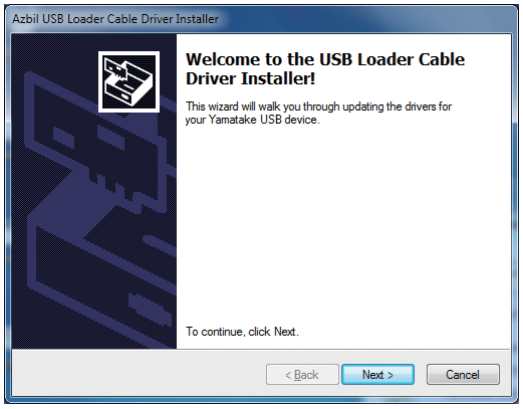


Click the [Next >] button.



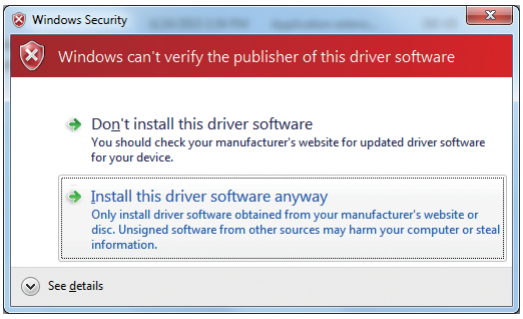
[6] Click the [Install] button.
>> This starts the loader cable driver installation.

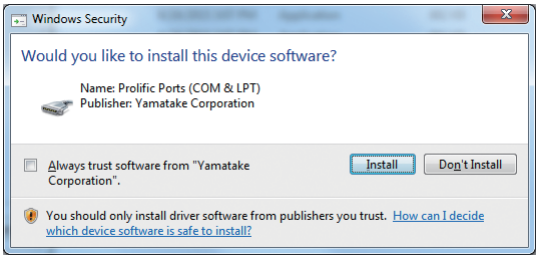




Handling Precautions

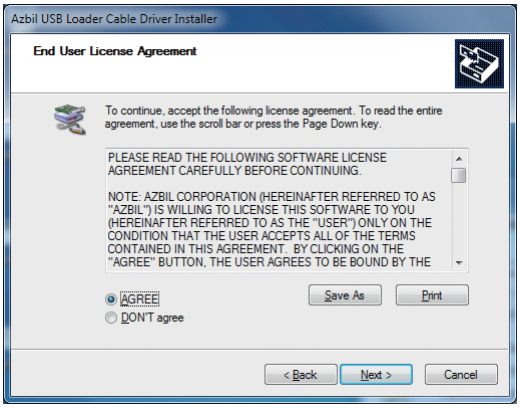
- If the following screen is displayed on Windows 7/8.1, click the [Install] button.





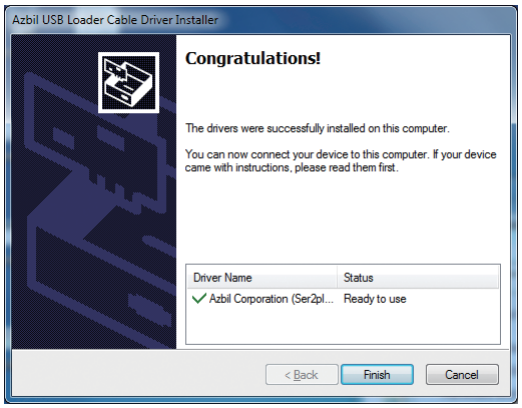
[7] Click the [Next >] button.

>>The following screen appears:

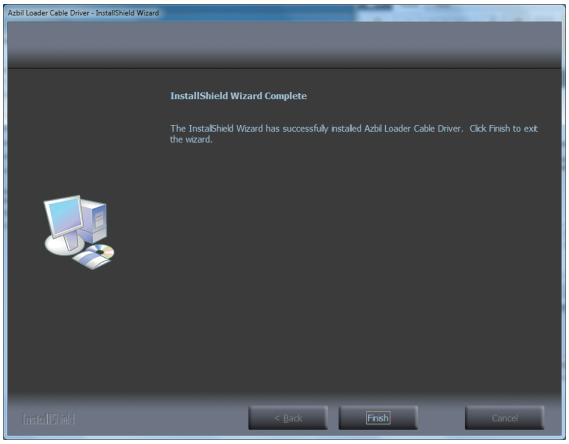


[8] If you agree to the software license agreement and wish to install the program, select the [AGREE] button, then click the [Next >] button.

>>The installation program then starts up, and after it is completed, the following screen appears:



Click the [Finish] button.



[9] Click the [Finish] button to complete installation.

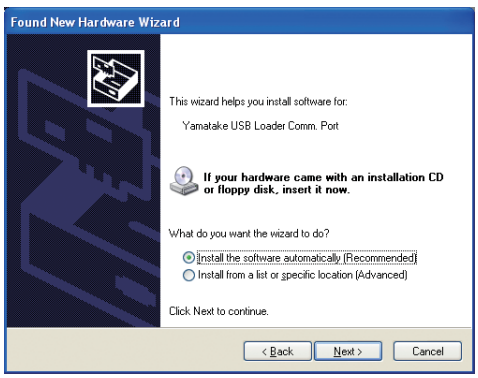
2. Insert the USB loader cable into the USB port.

>>When Windows recognizes the USB cable, the notification shown below appears on the task tray and the driver installation wizard appears.

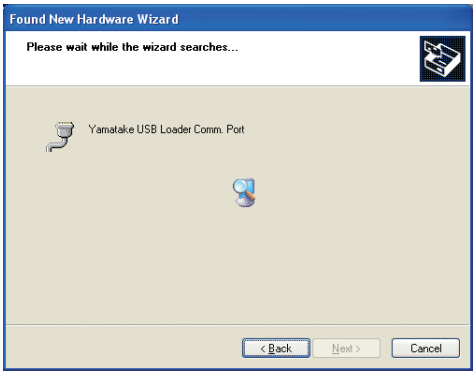
3. Install the device driver.

[1] Usually, when Windows recognizes the USB loader cable, the window shown below appears. (Display of the window depends on the Windows environment. If the window is not shown, skip to step 4.)
Select [No, not this time] and click the [Next >] button.

[2] For the retrieval location of the device driver to be installed, select [Install the software automatically (Recommended)] and click the [Next >] button.



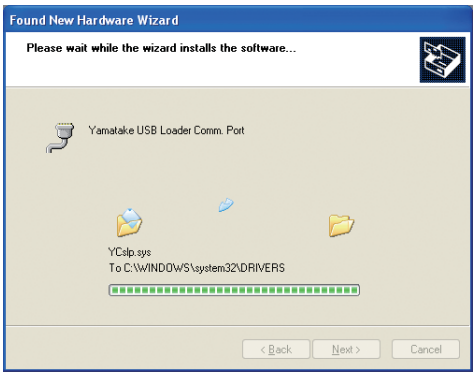
>>Retrieval of the device driver starts.



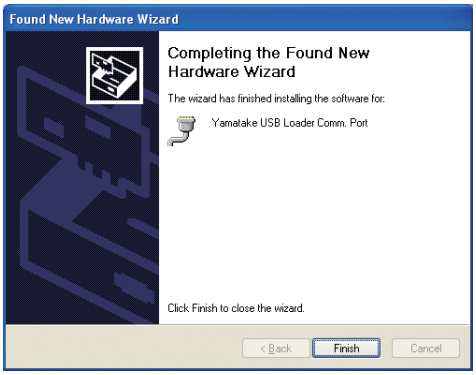
>>When the device driver is found, the following window appears:

[3] Click the [Continue Anyway] button.

>>Installation of the device driver starts

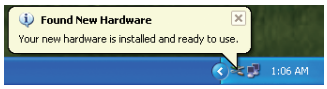


>>When the device driver installation is complete, the following window appears:

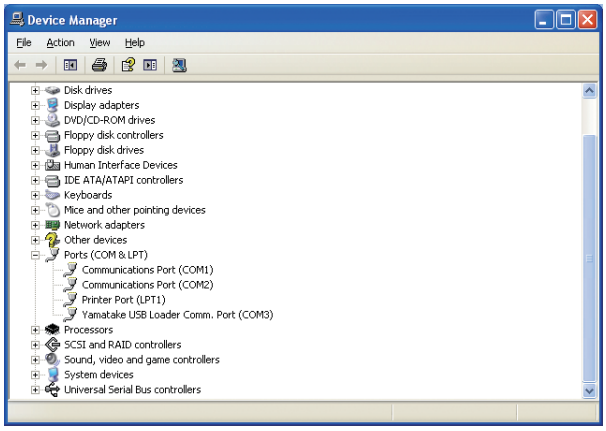


[4] Click the [Finish] button.

>>When the installation is completed, the notification shown below appears on the task tray, and Windows now correctly recognizes the USB loader cable.



[5] Select [Control Panel] → [System] → [Hardware] → [Device Manager], and find the port number for the Yamatake USB Loader Comm.Port from [Ports (COM & LPT)].



[6] Start up the loader, then from the Project window's menu bar, select [Online] → [Communications Path] to open the [Communications path] dialog box, and select [Loader jack].
Click [Advanced] to open the [Serial Communication] dialog box, confirm that the communication port checked in [5] is set, and click [OK].

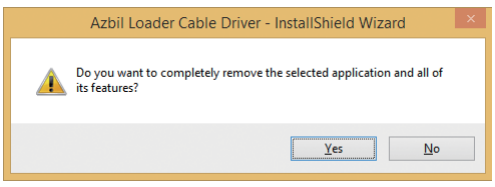
■ Uninstalling the Device Driver

Handling Precautions

- Removing the driver requires restarting the computer. Close other applications first, and then uninstall the driver.
- To uninstall the driver, administrator privileges are required on the computer. Installation should be done by the administrator or by a user who belongs to the administrator group.

1. Execute the driver removal program.

[1] Open [Control Panel]. Click [Programs and Features] and select [Azbil Loader Cable Driver]. Then click [Uninstall].



[2] Click the [Yes] button.

[3] Restart the computer.

1 - 4 Installing the USB Protection Key Driver

To use PID Simulator with the SLP-NX professional version, it is necessary to install the device driver.
Follow the procedure below to install the device driver.

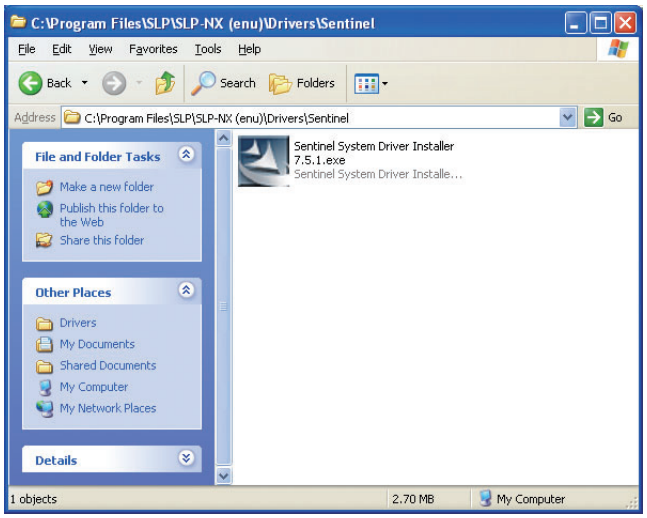
■ Installing the Device Driver

Handling Precautions

- Be sure to follow the procedure below when installing the device driver.
  The USB protection key may not be recognized if the procedure is not properly followed.
  If the key is not recognized, reinstall the driver, or uninstall it and then reinstall it.
- Administrator privileges on the computer are required for device driver installation. Installation should be done by the administrator or by a user who belongs to the administrator group.
  The USB loader cable is compatible with Windows 7/8.1 (32-bit and 64-bit versions).
- If there are multiple USB ports, connect the USB Protection Key to the same port every time. If it is connected to a different port, driver installation may be required again.

1. Install the USB protection key driver.

>>Open the loader destination folder “Sentinel” in Windows Explorer.
If the installation destination was not changed, the folder is located in C:\Program Files\SLP\SLP-NX (enu)\Drivers\Sentinel.

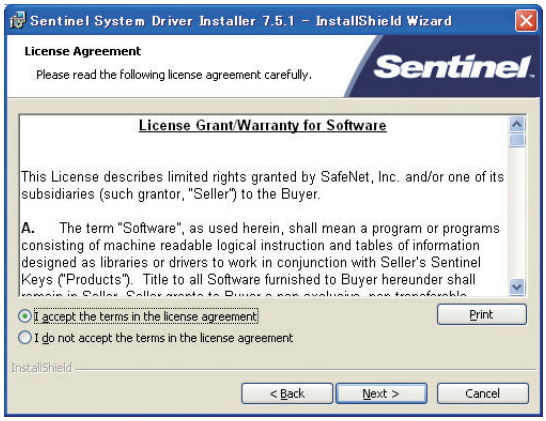


[1] Double-click [Sentinel System Driver Installer 7.5.1.exe].

>>The following screen appears.

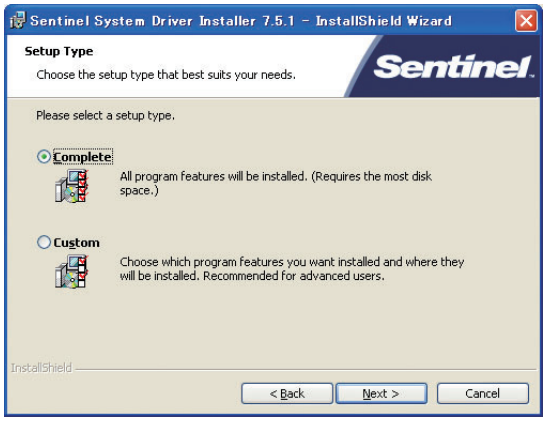
[2] Click the [Next >] button.

>>The following screen appears.



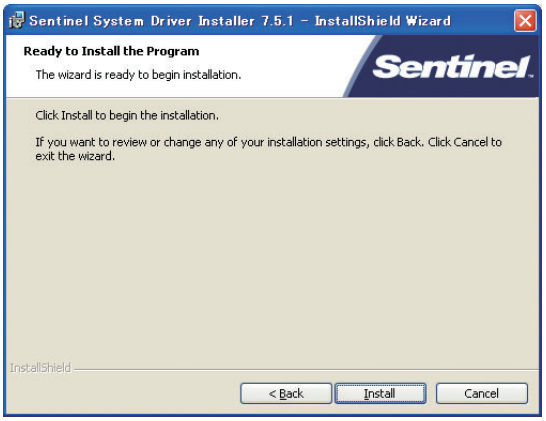
[3] If you accept the software license agreement and wish to install the software, select [I accept the terms in the license agreement] and click the [Next >] button.

>>The following screen appears.



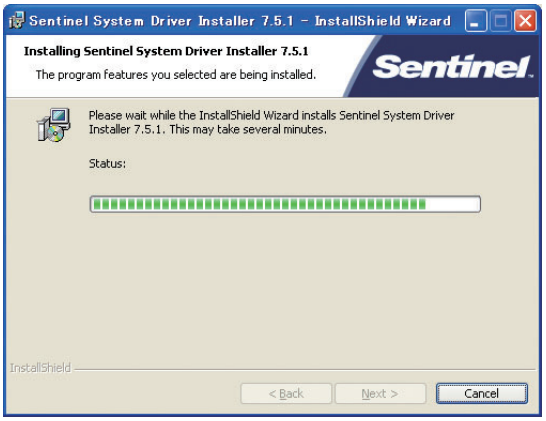
[4] Click the [Next >] button.

>>The following screen appears.

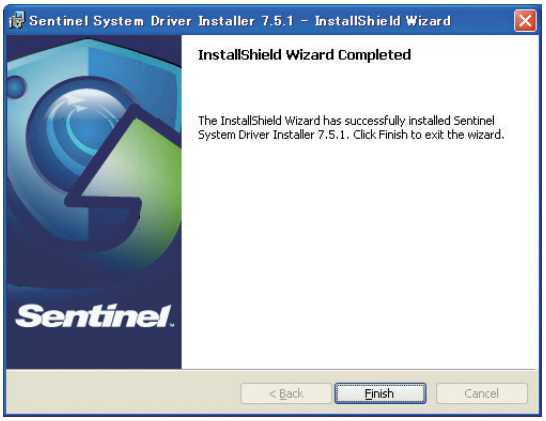


[5] Click the [Install] button.

>>Installation of the USB protection key driver begins.



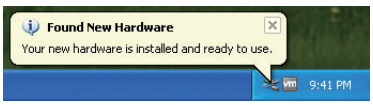
>>When installation is complete, the following screen is displayed.



[6] Click the [Finish] button to complete installation.

2. Insert the USB protection key into a USB port.

>>When Windows recognizes the USB protection key, the following notification appears on the task tray and the key can be used.

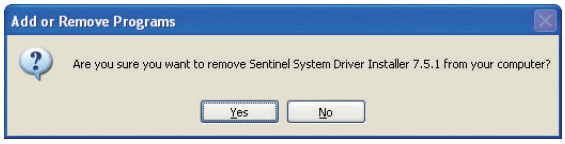


■ Uninstalling the device driver

Handling Precautions

- After uninstalling the driver, reboot the computer.
  Close other applications before uninstalling the driver.
- To uninstall the driver, administrator privileges on the computer are required.
  Removal of the driver should be done by the administrator or by a user who belongs to the administrator group.

[1] Open [Control Panel]. Click [Add or Remove Programs] and select [Sentinel System Driver Installer 7.5.1] and then click the [Delete] button.



[2] Click the [Yes] button.

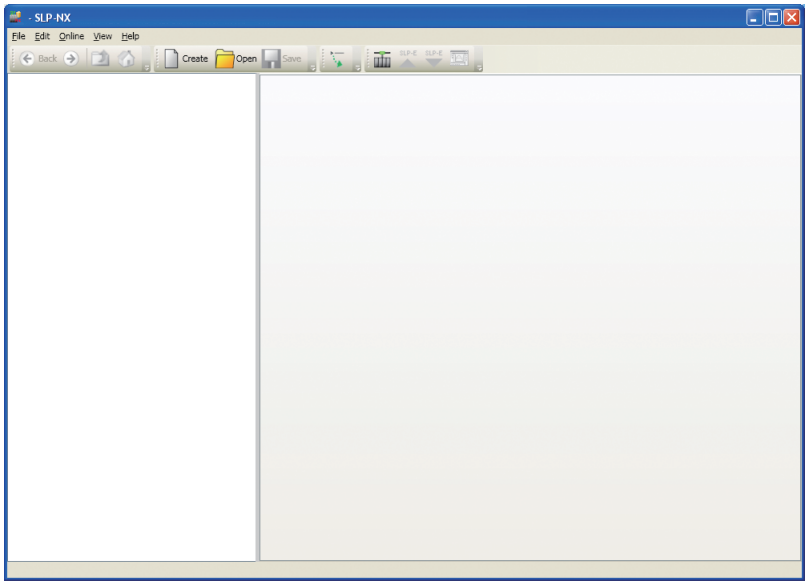
[3] Reboot the computer.

Chapter 2. STARTING AND QUITTING THE LOADER

2 - 1 Starting the Loader

Select [SLP-NX] from the Start Menu.

>>Once started up, a Project window is displayed as shown below.

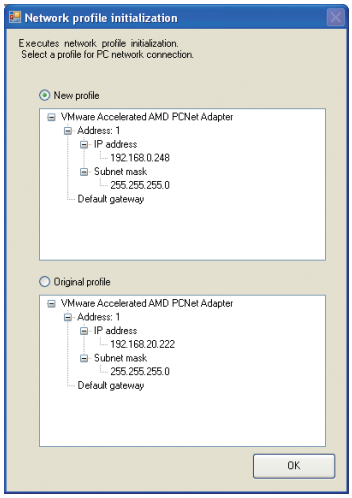


Handling Precautions

- Administrator privileges on the computer are required for operating the loader. Installation should be done by the administrator or by a user who belongs to the administrator group.

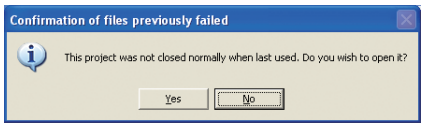
Note

- A network profile function is provided that allows you to temporarily change the network settings of the PC to which the module will be connected, but only while the loader is starting up.
  ■ Network Profile (page 5-31), or
  ■ How to Select [Auto configuration from actual module] to Create a Project - Step [4] (page 6-8), if a network profile to be used for the loader is already created, the following dialog box will appear at startup:



In this case, use the Radio button to select [Original profile] (current network settings), or select the name of the network profile used when previously running the loader.
When you select a network profile name, change the PC's network settings with the values for that network profile and then continue starting up the loader.
After the loader has started up, change the network profile with the same procedure used for ■ Network Profile (page 5-31).

- If the loader is exited abnormally during project editing, the following message box will be displayed the next time the loader is started up.
  Click the [Yes] button, and the project will open.

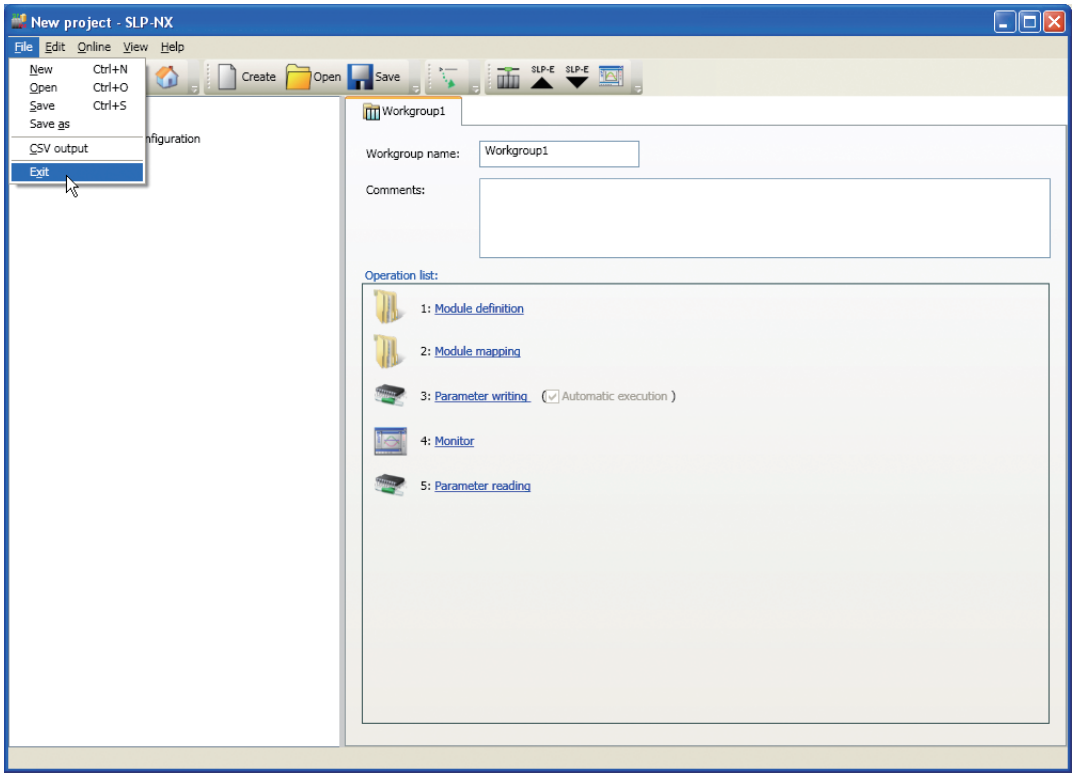


Handling Precautions

- If the loader is exited abnormally while running, the PC's network settings will remain as they were while the loader was running.
  Start up the loader, open the Network Profile window, then take appropriate action as described in ■ Network Profile (page 5-31).
  You can return to the network settings used before the loader's previous startup.

2 - 2 Quitting the Loader

To quit the loader, select [File] from the Project window's menu bar, then select [Exit],



Note

- If the computer's network settings were changed with the network profile function, they will return to normal when you quit the loader.

Chapter 3. LOADER WINDOW LAYOUT

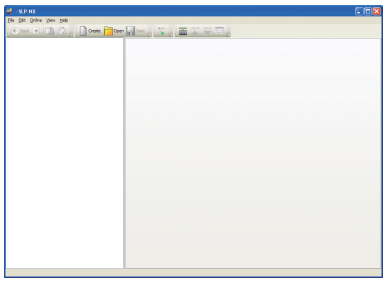
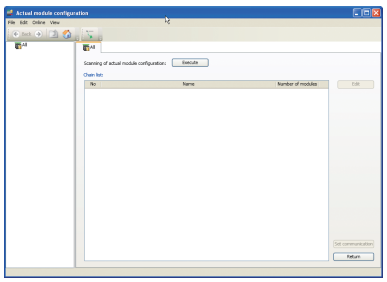
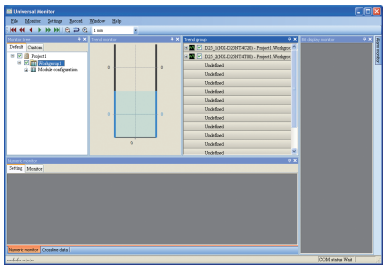
3 - 1 The Layout and Role of Windows

■ The Layout and Role of Loader Windows

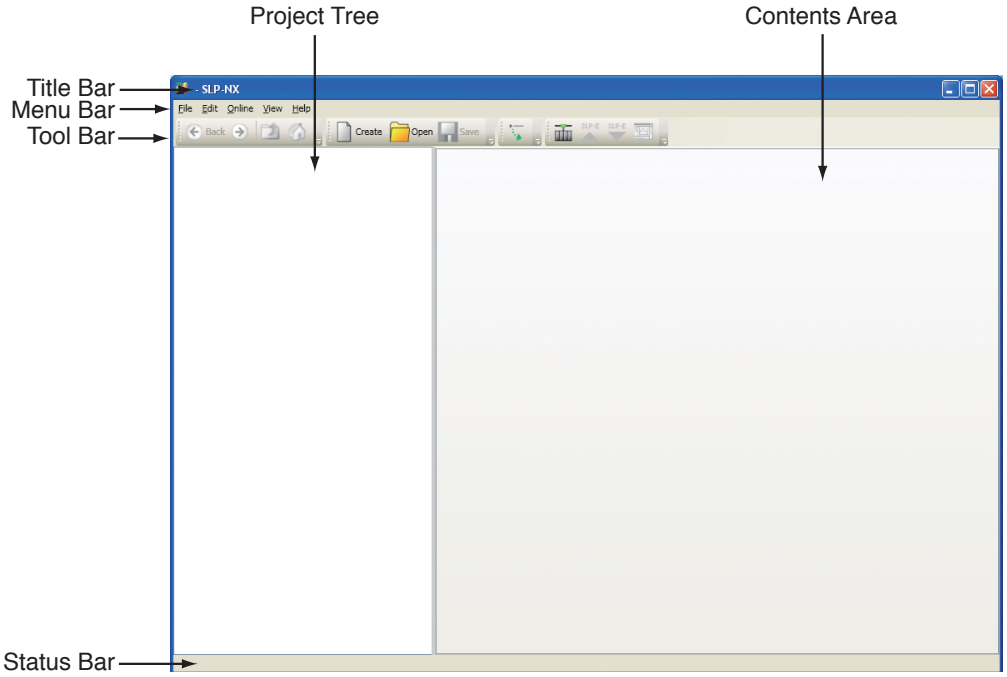
The loader has the following basic windows:

- Project window
- [Actual module configuration] window
- [Universal monitor] window

Explanations for each of these windows are shown below.

Name	Role	Window Image
Project window	This window is used to set the parameters of the modules required for system operation. ☞This chapter and Chapter 6. PARAMETER SETTINGS	
[Actual module configuration] window	This window is used to configure the settings for modules required for basic communication with the outside of them. ☞■ Actual Module Configuration Tree Levels (P. 5-4)	
[Universal monitor] window	This window is used to monitor module operations. It enables you to monitor multiple module operations at once. ☞7 - 3 Universal Monitor Window (P. 7-3)	

■ Project Window Layout



● **Title Bar**

The opened project name, loader name and version are displayed here.

● **Menu Bar**

Used to select or run various operations.
Available operations vary depending on what is displayed in the project tree and contents area.

● **Tool Bar**

Frequently used operations from among menu items are available as buttons on the tool bar.

● **Project Tree**

Items to be managed in projects are displayed in a hierarchical structure.
Click on an item to select it, and its corresponding setup screen will be displayed in the contents area.
☞ ■ Project Tree Levels (next page)

● **Contents Area**

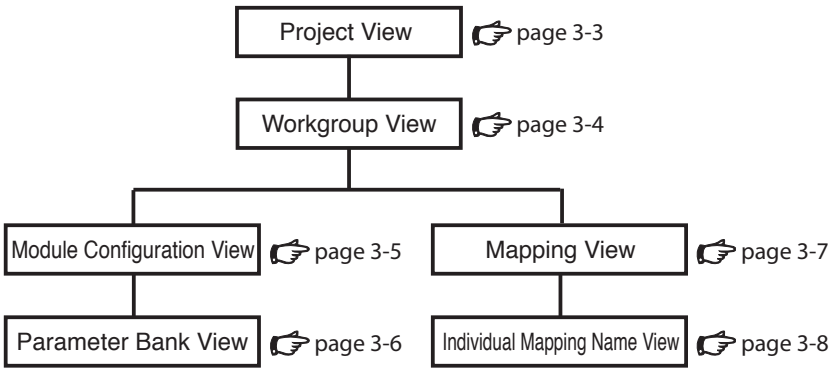
A setup screen is displayed here for items selected from the project tree.

● **Status Bar**

High-level communication addresses, setting ranges, etc. are displayed here for selected parameters.

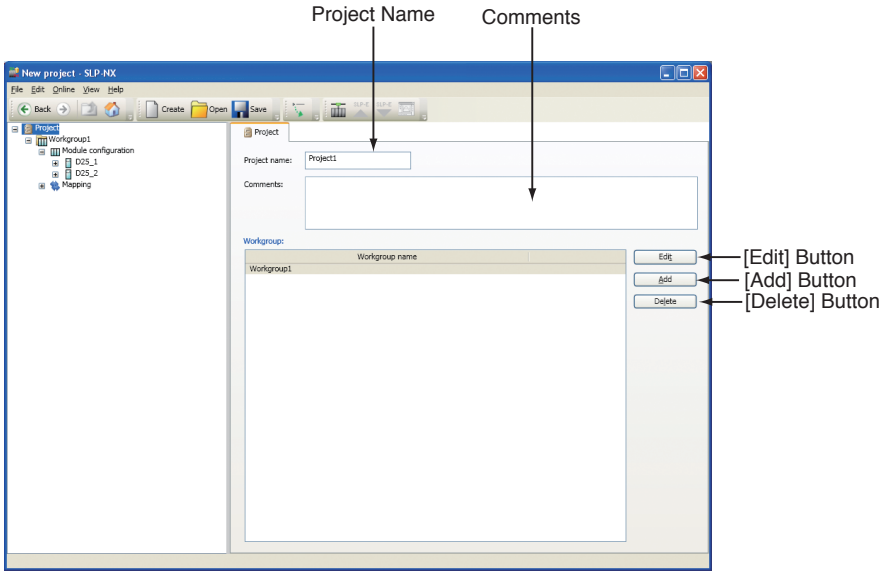
■ Project Tree Levels

The project tree hierarchy is constructed as follows.



The following explains what is displayed in the contents area when you select each of these levels from the project tree.

● Project View



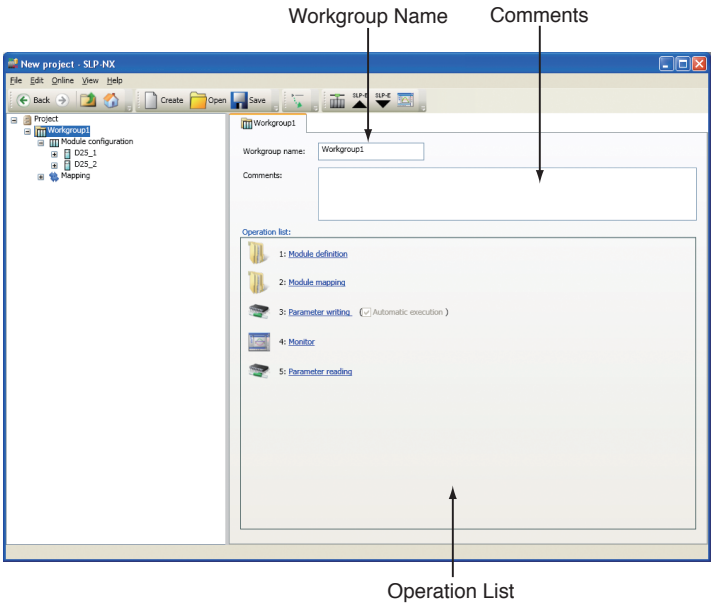
[Project] is displayed at the top level of the project tree.
When you select [Project] from the project tree, a project view is opened.
Workgroups can be added or deleted in the contents area.

- [Project Name]
  Sets the project's name.
- [Comments]
  Defines comments.
- [Edit] button
  The applicable workgroup in the project tree is selected.
- [Add] button
  Adds a workgroup.
- [Delete] button
  Deletes a workgroup.

Handling Precautions

- For project names, tag names, etc., use alphanumeric character strings only. If Unicode strings or the like are used, they may be garbled during CSV output, etc.

● Workgroup View

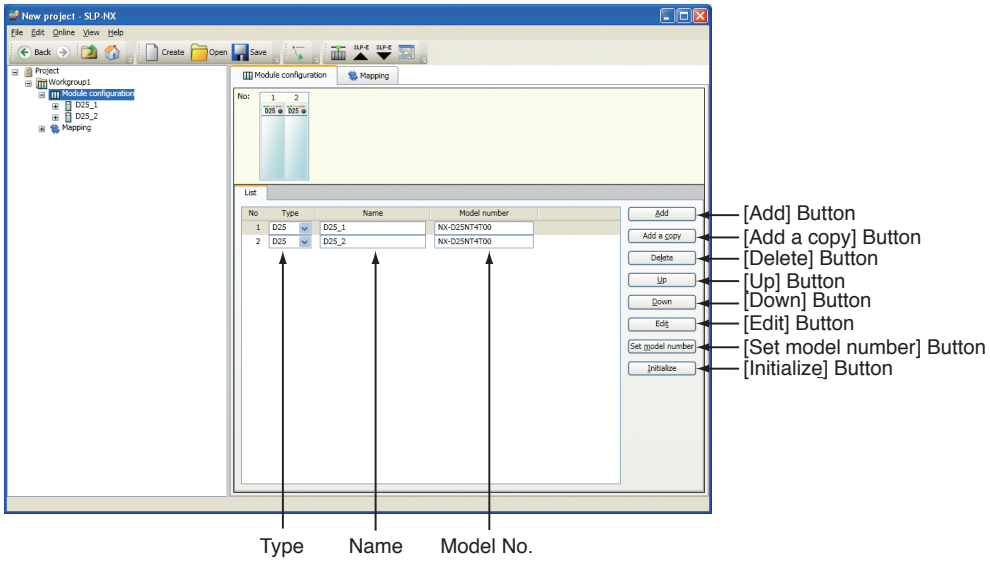


The [Workgroup] view is one level below the [Project] view.
In the [Workgroup] view, you define a cluster of methods, consisting of more than one module.
[Operation list] in the contents area contains the following items for the entire workgroup:

- [1: Module definition]
  When you click this, the Module Configuration view is displayed.
- [2: Module mapping]
  When you click this, the Mapping view is displayed.
- [3: Parameter writing]
  This allows you to write all parameters onto the module.
- [4: Monitor]
  This allows you to initiate the Universal Monitor.
- [5: Parameter reading]
  This allows you to read all parameters from the module.

For each workgroup, [Workgroup name] and [Comments] can be defined.

● Module Configuration View



[Module configuration] and [Mapping] views are one level below the [Workgroup] view.

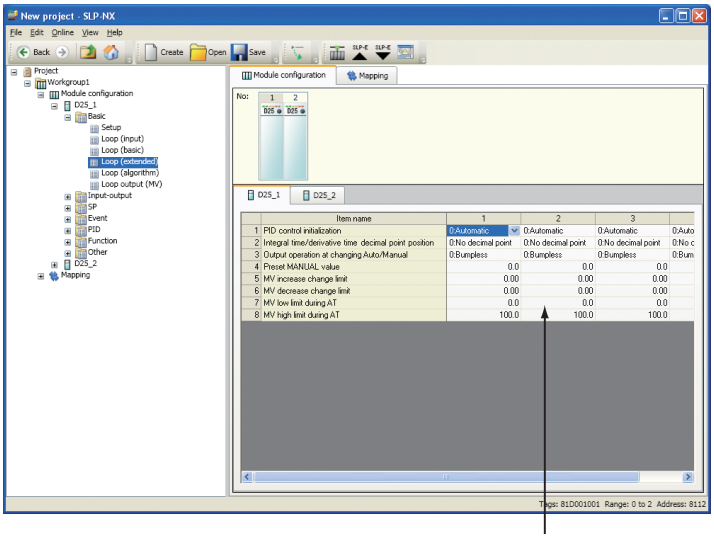
When [Module configuration] is selected in the project tree, you can define the configuration of modules belonging to the workgroup in the contents area.

When an actual module is used, selecting [Automatic configuration from actual module] in the [Create new project] dialog box allows you to automatically define the module configuration, so you don't have to do it manually.

The following settings can be made in the [Module configuration] view:

- [Add] button
  Adds a module.
- [Add a copy] button
  Adds a module with the parameter settings of any defined module.
- [Delete] button
  Deletes a module.
- [Up] button
  Moves the definitions of the selected module up one level in the list.
- [Down] button
  Moves the definitions of the selected module down one level in the list.
- [Edit] button
  Moves to the Parameter Bank view for the module selected in the project tree.
- [Set model number] button
  Displays the [Module model number setting] dialog box for the selected module.
- [Initialize] button
  Restores the initial parameters of the selected module.
- [Type]
  Defines the module's type (typical model number).
- [Name]
  Defines the module's name.
- [Model No.]
  In this box, you enter the module's model number manually.

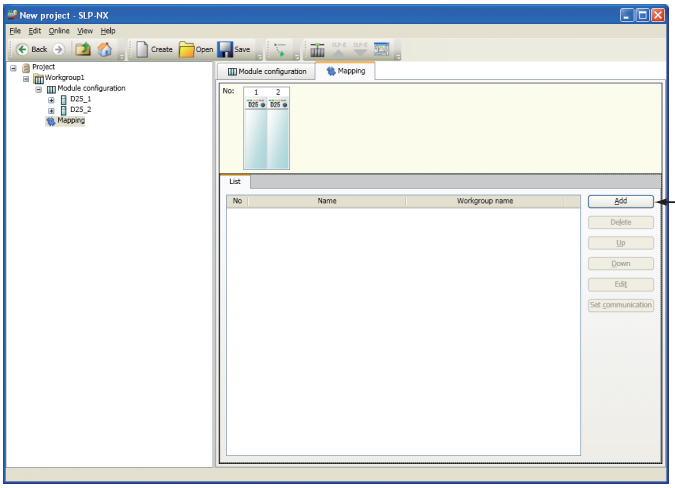
● Parameter Bank View

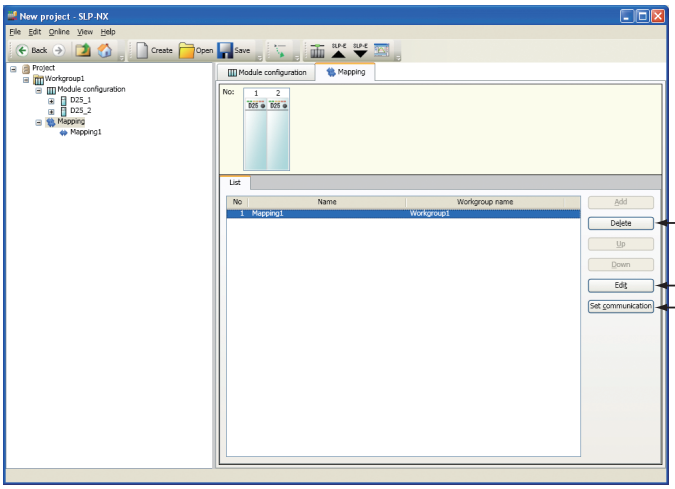


The Parameter Bank view is one level below the [Module configuration] view.
The Parameter Bank view has categories for each module on the tree, which are divided into levels.
Refer to each module's manual for the meaning and operation of each parameter.

- Editor Grid
  In this area, you can set the values of parameters belonging to the Parameter Bank.

● Mapping View



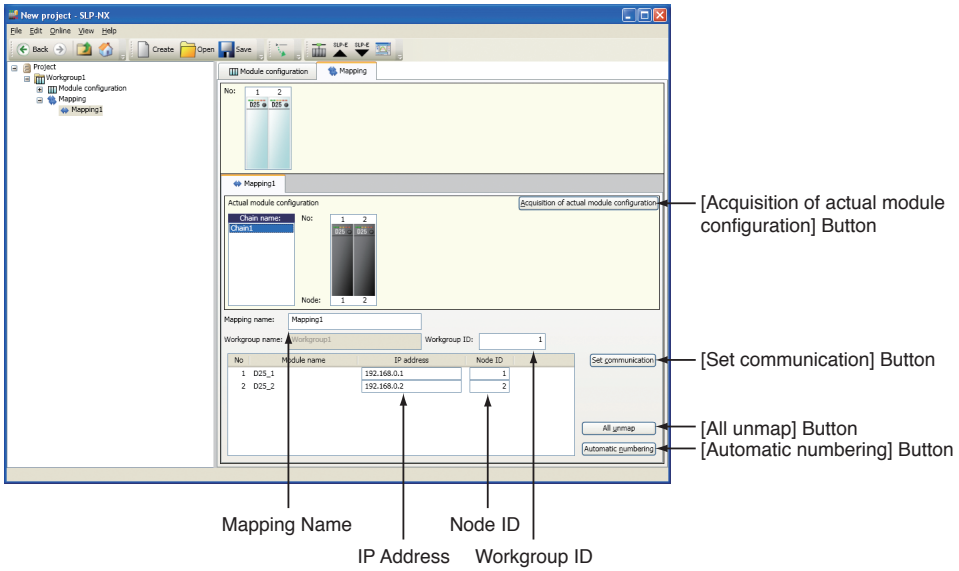


[Module configuration] and [Mapping] views are one level below the [Workgroup] view.

When [Mapping] is selected in the project tree, the following settings can be made in the contents area.

- [Add] button
  Adds mapping to each module and actual module belonging to a workgroup.
- [Delete] button
  Deletes mapping from each module belonging to a workgroup, to an actual module.
- [Edit] button
  Moves to the Individual Mapping Name view for the selected mapping.
- [Set communication] button
  This allows you to configure communication settings that are common to all modules within a workgroup, and RS-485 communication settings for each module.
- [Up] [Down] buttons are unsupported.

● Individual Mapping Name View



The Individual Mapping Name view is one level below the [Mapping] view. When an Individual Mapping Name is selected in the project tree, you can move the mapping from each module to an actual module in the contents area.

- [IP address], [Node ID], [Workgroup ID]
  In each of these boxes you can set a value manually.
- [Mapping name]
  You can change the name of a mapping.
- [Acquisition of actual module configuration] button
  Used to map a scanned module.
  The [Actual module configuration] window is displayed.
- [Set communication] button
  The [Communication settings (module)] dialog box is displayed.
- [All unmap] button
  Unmaps the modules.
  Module illustrations are grayed out in the Actual Module Configuration contents area.
- [Automatic numbering] button
  Numbers all IP address and node IDs.

Handling Precautions

- To change the IP address, node ID or workgroup ID of a module that is using data transfer function between modules or multi-loop cooperative control,
  ☞■ Changing the IP Address, etc. of a Module That Is Using Data Transfer Function between Modules or Multi-Loop Cooperative Control (P. 9-4).
- Do not add leading zeroes to IP addresses.

■ Project Window - Menu Configuration List

Menu	Submenu 1	Submenu 2	Description	Shortcut Keys	Remarks
File	New	—	Creates a new project. (Offline, from Actual Module Configuration)	[Ctrl + [N]	
	Open	—	Opens the project.	[Ctrl] + [O]	
	Save	—	Overwrite saves the project.	[Ctrl] + [S]	When the project is open.
	Save as	—	Saves the project with a different name.	—	
	CSV output	—	Outputs parameter settings as a CSV file.	—	
	Exit	—	Exits the loader.	—	If the Universal Monitor is running, it will also exit.
Edit	Cut	—	Cuts data.	[Ctrl] + [X]	Enabled when data that can be cut is selected.
	Copy	—	Copies data.	[Ctrl] + [C]	Enabled when data that can be copied is selected.
	Paste	—	Pastes data.	[Ctrl] + [V]	Enabled when pastable data has been cut or copied.
	Workgroup independent mode	—	Switches to Workgroup independent mode.	—	Unsupported
	Data check	—	Checks parameter settings.	—	
	Display [Logical operation definition] window	—	Displays the [Logical Operation Definition] window.	—	☞■ Logical Operation Display (P. 6-34).
Online	Actual module configuration	—	[Displays the [Actual Module Configuration] window.	—	
	Write Parameters	—	Writes parameters to a module.	—	Writes the target selected on the tree. ☞6 - 5 Writing Parameters (P. 6-46).
	Monitor	—	Initiates the Universal Monitor.	—	☞6 - 6 Monitoring Module Operations (P. 6-51) and Chapter 7. UNIVERSAL MONITOR.
	Read Parameters	—	Reads parameters from a module.	—	Reads to the target selected on the tree. ☞6 - 7 Reading Parameters (P. 6-56).
	Communications path	—	Changes communication path from PC to module.	—	☞■ Communication Path (P. 5-29).
	Network Profile	—	Switches network settings such as computer's IP address.	—	☞■ Network Profile (P. 5-31).
	Communications options	—	Loader communication time out settings.	—	☞■ Communications Options (P. 5-37).
	Compare module versions	—	Compares module versions between the project and the actual module.	—	☞■ Compare module versions (P. 6-59).

Menu	Submenu 1	Submenu 2	Description	Shortcut Keys	Remarks
View	Go	Back	Moves one position back on the project tree.	[Alt] + Left	When the project is open.
		Forward	Moves one position forward on the project tree.	[Alt] + Right	
		Up	Moves one level up on the project tree.		
		Home	Moves to the workgroup level belonging to the current project tree position.	[Alt] + [home]	
	Display line graph	—	Displays line table as a graph.	—	☞■ Line Graph Display (P. 6-35).
	Display the list of data transfer between modules	—	Displays the [List for data transfer between modules] window.	—	☞■ Display the List of Data Transfer between Modules (P. 6-30).
	Set user level	—	Changes the parameter user level.	—	☞■ User Levels (P. 6-19).
Help	Help	—	Displays the online help.	—	Unsupported
	About SLP-NX	—	Displays version and license information.	—	

■ Tool Bar

Icon Name	Icon	Function	Remarks
Back		Moves one position back on the project tree.	When the project is open the project tree.
Next		Moves one position forward of the project tree.	
Up		Moves one level up the project tree.	
Home		Moves to the workgroup level belonging to the current project tree position.	
Create		Creates a new project. (Offline, from Actual Module Configuration)	
Open		Opens the project.	
Save		Overwrite saves the project.	When the project is open.
Expand		Expands the project tree.	When the project is open.
[Actual module configuration] window		Displays the [Actual Module Configuration] window.	
Read	 *	Reads parameters from a module.	Reads from a device selected on the tree.☞6-7 Reading Parameters (P. 6-56).
Write	 *	Writes parameters to a module.	Writes to a device selected on the tree. ☞6-5 Writing Parameters (P. 6-46).
Monitor		Initiates the Universal Monitor.	☞6-6 Monitoring Module Operations (P. 6-51).

* If working via the USB loader cable,  (Read)  (Write) icons are displayed.

■ Version Information

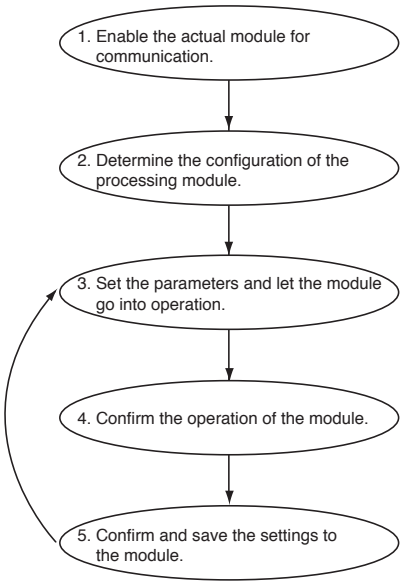
Select [Help] → [About SLP-NX] from the Project window's menu bar.

>>The following version and license information is displayed for this loader.

Chapter 4. WORK FLOW

4 - 1 General Work Flow

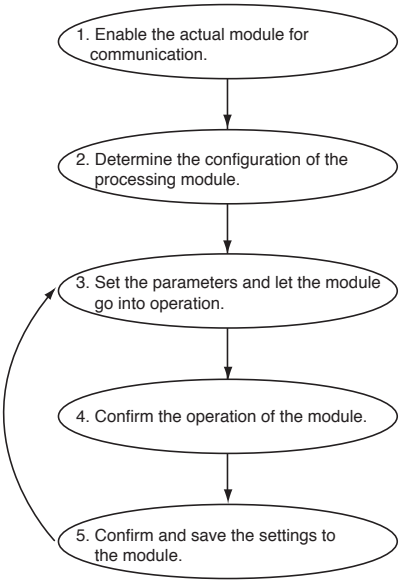
This section explains the basic procedures to set up parameters and actual module communication settings for modules to operate.



Operating window	Operation	Reference page
Mainly the [Actual module configuration] window	Prepare the actual module and configure the actual module communication settings.	5-2 Defining IP Address and Node Address (P. 5-7) 5-3 Communication Settings (P. 5-12)
[Project] window	Create the module configuration offline. OR Create the module configuration online.	6-1 Creating a Project (P. 6-1) 6-2 Defining Module Configuration (P. 6-11)
[Project] window	Edit the parameters. Specify the target module. Write the parameters.	6-3 Editing Parameters (P. 6-16) 6-4 Mapping (P. 6-38) 6-5 Writing Parameters (P. 6-46)
[Universal monitor] window	Confirm the operation on the Universal monitor.	6-6 Monitoring Module Operations (P. 6-51)
[Project] window	Read the parameters from the module. Output the settings in CSV format. Save the project.	6-7 Reading Parameters (P. 6-56) 6-11 Output to CSV File (P. 6-69) 6-9 Saving a Project (P. 6-65)
	Open the saved project.	6-10 Opening a Project (P. 6-67)

4 - 2 When There is Any Available Module

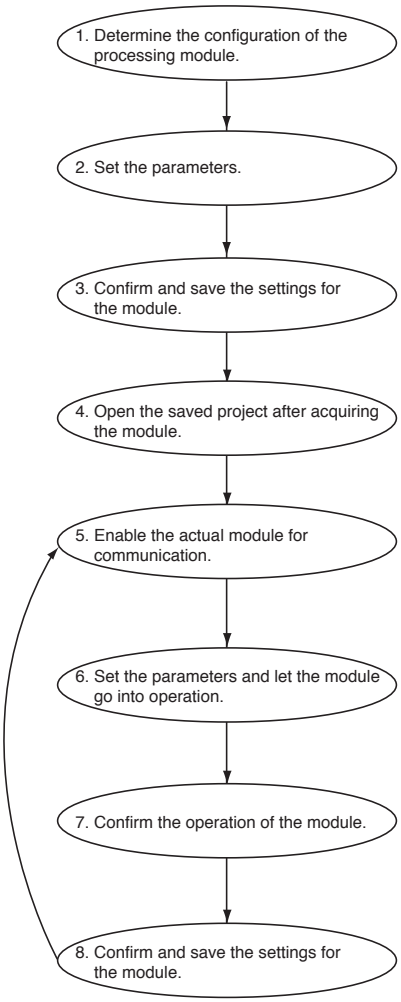
If any modules can be used, follow the steps explained below to set parameters and mapping for them to operate.



Operating window	Operation	Reference page
Mainly the [Actual module configuration] window	Prepare the actual module and configure the actual module communication settings.	5 - 2 Defining IP Address and Node Address (P. 5-7) 5 - 3 Communication Settings (P. 5-12)
[Project] window	Create the module configuration online.	6 - 1 Creating a Project (P. 6-1)
[Project] window	Edit the parameters. Write the parameters.	6 - 3 Editing Parameters (P. 6-16) 6 - 5 Writing Parameters (P. 6-46)
[Universal monitor] window	Confirm the operation on the Universal monitor.	6 - 6 Monitoring Module Operations (P. 6-51)
[Project] window	Read the parameters from the module. Output the settings in CSV format. Save the project.	6 - 7 Reading Parameters (P. 6-56) 6 - 11 Output to CSV File (P. 6-69) 6 - 9 Saving a Project (P. 6-65)
	Open the saved project.	6 - 10 Opening a Project (P. 6-67)

4 - 3 When There is No Available Module

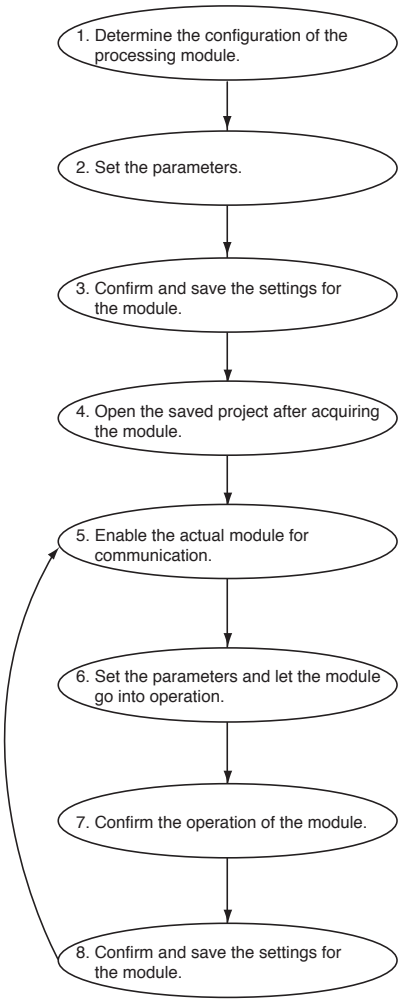
If any modules cannot be used initially, follow the steps explained below to set parameters and mapping for them to operate.



Operating window	Operation	Reference page
[Project] window	Create the module configuration offline.	6-1 Creating a Project (P. 6-1) 6-2 Defining Module Configuration (P. 6-11)
[Project] window	Edit the parameters. Define the mapping information.	6-3 Editing Parameters (P. 6-16) 6-4 Mapping (P. 6-38)
[Project] window	Output the settings in CSV format. Save the project.	6-11 Output to CSV File (P. 6-69) 6-9 Saving a Project (P. 6-65)
[Project] window	Open the saved project.	6-10 Opening a Project (P. 6-67)
[Project] window [Actual module configuration] window	Prepare the actual module and configure the actual module communication settings to the module using mapping information.	6-4 Mapping (P. 6-38) 5-3 Communication Settings (P. 5-12)
[Project] window	Write the parameters.	6-5 Writing Parameters (P. 6-46)
[Universal monitor] window	Confirm the operation on the Universal monitor.	6-6 Monitoring Module Operations (P. 6-51)
[Project] window	Read the parameters from the module. Output the settings in CSV format. Save the project.	6-7 Reading Parameters (P. 6-56) 6-11 Output to CSV File (P. 6-69) 6-9 Saving a Project (P. 6-65)
	Open the saved project.	6-10 Opening a Project (P. 6-67)

4 - 4 When You Change Module Configuration

Follow the steps explained below when you change the configuration of the processing module later, and set parameters and actual module communication settings again for them to operate.



Operating window	Operation	Reference page
[Project] window	Open the saved project. Modify the module configuration offline.	6 - 10 Opening a Project (P. 6-67) 6 - 2 Defining Module Configuration (P. 6-11)
[Project] window	Edit the parameters. Define the mapping information.	6 - 3 Editing Parameters (P. 6-16) 6 - 4 Mapping (P. 6-38)
[Project] window	Output the settings in CSV format. Save the project.	6 - 11 Output to CSV File (P. 6-69) 6 - 9 Saving a Project (P. 6-65)
[Project] window	Open the saved project.	6 - 10 Opening a Project (P. 6-67)
[Project] window [Actual module configuration] window	Prepare the actual module and configure the actual module communication settings to the module using mapping information.	6 - 4 Mapping (P. 6-38) 5 - 3 Communication Settings (P. 5-12)
[Project] window	Write the parameters.	6 - 5 Writing Parameters (P. 6-46)
[Universal monitor] window	Confirm the operation on the Universal monitor.	6 - 6 Monitoring Module Operations (P. 6-51)
[Project] window	Read the parameters from the module. Output the settings in CSV format. Save the project.	6 - 7 Reading Parameters (P. 6-56) 6 - 11 Output to CSV File (P. 6-69) 6 - 9 Saving a Project (P. 6-65)
	Open the saved project.	6 - 10 Opening a Project (P. 6-67)

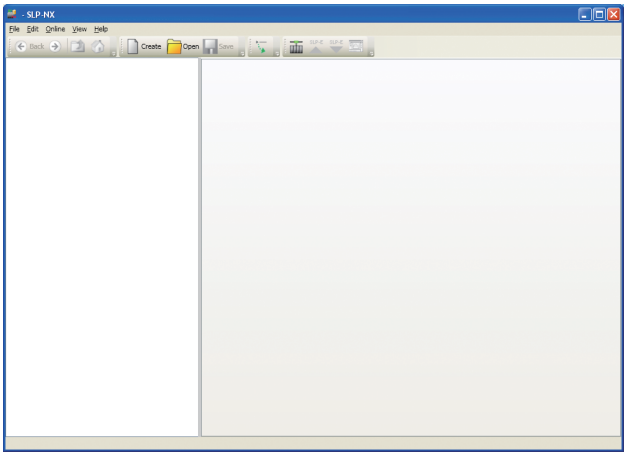
Chapter 5. ACTUAL MODULE COMMUNICATION SETTINGS

5 - 1 Displaying Actual Module Configuration Window

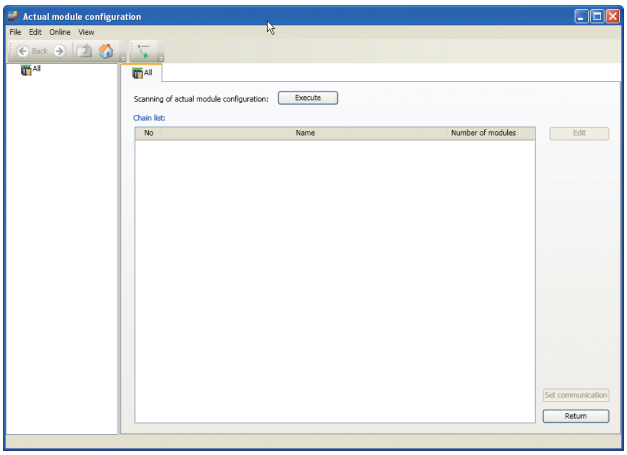
Before using this module, number it with an IP address and node address (workgroup ID and node ID).
Also, configure other communication settings as needed.
Configuring communication settings for a module, such as numbering an IP address and node address, is done in the [Actual module configuration] window.

■ How to Open the Actual Module Configuration Window

Click the  ([Actual module configuration] window) icon in the Project window, or go to the Project window's menu bar and select [Online] → [Actual module configuration].

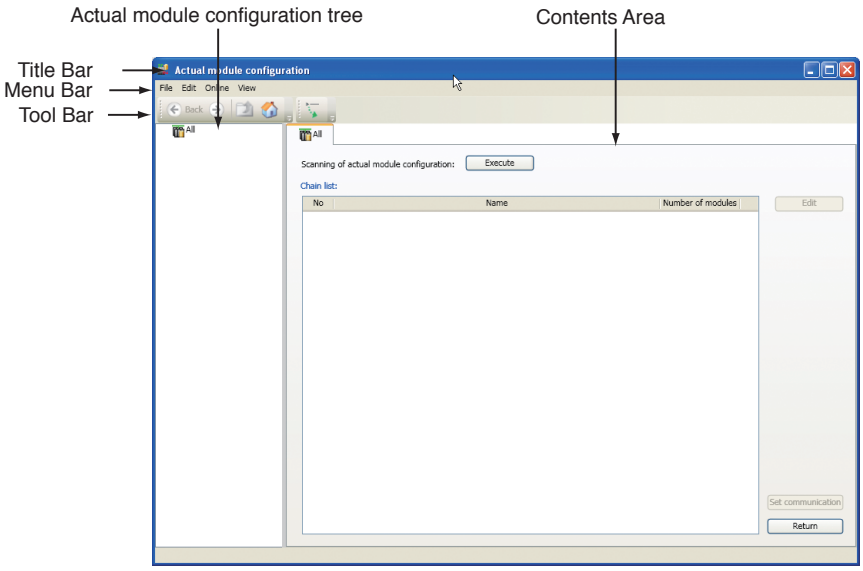


>>The [Actual module configuration] window is displayed.



■ Actual Module Configuration Window Layout

The [Actual module configuration] window is as follows:



The names and functions for each window part are described below.

● Title Bar

Displays the [Actual module configuration] window.

● Menu Bar

This is used to select or run various operations. Operable content differs depending on what is displayed in the Actual Module Configuration tree and contents area.

● Tool Bar

Frequently used operations from among menu items are available as buttons on the tool bar.

● Actual Module Configuration Tree

The actual module configuration is displayed here as a chain. Selecting any chain will display the applicable setup screen in the contents area.

☞ ■ Actual Module Configuration Tree Levels (P. 5-4)

● Contents Area

A screen is displayed here for items selected in the Actual Module Configuration Tree.

■ Actual Module Configuration Window - Menu Configuration List

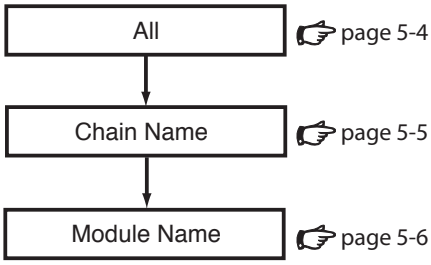
Menu	Icon	Submenu 1	Submenu 2	Description	Shortcut Keys
File	—	Close	—	Closes the [Actual module configuration] window.	—
Edit	—	Cut	—	Cuts data.	[Ctrl] + [X]
	—	Copy	—	Copies data.	[Ctrl] + [C]
	—	Paste	—	Pastes data.	[Ctrl] + [V]
Online	—	Workgroup independent mode	—	Unsupported	—
	—	Communications path	—	Changes communication path from PC to module. ☞■ Communication Path (P. 5-29).	—
	—	Network profile	—	Allows you to change the PC's IP address settings. ☞■ Network Profile (P. 5-31).	—
	—	Communications options	—	Loader communication time out settings. ☞■ Communications Options (P. 5-37).	—
	—	Sensitive to ring disconnection error	—	Changes between detecting and not detecting ring disconnection.	—
View		Go	Back	Moves one position back on the Actual Module Configuration Tree. Enabled when the project is open.	[Alt] + [Left]
			Forward	Moves one position forward on the Actual Module Configuration Tree. Enabled when the project is open.	[Alt] + [Right]
			Up	Moves one level up on the Actual Module Configuration Tree. Enabled when the project is open.	—
			Home	Moves to the top level (All) of the Actual Module Configuration Tree.	[Alt] + [home]
	—	[Workgroup] screen	—	Moves to the workgroup view in the Project window for the selected module. Enabled when a module is selected in the [Actual module configuration] window.	—
	—	Return to Project window	—	Returns focus to the Project window.	—
	—	Error display	—	Displays module errors. Displayed when an error occurs for a module selected in the [Actual module configuration] window.	—
	—	Set user level	—	Changes the user level.	—

■ Tool Bar

Icon Name	Icon	Function
Back		Moves one position back on the Actual Module Configuration Tree.
Next		Moves one position forward on the Actual Module Configuration Tree.
Up		Moves one level up on the Actual Module Configuration Tree.
Home		Moves to the top level (All) of the Actual Module Configuration Tree.
Expand		Expands the Actual Module Configuration Tree.

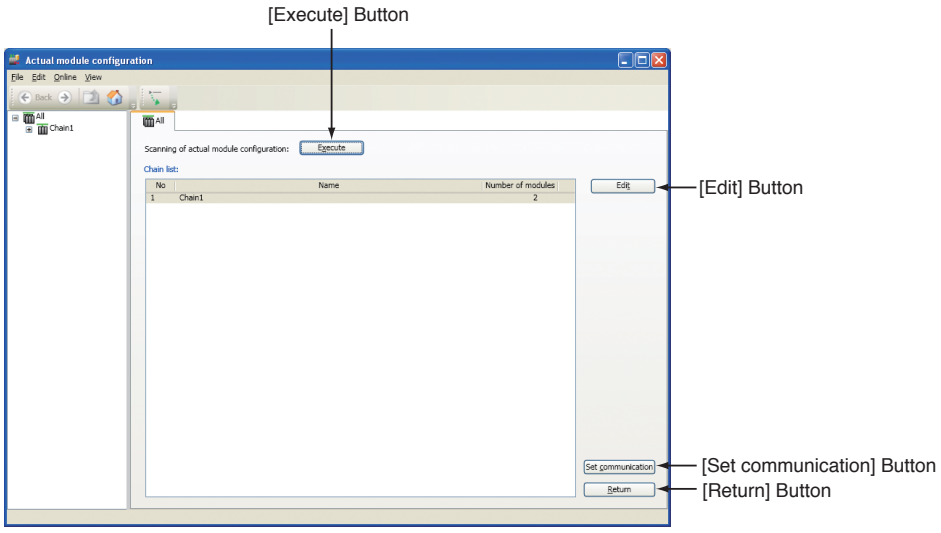
■ Actual Module Configuration Tree Levels

The Actual Module Configuration Tree is made up of the following levels.



● All

The Actual Module Configuration Tree's top level is called [All].
This enables you to scan the actual module configuration, configure the communication settings common to all modules, etc.

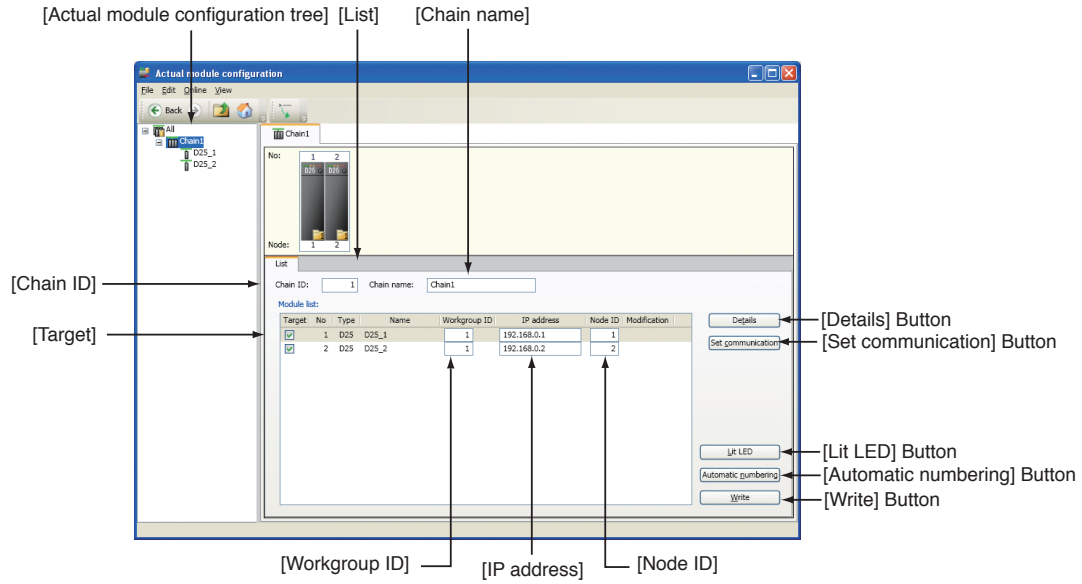


- [Execute] button
  Scans the actual module configuration.
- [Edit] button
  Displays a list of modules connected to the selected chain.
- [Set communication] button
  The [Communication settings (all)] dialog box is displayed.
- [Return] button
  Returns focus to the Project window.

● Chain Name

- A Chain Name is located one level below [All].
  You can configure the settings for each module (such as an IP address and node ID) here.

By clicking the [Write] button, you can write actual module communication settings to the module.



Each component of a Chain Name tab is explained below.

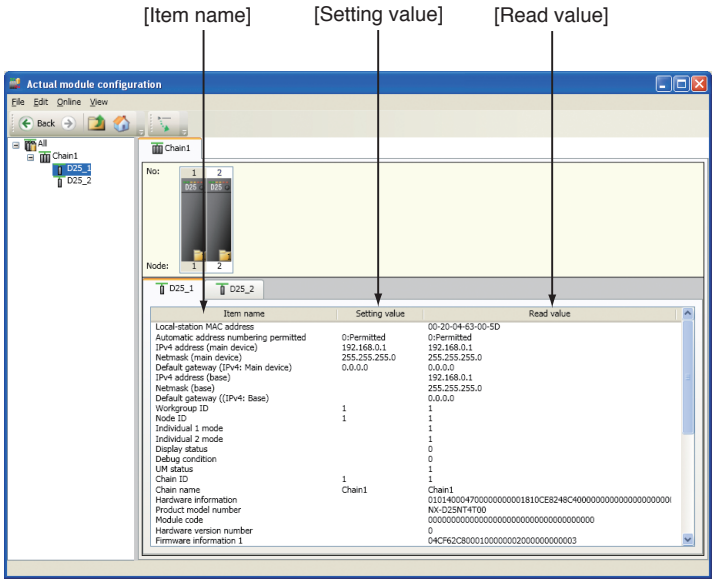
- [Chain ID]
  Can be set the chain ID.
- [Chain name]
  Can be set the chain name.
- [Target] Check Box
  These boxes are to be checked for LED lights, writing, and automatic numbering.
- [Workgroup ID]
  Displays the workgroup ID (the same value for Chain ID is displayed).
- [IP address]
  Can be set the IP address.
- [Node ID]
  Can be set the node ID.
- [Details] button
  Displays module information for the selected module.
- [Set communication] button
  Can be configured. Individual communication settings for the selected module.
- [Lit LED] button
  Turns on an LED light for the module with the [Target] check box checked.
- [Auto numbering] button
  This allows you to automatically set the IP address and node ID.
- [Write] button
  When clicked, the altered actual module communication settings will be written onto the modules with the [Target] check box checked.

Note

- If the module name acquired from the module itself differs from the module name specified for the project, the module name is shown preceded by an asterisk (*) in the actual module configuration tree and in the contents area of the [Actual module configuration] window.

● Module Name

Module Name is one level below a Chain Name.
Here is displayed module information acquired when executing a scan of the actual module configuration.



- [Item name]
  Name of acquired information.
- [Setting value]
  Setting value while editing in the [Actual module configuration] window.
- [Read value]
  Module value acquired when executing a scan of the actual module configuration.

Note

- From SLP-NX 4.00, as well as the value being edited, the reading results of the previous successful scan are displayed in the setting value column.

5 - 2 Defining IP Address and Node Address

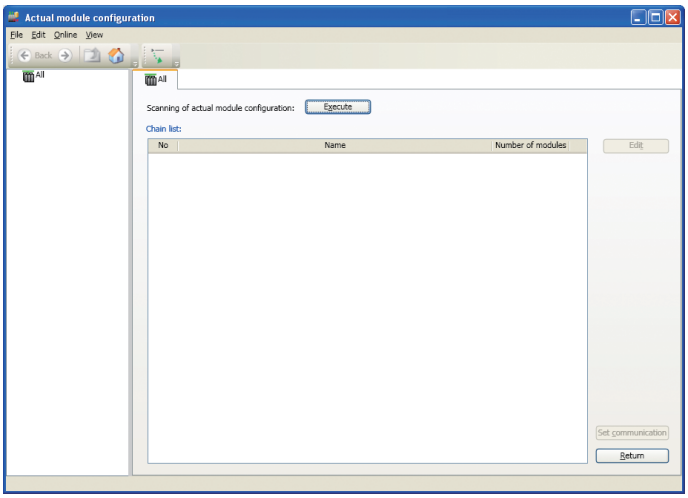
Address numbering is done in the [Actual module configuration] window.
If there is no available module, you can configure module settings via
6 - 4 Mapping (P. 6-38).

Handling Precautions

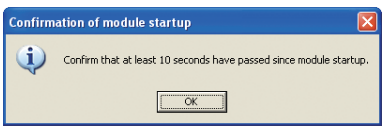
- To create a new project from the actual module configuration even if a ring error occurs, in the menu of [Actual module configuration] window, remove the check mark in [Online] → [Sensitive to _ring disconnection error], and then execute the actual module configuration scan. In SLP-NX Ver 3.02.2 or earlier, if a ring error has occurred, a new project cannot be built by executing an actual module configuration scan from the loader.
  If a problem with the ring occurs,the creation of a new project by scanning the actual module configuration will fail.
  In this case, resolve the ring problem or create the project offline.

■ Steps

[1] In the [All] tab of the [Actual module configuration] window, click the [Execute] button.



>>The [Confirmation of module startup] message box appears.



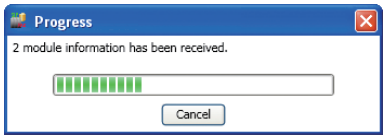
[2] Turn on the module to be numbered with an address, then connect the cable selected via communication path to a running PC.

Note

- If multiple modules are concatenated, and the Ethernet is used as a communication path, these modules can be numbered at once.

[3] Confirm connection, and click the [OK] button.

>>The [Progress] dialog box is displayed.



Note

- Make sure whether the loader and the module are properly connected in an appropriate environment.
  ☞ ■ Communication Path (P. 5-29) and ■ Network Profile (P. 5-31).

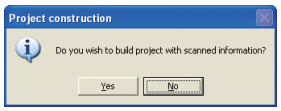
After this, one of many message boxes will be displayed depending on the module status.

[4]-1 If an error occurs during actual module configuration scan:
A message box containing the error description will be displayed.
Check the error description and take appropriate action.

Note

- For details on the errors, and counter measures, refer to:
  ☞ ■ Message List (P. 5-16).

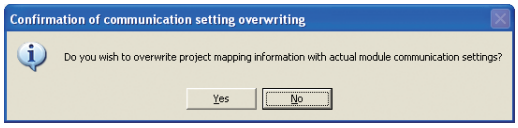
[4]-2 If no error occurs during actual module configuration scan, but the project is not open in the Project window:
The following message box is displayed. When you want to configure the communication settings for modules (such as address numbering), click the [No] button.



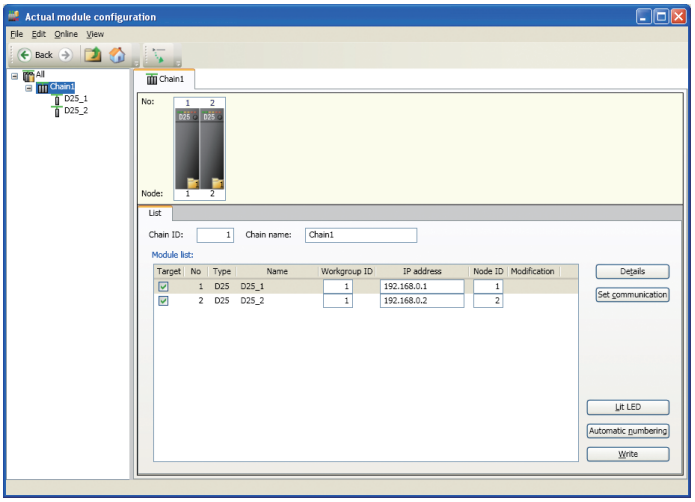
Note

- When you click the [Yes] button in the message box shown above,
  ☞ "Selecting [Auto configuration from actual module] to create" in 6-1, "Creating a Project" (page 6-1)

[4]-3 If no error occurs during actual module configuration scan, but you are editing a workgroup in the Project window:
The following message box is displayed. When you want to configure the communication settings for modules (such as address numbering), click the [No] button.

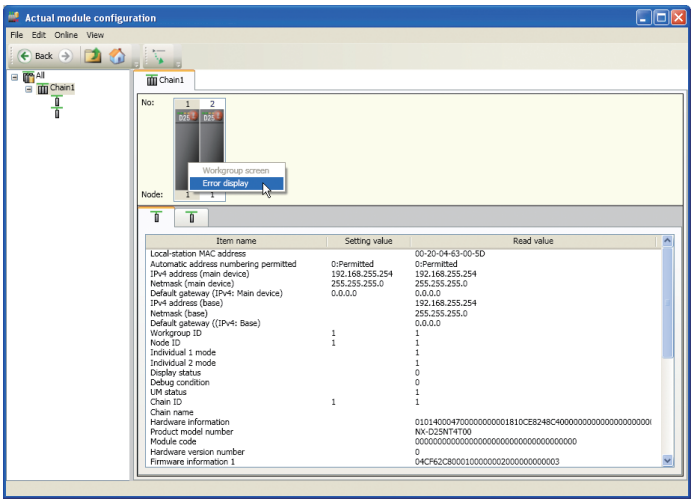


[5] Scan results are displayed on the screen for each chain.



Note

- If an error occurs:
  An error icon will flash for the module with a scan error. By right clicking on the module with the flashing error icon, and selecting [Error display], you can see the error description.



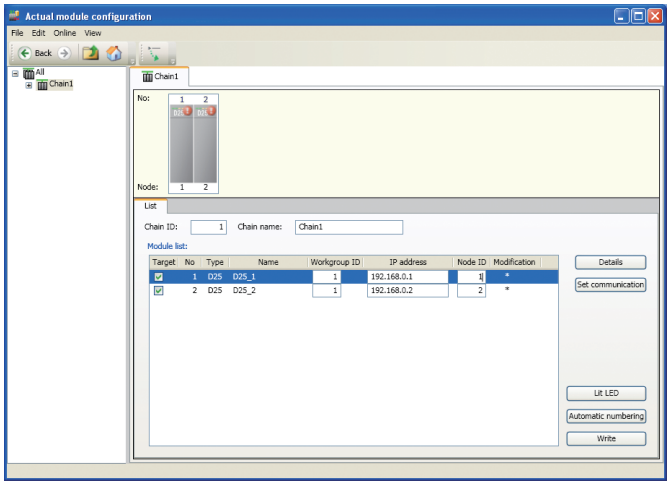
[6] For each chain, number the modules with addresses (IP addresses, node IDs, and workgroup IDs).

Handling Precautions

- Node IDs are required for data transfer function between modules and multi-loop cooperative control.
  If data transfer function between modules and multi-loop cooperative control are not used, there is no need to change the node IDs.

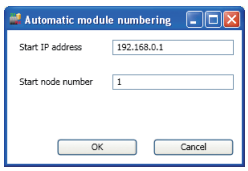
- To change the IP address, node ID or workgroup ID of a module that is using data transfer function between modules or multi-loop cooperative control,
  ☞■ Changing the IP Address, etc. of a Module That Is Using Data Transfer Function between Modules or Multi-Loop Cooperative Control (P. 9-4).
- The workgroup ID displayed on the screen is the identifier of a work group which represents a group made up of modules in the Project window. Since the workgroup ID is linked with the chain ID, it cannot be edited.

[6]-1 To configure the settings manually, click the line of the target module, and set the desired value directly in the edit box.



[6]-2 To configure the settings automatically (sequential numbering), click the [Automatic numbering] button.

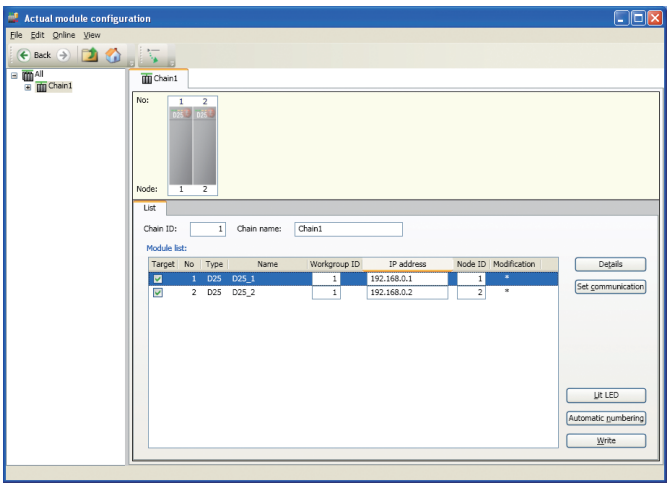
>>The [Auto module numbering] dialog box will then be displayed.



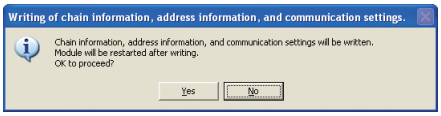
Note

- When there is any module which is not applicable for auto numbering, uncheck the appropriate [Target] box in the module list.
  After confirming the range of available IP addresses, specify the first IP address and node ID for the modules to be numbered, and click click the [OK] button.

[7] After completing numbering the IP addresses, node IDs, and workgroup IDs, click [Write] on the [Module list] screen to write actual module communication settings.



>>The [Writing of chain information, address information, and communication settings.] message box will then be displayed.



Handling Precautions

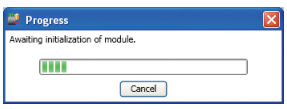
- Once writing is completed, the module will be reset (restarted). Confirm operational status and start working.

Note

- Writing of actual module communication settings to the module is done for each chain.
- If there are multiple chains, a different chain ID will be assigned to each chain, but if an appropriate chain name has already been set, comparative management for the actual chain is easy.
- The settings are written only to modules with the [Target] check box checked.
- If you want to confirm mapping with the target module before writing, perform the steps described in 5 - 4 Module LED Lights (P. 5-15) to turn on the module's LED light for confirmation.

[8] Click the [Yes] button on the [Writing of chain information, address information, and communication settings.] message box.

>>The [Progress] dialog box is displayed.



[9] Actual module configuration information is then automatically acquired from the module.

5 - 3 Communication Settings

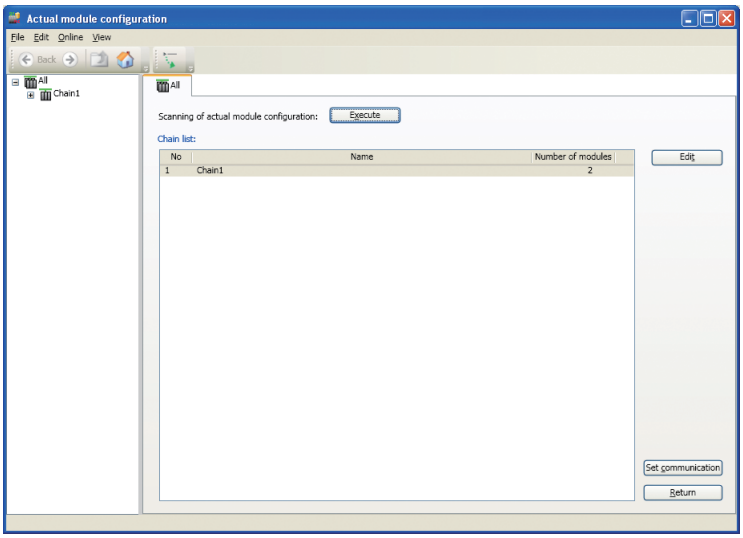
Communication settings other than the module's IP address and node address are to be configured in the [Actual module configuration] window [Set communication] button. The following settings can be configured.
If there is no available module, you can configure module settings via 6- 4 Mapping (P. 6-38).

Settings			Screen	
Type	Name	Description	All (page 5-13)	Chain Name (page 5-14)
Basic settings for module	Set the following value to all modules	Checks this box when performing the automatic address numbering prohibition function for all modules	❍	—
	Automatic address numbering is prohibited.	Excludes modules from auto address numbering. (Check mark will be removed from the list of target modules.)	❍	❍
IP settings	Netmask	IP net mask	❍	—
	Default gateway	IP default gateway	❍	—
Port settings	Set next value to all modules	Checks this box when you want port settings to apply to all modules.	❍	—
	Dedicated communication port number	Cannot be changed.	❍	❍
	MODBUS/TCP port number	MODBUS/TCP function's port number	❍	❍
	CPL/TCP port number	CPL/TCP communication port number	❍	❍
RS-485 detailed settings	Set the following value to all modules	Checks this box when you want the changes to RS-485 setting to apply to all modules.	❍	—
	RS-485 device address	Device address used for host communication (RS-485).	—	❍
	RS-485 protocol	Host communication (RS-485) protocol selection	❍	❍
	RS-485 transmission rate	Transmission speed used for host communication (RS-485)	❍	❍
	RS-485 bit length	Bit length used for host communication (RS-485)	❍	❍
	RS-485 parity status	With/without parity used for host communication (RS-485)	❍	❍
	RS-485 stop bits	Stop bit used for host communication (RS-485)	❍	❍
	RS-485 minimum response time	Minimum response time used for host communication (RS-485)	❍	❍

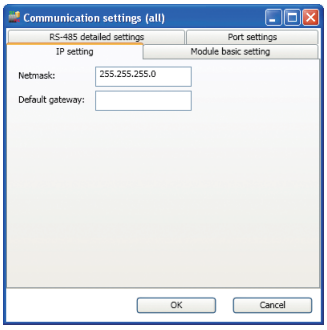
■ Setting Procedure

The following explains the setting procedure.

- To configure the settings common to all modules:
  Select [All] from the Actual Module Configuration Tree, then select a chain from the [All] tab's contents area and click [Set communication].

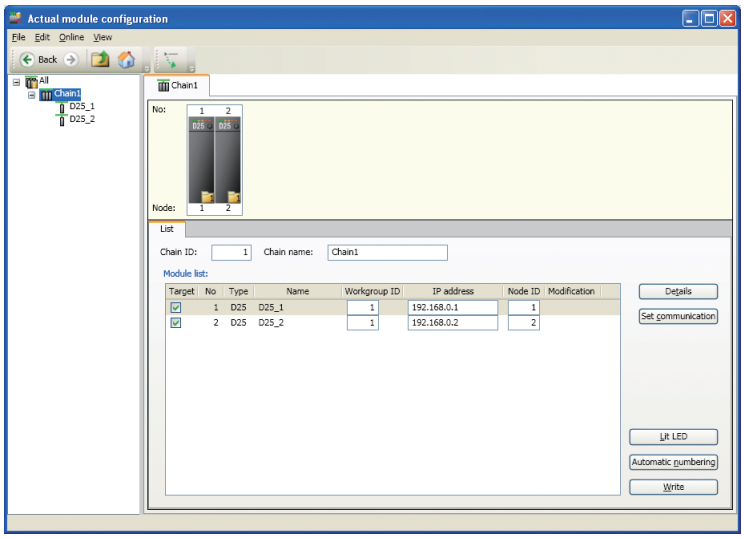


>>The [Communication settings (all)] dialog box will then be displayed.

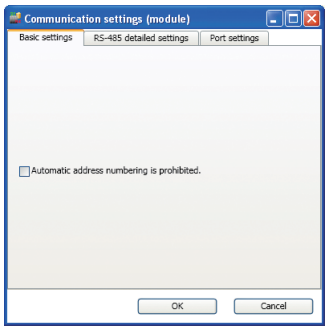


Set the necessary items, then click the [OK] button.

- To configure the settings for each module individually:
  Select a desired Chain Name from the Actual Module Configuration Tree, then select a line in the [List] tab for the module you want to set (when clicking the line for the target module, the background will turn gray), then click the [Set communication] button.



>>The following dialog box will then be displayed.



Set the necessary items, then click the [OK] button.

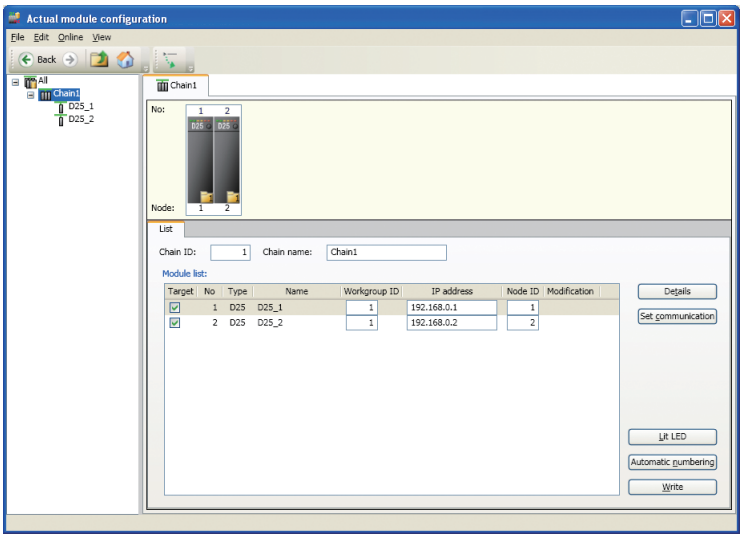
Note

- You can simultaneously change the actual module communication settings (IP address, node address, and communication settings) and write to the module.

5 - 4 Module LED Lights

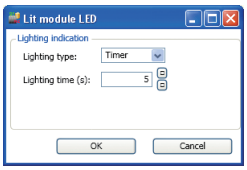
The module LED light function is used to confirm which module is an actual module when numbering a module's IP address, etc.

[1] Select a desired Chain Name from the Actual Module Configuration Tree in the [Actual module configuration] window, then check a check box under [Target] for the module you want to light up from the [List] tab in the contents area, and click the [Lit LED] button.



>>The [Lit module LED] dialog box will then be displayed.

[2] Set the values in the [Lighting indication] area, and click the [OK] button. In this area, you can select as the lighting type as [Timer], [ON], or [OFF]. When you select [Timer], you can also set the lighting time(s) as a value between 1 and 255 seconds.



>>All top LED lights will flash at a low speed for target modules.

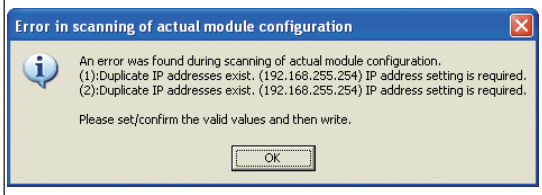
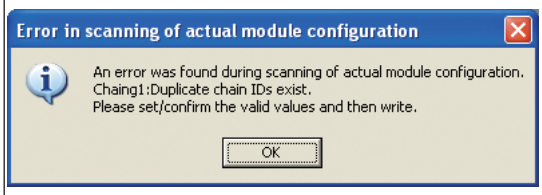
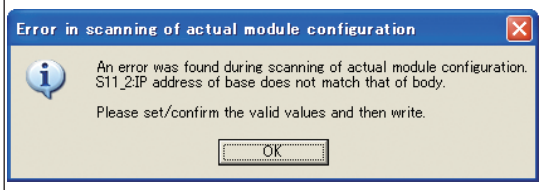
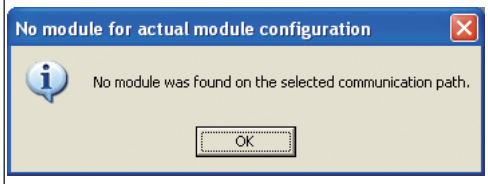
5 - 5 Confirming Mapping with Workgroups

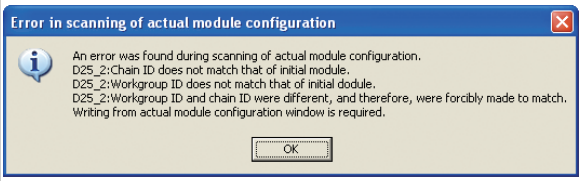
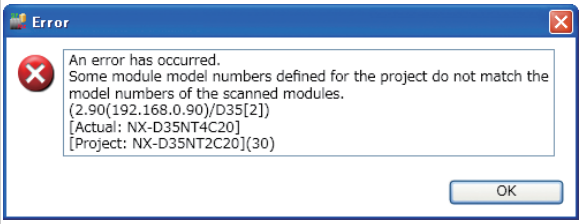
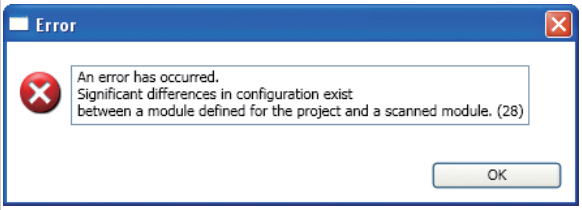
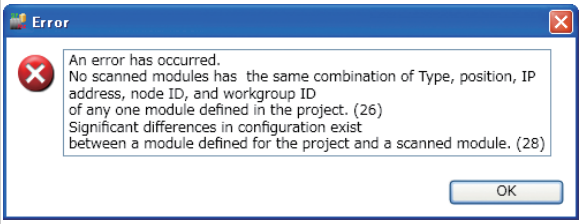
■ Overview

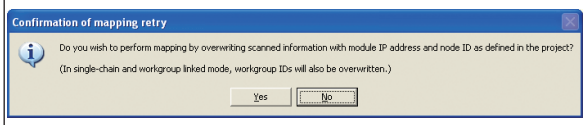
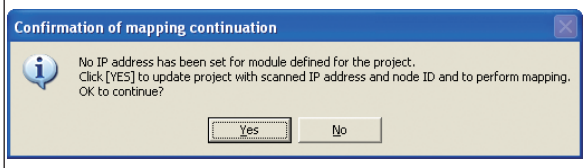
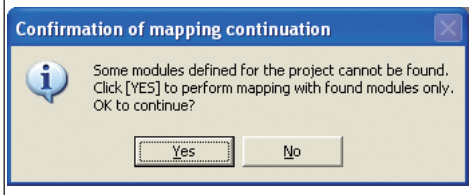
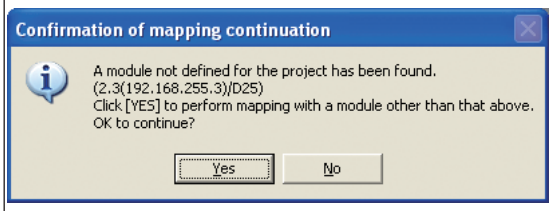
When you create a project offline and manually edit module configuration, or when you create a project with auto configuration from the actual module, but add module configuration or change the model number, you must maintain consistency between workgroup information and actual module configuration information. Check the consistency with the actual module configuration scan function, etc.

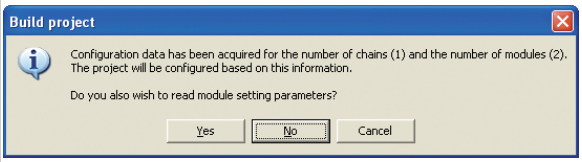
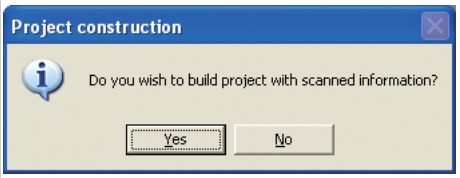
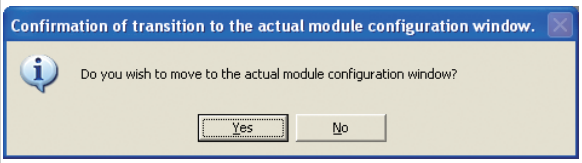
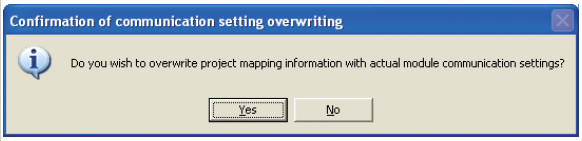
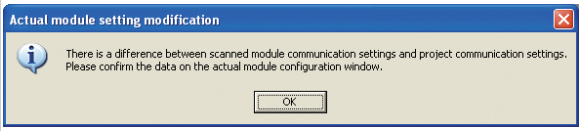
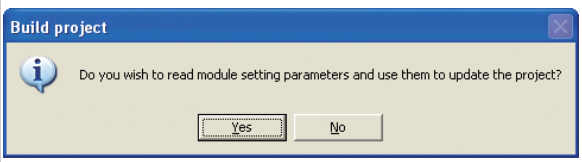
■ Message List

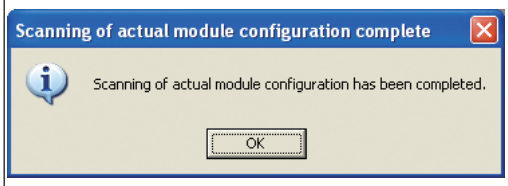
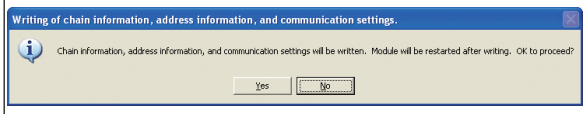
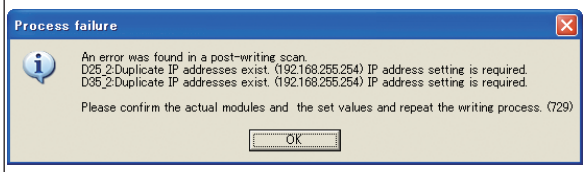
The following messages are displayed when you confirm mapping with workgroups.

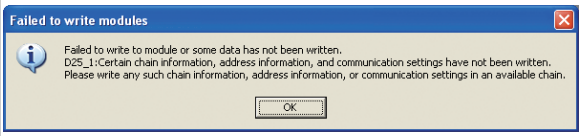
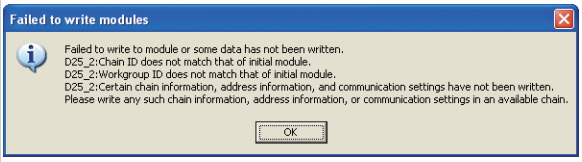
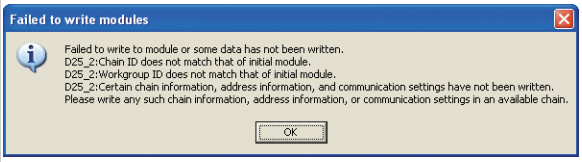
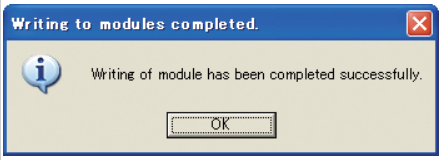
No.	Message	Cause and Action
1	 An error was found during scanning of actual module configuration. xxx: Duplicate IP addresses exist. IP address setting is required. Please set/confirm the valid values and then write.	<Module Error> The IP address is already used. Set a different IP address in the [Actual module configuration] window, and click [Write] to write to the module.
2	 An error was found during scanning of actual module configuration. xxx: Duplicate chain IDs exist. Please set/confirm the valid values and then write.	<Module Error> The chain ID is already used. Set a different separate chain ID for each chain in the [Actual module configuration] window, then click [Write] to write to the module.
3	 An error was found during scanning of actual module configuration. xxx: IP address of base does not match that of body. Please set/confirm the valid values and then write.	<Module Error> The module device and base combination has been changed. Return the module device and base combination to normal, or click [Write] in the [Actual module configuration] window to write to the module. This operation will write the IP addressinformation etc. that was written to the module to the base as well, eliminating any difference between the module device and base.
4	 No module was found on the selected communication path.	<Module Error> No module was found during scan. Confirm the following: • The module is turned on • The module and PC are connected properly • [Communications path settings] are set correctly

No.	Message	Cause and Action
5	 An error was found during scanning of actual module configuration. xxx: Chain ID does not match that of initial module. ... Writing from actual module configuration window is required. Please set/confirm the valid values and then write.	<Module Error> A module was found with different chain ID within the same chain. Confirm chain ID in the [Actual module configuration] window, then to make sure all chain IDs are the same within the chain, click [Write] to write to the module.
6	 An error has occurred. Some module model numbers defined for the project do not match the model numbers of the scanned modules. ...	<Module Error> Model number of module defined in the project differs from that of the scanned module. Clicking [OK] will display the [No. 8] message box, and this message box will be displayed again. In this case, confirm [Module configuration] in the Project window, and match it to the module's model number.
7	 An error has occurred. Significant differences in configuration exist between a module defined for the project and a scanned module.(28)  An error has occurred. No scanned modules has the same combination of type, position, IP address, node ID, and workgroup ID of any one module defined in the project. Significant differences in configuration exist between a module defined for the project and a scanned module. (28)	<Module Error> An error occurred during map processing. Because the type, position, IP address, node ID, and workgroup ID of the module defined in the project do not match those of the scanned module. Clicking [OK] will display the [No. 8] message box. If mapping cannot be performed after the [No. 8] message box is displayed, this message box will be displayed again. Please confirm project module settings when this occurs.

No.	Message	Cause and Action
8	 Do you wish to perform mapping by overwriting scanned information with module IP address and node ID as defined in the project? (In single-chain and workgroup linked mode, workgroup IDs will also be overwritten.)	<Confirmation of Mapping Retry> Displayed after an error message when there is significant difference between project settings and modules. Selecting [Yes] will transfer the scanned module's IP address and node ID to the project, and start mapping. When in workgroup linked mode with only one chain, the scanned workgroup ID will be used in the project, and mapping will be performed. When selecting [No], project settings will not be changed, and mapping will not be performed. Moreover, if you want to write project settings to the actual module, select [No] to cancel mapping, and after mapping with drag & drop in the Project window's [Mapping] screen, write to the module by clicking [Write] in the [Actual module configuration] window.
9	 No IP address has been set for module defined for the project. Click [YES] to update project with scanned IP address and node ID and to perform mapping. OK to continue?	<Confirmation of Mapping Continuation> An IP address has not been set to the project module defined in the project. Clicking [Yes] will transfer the scanned project, and mapping will occur. When selecting [No], project settings will not be changed, and mapping will not occur.
10	 Some modules defined for the project cannot be found. Click [YES] to perform mapping with found modules only. OK to continue?	<Confirmation of Mapping Continuation> Some modules defined in the project were not found when scanning. Clicking [Yes] will only perform mapping for modules that were found during scanning that are consistent with modules defined for the project. When selecting [No], mapping will not occur.
11	 A module not defined for the project has been found. ... Click [YES] to perform mapping with a module other than that above. OK to continue?	<Confirmation of Mapping Continuation> Module(s) not defined in the project were found when scanning. Clicking [Yes] will only perform mapping for modules that were found during scanning that are consistent with modules defined in the project. When selecting [No], mapping will not performed.

No.	Message	Cause and Action
12	 Configuration data has been acquired for the number of chains (x) and the number of modules (y). The project will be configured based on this information. Do you also wish to read module setting parameters?	<Build Project> Displayed when creating a new project with [Auto configuration from actual module], and a module scan occurs normally. Clicking [Yes] will read the module parameters and include them in the project. When selecting [No], the project will be created, but parameters will not be read. When selecting [Cancel], the project will not be created.
13	 Do you wish to build project with scanned information?	<Project Construction> Displayed when there is no project, but a scan of actual module configuration is performed normally. Clicking [Yes] will create a project. When selecting [No], a project will not be created.
14	 Do you wish to move to the actual module configuration window?	<Confirmation of Transition to the Actual Module Configuration Window> Displayed if there is any error during module scan when a new project is created using [Auto configuration from actual module], and an error occurs. Clicking [Yes] will display the [Actual module configuration] window, and module status can be confirmed. When selecting [No], the [Actual module configuration] window will return to its original empty state.
15	 Do you wish to overwrite project mapping information with actual module communication settings?	<Confirmation of communication setting overwriting> Displayed when module scanning and mapping occur normally. Selecting [Yes] will apply actual module communication settings of the scanned module to the project mapping data. When selecting [No], project mapping data set during mapping will not be changed.
16	 There is a difference between scanned module communication settings and project communication settings. Please confirm the data on the actual module configuration window.	<Communication Setting Differences> Displayed when selecting [No] in the [No.15] message box, and there are differences between the project's communication settings and the communication settings of the scanned modules. Please confirm communication settings in the [Actual module configuration] window.
17	 Do you wish to read module setting parameters and use them to update the project?	<Parameter Reading> Displayed when selecting [Yes] in the [No.15] message box. Clicking [Yes] will read the module parameters and apply them to the project. When selecting [No], the parameters will not be read.

No.	Message	Cause and Action
18	 Scanning of actual module configuration has been completed.	<Scanning Complete> Displayed when an actual module configuration scan is executed normally.
19	 Receiving parameters has been completed.	<Setting Parameter Reading Complete> Displayed when reading of module parameters is complete.
20	 Chain information, address information, and communication settings will be written. Module will be restarted after writing. OK to proceed?	<Write Confirmation> Displayed when clicking [Write] in the [Actual module configuration] window. When selecting [Yes], actual module communication settings are written to the module. The module is restarted when writing takes place. When selecting [No], nothing will be written to the module.
21	 An error was found in a post-writing scan. xxx: Duplicate IP addresses exist. IP address setting is required. Please confirm the actual modules and the set values and repeat the writing process. (729)	<Error After Writing> All information was successfully written to the module, but after that a scan detected duplicate IP address. Confirm module IP address via [Actual module configuration] and then click [Write] again to execute writing once more.

No.	Message	Cause and Action
22	 Failed to write to module or some data has not been written. xxx: Certain chain information, address information, and communication settings. Please write any such chain information, address information, or communication settings in an available chain.	<Error After Writing> There is an unwritten module in the [Actual module configuration] window. Check that the module is marked with "*" in the [Actual module configuration] window's [Modification] column, and then click [Write] to write the actual module communication settings to the module as needed.
23	 Failed to write to module or some data has not been written. xxx: Actual module configuration has been changed. Please clear the previous configuration and re-execute the process.	<Error After Writing> A difference was detected between project module configuration and scanned module configuration when writing to module. Click [Execute] from [Actual module configuration] to re-acquire actual module configuration, and then click [Write] again to write to the module.
24	 Failed to write to module or some data has not been written. xxx: Chain ID does not match that of initial module. ... Please write chain information, address information, or communication settings in a chain without data.	<Error After Writing> When writing to modules, a module with a chain ID differing from other modules in the same chain was found. Check for chain IDs in the [Actual module configuration] window, and click [Write] so that all modules in the chain have the same chain ID.
25	 Writing to modules has been completed successfully.	<Writing to Modules Completed> Displayed when all information has been written to the module.

■ Typical Methods of Confirmation

The following are three typical methods to confirm mapping between workgroups and actual module configuration.

1. Apply actual module communication settings to new modules
2. Apply parameters prepared in advance to actual modules
3. Read the parameters of an operating module and change the settings

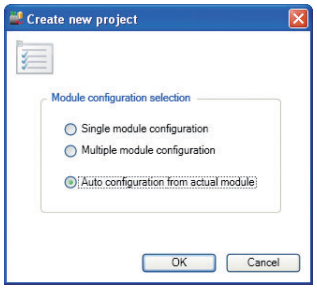
The steps for each method are explained below.

● Apply actual module communication settings to new modules

Start up the loader, and acquire actual module configuration from the new project.

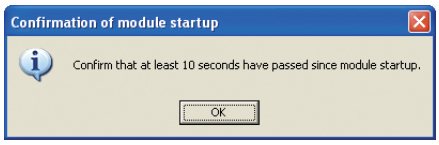
[1] Click the Create icon in the Project window, or select [File] → [New] from the Project window's menu bar.

>>The [Create new project] dialog box will then be displayed.

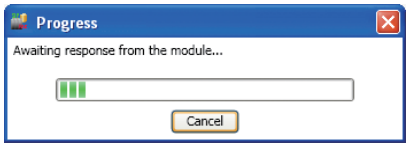


[2] Select [Auto configuration from actual module] and the[OK] button.

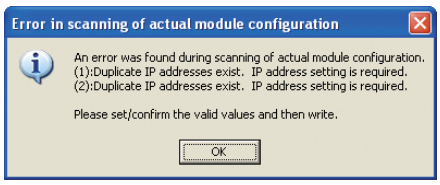
[3] The [Confirmation of module startup] message box appears.
Click the [OK] button.



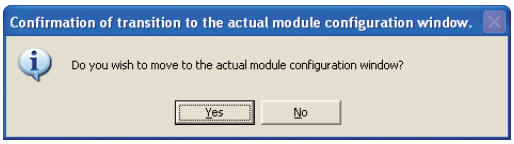
>>The Collection of the module's information begins, and the [Progress] dialog box is displayed.



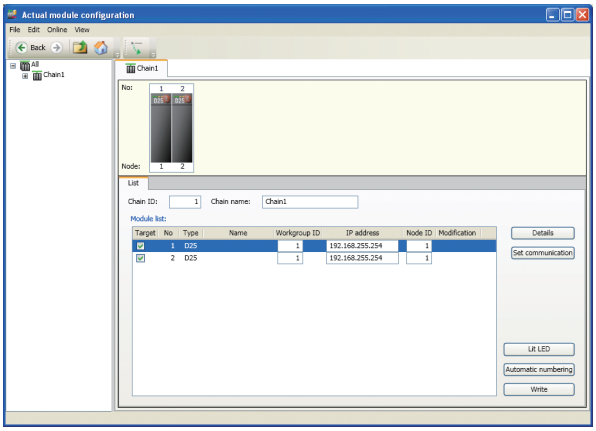
[4] A message box appears, explaining there are duplicate IP addresses.
Click the [OK] button.



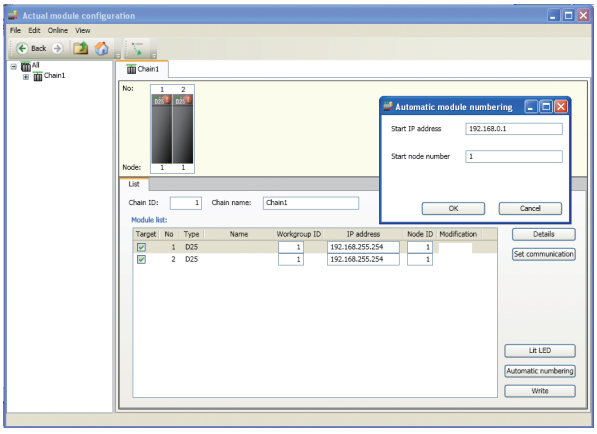
[5] The [Confirmation of transition to the actual module configuration window] message box is displayed.
Click the [Yes] button



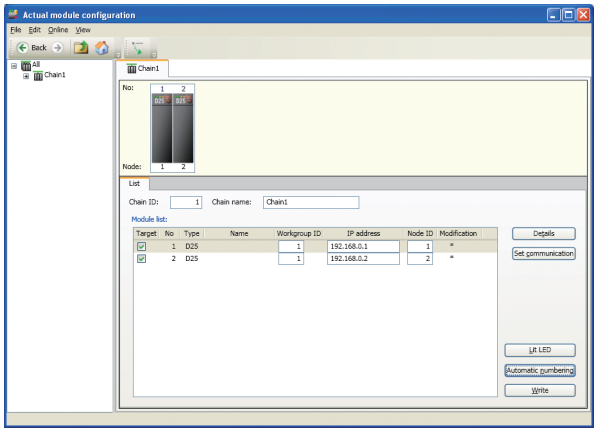
[6]-1 There are currently duplicated IP addresses and node IDs in the [Actual module configuration] window.



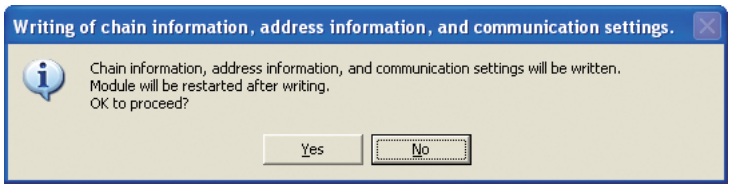
[6]-2 Click [Auto numbering] to number the IP address and node ID of all modules at the [Auto module numbering] dialog box, or enter each module's IP address and node ID individually in text boxes in the [Actual module configuration] window's contents area. (The example below shows the [Auto module numbering] dialog box is shown below as an example.)



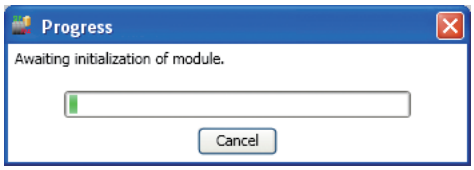
[6]-3 If the IP address and node ID have been changed, they are marked with a "*" in the [Modification] column. Click the [Write] button to write actual module communication settings to the module.



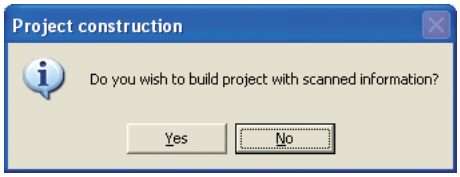
[7] The [Writing of chain information, address information, and communication settings] message box is displayed. Click the [Yes] button.



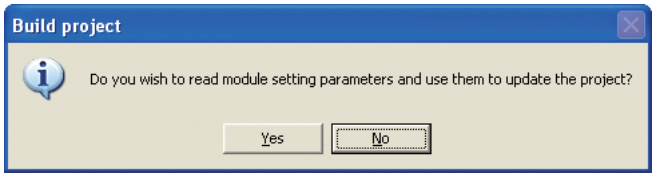
>>The [Progress] dialog box is displayed for writing progress.



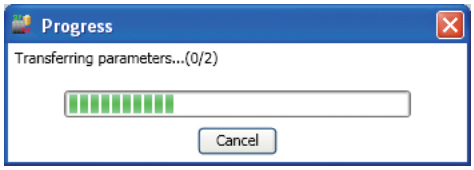
[8] The [Project construction] message box is displayed.
Click the [Yes] button.



[9] The message box for reading parameters is displayed.
Click the [Yes] button.
Parameters are then applied to the project.



>>The [Progress] dialog box is displayed for reading progress.

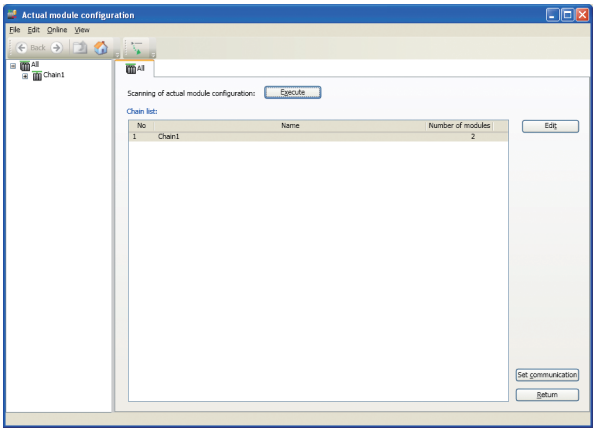


[10] The [Parameters received] message box is displayed.
Click the [OK] button.

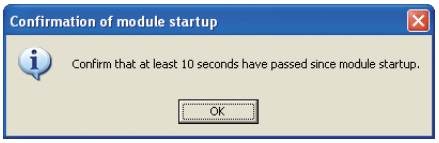
Select [File] → [Save as] from the Project window's menu bar, and save the project with an appropriate name.

● Apply parameters prepared in advance to actual modules

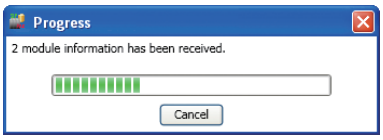
[1] Start up the loader, and open the project prepared in advance.
Open the [Actual module configuration] window, then click the [Execute] button for [Scanning of actual module configuration].



[2] The [Confirmation of module startup] message box is displayed.
Click the [OK] button.



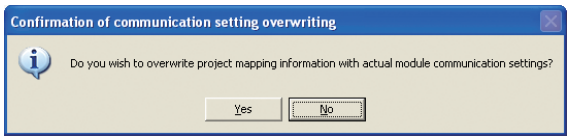
>>The [Progress] dialog box is displayed.



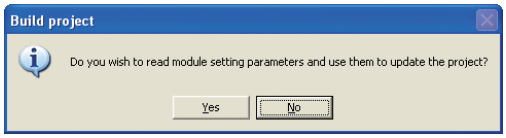
[3] Confirm that no error has occurred during the [Scanning of actual module configuration].

- If an error has occurred, refer to the "Message" and "Cause and Action" sections of ■ Message List (P. 5-16), and after taking appropriate action, start again from step [1].
- If no error has occurred, resume process from step [4].

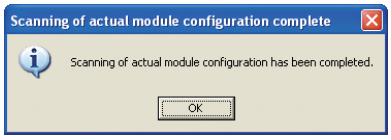
[4] The [Confirmation of communication setting overwriting] message box is displayed.
Click the [No] button..



[5] The [Build project] message box is displayed.
Click the [No] button.

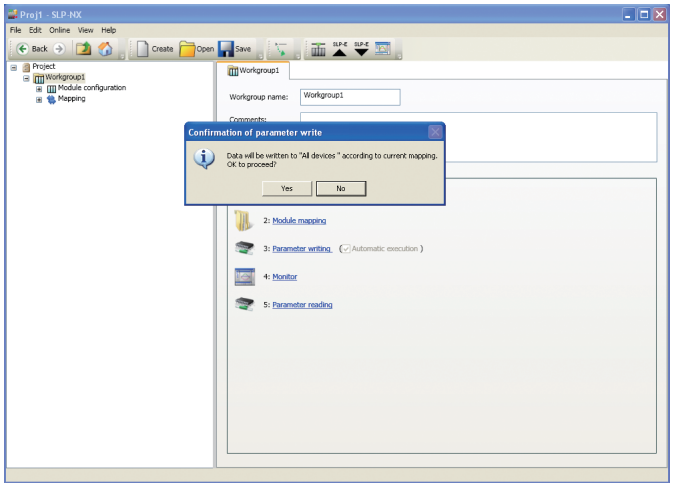


[6] The [Scanning of actual module configuration complete] message box is displayed.
Click the [OK] button.



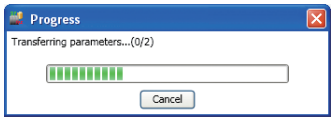
[7] Select a workgroup from the Project window, and use one of the following methods to write parameters to the modules.

- Select [3: Parameter writing] under [Operation list] in the [Workgroup] view's contents area.
- Select [Online] → [Write Parameters] from the Project window's menu bar.
- Select the SLP-E icon from the Project window's tool bar.

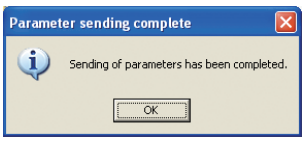


[8] The [Confirmation of parameter write] message box is displayed.
Click the [Yes] button.

>>Writing begins, and the [Progress] dialog box is displayed.



[9] The [Parameter sending complete] message box is displayed.
Click the [OK] button.



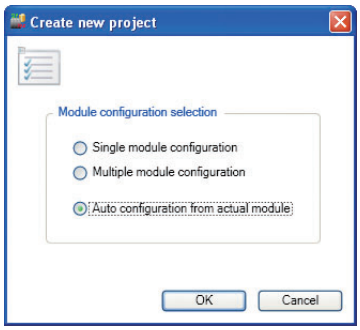
● **Read the parameters of an operating module and change the settings**

Start up the loader, and acquire actual module configuration from the new project.

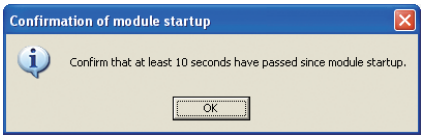
[1] Click the Create icon in the Project window, or select [File] -> [New] from the Project window's menu bar.

>>The [Create new project] dialog box will then be displayed.

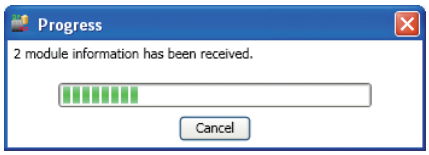
[2] Select [Auto configuration from actual module] and click the [OK] button..



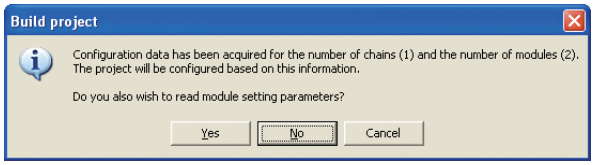
[3] The [Confirmation of module startup] message box appears.
Click the [OK] button.



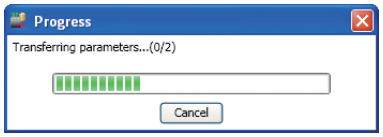
>>The Collection of the module's information begins, and the [Progress] dialog box is displayed.



[4] The [Build project] message box is displayed.
Changes will occur as the module setting parameters are being read, so click the [Yes] button.



[5] The [Progress] dialog box is displayed for reading progress.



[6] The [Parameters received] message box is displayed.
Click the [OK] button.

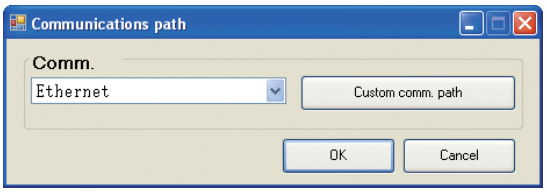
[7] When changing the actual module communication settings, change them at the [Actual module configuration] window, and perform writing.
When changing parameters, first change settings in the [Project] window, then perform parameter writing.

[8] Save the project under different names as necessary.

5 - 6 Other

■ Communication Path

A method of module-to-loader connection (Ethernet or USB loader cable) must be selected in the communication path.
When connecting via Ethernet, network interface assignment must be done for the PC to be used with the loader.



Select [Online] → [Communications path] from the [Actual module configuration] window or Project window's menu bar.

>>The [Communications path] dialog box is then displayed.

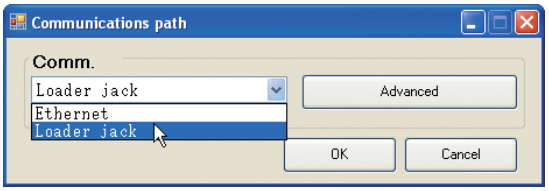
Note

- To select a USB loader cable, the following requirements must be met:
  - The USB loader cable must be recognized by the PC when connected.
  - Only 1 module must be registered to the project's module configuration.

● Connecting via USB loader cable

Connection can only be done via USB loader cable when the project consists of a single module.

[1] Select [Loader jack] in the combo box of the [Communications path] dialogue box.

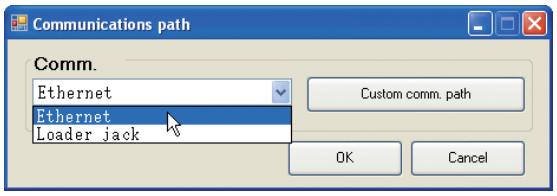


Click the [Advanced] button, and select the serial port to which the USB loader cable is connected. Normally the serial port to which the USB loader cable is connected will be automatically selected, so this doesn't have to be changed.

● Connecting via Ethernet

Ethernet connection can be done with a project made up of a single or multiple modules.

[1] Select [Ethernet] in the combo box of the [Communications path] dialog box.



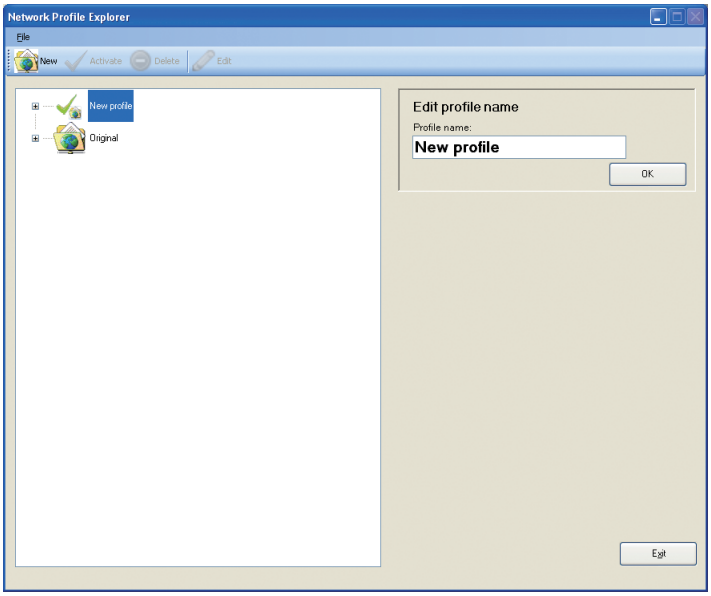
[2] Click the [Custom comm. path] button.

[3] Assign a network interface to the PC to be connected to module(s).

■ Network Profile

You can set or change network settings for the loader (IP address, default gateway, net mask) in the [Network Profile Explorer] dialog box.
The network setting selected as [Activate] here will be used as a network setting for the PC while the loader is starting up. Each time the loader starts up after this, you can select which network profile to use in the [Network profile initialization process] dialog box.
Also, when the loader is terminated, the network settings will automatically return to the same status as before the loader startup (displayed as [Original] in the [Network profile] window).
Select [Online] → [Network profile] from the [Actual module configuration] window or Project window's menu bar.

>>The [Network Profile Explorer] dialog box is then displayed.



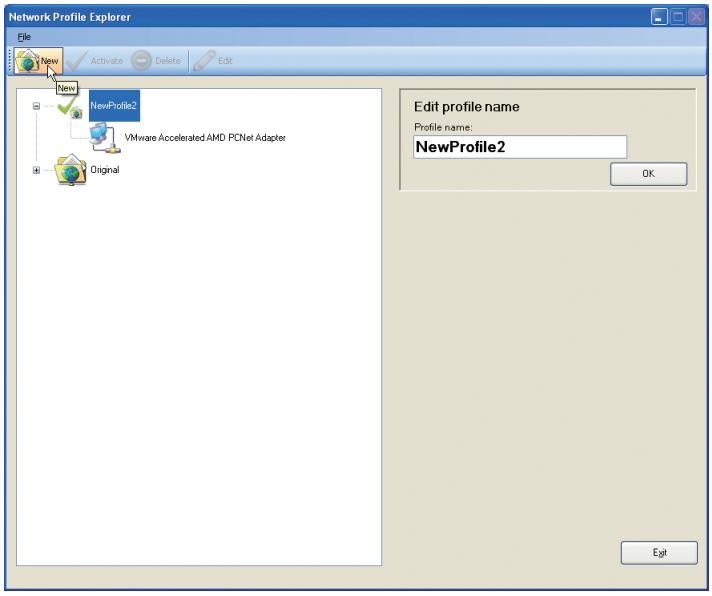
Handling Precautions

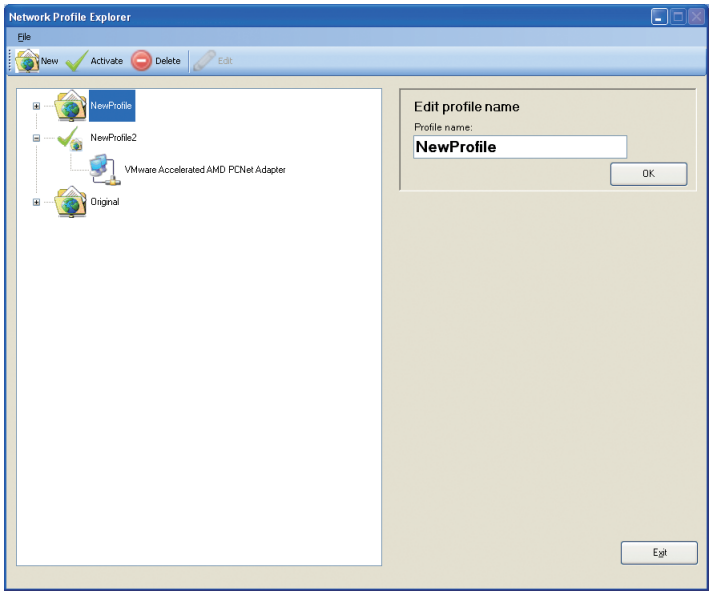
- If the loader is terminated abnormally, the network profile will recognize that the loader is still being used. To return the PC's network settings to the same status as before the loader startup, restart the loader, then terminate it. The [Select profile] window will be displayed. Select [Original] in this window to return the network settings to the same status as before the loader startup.
- When using the network profile function to change the PC's network settings, do not remove the Ethernet cable during processing. Otherwise, network settings may not be changed correctly.

● New

Select [New] from the [Network Profile Explorer] dialog box's tool bar.

>>A new network profile will be created.
Currently used network settings will be copied as they are, so make changes as necessary.
☞● Edit (P. 5-36).



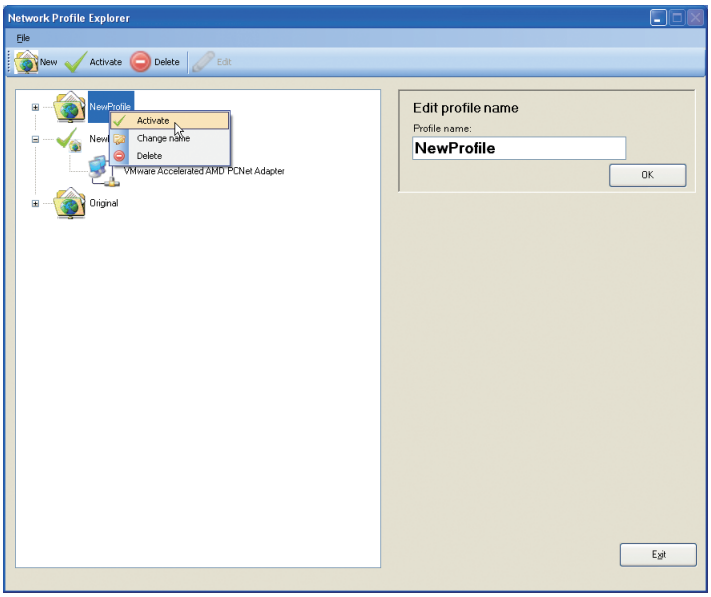


● Activate

Select a profile name (with a folder icon attached) from the [Network Profile Explorer] dialog box's tree view, then click on the tool bar's 

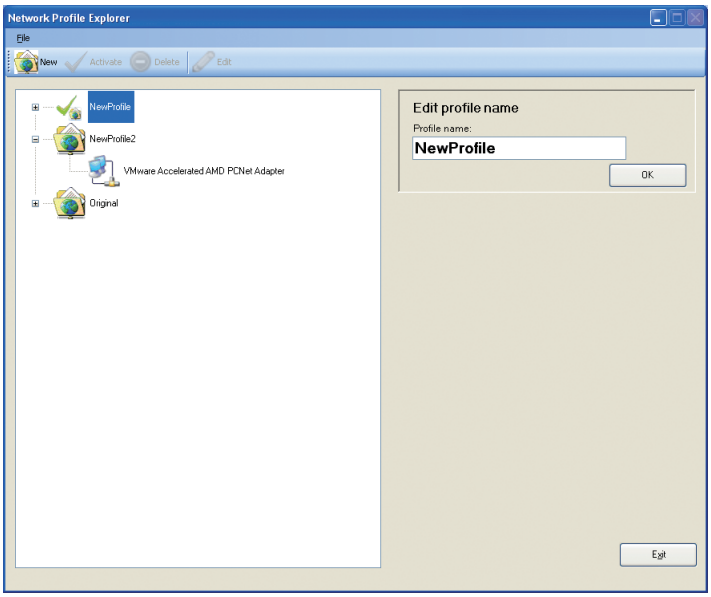
icon, or select [Activate] from the right click menu.

>>This will apply the selected network profile as settings for the PC starting up the loader, and will also cause the selected network profile to be selected as a default value each time the loader starts up from now on.



When selecting [Activate]:

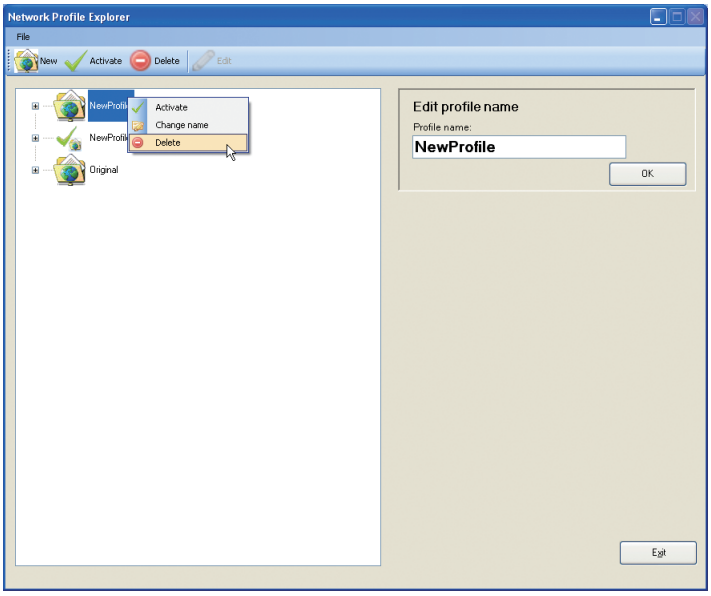
>>A check mark will be added to the tree view's profile name with "In use" as a profile, when that network profile has actually been enabled as a network setting for the PC.

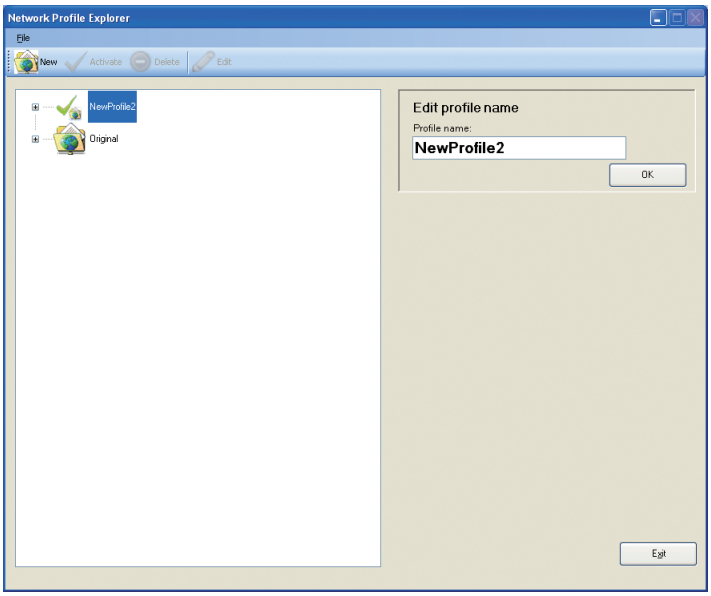


● Delete

Profiles other than the “In use” profile and “Original” profile can be deleted. Select a profile name (with a folder icon attached) from the [Network Profile Explorer] dialog box’s tree view, then click on the tool bar’s 

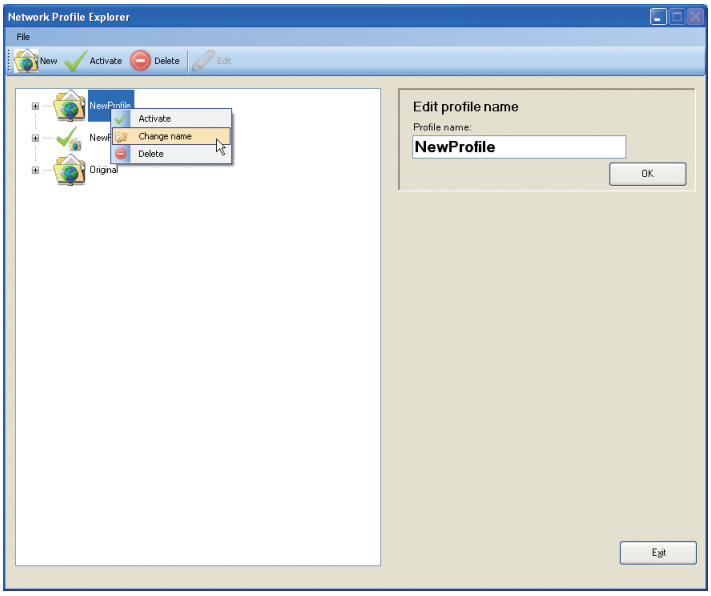
icon, or select [Delete] from the right click menu.





● Edit Profile Name

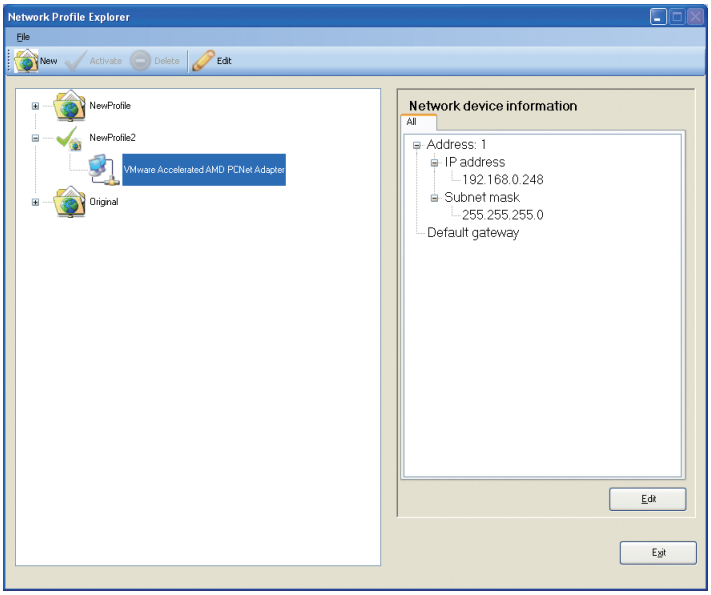
Profiles other than the “In use” profile and “Original” profile can be renamed. Select a profile name (with a folder icon attached) from the [Network Profile Explorer] dialog box’s tree view, then directly alter the name from the tree view, or change it via the profile name edit pane text box.



● Network Device Information

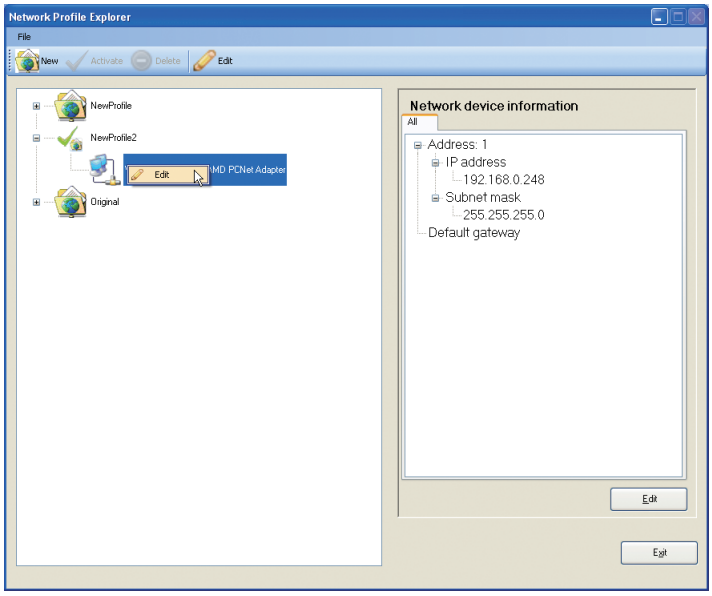
When you want to view the network interface IP address, sub net mask, or default gateway information of a certain profile, select a network interface name under the tree view’s profile name.

>>The information will be displayed in the Network Device Information pane on the right.



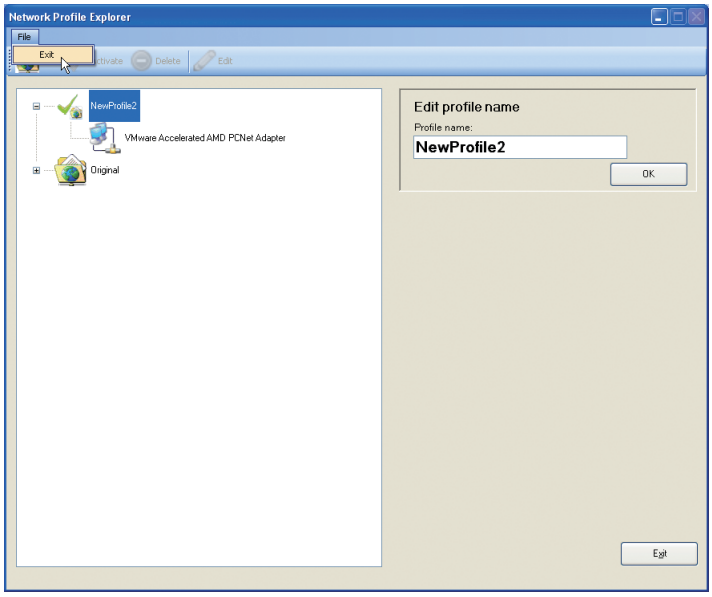
● **Edit**

The network interface IP address, sub net mask, and default gateway for profiles other than “Original” can be edited.
Select a network interface name from under the tree view’s profile, then click [Edit] from the tool bar, or from the network device information pane.



● **Exit**

This button exits the [Network Profile Explorer] dialog box.
Select [File] → [Exit] from the menu bar, or click the [Exit] button in the lower right corner of the dialog box.

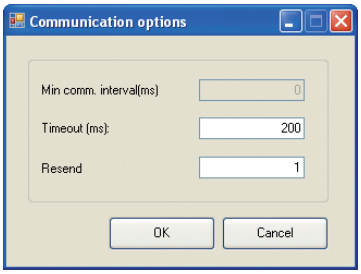


■ Communications Options

Set message timeout, etc. for module communication when connected via loader cable.
Normally this does not have to be changed.

Select [Online] → [Communications options] from the [Actual module configuration] window or Project window's menu bar.

>>The [Communications options] dialog box is then displayed.



● Minimum Communication Interval (ms)

Determine the interval to send the next request message after the reception of the response to the previous one.Values cannot be changed.

● Timeout (ms)

Determine the time taken for the response to a request message.
If there is no response within the timeout period, and the number of times of resending a request is specified, the request will be resent the specified number of times.

● Resend (number of times)

Determine the number of times of resending a request message when the response to the request message is timed out.

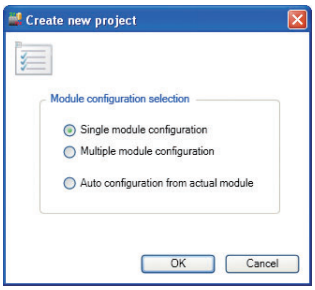
Chapter 6. PARAMETER SETTINGS

6 - 1 Creating a Project

■ Overview

Modules handled with the loader, such as module parameter settings, etc. are called projects. This chapter describes how to create a project.

Select [File] → [New] from the Project window's menu bar, or click the Create icon.
>>The [Create new project] dialog box will then be displayed.



The [Module configuration selection] radio buttons are described below.

- **Selecting [Single module configuration] to create**

When selecting the [Single module configuration] radio button to create a project, module configuration is registered as a single unit. The model number of the registered module is NX-D15NT4T00.
After creating the project, the model number can be changed, and additional modules can be added.
☞ ■ Selecting [Single module configuration] to Create a Project (P. 6-2).

Handling Precautions

- In the case of multi-loop cooperative control using the supervisor module, multiple module settings are configured at the same time. Therefore this connection method should not be used.

- **Selecting [Multiple module configuration] to create**

When selecting the [Multiple module configuration] radio button to create a project, the project will be created without any module being registered.
After the project is created, module configuration will be defined.
☞ ■ Selecting [Multiple module configuration] to Create a Project (P. 6-4).

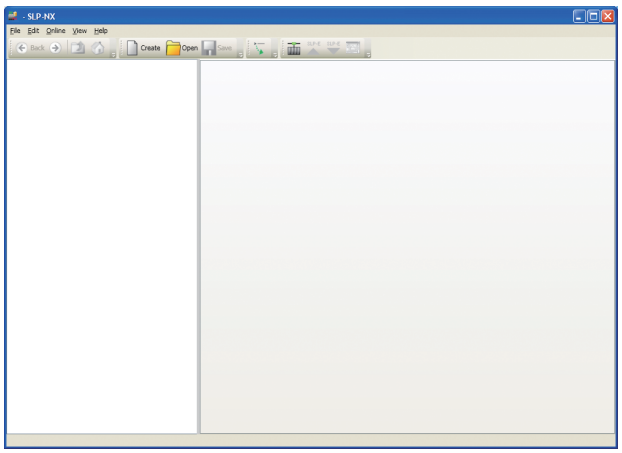
- **Selecting [Auto configuration from actual module] to create**

When the [Auto configuration from actual module] radio button is selected and a project is created, an actual module configuration scan is done and a project is created with the module definition and actual module communication settings based on the detected information.
☞ ■ Selecting [Auto configuration from actual module] to Create a Project (P. 6-6).

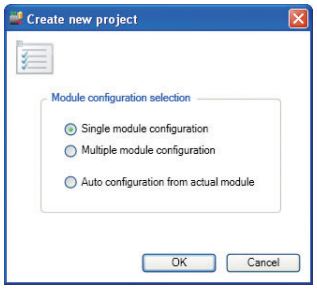
■ Selecting [Single module configuration] to Create a Project

The following steps explain how to register the module configuration for a single module while creating a project.
The model number of the registered module is NX-D15NT4T00.

[1] Select [File] → [New] from the Project window's menu bar, or click the Create icon.



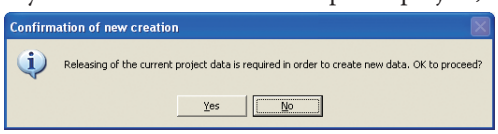
>>The [Create new project] dialog box will then be displayed.



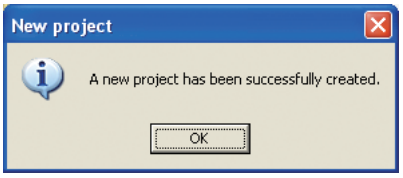
[2] Select [Single module configuration] and click the [OK] button.

Note

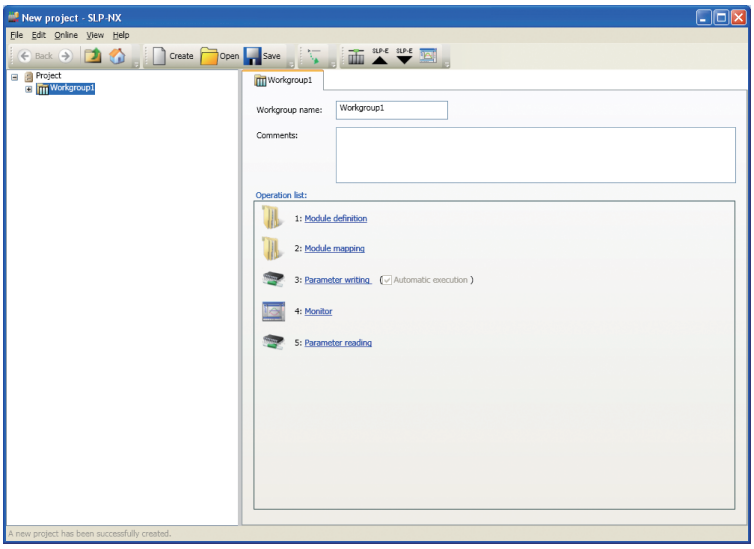
- If a new project is created while another project is already open, the [Confirmation of new creation] message box will be displayed. To close the opened project and start a new one, click the [Yes] button.
  If you don't want to close the opened project, click the [No] button.



[3] A [New project] message box is displayed when the new project has been created. Click the [OK] button.

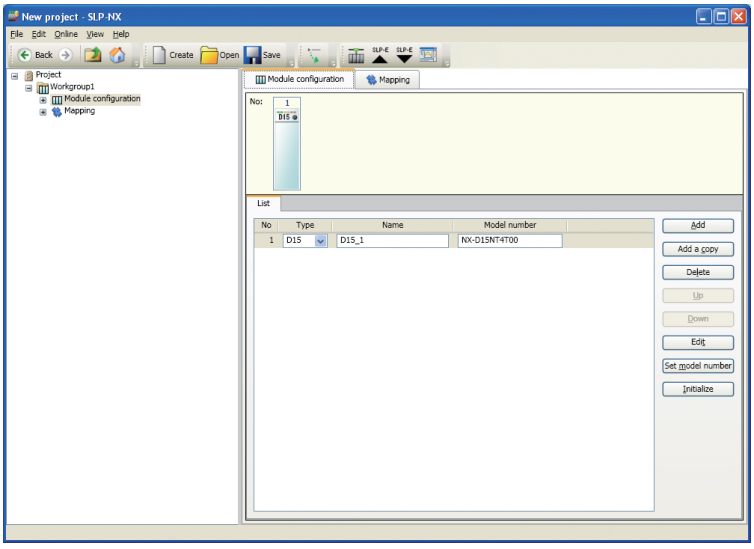


>>A workgroup display will then appear in the project tree.



[4] Select [1: Module definition] from the workgroup display's contents area.

>>Here you can confirm the model number NX-D15NT4T00 is registered for a single module configuration.



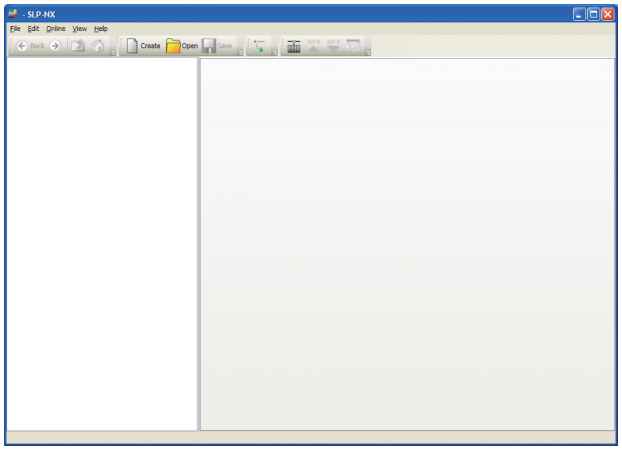
Note

- You can change NX-D15NT4T00 to another model number by changing the module type or model number. You can also add modules.

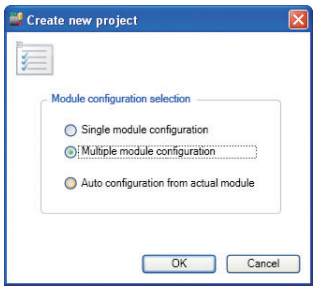
■ Selecting [Multiple module configuration] to Create a Project

The following steps explain how to create a project without registering module configuration.

[1] Select [File] → [New] from the Project window's menu bar, or click the Create icon.



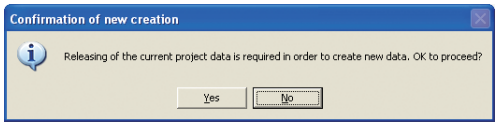
>>The [Create new project] dialog box will then be displayed.



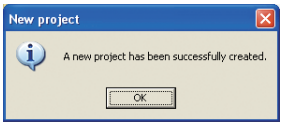
[2] Select [Multiple module configuration] and click the [OK] button.

Note

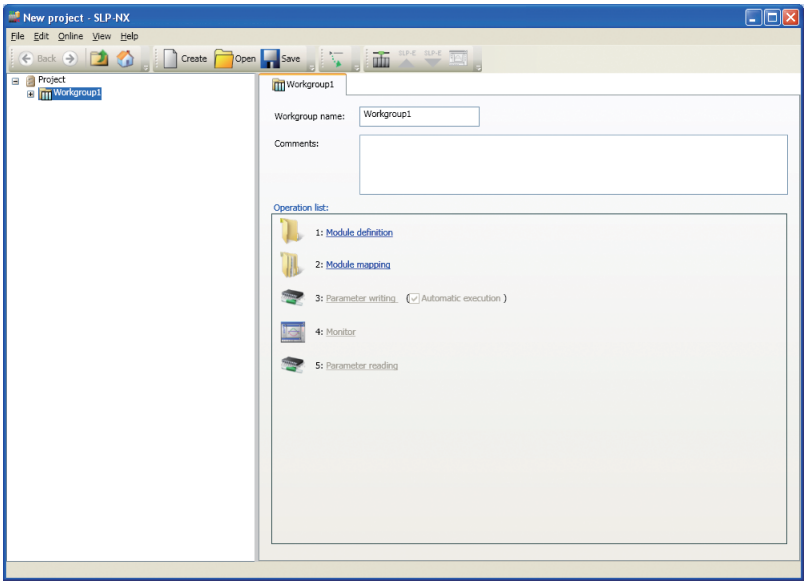
- If a new project is created while another project is already open, the [Confirmation of new creation] message box will be displayed. To close the opened project and start a new one, click the [Yes] button.
  If you don't want to close the open project, click the [No] button.



[3] A [New project] message box is displayed when the new project has been created. Click the [OK] button

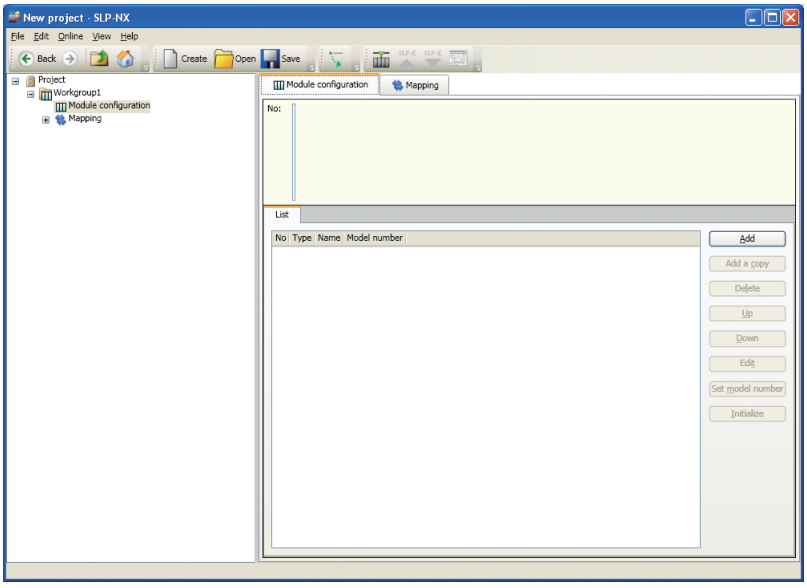


>>A workgroup display is then shown at the project tree.



[4] Select [1: Module definition] from the workgroup display's contents area.

>>Here you can confirm that no modules have been registered to the module configuration.



Note

- For details on module configuration settings,
  ☞ 6 - 2 Defining Module Configuration (P. 6-11).

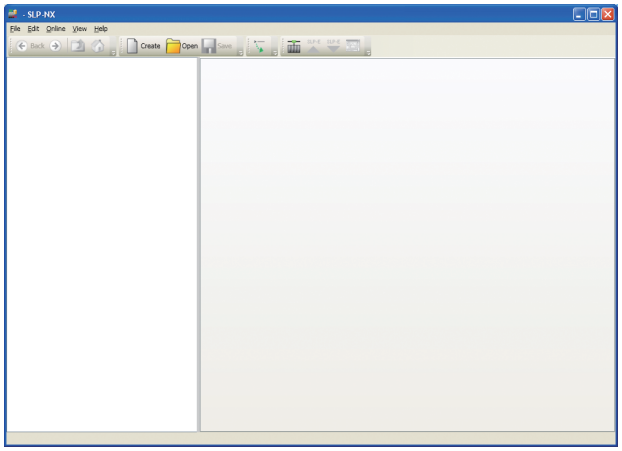
■ Selecting [Auto configuration from actual module] to Create a Project

This section describes how to use the actual module configuration to create a project and at the same time acquire the actual module communication settings.

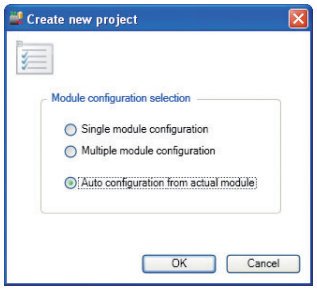
Handling Precautions

- To create a new project from the actual module configuration even if a ring error occurs, in the menu of [Actual module configuration] window, remove the check mark in [Online] → [Sensitive to _ring disconnection error], and then select "Auto configuration from actual module" to create the project. In SLP-NX Ver 3.02.2 or earlier, if a ring error has occurred, a new project cannot be built by executing an actual module configuration scan from the loader. In this case, eliminate the ring error, or create the project offline.
- The following steps describe how actual module communication settings are applied to a module.
  If you are not going to set actual module communication settings, first refer to 5- 2 Defining IP Address and Node Address (P. 5-7) , and then number an IP address, etc. to the module.

[1] Select [File] → [New] from the Project window's menu bar, or click the Create icon.



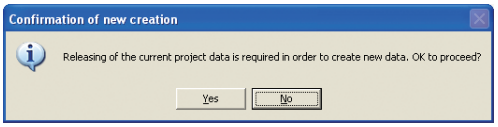
>>The [Create new project] dialog box will then be displayed.



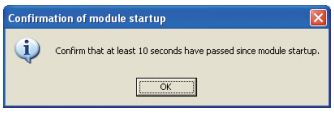
[2] Select [Auto configuration from actual module] and click the [OK] button.

Note

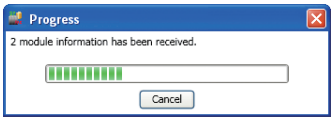
- If a new project is created while another project is already open, the [Confirmation of new creation] message box will be displayed. To close the opened project and start a new one, click the [Yes] button.
  If you don't want to close the open project, click the [No] button.



[3]-1 The [Confirmation of module startup] message box appears. Click the [OK] button to start the actual module configuration scan.



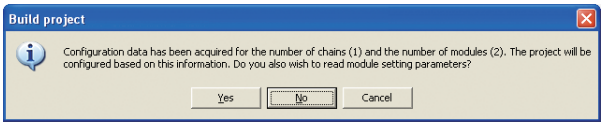
>>The [Progress] dialog box is displayed.



Depending on actual module configuration scan results, the project will differ as follows.

[3]-2 If there are no errors

>>The [Build project] message box is displayed.



If you want to coordinate a parameter reading
click the [Yes] button in the [Build project] message box. Then move on to step [4].

If a parameter reading is not necessary
click the [No] button in the [Build project] message box. Then move on to step [7].

To cancel an actual module configuration scan
click the [Cancel] button in the [Build project] message box.

[3]-3 If an error occurs

>>The [Error in scanning of actual module configuration] message box will be displayed.

Note

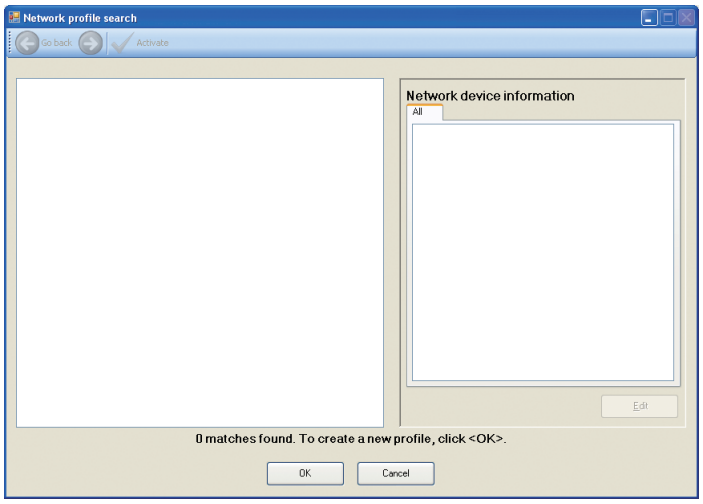
☞■ Message List (P. 5-16).

Click the [OK] button in the [Error in scanning of actual module configuration] message box.

>>The [Confirmation of transition to the actual module configuration window] message box will be displayed.

When clicking the [Yes] button in the [Confirmation of transition to the actual module configuration window] message box, the [Actual module configuration] window shown in step [5] in 5 - 2 Defining IP Address and Node Address (P. 5-7) will be displayed.
Clicking the [No] button will end the process. First work to avoid the displayed error.

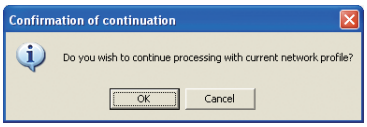
[4]-1 If the settings are unable to directly communicate with modules connected via PC network settings, a [Network profile search] dialog box is displayed. If the settings are able to directly communicate with modules connected via PC network settings, the parameter receiving process begins.
In this case, move on to step [5].



[4]-2 If an applicable profile is available among those registered, a dialog box is displayed to confirm whether or not the found profile will be used.

<When using a registered profile that is displayed>
Click the [OK] button and move on to step [5].

<When not using any profile that is displayed >
Click the [Cancel] button.
Note) A [Confirmation of continuation] message box is displayed. To cancel communication, click the [Cancel] button.

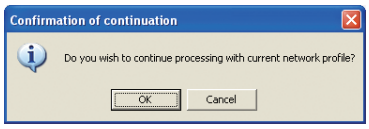


When [OK] is clicked in the [Confirmation of continuation] message box, the process proceeds to step [5], but when communication fails, the [Process failure] message box is displayed. Reset the module and PC network settings correctly before repeating the process.

[4]-2 If an applicable profile is not available among those registered, a dialog box is displayed to confirm whether or not you want to create a new profile.

<When creating a new profile>

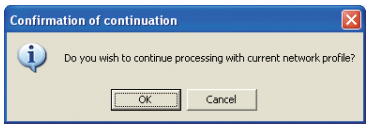
Click the [OK] button to create a new applicable profile, and a dialog box will be displayed to confirm whether or not you will use it.
When clicking the [OK] button again, the profile will switch to a new one. In this case, move on to step [5].
If you do not want to use the new profile, click the [Cancel] button.
Note) A [Confirmation of continuation] message box is displayed. To cancel communication, click the [Cancel] button.



When [OK] is clicked in the [Confirmation of continuation] message box, the process proceeds to step [5], but when communication fails, the [Process failure] message box is displayed. Reset the module and PC network settings properly before repeating the process.

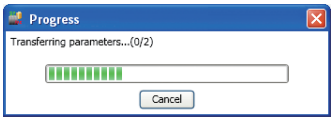
<When not creating a new profile>

Click the [Cancel] button.
Note) A [Confirmation of continuation] message box is displayed. To cancel communication, click [Cancel].



When [OK] is clicked in the [Confirmation of continuation] message box, the process proceeds to step [5], but when communication fails, the [Process failure] message box is displayed. Reset the module and PC network settings properly before repeating the process.

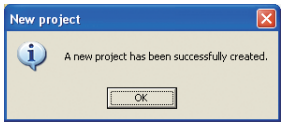
[5] When receiving parameter files, the [Progress] dialog box is displayed.



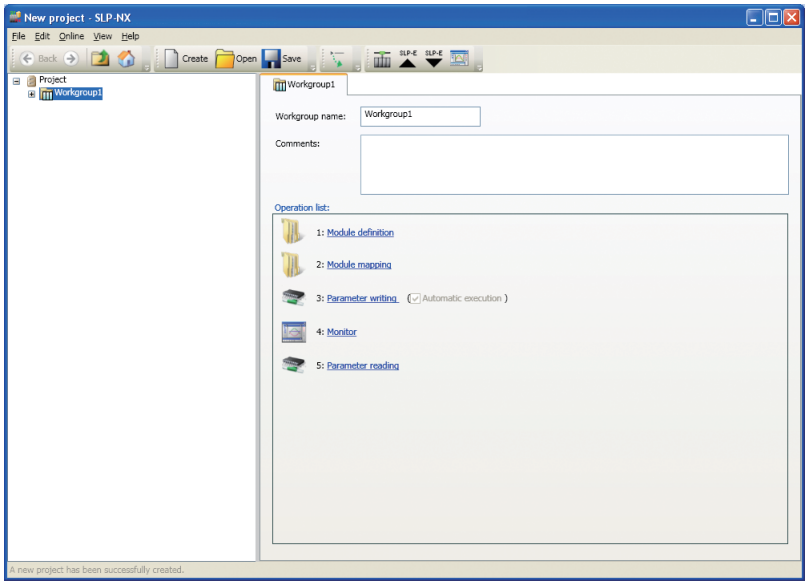
[6] When the files have been received, the [Parameters received] message box is displayed. Click the [OK] button.

Then move on to step [8].

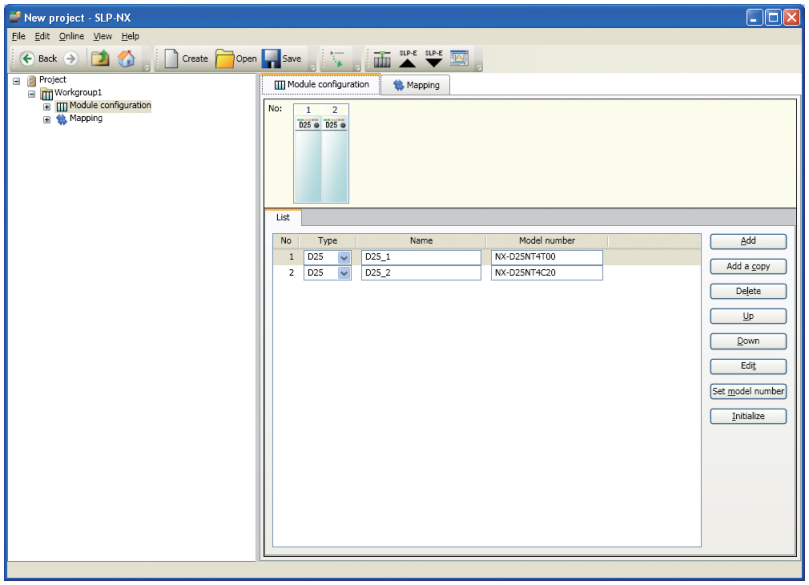
[7] A [New project] message box is displayed when the project has been created. Click the [OK] button..



[8] A workgroup display will then appear in the project tree.



[9] Select [1: Module definition] from the workgroup display's contents area. When information acquired from network modules is shown on the module configuration display, registration of module configuration settings can be confirmed.



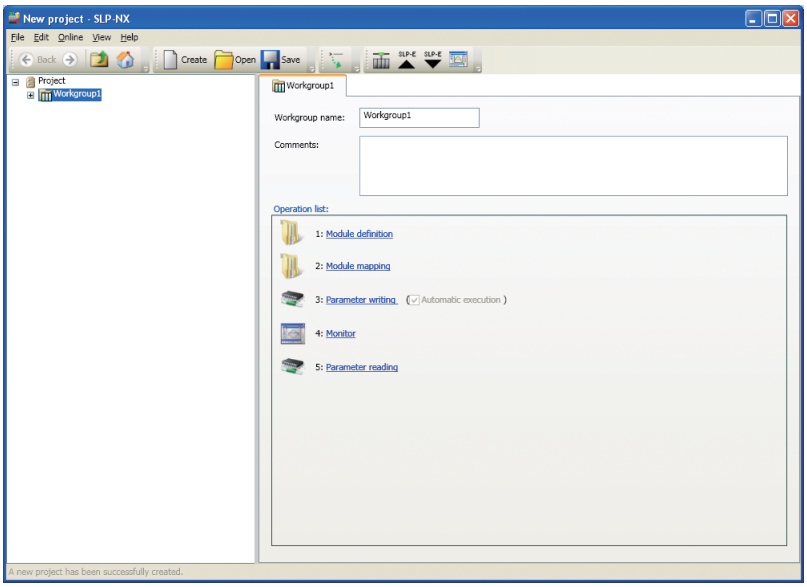
6 - 2 Defining Module Configuration

When selecting [1: Module definition] in the Project window → [Workgroup] view's contents area, the module configuration belonging to the workgroup will be displayed.

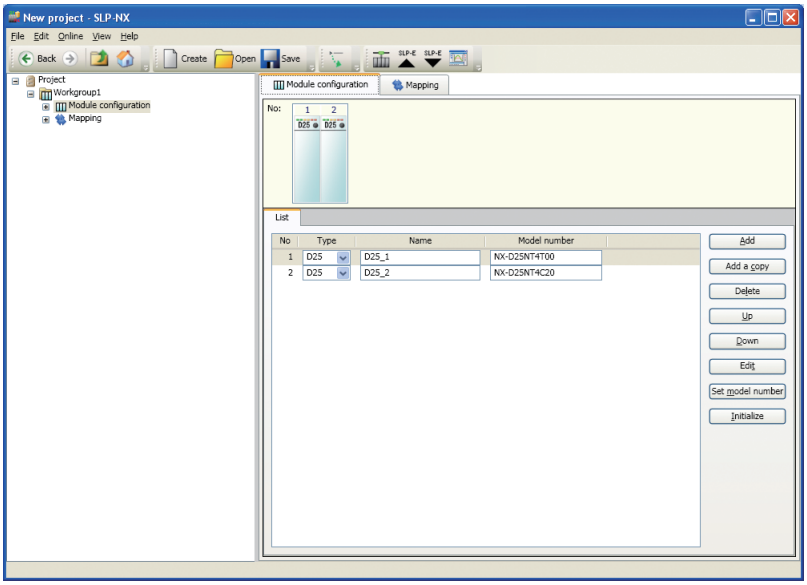
Note

- The actual module configuration's chain is a workgroup.

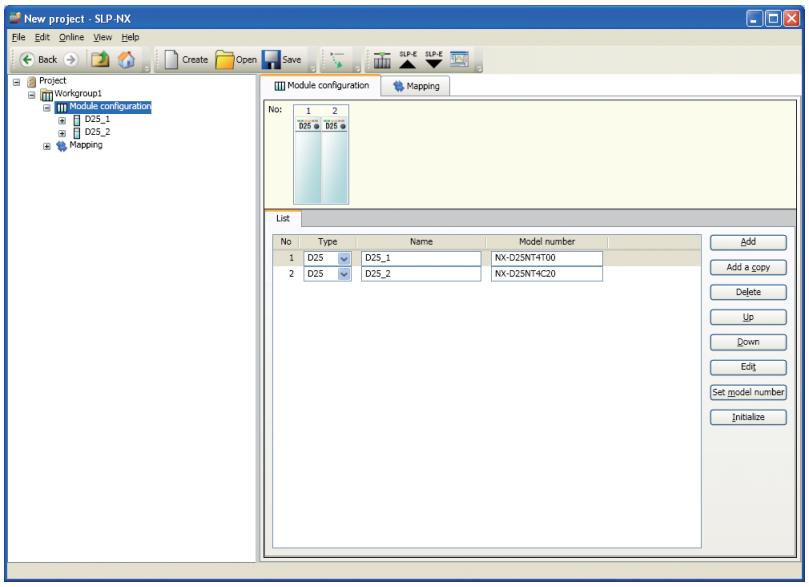
Select [1: Module definition] from the [Workgroup] view's contents area.



>>The [Module configuration] screen is then displayed.



In the [Workgroup] view's [Module configuration] screen, module types (basic model number), module names (automatically named by loader if a module that acquired information has no name), and model numbers that belong to the workgroup are listed.



Handling Precautions

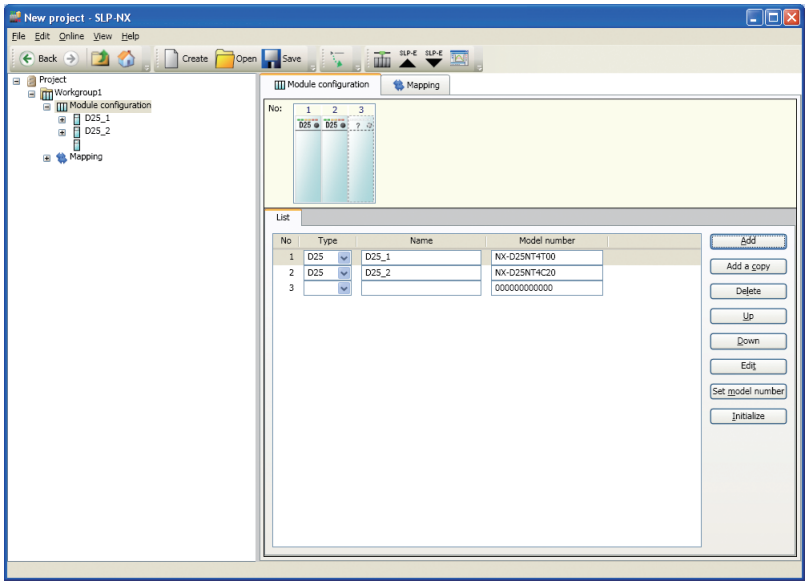
- If a module type on the list is changed, the [Confirmation of module type modification] message box is displayed. When a module's type is changed, all of its parameters will be initialized.

■ Adding Modules

To add a module to the workgroup's module configuration, select the [Add] button or [Add a copy] button.

● Selecting the [Add] button to add a module

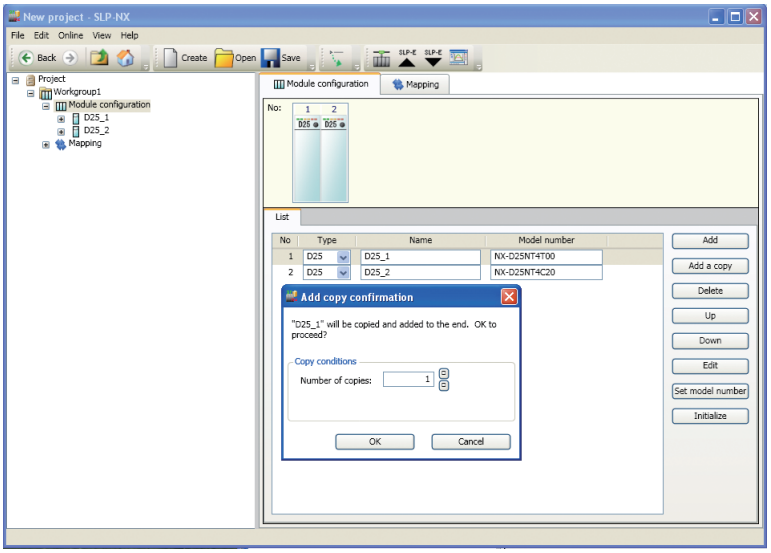
A single module with the model number NX-D15NT4T00 will be added to the module configuration.



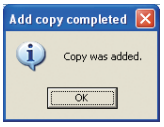
● **Selecting the [Add a copy] button to add a module**

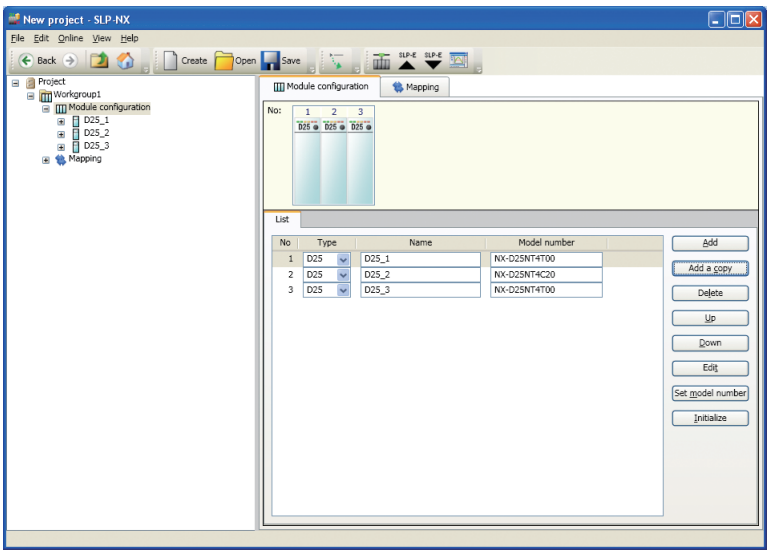
Select the module to be copied in the module list, and then click the [Add a copy] button.

>>The [Add copy confirmation] dialog box will then be displayed.
This function will also copy parameters of the copied module.



Set the copy conditions (number of copies), and click the [OK] button..
Clicking the [Cancel] button will cancel the process.
When setting the number of copies and clicking the [OK] button, the [Add copy completed] message box is displayed, and the designated number of copied modules are added.





■ Delete

Select the module to be deleted in the module list, and then click the [Delete] button. When the [Delete confirmation] message box is displayed, click the [Yes] button.

>>The selected module will then be deleted.

■ Edit

Have a module to edit selected in the module list, then click the [Edit] button.

>>The selected module will then be selected in the project tree.
Select  from the tool bar, or double click the selected position on the project tree to display parameters for the selected module on the project tree.
☞ 6 - 3 Editing Parameters (P. 6-16).

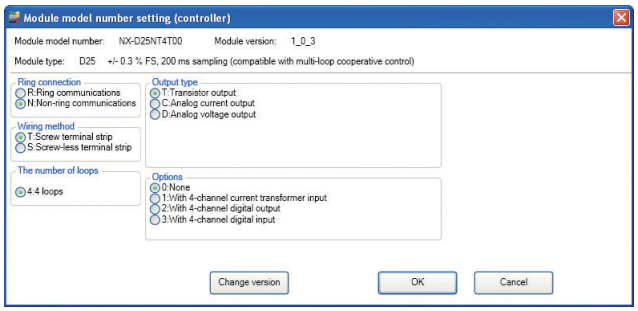
Note

- Parameters displayed in the project tree will differ according to user level.
☞ ■ User Levels (P. 6-19).

■ Set Model Number (Confirm or Change a Module's Model Number Details)

[1] When information is acquired via the actual module configuration scan, it is usually unnecessary to change model number details. When you want to confirm or change a module's model number details, select the module in the module list, and then select [Set model number].

>>The [Module model number setting] dialog box is displayed.



[2] Select a radio button for the model number you want to change, then click the [OK] button. The selected model number will be changed.

Note

- When you already know the model number, it can be changed directly by entering it in the [Model number] text box. (Excluding basic model numbers)
- When entering a model number manually, or changing it after creating a project with the actual module configuration scan function, a write error will occur during parameter writing if it is inconsistent with the actual module's model number.
- Initialize or change the version as necessary. ☞ ■ Initialize (P. 6-15).
- "Change version" Dialog Box, page 6-64 (for information about the [Change version] button) ☞ ■ User Levels (P. 6-19).

■ Initialize

Have a module selected for parameter initialization in the module list, then click the [Initialize] button.

>> Parameters for the selected module will be initialized.

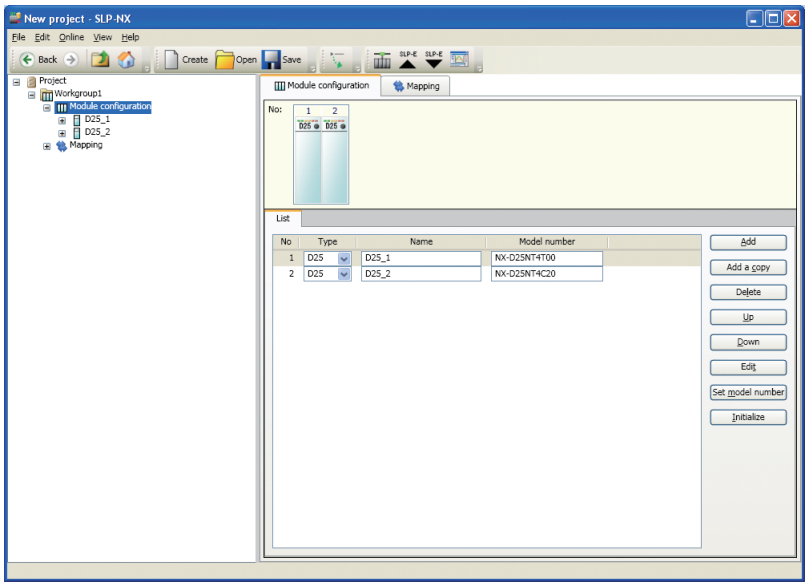
Handling Precautions

- When parameters are initialized, the module version is updated to the latest one that the loader recognizes.
- ☞ 6-8 Handling Module Versions (P. 6-59)

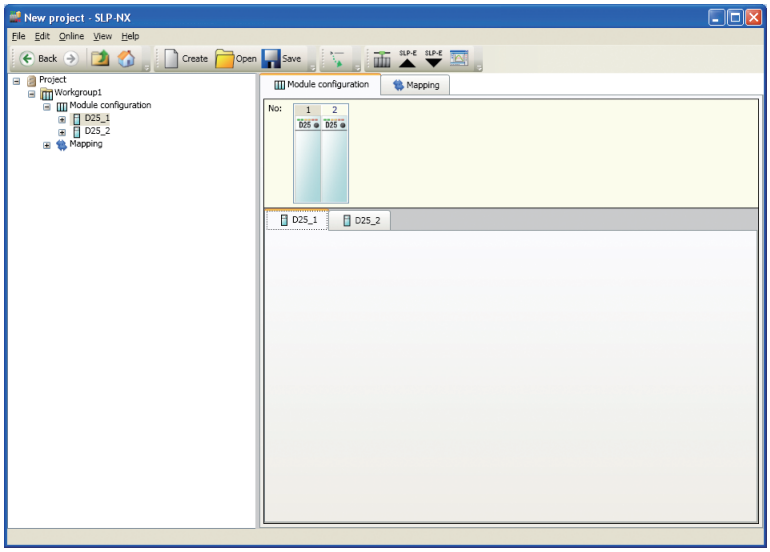
6 - 3 Editing Parameters

Each parameter can be edited by performing the following steps.

[1] Select the module to be edited in the module configuration display list, and then click the [Edit] button.

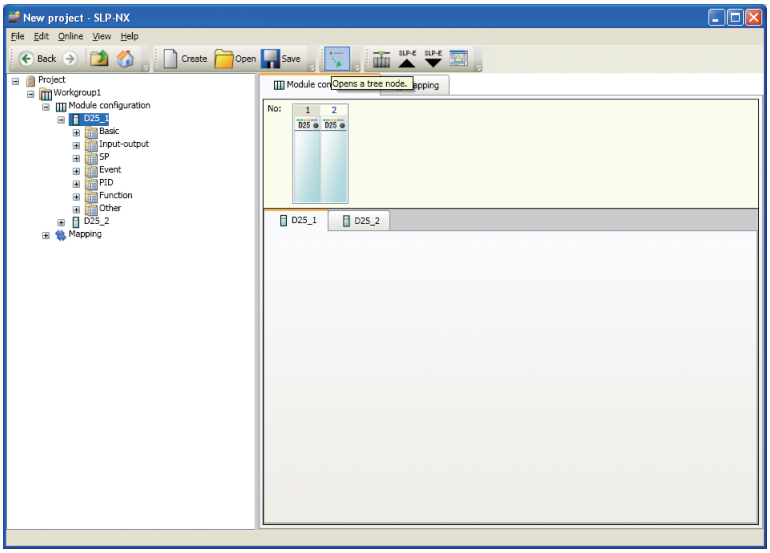


>>The selected module will then be selected in the project tree.



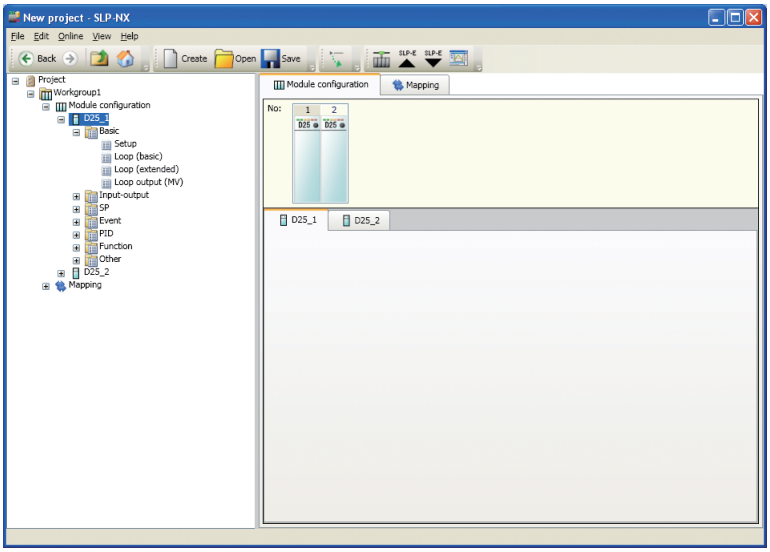
[2] Click the [+] mark displayed on the left of the module name's node.

>>Categories will then be displayed.



[3] Click the [+] mark on the left of any category name.

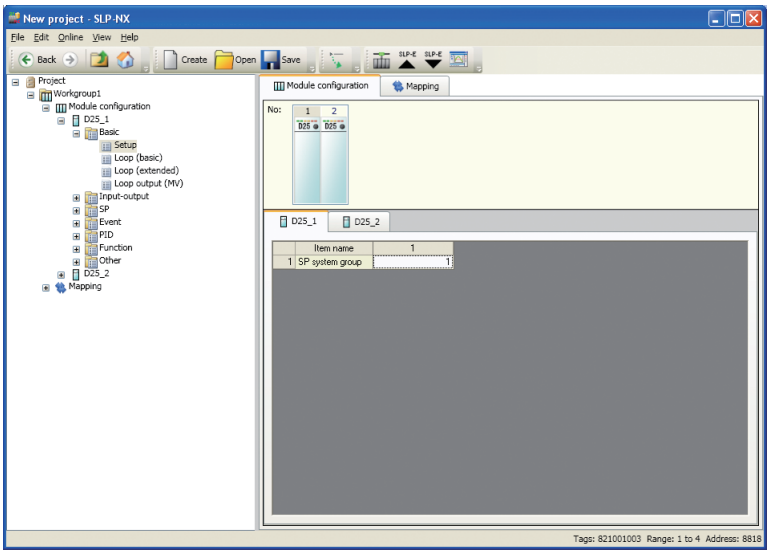
>>The parameter bank will then be displayed.



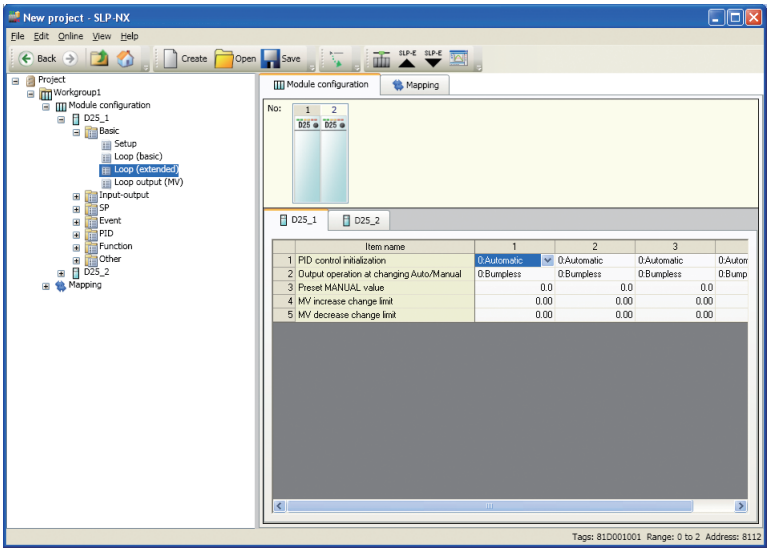
[4] Click the parameter bank name.

>>An editor grid will then be displayed for that parameter bank in the contents area.

- For basic/setup

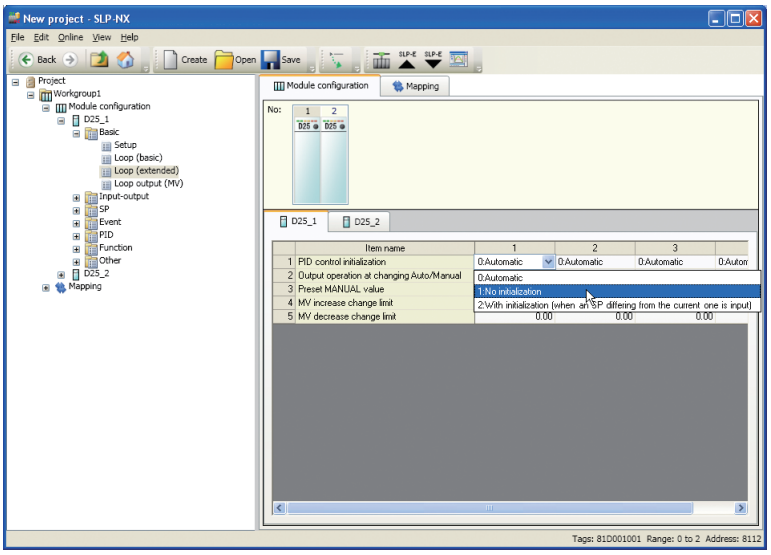


- For basic/loop (extended)



[5] Enter data values directly, or select an option from the combo box to change parameters.

- For combo box



■ User Levels

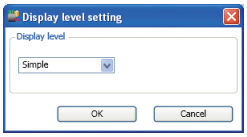
Parameters displayed by the loader will differ depending on the user level.
There are three user levels in total, as shown below.

- Simple : Only basic settings are displayed.
- Standard : Standard functions are displayed.
- Multi-function : More advanced functions are displayed.

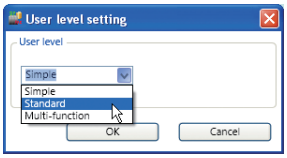
☞ Each module's user manual.

[1] To change the user level, select [View] → [Set user level] from an open project, or from the [Actual module configuration] window's menu bar.

>> The [User level setting] dialog box is then displayed.



[2] Select a level you want to change from the combo box, then click the [OK] button.



Note

- When the loader is started next time by the same user of the Windows, the user level will be the same as when the loader was terminated previously.

■ Copy

Select a single parameter cell, string numbers (select all strings), or line numbers (select all lines), then right click and select [Copy] (or press Ctrl+C), to copy the selected data area to the copy buffer.

■ Paste

Select a single parameter cell, string numbers (select all strings), or line numbers (select all lines), then right click and select [Paste] (or press Ctrl+V), to paste the data values copied to the copy buffer. Note that "select all strings" and "select all lines" will be pasted within the same parameter bank.
When pasting, the data setting range of the paste destination will be applied.

■ Edit

Selecting and right clicking a single parameter cell, then selecting [Edit], enables you to directly change data. (Parameters normally entered in a combo box can also be used.)

Handling Precautions

- For project names, tag names, etc., use alphanumeric character strings only. If Unicode strings or the like are used, they may be garbled during CSV output, etc.

■ Setting Up the Data Transfer Function between Modules

This function enables you to use monitor data or parameters from other modules as actual module parameters via the actual module's user-defined bits or user-defined numbers.

Note

- User-defined bits and user-defined numbers are used one at a time for parameters each time remote data is used.
  ☞ Network Instrumentation Module User's Manual for Network Design Version (CP-SP-1313E).

Handling Precautions

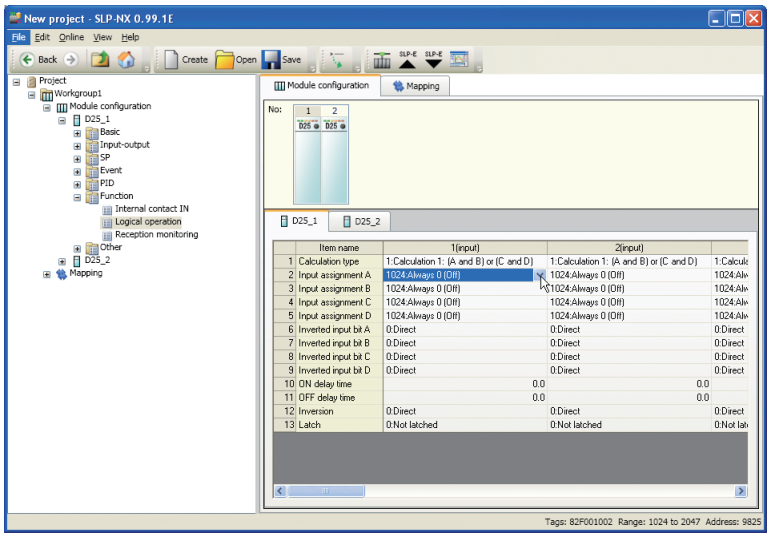
- The model numbers of certain modules are not compatible with the data transfer function between modules.
  Example: NX-D15 is not compatible with the data transfer function between modules.
- Modules using the data transfer function between modules must have different node IDs within the same workgroup.
- After setting up the data transfer function between modules, parameters must be written tor the actual module and other module as shown in 6 - 5 Writing Parameters (P. 6-46).
  Write parameters for both modules or all workgroups.
- Do not set up data transfer function between modules for the modules that are using multi-loop cooperative control.

Steps for this process are shown below.

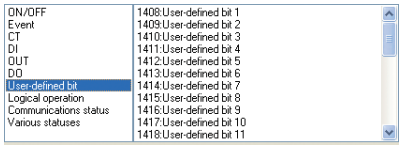
● Basic Steps

As an example, the Logical Operation Function's input assignment A data will be used in the DI input port status of another module.
To use the Logical Operation Function, the user level must be set to [Standard] or [Multi-function].

[1] Click the down arrow on the combo box for the [Input assignment A] parameter setting in the [Logical operation] parameter bank.



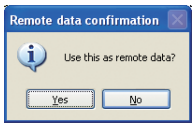
[2] There are two types of combo boxes: Level 1 and Level 2. Select a user-defined bit from Level 1, then select a number that is not being used for anything else from Level 2.



Note

- If the user-defined bit is already in use, the remote data name will be displayed in its place.

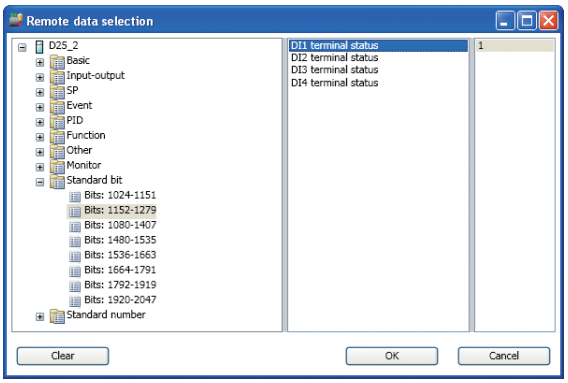
[3] Click the [Yes] button on the [Remote data confirmation] message box.



Note

- When clicking the [No] button, the user-defined bit number of the selected number will be assigned.

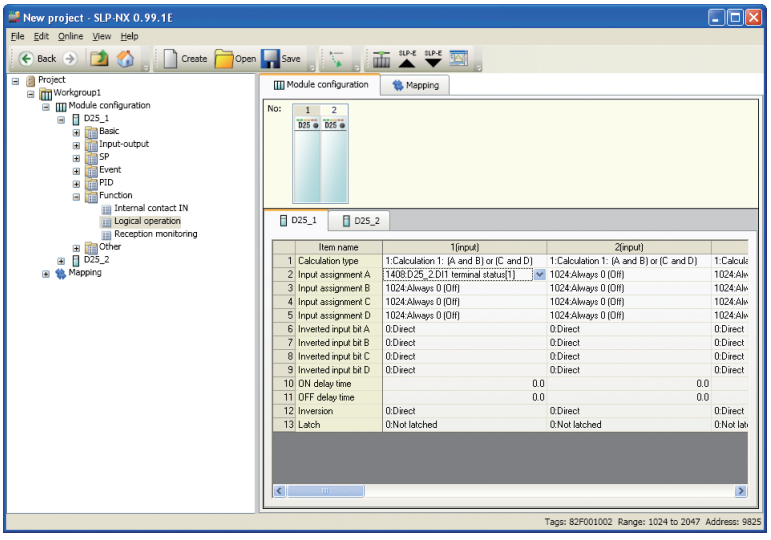
[4] The [Remote data selection] dialog box is then displayed.
Select the necessary data. Select [DI1 terminal status] from the targeted module's [Standard bit] bank.



Note

- This data number is displayed when the far right pane is divided by channel or loop. If there is only one, it will be selected automatically.

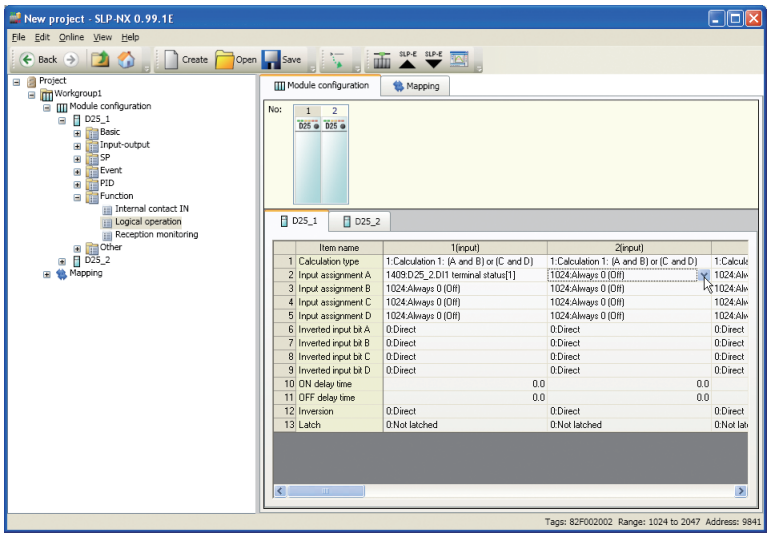
[5] Click the [OK] button to confirm, and when exiting the [Remote data selection] dialog box, you can confirm that data from another module is selected for parameter as seen below.
Clicking the [Cancel] button in the [Remote data selection] dialog box will register the assigned user-defined bit number, but not the remote data.



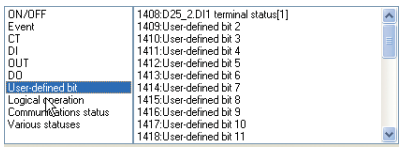
● Steps for using the same remote data for multiple parameters

The following steps explain how to use remote data being used as parameters for different parameters within the same module.
As with basic steps, the process of registering the DI input terminal status of another module to the Logical Operation Function's 2 (Input) Input Assignment A will be used as an example.

[1] Make sure the basic steps have already been completed.
In order to use the same remote data for other parameters click the down arrow on the combo box - 2 (input) - for [Input assignment A] in the Logical Operation Function as done in the basic steps.



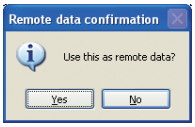
[2] When selecting a user-defined bit from the Level 1 combo box, the remote data name is displayed in the user-defined number, which has already been in use on the Level 2 combo box since basic steps were performed. Select that. (The DI1 terminal status of D25_2 is used in the example below.)



Note

- If already in use, the remote data name will be displayed in place of the user-defined bit's data name.

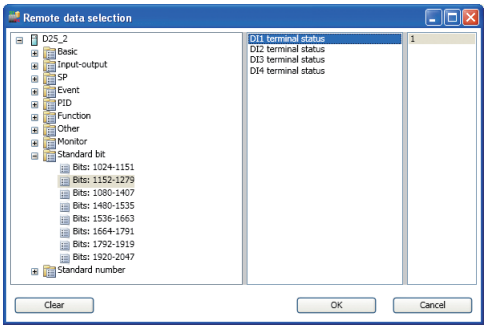
[3] Click the [Yes] button on the [Remote data confirmation] message box.



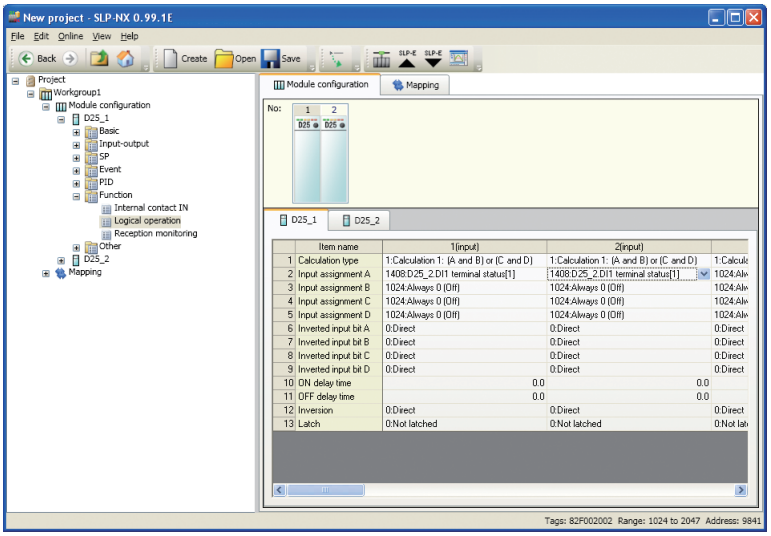
Note

- When clicking the [No] button, only the selected user-defined bit number will be assigned. Parameters set during the basic steps will also be user-defined bit numbers.

[4] Data will already be selected in the [Remote data selection] dialog box. Click [OK] or [Cancel].



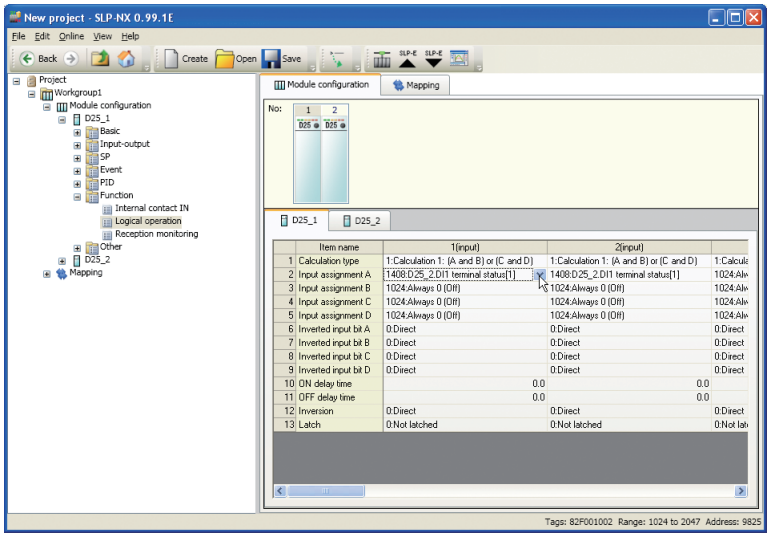
[5] You can confirm that the same remote data is being used for different parameters.



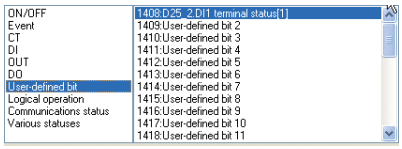
● Steps for cancelling the use of a single parameter when the same remote data is being used for multiple parameters

The following steps describe how to cancel single parameter use of remote data being used for multiple parameters. The steps performed when using the same remote data for multiple parameters will be used as an example. The same remote data will be used for the Logical Operation Function's (Input 1 and Input 2) Input Assignment A.

[1] The same remote data is already selected from ● Steps for using the same remote data for multiple parameters. To only cancel some use of the remote data for parameters, click the down arrow in the combo boxes of those parameters.

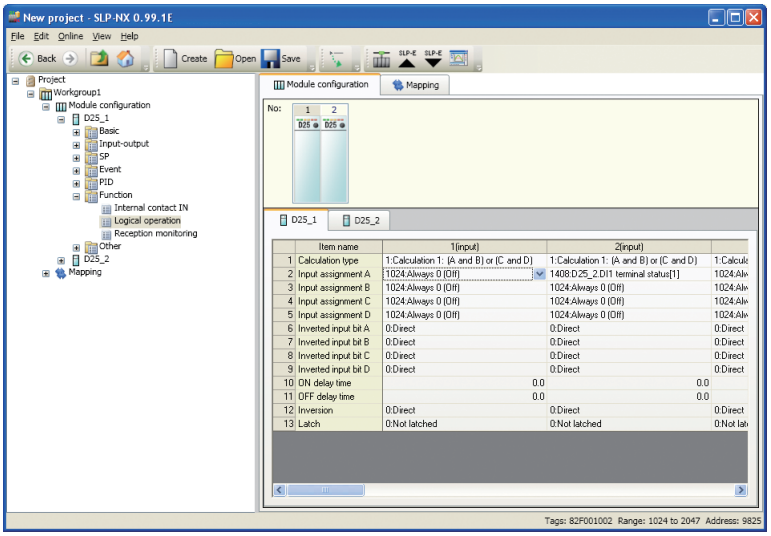


[2] You can confirm that remote data is selected in the combo boxes.



[3] In the combo box, change to a user-defined bit number that hasn't been assigned to remote data, or change to an option other than the user-defined bit. This allows you to change exclusive use of those parameters to local data. (In the example below, [Always 0 (Off)] has been selected in the [ON/OFF] option.)

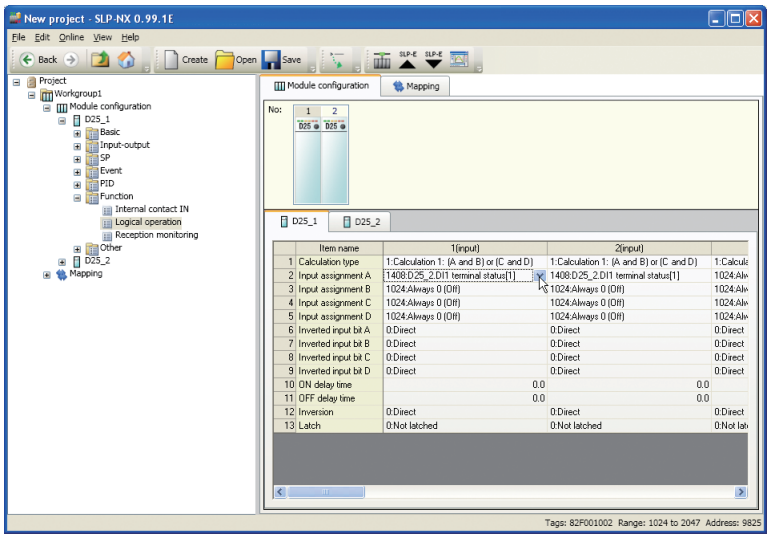
[4] You can confirm that only a portion of the parameters have been set to local data.



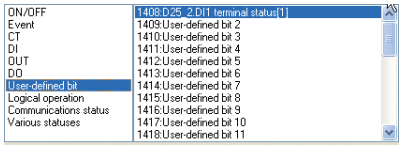
● Steps for clearing all remote data use when the same remote data is being used for multiple parameters

The following steps explain how to clear all remote data use when remote data is being used for more than one parameter.
The same remote data used for basic steps, with the Logical Operation Function's Input Assignment A, will be used for this example.

[1] "Steps for using the same remote data for multiple parameters" must already be completed. To clear the use of remote data for multiple parameters, click the down arrow in the combo box of any parameter.

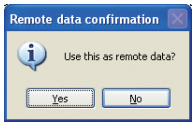


[2] You can confirm the remote data is selected in the combo box.

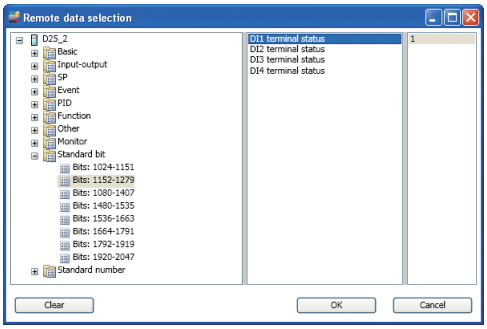


[3]-1 After performing step [2] above, click the 2nd level's selection status name (in the example above, it is the DI1 terminal status of D25_2).

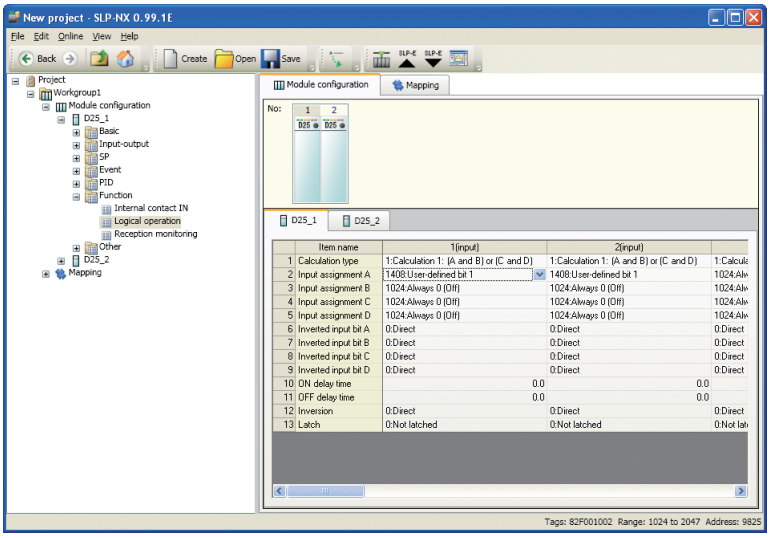
[3]-2 Click the [Yes] button on the [Remote data confirmation] message box.



[3]-3 Click the [Clear] button on the [Remote data selection] dialog box.



[4] You can confirm that remote data is no longer assigned as any of the parameters.

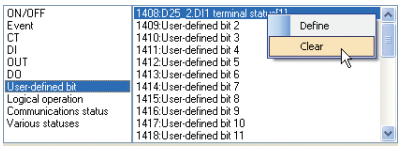


Note

- If using the same remote data while using different user-defined bit/user-defined numbers, perform the clear process for each instance.
- After performing the clear process, parameters will be the same as user-defined bit/user-defined numbers that were being used. When assigning different remote data to those user-defined bit/user-defined numbers, all parameters using those numbers can use the remote data.

● Steps for clearing remote data use from the [Remote data selection] combo box

- Remote data use can also be cleared by right clicking numbers you want to clear from the Level 2 combo box, then selecting [Clear].



■ Display the List of Data Transfer between Modules

This function displays a list of the settings for data transfer between modules.

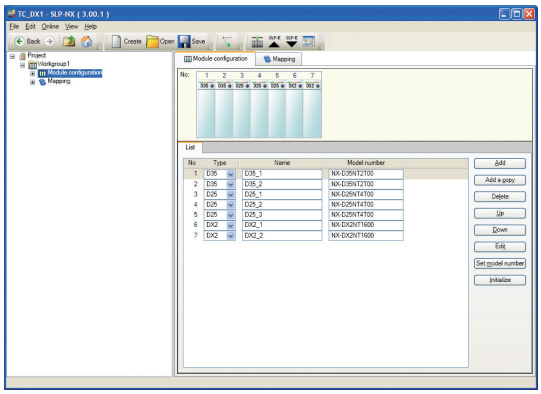
Note

- ☞ Chapter 5, "Function for Transmitting Data Between Modules" in Network Instrumentation Module User's Manual Network Design Version, CP-SP-1313E

Handling Precautions

- This function shows a list of the settings for data transfer between modules. When changing the settings, see "■ Setting Up the Data Transfer Function between Modules (P. 6-21).

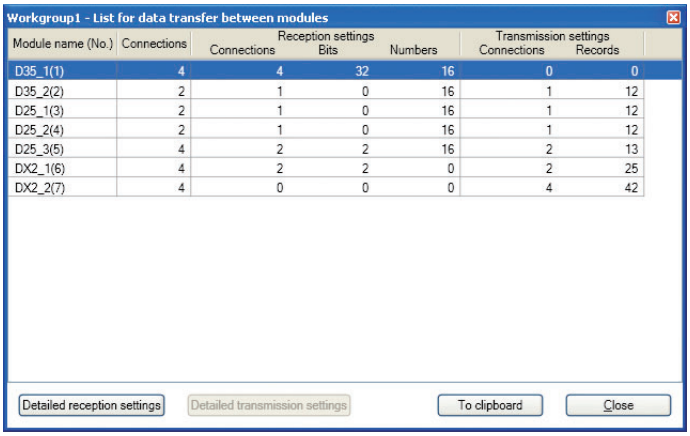
(1) Select a lower level than the target workgroup from the [Project] window's project tree.



(2) In the [Project] window's menu bar, select [View] → [Display the list of data transfer between modules]

(3) The [List for data transfer between modules] dialog box shows the settings for data transfer between modules.

[List for data transfer between modules] dialog box



- **Title Bar**

  Shows the workgroup name.

- **Module name (No.)**

  Shows module names and numbers in the module configuration window.

- **Connections**

  Shows the total No. of module reception and transmission connections

- **Connections (reception settings)**

  Shows how many receiving connections the module has.

- **Bits**

  Shows the total number of user-defined bits that the module has received.

- **Numbers**

  Shows the total number of user-defined numbers that the module has received.

- **Connections (transmission settings)**

  Shows how many transmitting connections the module has.

- **Records**

  Shows the total number of parameters that the module has transmitted.

- **[Detailed reception settings] button**

  Shows the [Detailed reception settings] dialog box for the selected module. It is disabled if the number of connections is set to 0.

- **[Detailed transmission settings] button**

  Shows the [Detailed transmission settings] dialog box for the selected module. It is disabled if the number of connections is set to 0.

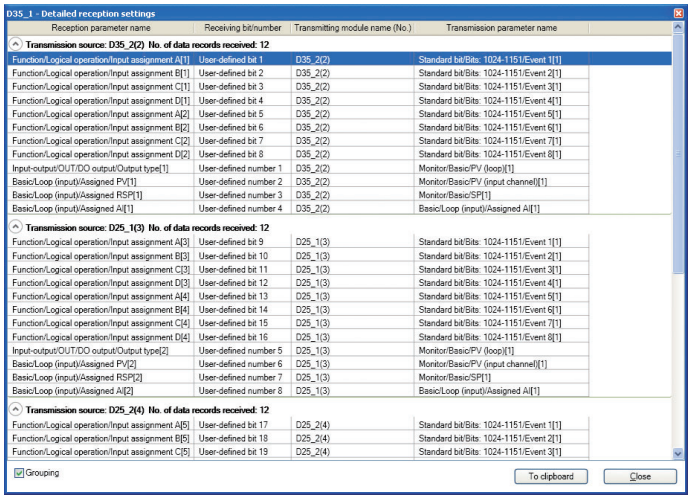
- **[To clipboard] button**

  Copies the displayed contents to the Windows clipboard.

- **[Close] button**

  Closes the [List for data transfer between modules] dialog box.

[Detailed reception settings] window



The size of the [Detailed reception settings] window can be changed if the display width is not sufficient.

- **Title bar**

  Shows the module name.

- **Reception parameter name**

  Shows the name of the parameter to which data received by the receiver module will be written.

- **Receiving bit/number**

  Shows the user-defined number or bit destination for the data received by receiver module. The data will be written to parameters listed in the [Reception parameter name] column.

- **Transmitting module name (No.)**

  Shows transmitting module names and numbers.

- **Transmission parameter name**

  Shows the name of the parameters sent from the transmitting module.

- **Group title**

  Groups data records for each transmission source module and shows the transmission source module name and the number of received data records. Module status details can be displayed or hidden by clicking the button to the left of the group title.

- **[Grouping] check box**

  Displays or hides the group title.

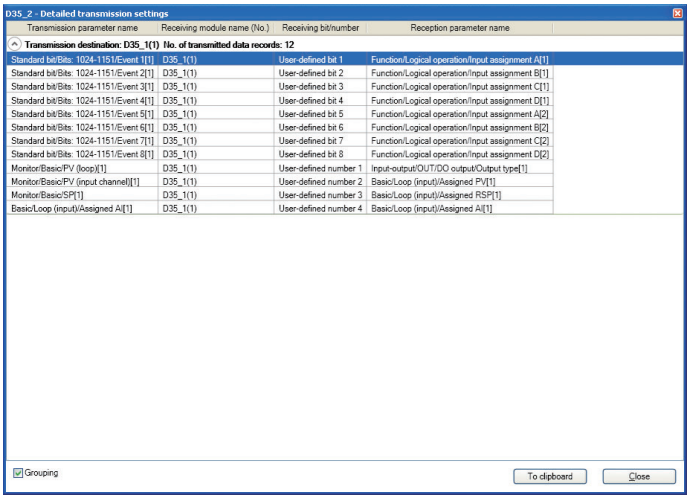
- **[To clipboard] button**

  Copies the displayed contents to the clipboard.

- **[Close] button**

  Closes the [Detailed reception settings] window.

[Detailed transmission settings] window.



The size of the [Detailed transmission settings] window can be changed if the display width is not sufficient.

- **Title bar**

  Shows module name.

- **Transmission parameter name**

  Shows the name of the parameter to be sent.

- **Receiving module name (No.)**

  Shows receiving module names and numbers.

- **Receiving bit/number**

  Shows user-defined number or bit destination for data received by receiver module. The data will be written to the parameter listed in the [Reception parameter name] column.

- **Reception parameter name**

  Shows the name of the parameter to which data received by the receiver module will be written.

- **Group title**

  Groups data records for each destination module and shows the destination module name and the number of data records sent. Module status details can be displayed or hidden by clicking the button to the left of the group title.

- **[Grouping] check box**

  Displays or hides the group title.

- **[To clipboard] button**

  Copies the displayed contents to the clipboard.

- **[Close] button**

  Closes the [Detailed transmission settings] window.

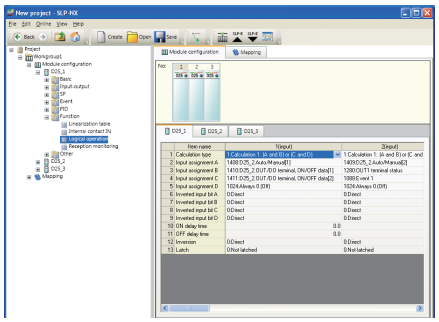
Handling Precautions

- If there is no corresponding module (no destination module for the data that was read, etc.), a warning appears for the appropriate item.
  Details about the warning can be seen by hovering the mouse pointer over the warning icon.

■ Logical Operation Display

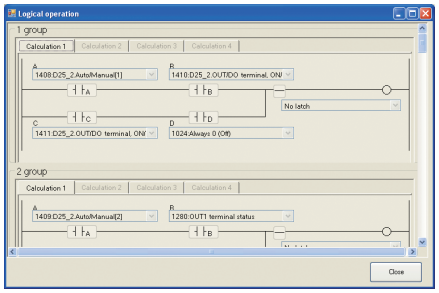
This function displays a list of the settings for logical operations.

[1] Select the [Logical operation] parameter bank.



[2] Select [Edit] → [Display logical operation definition window] from the project window menu bar.

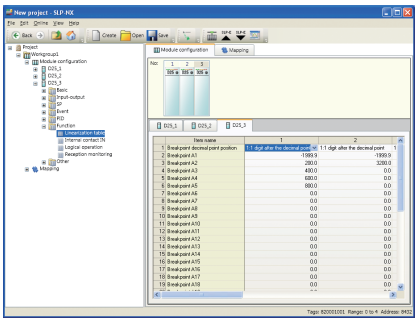
[3] The logical operation settings are displayed in the [Logical operation] window.



■ Line Graph Display

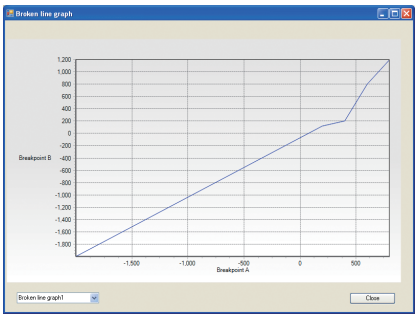
This function displays the linearization table settings.

[1] Select the [Linearization table] parameter bank.



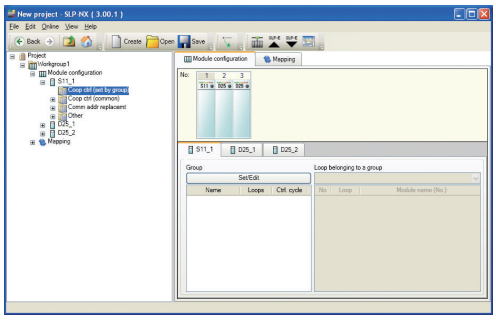
[2] Select [View] → [Display line graph] from the Project window's menu bar.

[3] The linearization settings are displayed in the [Line graph] window.



■ Setup of Multi-Loop Cooperative Control

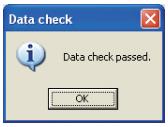
Select the [Cooperative Control (Set by Group)] category of the supervisor module from the project tree.



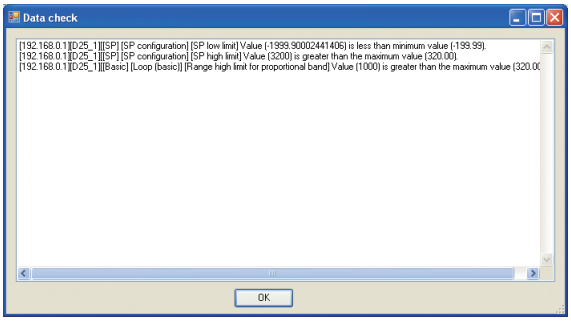
Click the [Set/Edit] button in the group settings list in the contents area.
The screen for configuring the advanced settings for cooperative control is displayed. Configure the settings. For details, refer to Network Instrumentation Module NX-S11/12/21 Supervisor Module User's Manual Functions (CP-SP-1324E).

■ Data Check

With a project open in the Project window, selecting [Edit] → [Data check] from the menu bar enables you to check the parameters of all modules registered to the project. If no problems are indicated by the data check results, the following will be displayed.



If problem(s) are indicated by the results, the following [Data check] message box is displayed.



Note

- The setting range will be inspected during normal input, but changing upper/lower limits, or altering the decimal point position, etc. will check the range of other settings if they are changed.
  Fields output to each line of the error display are as follows.

No.	Description
1	The mapping data module's IP address
2	Module name
3	The parameter category name
4	The parameter bank name
5	The parameter item name
6	Error message

6 - 4 Mapping

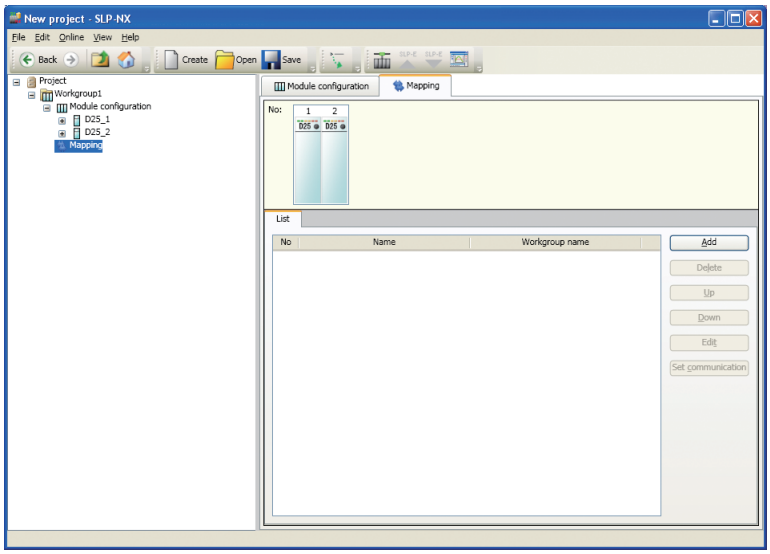
■ Overview

Mapping is to associate a module configured via workgroup with an actual module.
Mapping data are module communication settings.
Mapping data can be set up in the view of [Mapping], on the Project window's project tree.
If there is an available module, you can use the actual module configuration scan function to acquire module configuration and actual module communication settings, and set up mapping data automatically.
Module communication settings will be defined and written to the module in the [Actual module configuration] window.
If there is not any available module, you can set module communication settings as mapping data in advance by following this mapping procedure.

■ Creating a Mapping

Since a mapping can be created when you create a project, or when you use the actual module configuration scan function, the tasks described in this section are usually not necessary.
When you want to delete and re-create the mapping, follow the steps described below.

[1] Go to the Project window's project tree and select the [Mapping] workgroup for creating mapping data. Confirm that mapping data is empty in the [List] screen, then select [Add].

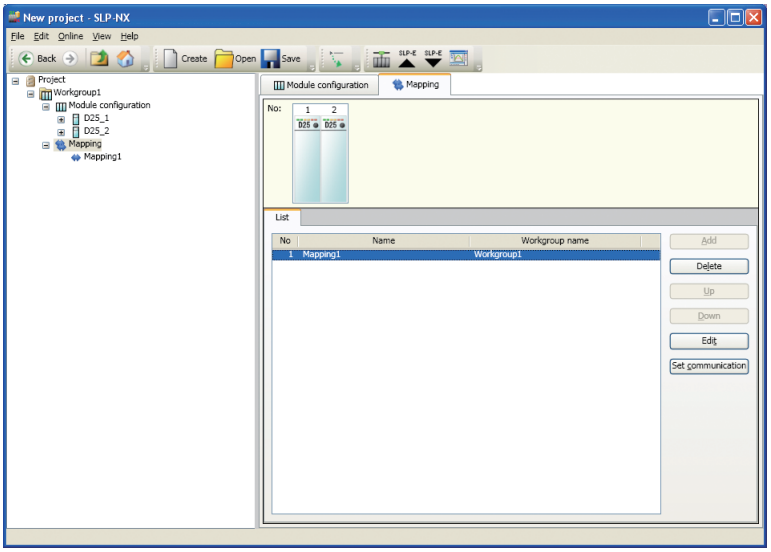


■ Editing Mapping Data

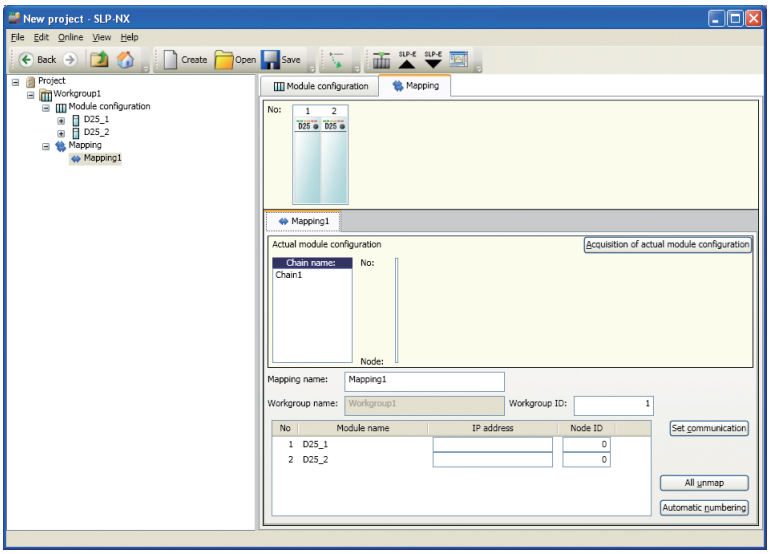
When you use the actual module configuration scan function to acquire module configuration and actual module communication settings, mapping data can be set up automatically. Therefore, the tasks described in this section are not necessary. When you create a project offline, a mapping will be created, but mapping data will not be set up.

To edit mapping data, perform the following steps.

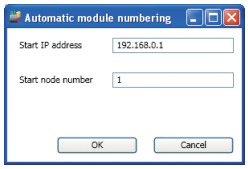
[1] Select the [Mapping] workgroup from the Project window's project tree. Confirm that the mapping data is displayed in the [List] screen, and click the [Edit] button.



[2] The [Individual Mapping] screen is then displayed.



[3] Set the IP address and node ID. Clicking the text box enables you to enter them directly. Also, by clicking [Automatic numbering], setting the first IP address and node ID in the [Automatic module numbering] dialog box, and clicking the [OK] button, you can perform setup via consecutive numbering.



Note

- If multiple workgroups are on the same network, workgroup ID will be used for identification.

■ Editing/Managing Communication Settings

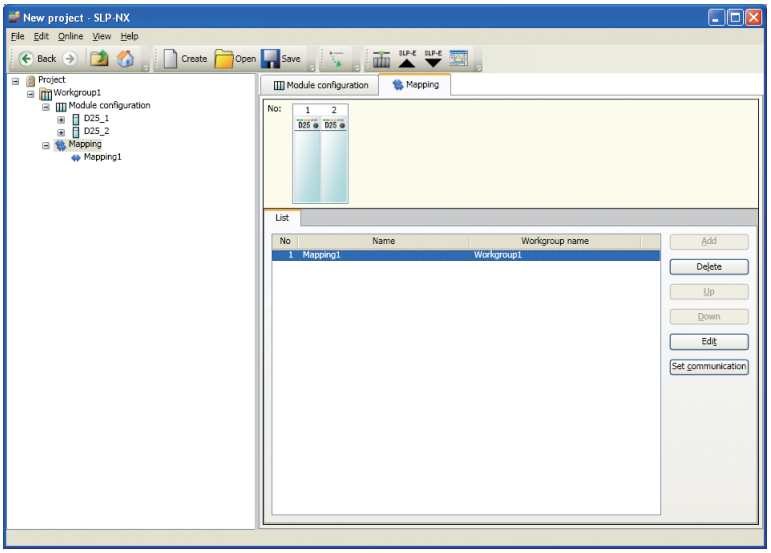
Communication settings other than the module's IP address and node address are set via the Mapping view's [Set communication].
You can set the following.

Settings			Screen	
Type	Name	Description	All (page 6-41)	Chain Name (page 6-42)
Basic settings for module	Set the following value to all modules	Checks this box when performing the automatic address numbering prohibition function for all modules.	❍	—
	Automatic address numbering is prohibited.	Excludes modules from auto address numbering.	❍	❍
IP settings	Netmask	IP net mask	❍	—
	Default gateway	IP default gateway	❍	—
Port settings	Set the following value to all modules	Checks this box when you want port settings to apply to all modules.	❍	—
	Dedicated communication port number	Cannot be changed.	❍	❍
	MODBUS/TCP port number	MODBUS/TCP function's port number	❍	❍
	CPL/TCP port number	CPL/TCP communication port number	❍	❍
RS-485 detailed settings	Set the following value to all modules	Checks this box when you want the changes to RS-485 setting to apply to all modules.	❍	—
	RS-485 device address	Device address used for host communication (RS-485).	—	❍
	RS-485 protocol	Host communication (RS-485) protocol selection	❍	❍
	RS-485 transmission rate	Transmission speed used for host communication (RS-485)	❍	❍
	RS-485 bit length	Bit length used for host communication (RS-485)	❍	❍
	RS-485 parity status	With/without parity used for host communication (RS-485)	❍	❍
	RS-485 stop bits	Stop bit used for host communication (RS-485)	❍	❍
	RS-485 minimum response time	Minimum response time used for host communication (RS-485)	❍	❍

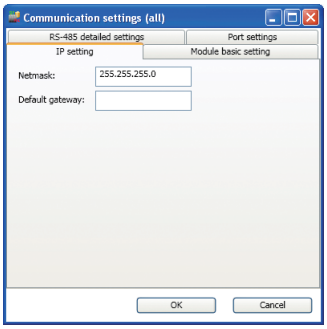
● **When configuring communication settings common to a workgroup**

The steps are explained below.

[1] Go to the Project window's project tree and select the [Mapping] workgroup for editing mapping data.
Confirm that workgroup configuration is not empty in the [List] screen, and click the [Set communication] button.



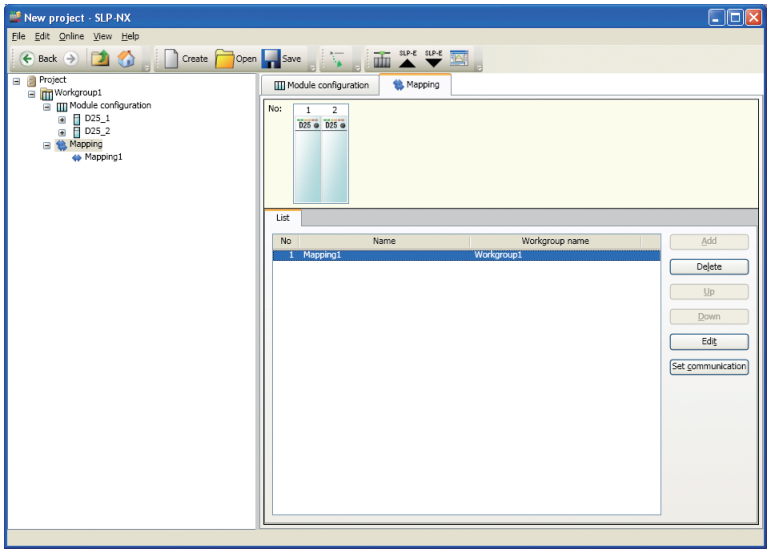
[2] The [Communication settings (all)] dialog box will then be displayed.
Set the necessary items, then click the [OK] button.



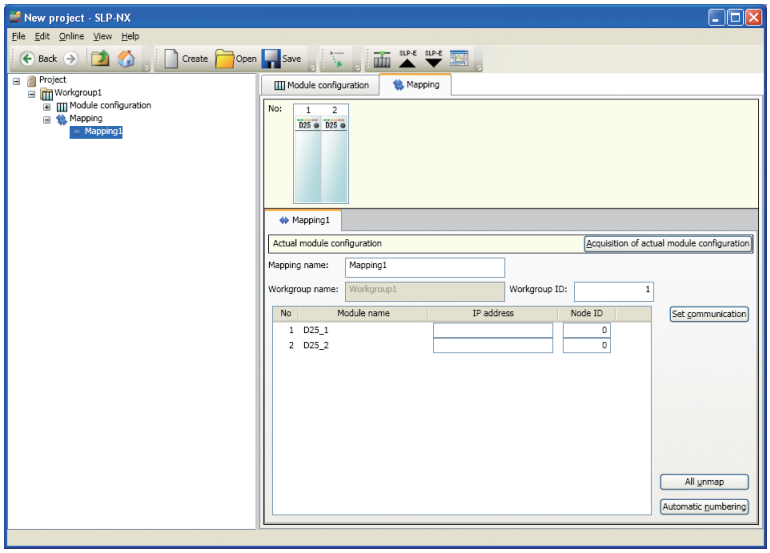
● When configuring communication settings for each module

The steps are explained below.

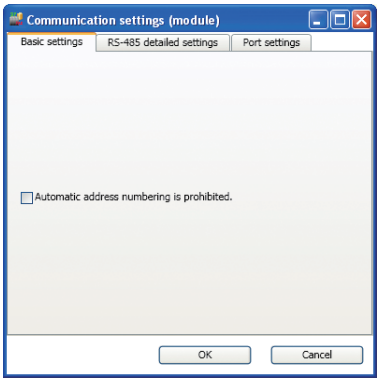
[1] Go to the Project window's project tree and select the [Mapping] workgroup for editing mapping data.
Confirm that workgroup configuration is not empty in the [List] screen, and click the [Edit] button.



[2] Select a module line in the [Individual Mapping] screen, then click the [Set communication] button.



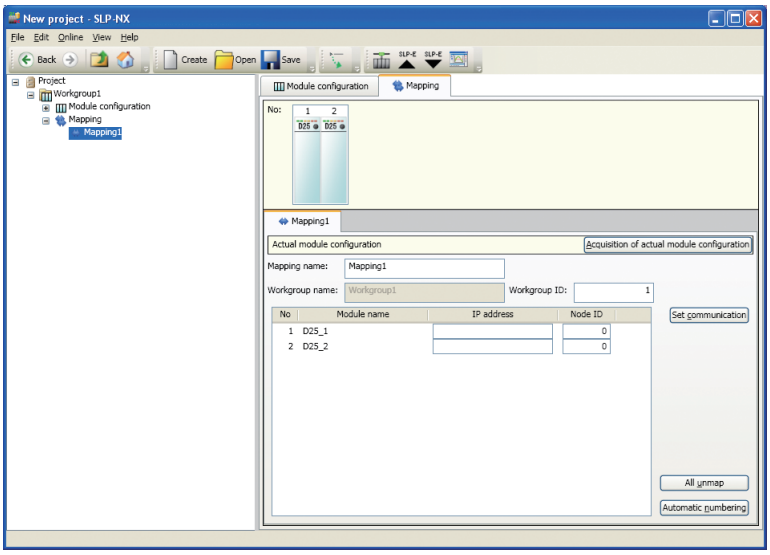
[3] The [Communication settings (module)] dialog box will then be displayed. Set the necessary items, then click the [OK] button.



■ Mapping to Actual Module with Edited Mapping Data

When there is not any available module, and module communication settings (IP address/node address, communication settings, etc) have been set as mapping data, you need to write the mapping data to the actual module before you use the module actually.
The steps are explained below.

[1] Display the mapping data to be written.
Confirm that the mapping data is displayed in the [List] screen, then click the [Edit] button to display the [Individual Mapping] screen.
Click the [Acquisition of actual module configuration] button at the [Individual Mapping] screen.



[2] The [Actual module configuration] window opens.
Execute an actual module configuration scan.

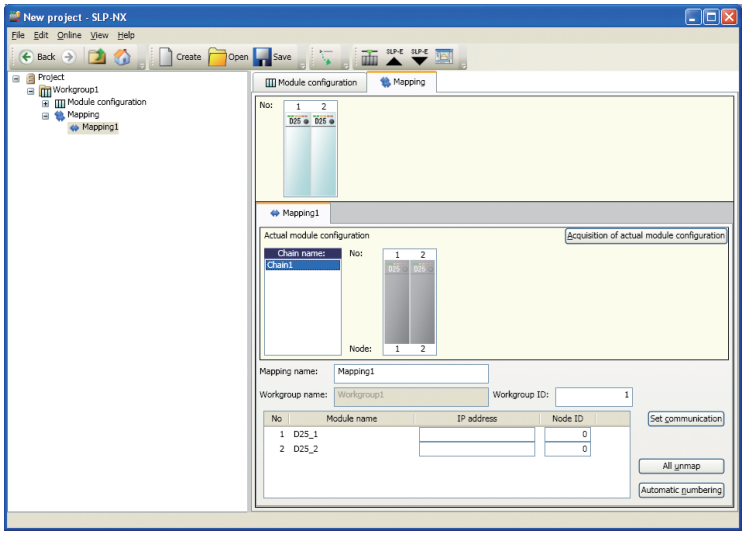
[3] If an error with the actual module is confirmed during the actual module configuration scan, close the [Actual module configuration] window, and return to the [Individual Mapping] screen.

Note

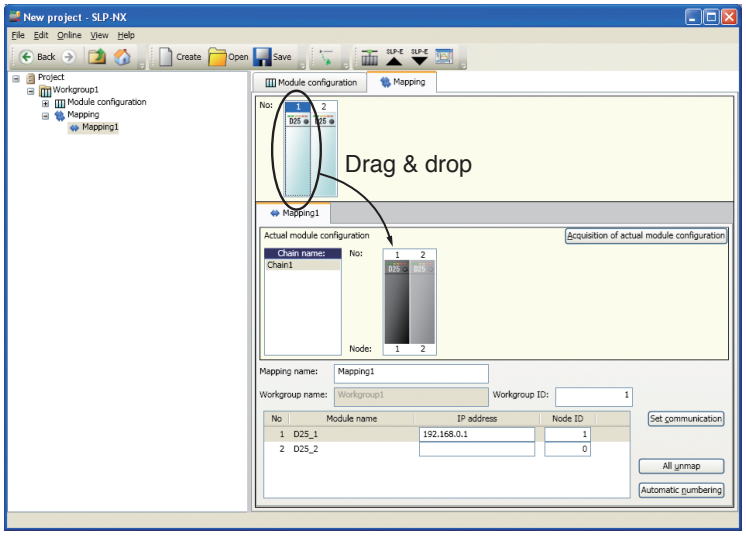
☞■ Message List (P. 5-16).

[4] Actual module configuration data acquired through the actual module configuration scan is then displayed in [Actual module configuration] in the contents area.

* Select the chain.



[5] By dragging and dropping a module (illustration) under [Mapping] onto a module (illustration) under [Actual module configuration], the mapping data will be mapped to the actual module configuration information. Once mapping is completed, the module (illustration) under [Actual module configuration] will change in color from gray to black.



Handling Precautions

- If the module's basic model number (module type) does not match up, drag and drop cannot be performed. In this case, you will have to change the module type in the module configuration display, or change the actual module. For the module model numbers of projects, check the module configuration screen, and for the model numbers of actual modules, click a module in the actual module configuration screen and check the line of the product model number.

Note

- If there are multiple workgroups, the same operation will have to be performed for each one as necessary.
- By holding down [Shift] and clicking to select multiple modules, then dragging and dropping them, mapping can be performed for multiple modules at once.
- In the tasks described in this section, you would only do mapping on the loader. (The mapping data is not written to the actual module.)
  To write the mapping data to the actual module, write actual module communication settings from the [Actual module configuration] window.

6 - 5 Writing Parameters

Parameters can be written to all modules in a workgroup at once, or to an individual module.

Handling Precautions

- In any of the following cases, the module is reset (restarted) after parameter writing is complete. Then confirm the operational status.
  - NX-D15/25, ROM version 1.xx
  - There is a supervisor module or a module under the control of a supervisor module
  - A controller module is removed from under the control of a supervisor module
  - The NX-D25/35 and the project have different settings for the cycle period parameter.

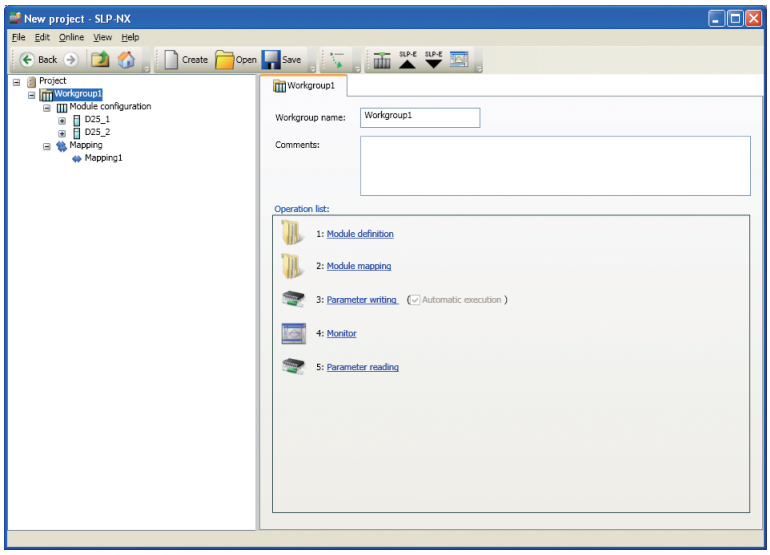
  In modules (NX-D15/25 with ROM version 2.00) that do not fit into one of the categories above, and in digital/pulse input modules, the device operation mode changes to IDLE mode during parameter writing.
  To display the ROM version of the NX-D15/25/35, in the SLP-NX project tree, select the module that read the parameters. Under the Other category, in the Instrument Information bank, "2.00" is displayed as the F/W ROM version 1 parameter. In this case, the ROM version is Ver. 2.00.

■ Workgroup Batch Writing

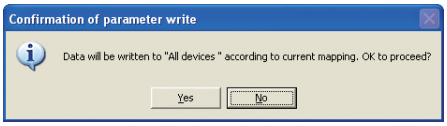
This is a method for writing parameters to all modules in a workgroup.
This method is possible only via Ethernet. (USB loader cable is not supported.)
Set up the communication path and network profile in advance.

[1] Select a workgroup from the Project window's project tree for batch parameter writing.
By performing one of the following operations, all parameters can be written to modules belonging to the workgroup.

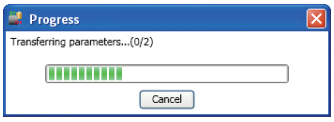
- Select [3: Parameter writing] under [Operation list] in the [Workgroup] view's contents area.
- Select [Online] → [Write Parameters] from the Project window's menu bar.
- Select the SLP-E icon from the Project window's tool bar.



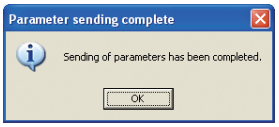
[2] When the [Confirmation of parameter write] message box is displayed, click the [Yes] button to write parameters.



[3] When writing parameter files, a [Progress] dialog box is displayed.



[4] When writing is completed normally, and the [Parameter sending complete] message box is displayed, click the [OK] button to end the process.



If writing is completed abnormally, error information will be displayed.
After dealing with the error situation, write parameters again.

■ Writing to a Single Module

This is a method for writing parameters to all modules in a workgroup.
When writing parameters to a single module, it can be performed via Ethernet, or via USB loader cable. Set up the communication path and network profile in advance (when using Ethernet).

Handling Precautions

- When using a USB loader cable, the USB driver must be installed in advance. ☞ 1- 4 Installing the USB Loader Cable Device Driver (P. 1-4).
- The communication path for the USB loader cable cannot be set unless the project has been configured with one module.
  If the project is configured with multiple modules, the USB loader cable cannot be used.
- To use the data transfer function between modules, the project must be configured with multiple modules.
  In order to be executed, the data transfer function between modules needs the setting information of the modules between which data will be exchanged.
  Do not read the parameters as a single module and then write them, because the data transfer function between modules may operate in an unintended way.

[1] Select a module from the Project window's project tree for parameter writing. Parameters can be written to the module via one of the following methods.

- Select [3: Parameter writing] under [Operation list] in the [Workgroup] view's contents area.
- Select [Online] → [Write Parameters] from the Project window's menu bar.
- Select the 

icon (when using Ethernet) or the 

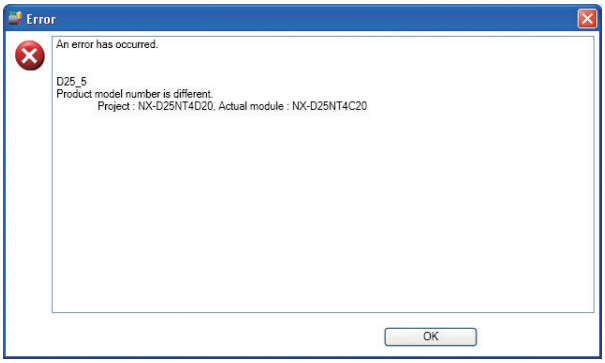
icon (when using USB loader cable) from the Project window's tool bar.

[2] Steps after this are the same as with ☞ ■ Workgroup Batch Reading (P. 6-56).

Handling Precautions

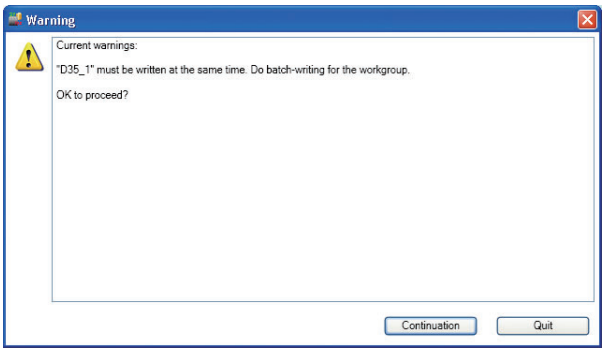
The following warnings may be shown depending on the write module selection and combination.

- Cannot write to the specified model number



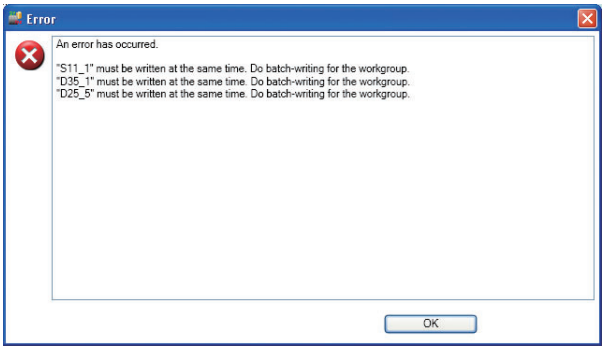
Change the model number to the actual module number using the [Module model number setting] dialog box.

- Selection and attempt to write to a single module that is configured for data transfer between modules.



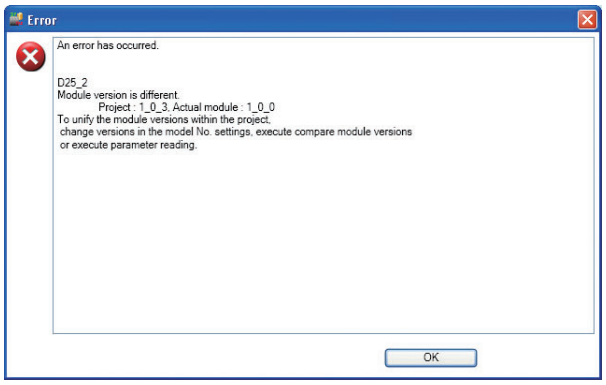
Select the workgroup and try again.

- Selection and attempt to write to a single module that is being used for multi-loop cooperative control.



Select the workgroup and try again.

• Different module versions



The actual module version is earlier than the module version stored in the project. Make the versions the same.

☞ 6 - 8 Handling Module Versions (P. 6-59)

6 - 6 Monitoring Module Operations

■ Overview

Monitoring of module operations is done in the [Universal monitor] window.
☞ Chapter 7. UNIVERSAL MONITOR (P. 7-1).

Handling Precautions

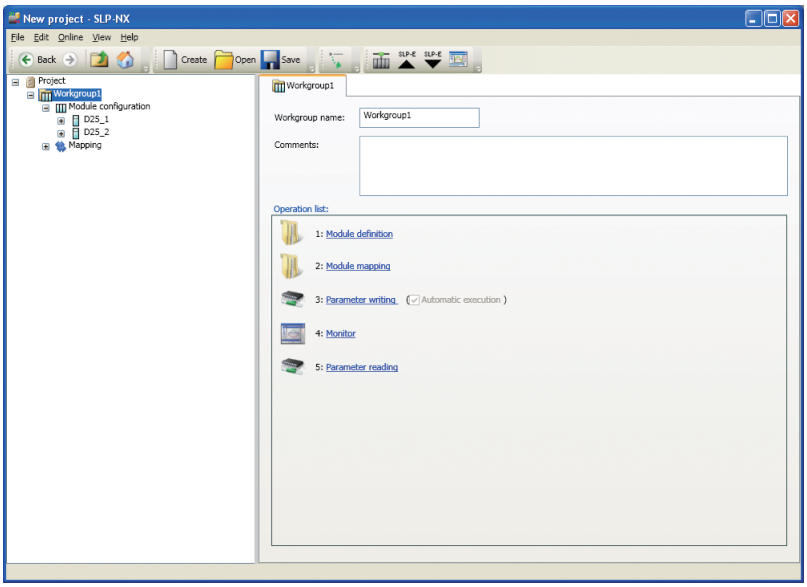
- When changing parameters in the universal monitor, the changes are applied to modules, so the loader's project data remains unchanged. If the changes need to be applied to the project data as well, perform parameter reading.

■ Method of Operation

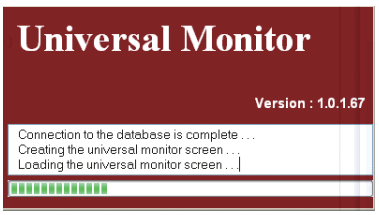
A simple sequence method is explained as follows.

[1] Select a workgroup from the Project window's project tree to display the [Workgroup] view. Perform one of the following operations to start up the universal monitor.

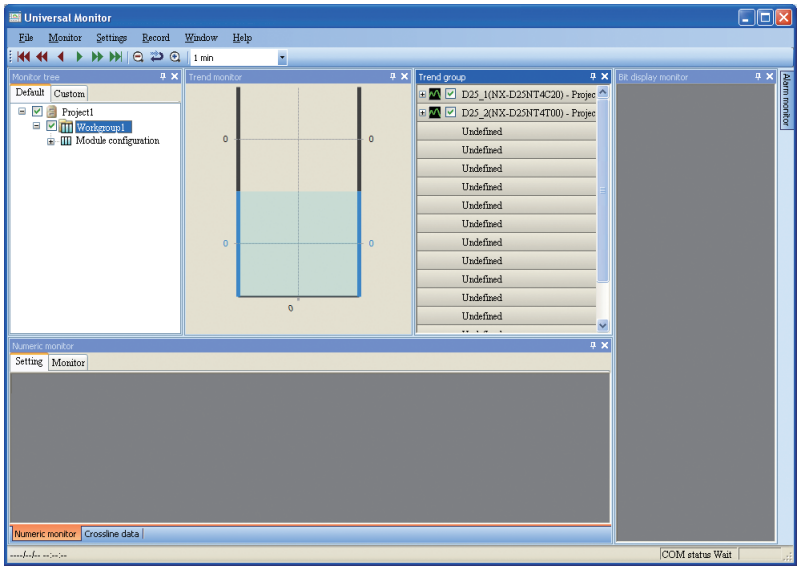
- Select [4: Monitor] under [Operation list] in the contents area.
- Select [Online] → [Monitor] from the Project window's menu bar.
- Select the  icon from the Project window's tool bar.



>> The Universal Monitor Startup dialog box is then displayed.

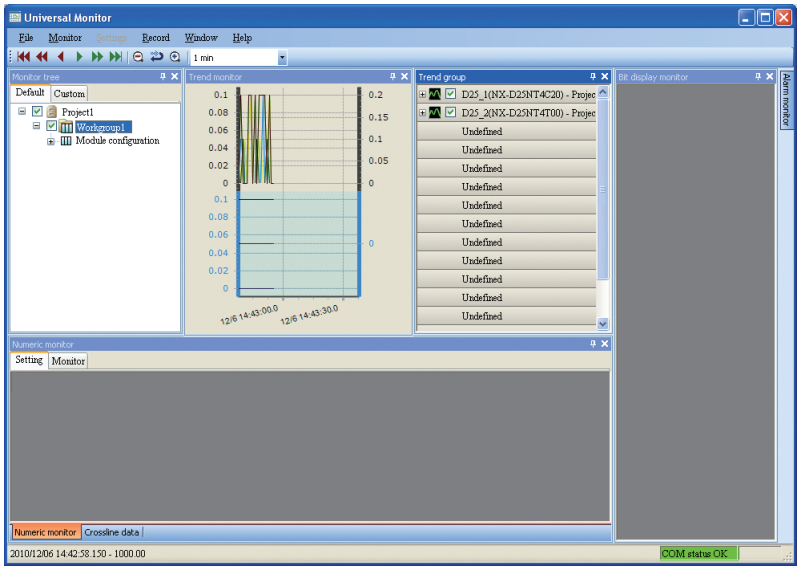


[2] When the startup process has ended, the [Universal monitor] window will be displayed.

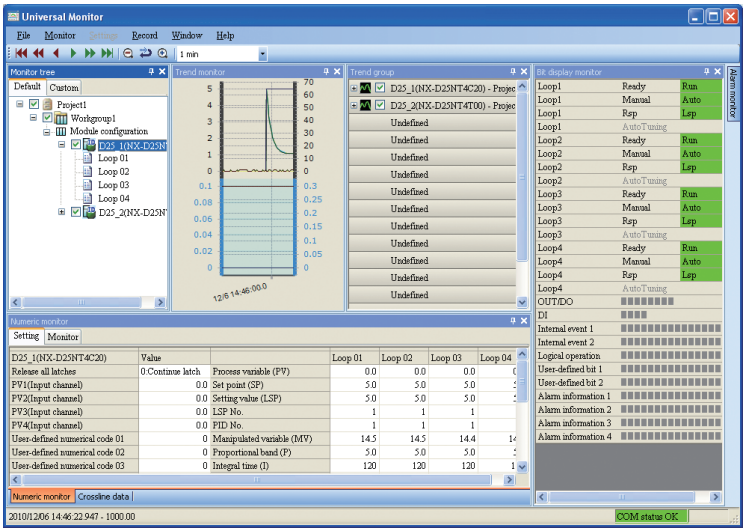


[3] When selecting [Monitor] → [Start] from the [Universal monitor] window's menu bar, the status bar's communication status will change from [Wait] to [OK], and the monitor will start up.

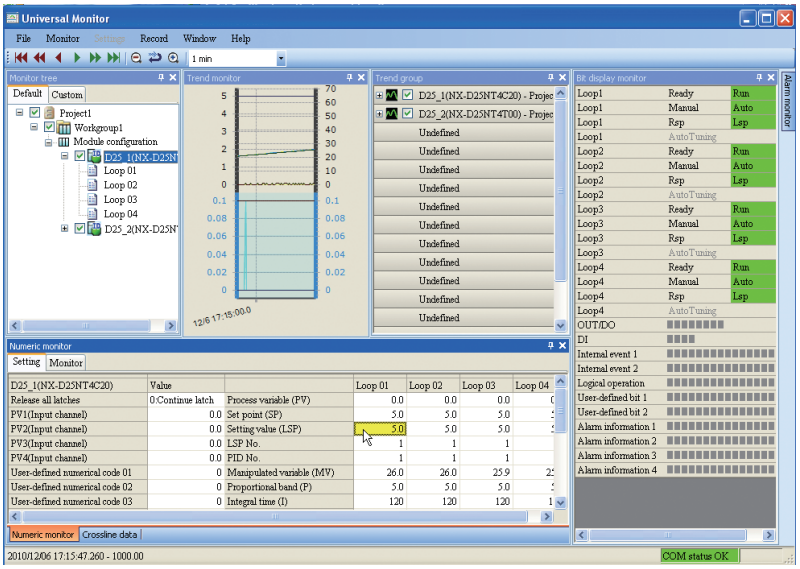
- Monitor startup operation

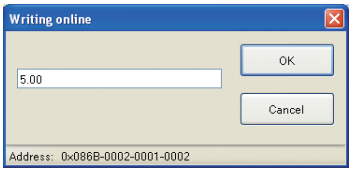


- After monitor startup
  (When a module is selected for monitoring from [Module configuration] at the [Universal monitor] window's monitor tree.)

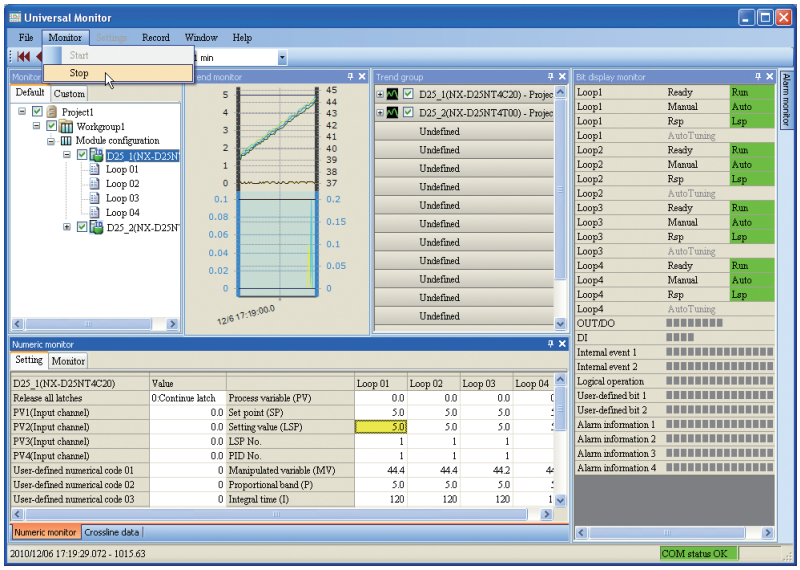


[4] To change a specific module's parameters and operational status, select a target module from the [Universal monitor] window's monitor tree, display the numeric monitor settings tab, double click the target for performing numeric grid changes, change values in the [Writing online] dialog box, and click the [OK] button to confirm the changes.

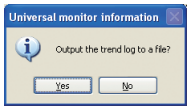




[5] To cancel a monitor operation, select [Monitor] → [Stop] from the [Universal monitor] window's menu bar.



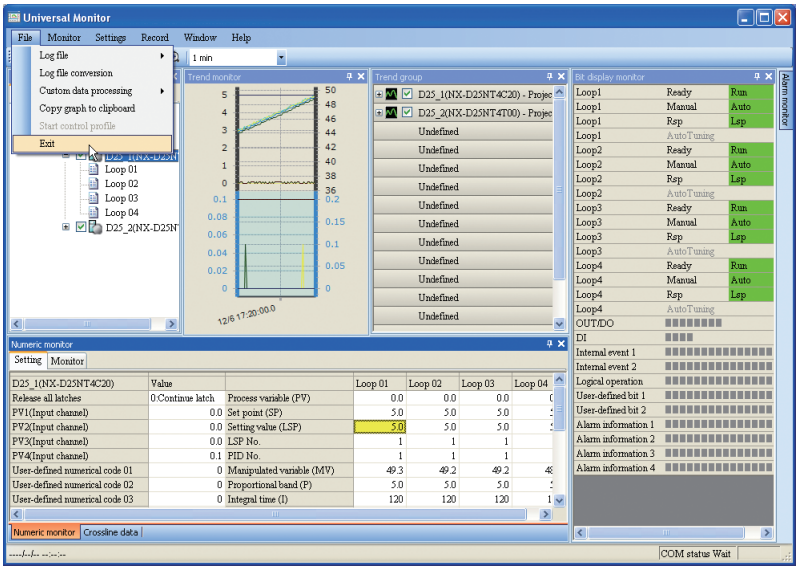
[6] When cancelling a monitor operation, the [Universal monitor information] message box is displayed, asking whether or not a CSV-format trend log file should be output.
If a trend log file is needed, click the [Yes] button.



Note

- Even when clicking the [No] button, a CSV-format trend log file can still be created.
- [1] Select [File] → [Log file conversion] from the [Universal monitor] window's menu bar.
- >> The [Open log file] dialog box will then be displayed.
- [2] Select a file that you want a CSV-format trend log file output from, and click the [Open] button.
- >> The [Save As] dialog box will then be displayed.
- [3] Click the [Save] button.
- >> A CSV-format trend log file is created, and the [Universal monitor information] message box is displayed.
- [4] Click the [Yes] button, and Explorer will start up.

[7] To exit the universal monitor, select [File] → [Exit] from the [Universal monitor] window's menu bar.


Universal Monitor
File
Monitor
Settings
Record
Window
Help
Log file
Log file conversion
Custom data processing
Copy graph to clipboard
Start control profile
Exit
1 min
Loop 01
Loop 02
Loop 03
Loop 04
Trend monitor
Trend group
D25_1(NX-D25NT4C20) - Projec
D25_2(NX-D25NT4T00) - Projec
Undefined
Bit display monitor
Alarm monitor
Loop1 Ready Run
Loop1 Manual Auto
Loop1 Rsp Lsp
Loop1 AutoTuning
Loop2 Ready Run
Loop2 Manual Auto
Loop2 Rsp Lsp
Loop2 AutoTuning
Loop3 Ready Run
Loop3 Manual Auto
Loop3 Rsp Lsp
Loop3 AutoTuning
Loop4 Ready Run
Loop4 Manual Auto
Loop4 Rsp Lsp
Loop4 AutoTuning
OUT/DO
DI
Internal event 1
Internal event 2
Logical operation
User-defined bit 1
User-defined bit 2
Alarm information 1
Alarm information 2
Alarm information 3
Alarm information 4
Numeric monitor
Setting
Monitor
D25_1(NX-D25NT4C20)
Value
Loop 01
Loop 02
Loop 03
Loop 04
Release all latches
0:Continue latch
Process variable (PV)
PV1(Input channel)
Set point (SP)
PV2(Input channel)
Setting value (LSP)
PV3(Input channel)
LSP No.
PV4(Input channel)
PID No.
User-defined numerical code 01
Manipulated variable (MV)
User-defined numerical code 02
Proportional band (P)
User-defined numerical code 03
Integral time (I)
Numeric monitor
Crossline data
COM status Wait

6 - 7 Reading Parameters

■ Overview

There are two methods to read parameters: parameter reading on a workgroup basis. and parameter reading on a module basis.

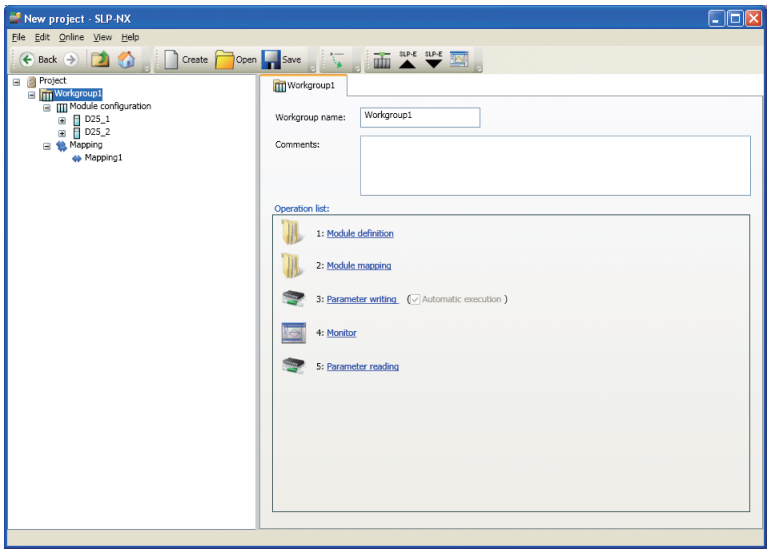
■ Workgroup Batch Reading

This is a method for reading parameters from all modules in a workgroup.
This method is possible only via Ethernet. (USB loader cable is not supported.)
Set up the communication path and network profile in advance.

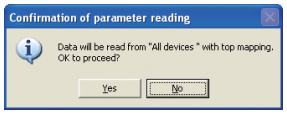
[1] Select a workgroup from the Project window's project tree for batch parameter reading. By performing one of the following operations, parameters can be read from all modules belonging to the workgroup.

- Select [5: Parameter reading] under [Operation list] in the [Workgroup] view's contents area.
- Select [Online] → [Read Parameters] from the Project window's menu bar.
- Select the 

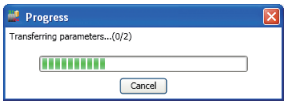
icon from the Project window's tool bar.



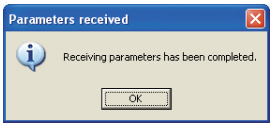
[2] When the [Confirmation of parameter read] message box is displayed, click the [Yes] button to read parameters.



[3] When reading parameter files, the following [Progress] dialog box is displayed.



[4] When reading is completed normally, and the [Parameters received] message box is displayed, click the [OK] button to end the process.



If reading is completed abnormally, error information will be displayed in a message box.
After dealing with the error situation, read parameters again.

■ Reading from a Single Module

This is a method for reading parameters on a single module basis.
The parameters of a single module can be read via Ethernet, or via USB loader cable. Set up the communication path and network profile in advance (when using Ethernet).

Handling Precautions

- When using a USB loader cable, the USB driver must be installed in advance.
  ☞ 1- 4 Installing the USB Loader Cable Device Driver (P. 1-4).
- The communication path for the USB loader cable cannot be set unless the project has been configured with one module.
  If the project is configured with multiple modules, the USB loader cable cannot be used.
- To use the data transfer function between modules, the project must be configured with multiple modules.
  In order to be executed, the data transfer function between modules needs the setting information of the modules between which data will be exchanged.
  Do not read the parameters as a single module and then write them, because the data transfer function between modules may operate in an unintended way.

[1] Select a module from the Project window's project tree for parameter reading. Parameters can be read from modules via one of the following methods.

- Select [5: Parameter reading] under [Operation list] in the contents area.
- Select [Online] → [Read Parameters] from the Project window's menu bar.
- Select the 

icon (when using Ethernet) or the 

icon (when using USB loader cable) from the Project window's tool bar.

[2] Steps after this are the same as with ■ Workgroup Batch Reading (P. 6-56).

6 - 8 Handling Module Versions

Each Network Instrumentation Module has a module version for the management of parameter compatibility. This section describes the relationship between module version that the SLP-NX stores for projects and the actual module version that is used for parameter read and write, and how to manage versions.

Relationship between the loader module version and the actual module version

If the loader creates a project off-line, it is configured using the latest module version recognized by the loader. Each module has its own module version. The procedure when parameters are written is as follows.

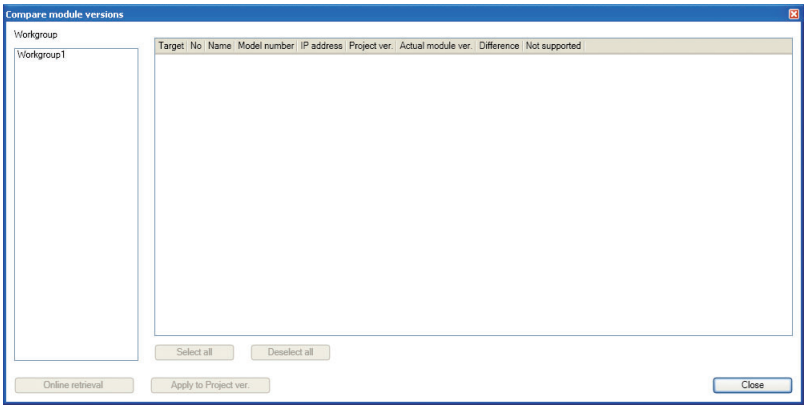
- If the actual module version is newer than or the same as the module version stored in the project, parameters can be written.
  If the actual module version is not supported by the loader, the [Parameter initialization module selection] dialog box appears.
- If the actual module version is older than the module version stored in the project, an error occurs. If the loader can communicate with a module, the module version in the project can be changed using the [Compare module versions] dialog box. If there is no actual module, the module version setting can be changed using the [Change version] button in the [Module model number setting (controller)].

Once parameters are read from an actual module, the module's actual version is stored in the project.

If a data check or parameter write is executed after a module version in the project is changed, the parameters are converted to a set of parameters that are appropriate for the module version.

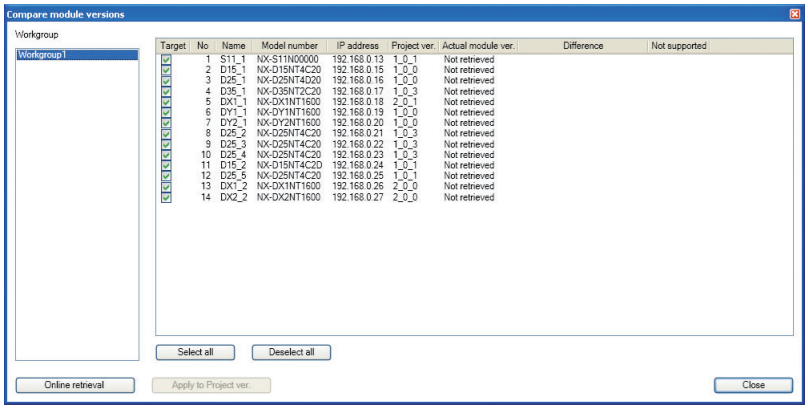
■ Compare module versions

[1] In the [Project] window's menu bar, select [Online] → [Compare module versions].



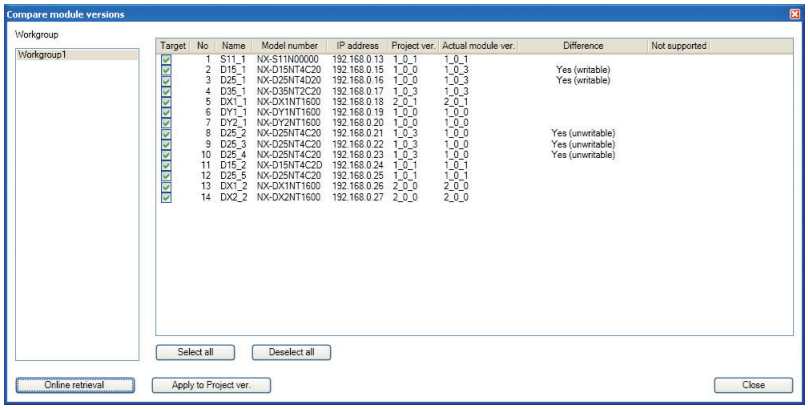
[2] Select a workgroup from the workgroup list on the left.

>>A list of workgroup modules, including module names, model numbers, IP addresses, and project module versions, is displayed. At this point, since the loader has not acquired data from the modules, the columns for [Actual module ver.], [Difference], and [Not supported] are shown as "Not retrieved" or blank.



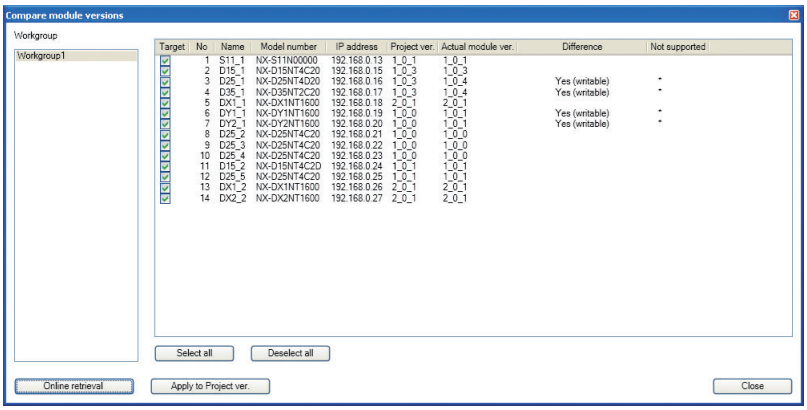
[3] Check the check boxes under [Target] for the modules you want to compare and click the [Online retrieval] button. All check boxes in the column can be selected or deselected using the [Select all] or [Deselect all] buttons.

>>Module version information is collected from the target modules and is reflected in the columns for [Actual module ver.], [Difference], and [Not supported].



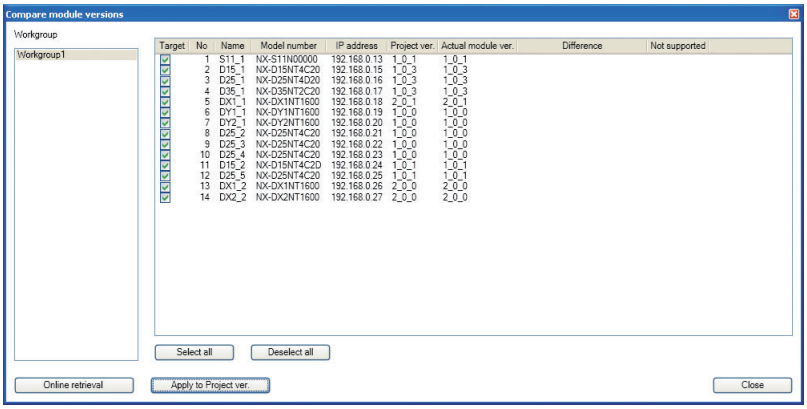
Note

- The [Difference] column indicates "writable" or "unwritable" if there is a difference in versions between the project and the actual module.
  If the module is not supported by the loader, "*" is shown in the [Not supported] column, as seen below.



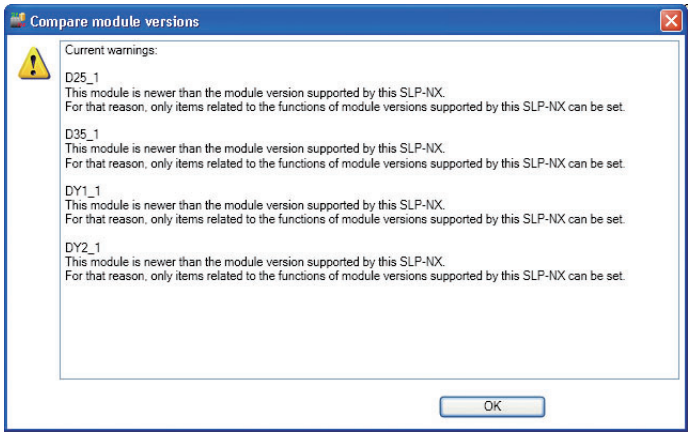
[4] To apply the module version information that was read from the actual module to the project, click the [Apply to Project ver.] button.

>> The information is applied to the project.

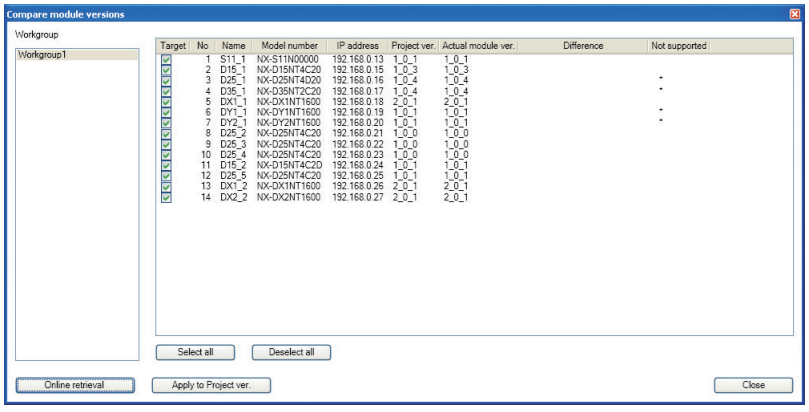


Note

- If [Apply to Project ver.] is executed from the [Compare module versions] dialog box, data checking or data check processing at the beginning of parameter writing is executed, and any increase or decrease in the actual parameters is applied to the project.
- If the loader executes [Apply to Project ver.] for an unsupported module version, the message seen below is displayed.



In addition, after the data is applied to the project, the [Compare module versions] dialog box is displayed as shown below.

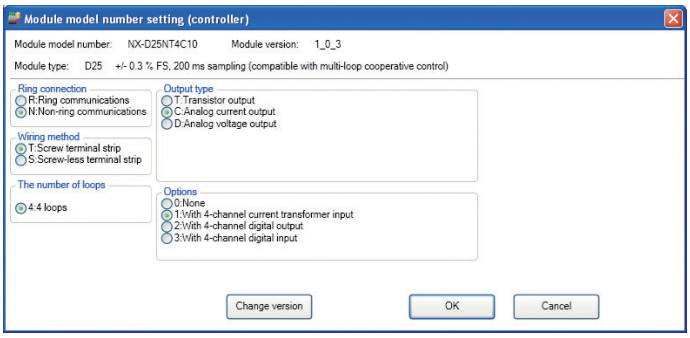


■ [Change version] dialog box

Even if there is no actual module, the module version in the project can be changed in advance using the [Change version] dialog box.

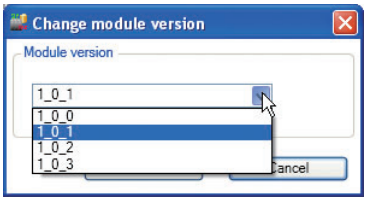
[1] With the desired module selected in the target column of the module list, click the [Set model number] button.

>> The [Module model number setting] dialog box is displayed.



[2] Click the [Change version] button.

>> The list box shows the module versions that can be selected. Choose the desired version and click the [OK] button. To change the module version stored in the project, click the [OK] button in the [Module model number setting] dialog box.



Note

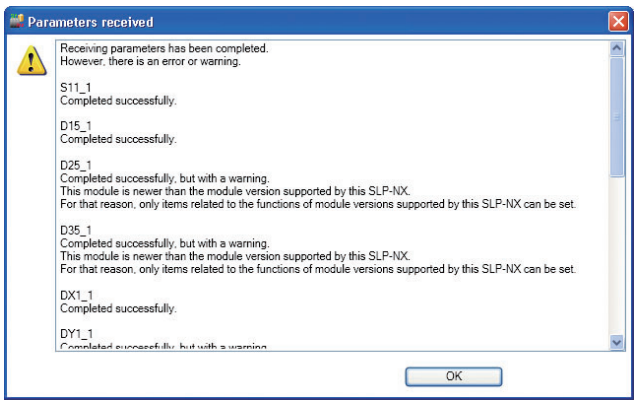
- If a module version is changed using the [Change module version] dialog box, an increase or decrease in actual parameters is applied to the project by means of a data check (P. 6-37).

Handling Precautions

- Initializing using the [Initialize] button in the [Module configuration] window changes the module versions in the project to the latest ones recognized by the loader.

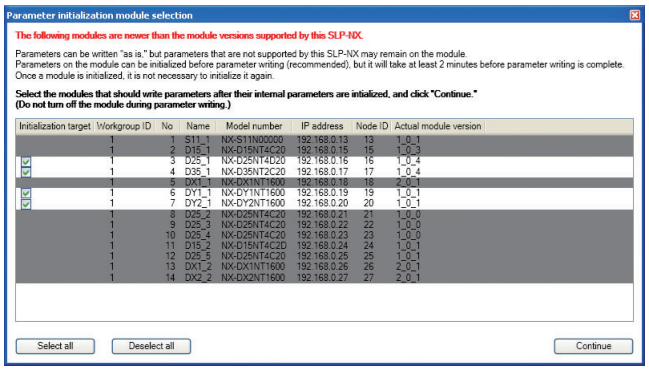
Handling Precautions

- If the loader attempts to read a module, and the module's version is not supported, the following warning appears.



- If the loader attempts to write parameters to a module whose version is not supported by the loader, a warning dialog box like the one below is displayed.

>> It is possible to initialize parameters that the loader does not recognize. The background of modules that do not need initialization is dark. The [Initialization target] check box is displayed for all unsupported module versions that need initialization. In the dialog box they are automatically selected as initialization targets. Select the desired "initialization target" modules by checking or unchecking individual [Initialization target] check boxes or clicking the [Select all] or [Deselect all] buttons. When the [Continue] button is clicked, initialization and parameter writing begin for the target modules. For modules with no check mark or with a dark background, parameters are written without initialization.



Handling Precautions

- If there is an initialization target module, writing parameters takes up to about 2 minutes.

6 - 9 Saving a Project

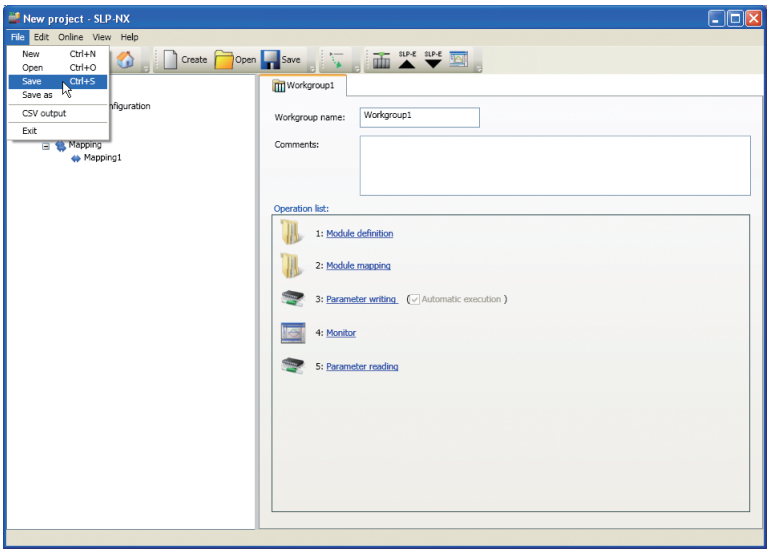
■ Overview

This section describes how to save a project as a file.

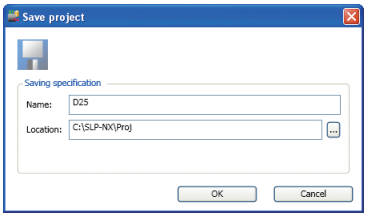
■ Method of Operation

[1] A project file can be saved by using one of the following methods.

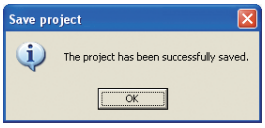
- Select [File] → [Save] from the Project window's menu bar.
- Select [File] → [Save as] from the Project window's menu bar.
- Select the Save icon from the Project window's tool bar.



[2] When saving a new project, or saving a project under another name, the [Save project] dialog box will appear. Set the saving options (name, location) and click the [OK] button.



[3] When the file has been successfully saved, and the [Save project] message box is displayed, click the [OK] button.



Handling Precautions

- The following characters are not allowed in a project name.
  . (period)
  : (colon)
  " (quotation marks)
  <> (less-than, greater-than signs)
  | (vertical bar)
  / (slash)
  \ (back slash)
  ? (question mark)
  * (asterisk)

Note

- The project file is kept in a folder (of multiple files). When moving the project file to a different destination, move the entire folder.
- Starting with SLP-NX version 5.00, project files are created in the SLX2 format. SLX2 project files are not compatible with SLX files.
  Therefore, SLP-NX 4.01 and earlier versions cannot open SLX2 project files.
  To open SLX project files using SLP-NX 5.00 choose the file type “SLP-NX project file (*.SLX)” to display them in the file list, and select the desired file.
  When opened, the file is converted to SLX2.
  The original SLX project files are automatically saved in a backup folder.

6 - 10 Opening a Project

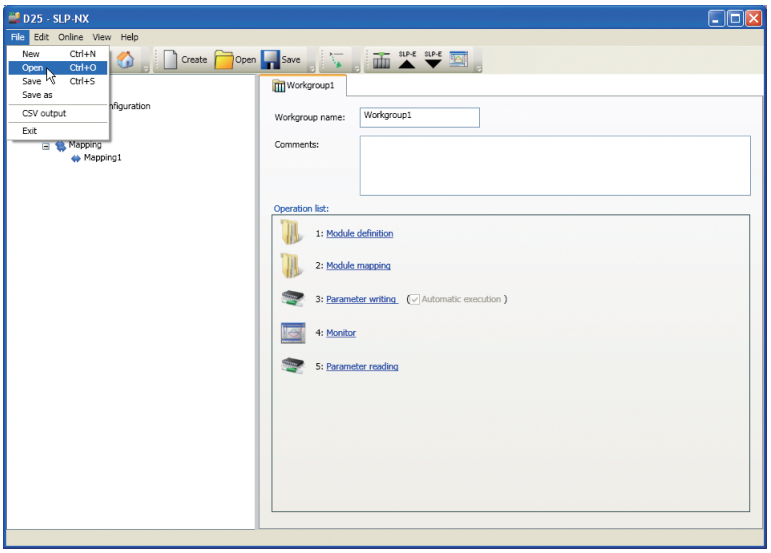
■ Overview

Saved projects can be opened again with the loader.

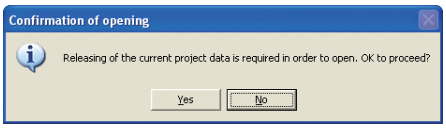
■ Method of Operation

[1] The project file can be opened using either of the following methods.

- Select [File] → [Open] from the project window menu bar.
- Click the icon on the project window tool bar.



[2] When the project is opened, a [Confirmation of opening] message box will be displayed.

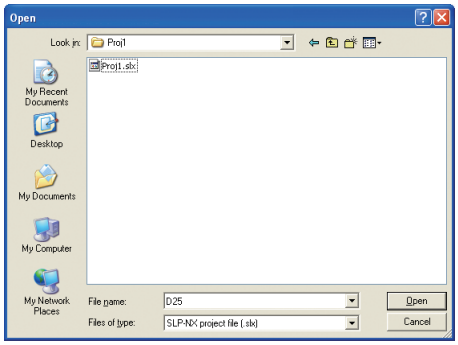


To exit a project that is already open, click the [Yes] button.
If you don't want to exit the open project, click the [No] button.

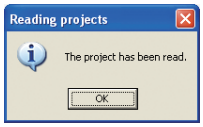
Note

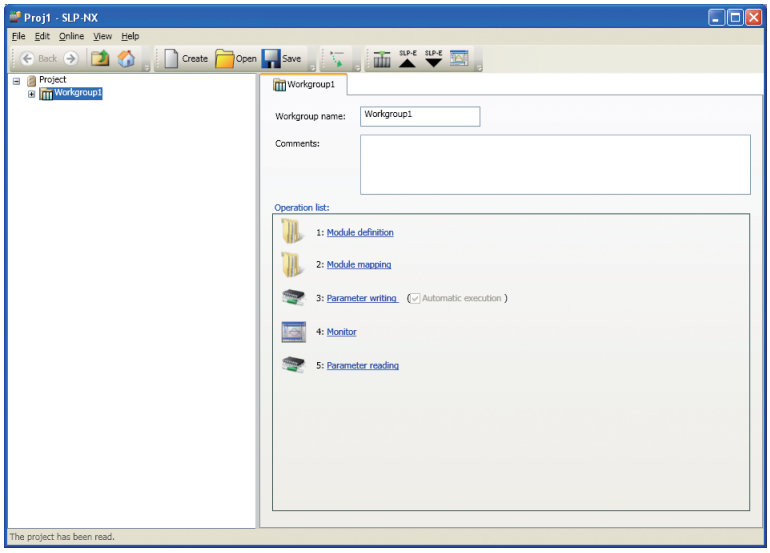
- Even if the [Yes] button is clicked and work proceeds, if the work is cancelled in step [3] or later, the project that was already open will return to the opened condition.

[3] The [Open] dialog box will then be displayed.
If a previously saved project exists, that project is designated as the initial value.
If you want to go with the previously saved project, click the [Open] button, and if you want to open a different project, designate it and click the [Open] button.
If you want to cancel, click the [Cancel] button.



[4] Once reading of the project file has completed, a [Reading projects] message box is displayed. Click the [OK] button, and a Workgroup view is displayed.





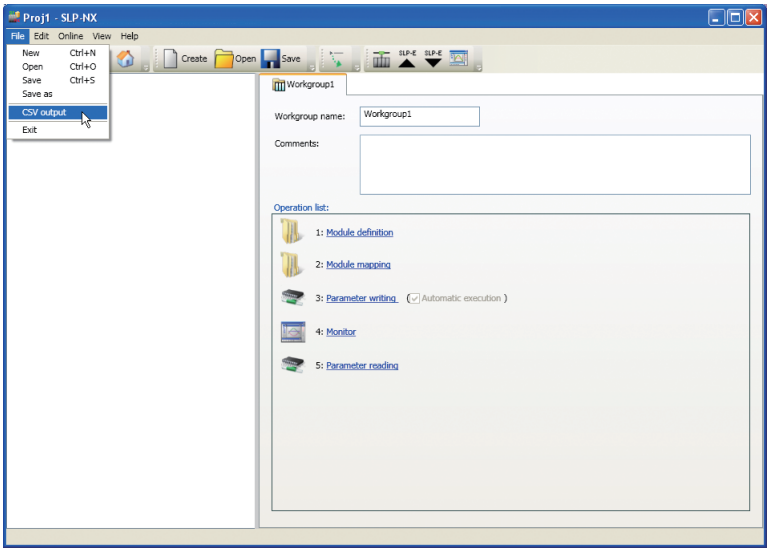
6 - 11 Output to CSV File

■ Overview

All module parameter settings registered to the project (including IP address, etc.) can be output to a CSV file.

■ Method of Operation

[1] Select [File] → [CSV output] from the Project window's menu bar.



[2] In the [Save as] dialog box, specify a [Location] and [File name], then select [Save].
The CSV file will be output.
Fields output to each line are as follows.

No.	Field Name	Description
1	IPAddress	The mapping data module's IP address
2	WorkgroupID	The mapping data module's workgroup ID
3	WorkgroupName	The workgroup's name
4	ModuleName	The module's name
5	ModuleType	The module's model number
6	NodeID	The mapping data module's node ID
7	FolderName	Parameter category name
8	BankName	Parameter bank name
9	Name	Parameter item name
10	Number	Sequential number of the same parameter
11	DataType	Parameter type
12	RAM Address	RAM address for access via host communication
13	EEPROM Address	EEPROM address for access via host communication
14	Value	Setting value
15	DefaultValue	Initial value (default)
16	Diff	Difference from initial value (default) output with "*" mark

Handling Precautions

- For project names, tag names, etc., use alphanumeric character strings only. If Unicode strings or the like are used, they may be garbled during CSV output, etc.

Note

- Parameters output via CSV file output are organized by user level.
  ☞ 6- 3 Editing Parameters (P. 6-16), and the user manual of each module.

Chapter 7. UNIVERSAL MONITOR

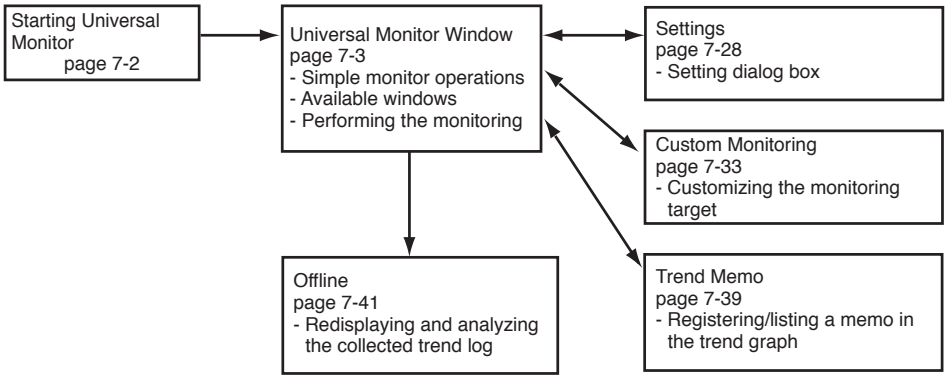
7 - 1 Monitoring Function Overview

Universal monitor is used for monitoring the module status, or verifying the operation status during test running or actual running after a parameter is changed, etc.

Handling Precautions

- Universal monitor does not include general-purpose 24-hour data-logger functionality.
  It can be used for temporary monitoring such as in test-run adjustment.
  Please do not use the universal monitor function for long-term data sampling or continuous alert monitoring, etc.
  Because universal monitor is not an application software designed for long-term operation, such usage may result in the stoppage of data sampling, effects on the other application software due to a high load on the computer being used, or insufficient hard-disk space.
  Make sure that the computer's power option settings will not allow it to go into sleep or standby mode when universal monitor is operating. Also, be sure to ensure that there is sufficient space on the hard disk by checking it and moving log files accordingly, etc., even when not using this function continuously.

■ Universal monitoring flow of operation

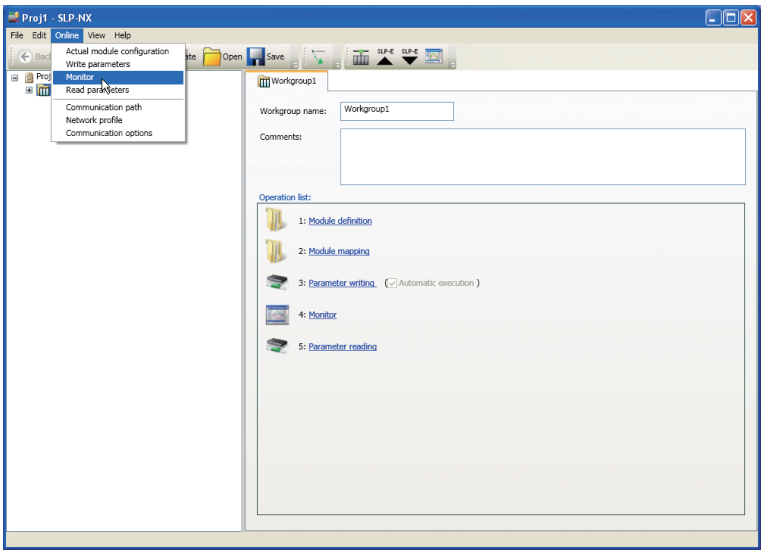


7 - 2 Starting Universal Monitor

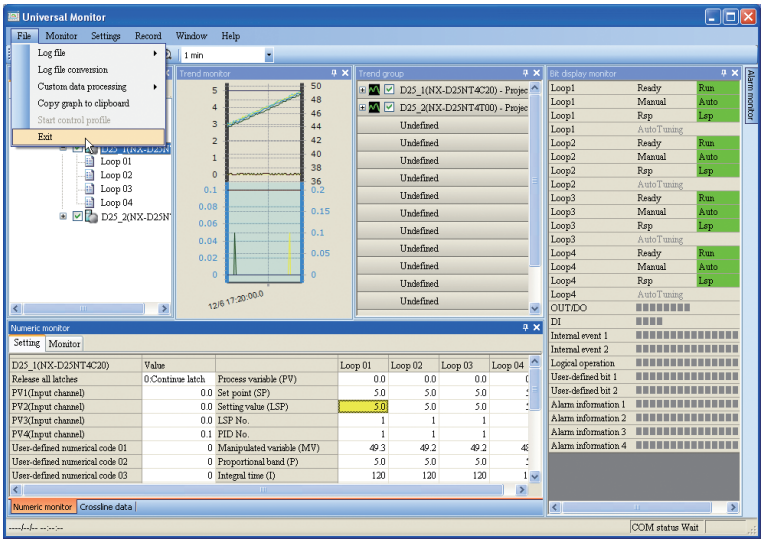
Start the universal monitor using one of the procedures below:

- In the workgroup display of the [Project] window, select [4. Monitor] from the [Operation list]
- Select [Online] → [Monitor] from the menu bar of the [Project] window.
- Click the icon on the tool bar of the [Project] window.

The selection of [Online] → [Monitor] from the menu bar of the [Project] window is shown below.



The following window is displayed after starting the Universal monitor.

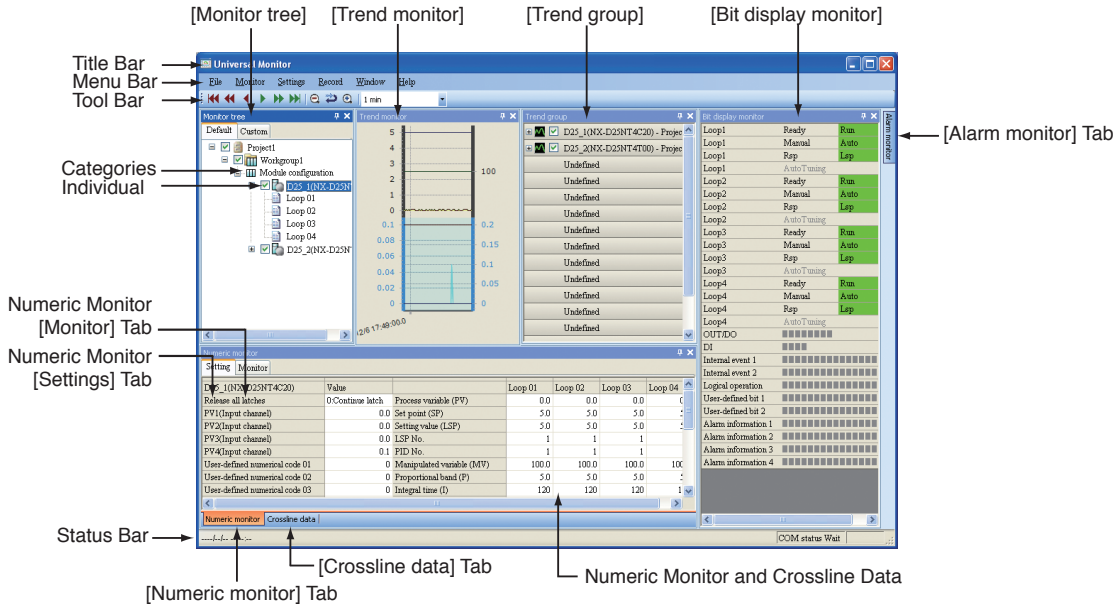


Note

- Universal monitor will operate with a user level based on the status when it was started. To change the user level of parameters for the universal monitor, make the changes (“6-3 Editing Parameters (page 6-16)”), and then close and restart the universal monitor. While the universal monitor is open, even if the module configuration is changed, the changes are not reflected in the universal monitor. If you change the module configuration (“6-2 Defining Module Configuration (page 6-11)), close and restart the universal monitor.
- When the [Universal monitor] window is closed, the position of each window is stored and windows are displayed the same way when the program is started next.

7 - 3 Universal Monitor Window

The structure of the [Universal monitor] window is shown below.



The window names and functions displayed in the [Universal monitor] window are as follows.
The window can switch between floating and docking modes.

- **[Monitor tree] window**

  In conjunction with the [Numeric monitor] window, displays a list of monitored modules and loops that can be selected.

- **[Trend monitor] window**

  Displays graph data for each monitor in real time.

- **[Trend group] window**

  Shows graph view/hide, colors, and the latest data values for the [Trend monitor] window.

- **[Bit display monitor] window**

  Displays the bit display target parameters for the module(s) selected in the [Monitor tree].

- **[Alarm monitor] window**

  Displays alarm status in a grid and in front automatically when an alarm occurs. Also, if the mouse cursor is placed over the [Alarm monitor] tab, the [Alarm monitor] window will be displayed in front.

- **[Numeric monitor] window**

  Displays in a grid the parameters of modules and loops selected in the [Monitor tree], making them editable. When the [Numeric monitor] tab is clicked, the [Numeric monitor] window is displayed.

Handling Precautions

- When the [Setting] tab of the [Numeric monitor] window is selected, an editable grid is displayed. Changes cannot be made with the [Monitor] tab. Also, depending on the parameters, changes cannot be made in some cases.
  ☞ user's manual for each module.

● **[Crossline data] window**

Displayed when the [Crossline data] tab is clicked. Displays the crossline cursor value from the [Trend monitor] window. This can be used when monitoring is being stopped.

■ Project Window - Menu Configuration List

Menu	Submenu 1	Submenu 2	Description	Remarks
File	Log file	Open log file	Reads the log file (CSV format) and displays the trend monitor.	Enabled only when monitoring is being stopped.
		Open log file [Multi-time mode]	Reads multiple log files (CSV format) and groups the data if the same data type exists.	
	Log file conversion	—	Select the file and then select the output format. ☞■ Log File Conversion (P. 7-42).	
	Custom data processing	Import	Selects a custom data file (XML format) from the Select File dialog box and adds it to the custom items.	
		Export	Writes the items currently registered in the custom monitor to the custom data file (XML format).	
	Copy graph to clipboard	—	Copies the graph drawing region of the trend monitor to the Clipboard.	
	Start control profile	—	Not supported	—
	Exit	—	Closes the [Universal monitor] window.	Enabled only when monitoring is being stopped.
Monitor	Start	—	Starts monitoring.	Enabled only when monitoring is being stopped.
	Stop	—	Stops monitoring. (The graph is not cleared.) After monitoring is stopped, the [Universal monitor information] dialog box is displayed, prompting whether to output a CSV file of the trend log.	The graph is not cleared until [Start] is selected again.
Settings	Edit monitoring data	—	☞7- 7 Custom Monitoring (P. 7-33)	Enabled only when monitoring is being stopped.
	Communication destination	—	☞■ Communication destination (P. 7-28)	
	Monitor settings	—	☞■ Monitor settings (P. 7-28)	
	Trend color settings	—	☞■ Trend monitor color settings (P. 7-30)	
	Options	—	☞■ Options (P. 7-31)	
Record	View trend memo	—	☞7- 8 Trend Memo (P. 7-39)	—
	Trend memo registration	—	☞7- 8 Trend Memo (P. 7-39)	—

Menu	Submenu 1	Submenu 2	Description	Remarks
Window	Fixed-position window	—	Prohibits floating of windows.	Turn ON/OFF by adding/removing a check mark.
	Return to standard position	—	Returns the position of each window to their standard positions.	Enabled only when the [Fixed-position window] menu item is OFF.
	View	Monitor tree	Displays the [Monitor tree] window.	If the window is already displayed, it becomes active.
		Trend monitor	Displays the [Trend monitor] window.	
		Crossline Data	Displays the [Crossline data] window.	
		Trend Group	Displays the [Trend group] window.	
		Numeric monitor	Displays the [Numeric monitor] window.	
		Alarm monitor	Displays the [Alarm monitor] window.	
		Bit display Monitor	Displays the [Bit display monitor] window.	
		Logical operation monitor	Displays the [Logical Operation Definition] window.	
	Favorite	Add to favorites	Registers the current window configuration.	—
		Organize favorites	Changes or deletes the names of window configurations registered to favorites.	—
Help	Show help	—	—	Nothing is displayed.
	About (version info)	—	Displays the [Version] dialog box.	—

Handling Precautions

- The import for custom data processing checks whether there are corresponding items for node numbers, IP addresses and model numbers. If matching items do not exist, a warning is displayed during the import. In this case select [Settings] → [Edit monitoring data], and check the custom monitoring settings.
  ☞ 7- 7 Custom Monitoring (P. 7-33)

■ Window configuration operations

The [Universal monitor] window consists of multiple windows placed together. Size adjustments, as well as switching between floating and docking modes, can be made by dragging these windows.

● Positionally fix window

By selecting [Window] → [Fixed-position window] from the menu bar of the [Universal monitor] window, the positions of all windows are fixed, and floating is prohibited.
With a check mark, all windows have a fixed position.

● Return to standard window position

Clicking on [Window] → [Return to standard position] from the menu bar of the [Universal monitor] window will return all windows to their standard positions.

Handling Precautions

- [Return to standard position] is only enabled when [Fixed-position window] is not checked.

● Window redisplay

From the pop-up menu displayed by clicking [Window] → [View] from the menu bar of the [Universal monitor] window, the selected window is displayed in front.

● Window position memory

When the [Universal monitor] window is closed, the position of each window is stored and each window is displayed in the same position when the program is started next.

● Closing windows

To close a window, click the  icon on the window's title bar.

7 - 4 Starting or Stopping Monitoring

■ Starting monitoring

[1] Select [Monitor] → [Start] from the menu bar of the [Universal monitor] window.

>>Monitoring begins.

[2] Select [Module] in the [Monitor tree].

>>[Numeric monitor] and [Bit display monitor] are displayed.

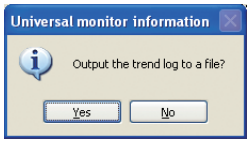
Handling Precautions

- Do not edit or delete module configurations when monitoring is being started. When changing module configuration, close the [Universal monitor] window, and restart it after writing to the module(s).
- When using the Universal monitor with a USB loader cable in an environment with multiple modules, do not connect the USB loader cable to a different module after starting monitoring. Restart the SLP or reopen the project.

■ Stopping monitoring

[1] Select [Monitor] → [Exit] from the menu bar of the [Universal monitor] window.

>>The [Universal monitor information] message box is displayed.

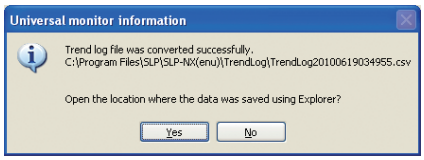


Note

- Even if the [No] button is selected, monitoring will stop.
  To reopen monitoring, follow the procedure in ■ Starting monitoring.
- Even if the [No] button is selected, a CSV-format trend log file can be created afterward using the procedure below.
  1. Select [File] → [Log file conversion] from the menu bar of the [Universal monitor] window.
  2. Select a CSV-format trend log file as the file that you want to output in the [Open log file] dialog box that is displayed.
  3. Click the [Open] button.
  4. Click the [Save] button in the [Save As] dialog box.

[2] When outputting a trend log file, click the [Yes] button.

>>A trend log file (CSV format) is created, and the [Universal monitor information] message box is displayed confirming whether or not to open the location where the file was stored with Explorer.



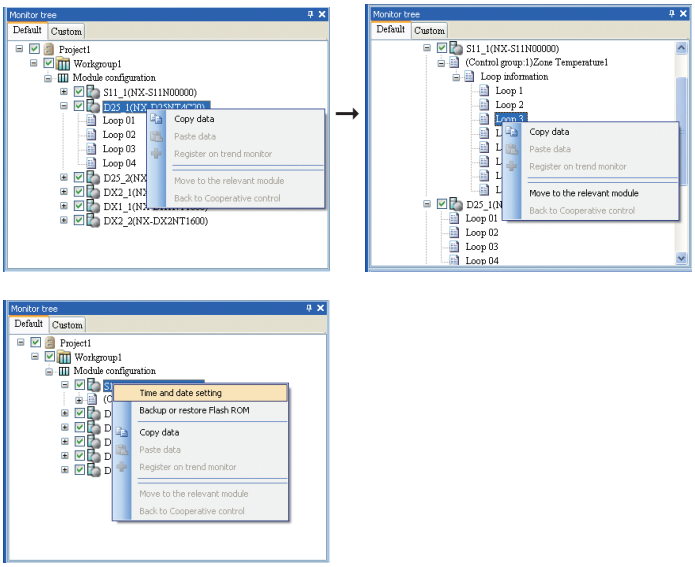
[3] To confirm the CSV-format trend log file with Explorer, click the [Yes] button.

>>The output trend log file (CSV output) is displayed in Explorer.

7 - 5 Explanations of Individual Windows

■ Monitor tree window

The Monitor tree window is as follows.



● Display items

The following items are displayed in the tree, starting from the left.

- [Data sampling switchover] check box
  Displays the [Data sampling switchover] check box for a project, workgroup or module. There is no data sampling of modules that are not selected for sampling, and therefore trend graphs, trend groups, numeric monitor, bit display monitor and alarm monitor are not updated.
- Check status or projects and workgroups
  Icon: Sample data from modules in the project/workgroup.
  Icon: Does not sample any data from modules in the project/workgroup.
  Icon: Mixed status: some data from modules in the project/workgroup is sampled and some is not.

Note that there are only 2 possible settings for the project/workgroup check boxes: sample and do not sample. To switch the sampling status, click the icon portion.

- Check status of modules
  Icon: Samples data from module
  Icon: Does not sample data from module.

To switch the sampling status, click the icon portion.

- Module communication status icons
  Icons are displayed that indicate the status of communication with the modules, and the module communication status resulting from the module status. Icons also identify which modules are controlled by the supervisor module.

Communication status	Module status	Controlled by the supervisor module	
		No	Yes
Communication standby			
Communication interruption			
	IDLE mode	(blinking) 	(blinking) 
	RUN mode		
	Soft Failure		
	Soft Failure idle	(blinking) 	(blinking) 
	Hard Failure		
	Initializing		

● Configuration

The [Default] and [Custom] tabs make up this window.

- [Default] tab
  Displayed based on each category and the individual units for categories for the workgroup configuration.
- [Custom] tab
  Information is displayed in the [Custom] tab once the custom monitoring function ("7-7 Custom Monitoring (P. 7-33)") has been registered.

● Coordination with the [Numeric monitor] window and the [Bit display monitor] window

The [Numeric monitor] window and the [Bit display monitor] window are displayed in conjunction with the selection of modules and module categories.

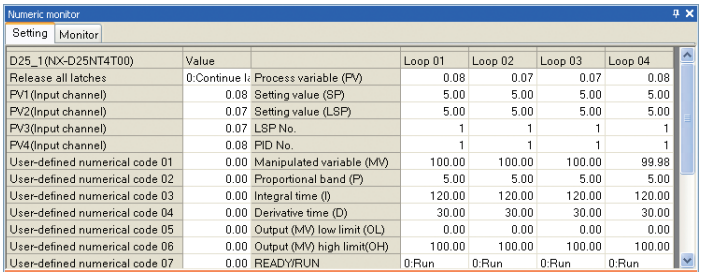
● **Right-click menu**

Menu items	Functions	Remarks
Copy data	Copies the level of the monitor tree.	—
Paste data	Pastes the copied level to the applicable level. This menu is enabled when the [Custom] tab is selected in the [Monitor tree] window.	—
Register to trend monitor	Registers the selected tree to the trend monitor.	Enabled only when the [Custom] tab is selected in the [Monitor tree] window.
Move to the relevant module	Moves to the module to which the loops that are selected in the control group of the supervisor module belong.	Enabled only when the supervisor module is right-clicked in the [Monitor tree] window.
Back to cooperative control	Returns from the module registered in the control group to the supervisor module.	Enabled only after moving with the [Move to the relevant module] menu option in the [Monitor tree] window.
Set date and time	Sets the date and time for the supervisor module.	Enabled only when the supervisor module is right-clicked in the [Monitor tree] window.
Flash ROM backup and restore	Displays the dialog box for backing up the supervisor module parameters to the flash ROM or restoring the parameters.	Enabled only when the supervisor module is right-clicked in the [Monitor tree] window.

■ [Numeric monitor] window

The [Numeric monitor] window displays data related to a category selected in the [Monitor tree].

Example: When modules are selected on the Monitor tree of the controller module



● Displayed data

Displayed data comes from a model prepared as a loader from each category, the data from which is displayed in the [Default] tab of the [Monitor tree] window.

When the necessary data is not in this model,

☞ 7 - 7 Custom Monitoring (P. 7-33)

● Right-click menu

Menu items	Functions	Remarks
Copy items	Copies cell data.	Disabled when a column or row header is selected.
Add copied items	Adds data copied with [Copy items] to the end of the columns on the Numeric monitor (in the case of Custom).	Enabled only when the [Custom] tab is selected in the [Monitor tree] window and the column header of the numeric monitor is selected.
History of PID parameter change*	Checks the changed PID setting parameters.	—
Move to the relevant module	Switches the monitor tree and numeric monitor displays to the controller module to which the various control loops for cooperative control belong.	Enabled only when the control loop column for cooperative control is selected.
Back to cooperative control	Switches the monitor tree and numeric monitor displays to the previous control group of coordination control.	Enabled only after the display is switched with the [Move to corresponding module] menu option.

* The History of PID parameter change function is enabled for controller modules.

● Settings tab and Monitor tab

The [Numeric monitor] window is divided into the [Setting] tab and the [Monitor] tab.

In the [Setting] tab, with data writable to a module, data can only be written when monitoring is being started.

Writing to EEPROM device in the case of NX-D_ _, NX-DX_ or NX-DY_.

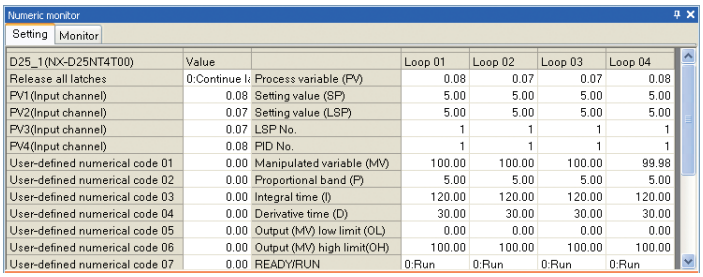
Writing to SRAM device in the case of NX-S_ _.

In the [Monitor] tab, even with data writable to a module, data can only be viewed when monitoring is being started.

■ Numeric grid display

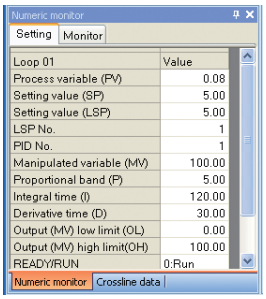
The tabs of the [Numeric monitor] window are displayed in the following format based on a category or the individual units in a category selected in the [Monitor tree] window.

- If a category has been selected
  The lists of the main data for the selected category and the data for the individual units in the category are displayed in the [Numeric monitor] window.
  If the cells of the numeric grid are clicked, item names are displayed as tool tips.



D25_1 (NX-D25NT4T00)	Value		Loop 01	Loop 02	Loop 03	Loop 04
Release all latches	0:Continue l	Process variable (PV)	0.08	0.07	0.07	0.08
PV1 (Input channel)	0.08	Setting value (SP)	5.00	5.00	5.00	5.00
PV2 (Input channel)	0.07	Setting value (LSP)	5.00	5.00	5.00	5.00
PV3 (Input channel)	0.07	LSP No.	1	1	1	1
PV4 (Input channel)	0.08	PID No.	1	1	1	1
User-defined numerical code 01	0.00	Manipulated variable (MV)	100.00	100.00	100.00	99.98
User-defined numerical code 02	0.00	Proportional band (P)	5.00	5.00	5.00	5.00
User-defined numerical code 03	0.00	Integral time (I)	120.00	120.00	120.00	120.00
User-defined numerical code 04	0.00	Derivative time (D)	30.00	30.00	30.00	30.00
User-defined numerical code 05	0.00	Output (MV) low limit (OL)	0.00	0.00	0.00	0.00
User-defined numerical code 06	0.00	Output (MV) high limit(OH)	100.00	100.00	100.00	100.00
User-defined numerical code 07	0.00	READY/RUN	0:Run	0:Run	0:Run	0:Run

- If the individual units in a category have been selected
  The list of data for the individual units in a selected category is displayed in the [Numeric monitor] window.
  Example: Select the controller module loop in the Monitor tree



Loop 01	Value
Process variable (PV)	0.08
Setting value (SP)	5.00
Setting value (LSP)	5.00
LSP No.	1
PID No.	1
Manipulated variable (MV)	100.00
Proportional band (P)	5.00
Integral time (I)	120.00
Derivative time (D)	30.00
Output (MV) low limit (OL)	0.00
Output (MV) high limit(OH)	100.00
READY/RUN	0:Run

● Editing values

In the [Numeric monitor] window [Setting] tab, if monitoring has been started,

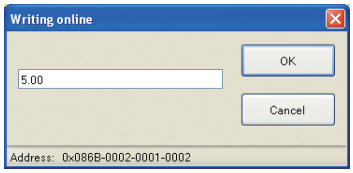
- When a grid cell is double-clicked

or

- When the [Enter] key is pressed

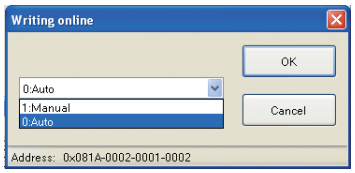
Values can be set in the [Writing online] dialog box that is displayed.
Clicking the [OK] button in the [Writing online] dialog box writes the input values to the module(s).
If the [Cancel] button is clicked, the values entered in the [Writing online] dialog box are not applied.
Based on the data type of the target value, one of the two [Writing online] dialog boxes below will be displayed.

- Change by numeric input



Enter a numeric value in the edit box of the [Writing online] dialog box, click the [OK] button, and when the dialog box is closed, the value is written to the module.
If the [Cancel] button is clicked, the value entered is not applied.
When the [OK] button is clicked, a check of the upper and lower limit values of the edited value is performed, and if the data is out of range the entered value will remain the same as previously confirmed.

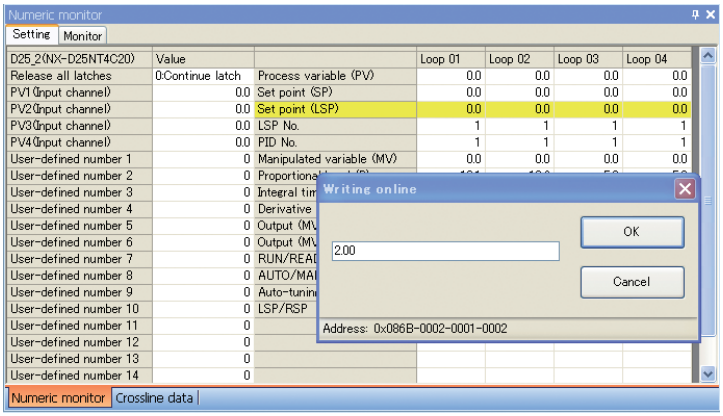
- Change by selection



A list box is displayed in the [Writing online] dialog box.
Select one of these from the list box and click the [OK] button. The value is written to the module when the dialog box is closed.
If the [Cancel] button is clicked, the value entered is not applied.

● Editing the row unit value

When a row header is clicked, the data in the same row is selected.
Also, if a row header is double-clicked, the [Writing online] dialog box corresponding to the selected row data is displayed, and the edited value is applied to all selected data.
For the initial value displayed in the [Writing online] dialog box, the value of the leftmost item is displayed, even in the case of an edit box or radio button.
Example: If the “Set point (LSP)” cell is double-clicked and settings made with multiple loops displayed, all “Setting value (LSP)” for the target loops can be changed.



● **Data registration to unconfigured groups in the [Trend group] window**

[Monitor tree] window, if categories or individual units for each category are selected, the applicable data is displayed in the Numeric monitor. If a drag-and-drop operation from the [Numeric monitor] window to a [Trend group] window unconfigured group is performed with either a numeric monitoring cell, column header, or row header selected, a trend group with the selected data range registered is created.

When a column header is selected the item name is set for the trend group category name, when a row header is selected the column name is set, and when a cell is selected the module name is set.

Handling Precautions

- This operation can only be used when monitoring is being stopped.

● **Data registration to existing groups in the Trend group window**

[Monitor tree] window, if categories or individual units for each category are selected, the applicable data is displayed in the Numeric monitor. If a drag-and-drop operation from the [Numeric monitor] window to a [Trend group] window existing group is performed with either a numeric monitoring cell, column header, or row header selected, the data dragged from the source is added to the group data of the drop target.

In this case if a column header or row header is selected, all selected column or row data is added.

Handling Precautions

- This operation can only be used when monitoring is being stopped.

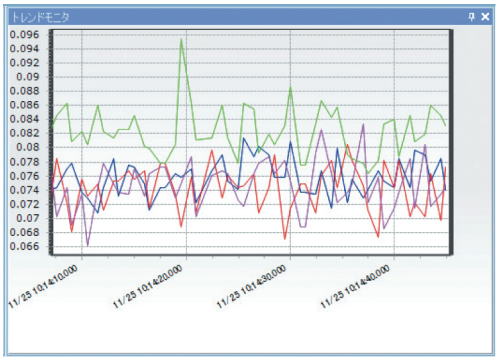
● **History of PID parameter change (with controller modules)**

If a right-click is performed with a column header in the [Numeric monitor] window selected, [History of PID parameter change] is displayed.

If the [History of PID parameter change] menu is selected, the [History of PID parameter change] dialog box is displayed.

■ Trend monitor window

The [Trend monitor] window is displayed in the following way.

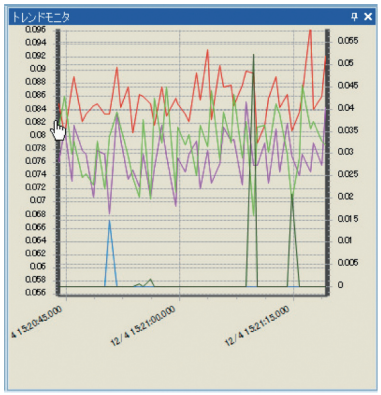


Trend monitoring can display the graphs of up to eight groups at the same time. If the mouse cursor is placed on the graph area, the name of the [Trend group] window will be highlighted.

- Graph display area scrolling
  Dragging the vertical axes on the left or right, or the graph display area (left/right mouse button for vertical axes, right button for graph area) will scroll the graph rendering area.
  Scroll vertically by trend group units, or scroll the entire group when including the horizontal axis.
  This function can be used when rendering a graph during monitoring or displaying a graph after stopping monitoring.
  * Can also be used in the Universal monitor [Offline].
  To return to initial status (entire monitor is an updated graph), use the same method as for cancelling [Zoom], described below.

Note

- When scrolling only the vertical axis while monitoring is being started, graph rendering will be continued.
  When scrolling to the future area with the horizontal axis, graph rendering will continue until the graph reaches the right side of the display area, but will stop after it has been reached. Also, when scrolling to the past area, rendering will stop with the current graph. Data sampling will continue.
  Example: The vertical axis on the left of the graph is specified with the mouse pointer.



- Zoom
  By holding down the left button of the mouse and dragging from upper left to lower right to form a rectangle in the graph area, the graph display for the trend group where you performed the operation will be enlarged.
  To cancel zoom display, perform the reverse, dragging the mouse from lower right to upper left to draw a rectangle.
  This function can be used when rendering a graph during monitoring or displaying a graph after stopping monitoring.
  * Can also be used in the Universal monitor [Offline].
  Graph rendering stops when zoom is used.
  * When zooming includes the future area, graph rendering will continue until the graph reaches the right side of the display area, but will stop after it has been reached. Data sampling will continue.

- Crossline cursor
  When the mouse cursor is placed within the graph area, the lines displayed on the vertical axis are called crosslines. These can be used in conjunction with the [Crossline data] window. This function can be used for the entire group.
  * Group units are used in the [Crossline data] window.

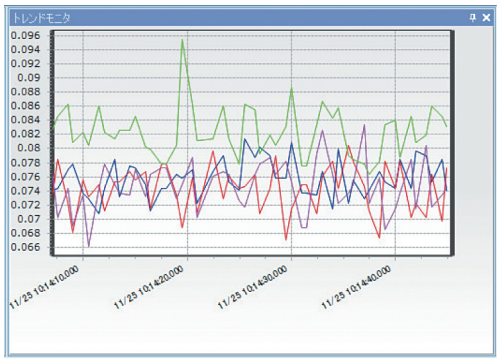
  - Moving the cursor : The data for points where the crossline cursor and graph overlap is displayed in the [Crossline data] window.
  - Double-clicking : The starting point for the crossline cursor is established. (Changes to bold line display.) If the crossline cursor is moved with the mouse, the start point data established in the [Crossline data] window and end point data for points overlapping with the crossline are displayed.
    * When establishing the start point, if the crossline is single-clicked again it is fixed as the end point. Clicking again cancels the fixed end point. Double-click the start point to cancel it.
  - Display time : Time displayed in trend monitoring is displayed in relative time and absolute time, and is updated on the monitoring cycle. Display time is switched between absolute time and relative time by selecting [Settings] → [Options] from the menu.

Handling Precautions

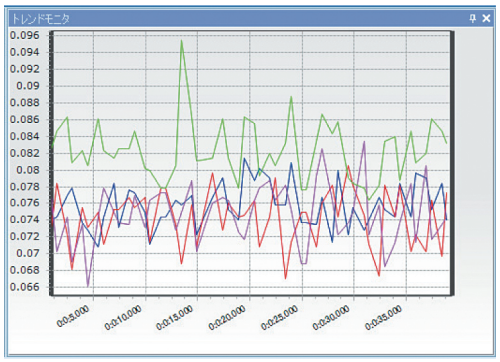
- This can be used when graph data is being displayed in the graph area.
- This operation can only be used when monitoring is being stopped.
  Can also be used in the Universal monitor [Offline].

☞■ Crossline data window (P. 7-23) regarding the [Crossline data] window display contents.

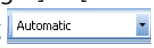
- Absolute time : Displays the current time. The horizontal axis display format is “MM/dd hh:mm:ss.fff”.



- Relative time : Displays monitoring start time as 0. The horizontal axis display format is “hh:mm:ss.fff”. The trend graph is displayed in the range of 0:00:00-23:59:59, and when 24 hours has elapsed the time display is reset to 0:00:00.



● Display time length (X axis on a graph)

Select [Settings] → [Monitor settings] from the menu bar of the [Universal monitor] window.
The [Monitor settings] dialog box is displayed.
Select one of the seven display lengths (1 min, 2 min, 10 min, 1 h, 12 h, 24 h, and automatic) in [Display time length] in [Trend graph settings].
Settings can also be made using 

in the [Universal monitor] window tool bar.

Note

- Display time length settings can be changed from the tool bar even when monitoring is being started.
- Display length settings will be stored and become the initial settings next time that universal monitor is started.

Handling Precautions

- Display time length cannot be changed by using [Settings] → [Monitor settings] from the menu bar of the [Universal monitor] window while monitoring operations are active.

● **Set trend high and low limit values (graph Y axis) to desired values**

Select [Settings] → [Monitor settings] from the menu bar of the [Universal monitor] window.
The [Monitor settings] dialog box is displayed.
Either "Automatic" or "Fixed" (range entry setting) can be set in [Trend graph settings] → [High and low limits].

Note

- The target will be all trend groups and the left and right axes.
- The same settings can be made in [Y axis high and low limits settings] in the [Trend group] window. This operation can be used to make settings for trend group units and for each left and right axis.

Handling Precautions

- This operation is possible only when monitoring is stopped.

● **Automatic clearing of displayed data**

Select [Settings] → [Monitor settings] from the menu bar of the [Universal monitor] window.
If a fixed sample number (10,000 items) of data is displayed, the graph display will be automatically cleared.
Settings range, etc.
☞ ■ List of Value Limits (P. 9-2).

Handling Precautions

- This operation is possible only when monitoring is stopped.

● **Zoom in, zoom out**

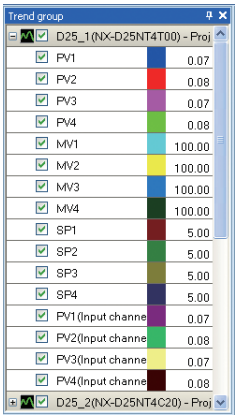
Select the icon from the [Universal monitor] window tool bar.
 Icon : Zoom in
 Icon : Zoom out
One click enlarges or reduces by 25%.
This can be used either when monitoring is being started or stopped.
* The Universal monitor [Offline] can also be used.

● **Manual horizontal scrolling**

Select the icon from the [Universal monitor] window tool bar.
 Icon : Return to start time
 Icon : Advance to most recent time
 /  Icon : Scrolls one-half of the screen
 /  Icon : Scrolls one-fourth of the screen
This can be used either when monitoring is being started or stopped.
* The Universal monitor [Offline] can also be used.

■ Trend group window

The [Trend group] window groups registered data, and can perform display in the [Trend monitor] window and sampling status operations.



Items are displayed in list format.
A maximum of 32 data items can be registered in a group.
A maximum of eight registered trend groups can be displayed at the same time in the [Trend monitor] window.
To display data registered to a trend group, click either the leftmost  icon or the group name.

● Display items

Items are displayed from the left side in order as follows.

- [Data sampling switchover] check box
  Switch the data sampling status of the trend monitor. There are two statuses, and their meanings are given below.
   Icon : Makes a trend group the target for sampling
   Icon : Does not make a trend group the target for sampling
  To switch the sampling status, click the icon portion.

- [Graph update switchover] check box
  Switches the graph view/hide status. Checks can be selected for three levels. The meaning of each check is given as below.
  - Check status of groups
     Icon : Views all data registered to a group
     Icon : Hides all data registered to a group
     Icon : Views some of the data registered to a group, and hides the other
    Changing the check mark for an entire group switches only between the two states of view/hide. To switch the view state, click the icon portion.
  - Check status of individual data items
     Icon : Display target data in graph
     Icon : Do not display target data in graph
    To switch the display state, click the icon portion.

- Item names
  Displays group names and data names.
  If the name is longer than the display length, placing the mouse cursor over the name will display the entire name in a tool tip.
  For custom-registered trend groups, item names can be changed when monitoring is being stopped.
  <For a group name>
  Selecting [Data name change] from the right-click menu displays the [Data name change] dialog box in which a name can be changed.
  <For a data name>
  Double-clicking a cell or selecting [Data name change] from the right-click menu displays the [Data name change] dialog box in which a name can be changed.

- Graph rendering color
  Displays the line color of the corresponding graph.
  If the graph color cell is double-clicked, the [Trend graph settings] dialog box is displayed, and the line color, the line type, and the display axis for the corresponding graph can be set.

- The latest data values
  The latest values of the corresponding data are displayed in real time.
  Values cannot be changed.

● **Functions**

Select [Monitor] → [Start] from the menu bar of the [Universal monitor] window.
The latest data values of the trend group and the trend graph are updated in real time.
Selecting [Monitor] → [Exit] from the menu stops monitoring and updating of both of the trend graph and the latest data values.
The trend graph and latest data values will not be cleared until the start of monitoring is selected again.
The monitoring cycle can be changed to a desired value. The default is 400 msec via Ethernet, and 2,000 msec via a USB loader cable.
The trend graph is automatically allocated depending on the number of graph display check boxes selected in each group name for trend groups.
The number of allocations is up to eight items vertically.
Allocated graphs are linked to trend group data in order from the top area.
The order in which items are displayed in trend groups can be changed by dragging and dropping header items when monitoring is being stopped.
By dragging and dropping definitions from the Numeric monitor or the Bit display monitor to the Trend group, data to monitor can be added.

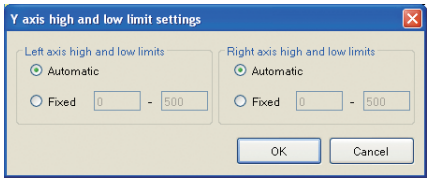
Handling Precautions

- Because data sampling for the [Trend group] window and [Numeric Monitor] window are conducted individually, values for the same data may be displayed differently.

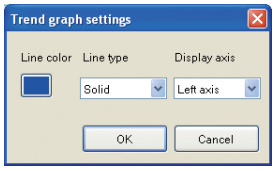
● Trend group right-click menu

Menu items	Functions	Remarks
Full-screen display	Displays only the selected group in the [Trend monitor] window. The header of the group that is full-screen display in the window is displayed in yellow.	—
Y axis high and low limits settings	Displays the [Y axis high and low limits settings] dialog box. Set the [Y axis high and low limits settings] for the selected group. ☞ [Y axis high and low limits settings] dialog box (below).	—
Digital trend switchover	Switch the selected group to the digital trend setting. The header of the selected group when set is displayed in blue.	Enabled only when monitoring is being stopped.
Trend graph settings	Displays the dialog box for setting the line color, the line type, and the display axis. Set all information of data registered under a group. ☞ [Trend graph settings] dialog box (below).	—
Data name change	Displays the dialog box for changing the data name. Set the name of the selected data. ☞ [Data name change] dialog box (next page).	Enabled only when monitoring is being stopped.
Remove from trend monitor.	Enabled only when a group is selected. Removes the selected group from the trend monitor. (Groups registered by default cannot be deleted.)	
Remove individual data	Enabled only when data is selected, and then removes the selected data.	

- [Y axis high and low limits settings] dialog box
  Set the Y axis high and low limits for the applicable group.

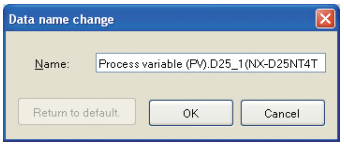


- [Trend graph settings] dialog box
  Set the line color, the line type, and the display axis for the graph of the applicable data.



[Data name change] dialog box

Set the name of the applicable data.



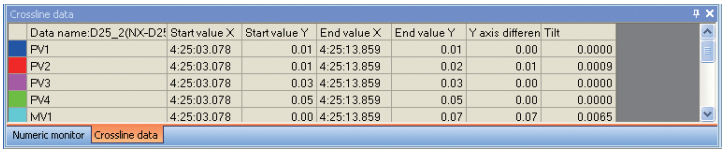
Click the [OK] button.

Note

- The [Return to default.] button will be enabled when a different name is entered, and the name is returned to the name at the time that the dialog box was initiated.

■ Crossline data window

Crossline data is displayed as follows.



● Display items

- Data name
  Displays trend group data names when moving the cursor in the [Trend monitor] window, or those corresponding to double-click locations.
- Start point value X, start point value Y
  Displays trend group start point times and values at start point when moving the cursor in the [Trend monitor] window, or those corresponding to double-click locations.
- End point value X, end point value Y
  Displays trend group end point times and values at end point when moving the cursor or double-clicking when the start point has been established in the [Trend monitor] window.

Note

- If no data exists, [–] is displayed.

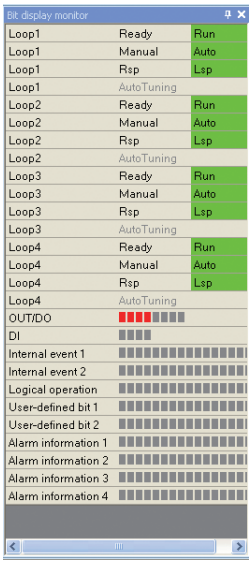
- Y axis difference value
  Displays the difference between start point value Y and end point value Y.
- Tilt
  Displays the tilt between start point values (X, Y) and end point values (X, Y).

● Functions

The crossline function is only enabled when monitoring is being stopped.
When the cursor is moved in the trend graph, perpendicular lines are rendered in the trend graph area, displaying corresponding each value for Y from the X axis value.
Displays the difference value/tilt between the point double-clicked on the trend graph and the point to which the mouse has been moved or which was clicked in coordinates.

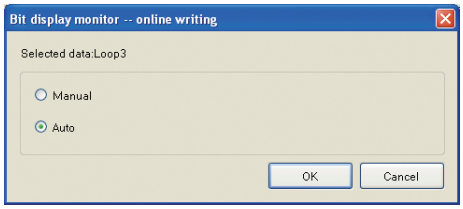
■ Bit display monitor window

The [Bit display monitor] window is described below.
Example: Controller module



If a category is selected in the [Monitor tree] window, the content for bit display is displayed in the [Bit display monitor] window.
It is possible to register bit data to the [Trend monitor] window by selecting it in the [Bit display monitor] window and dragging and dropping it in the [Trend group] window.
When registering data to the [Trend monitor] window, a message to confirm whether to set it as a digital trend will be displayed.
If data rows are double-clicked when monitoring is being started, the [Bit display monitor -- online writing] dialog box is displayed and values can be changed.

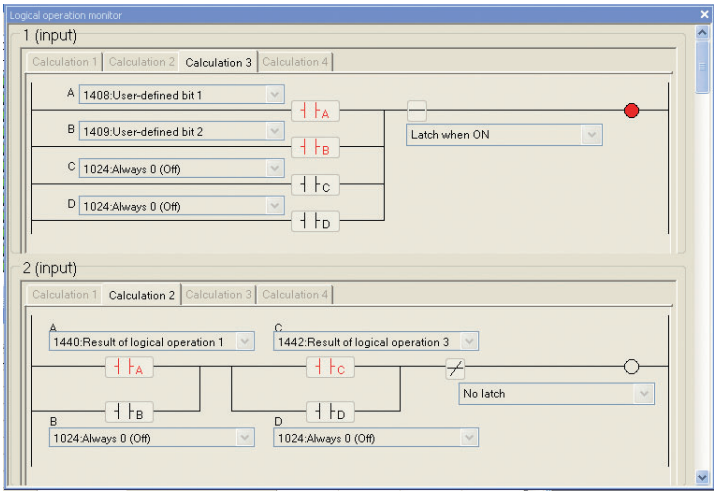
- [Bit display monitor -- online writing] dialog box
  If data rows are double-clicked when monitoring is being started, the [Bit display monitor -- online writing] dialog box is displayed.



  Select one of the choices and click the [OK] button, and when the dialog box closes the value is written to the module.
  If the [Cancel] button is clicked, the value entered is not applied.

■ Logical Operation Monitor Window

In the [Logical operation monitor] window, the settings for logical operation, input assignment, and logical operation results can be checked. Calculations that meet the conditions are displayed in red.



To display the [Logical operation monitor] window, do either of the following operations.

- On the [Universal monitor] window menu bar, select [Window] → [View] → [Logical operation monitor].
- Select on the [Universal monitor] window toolbar.

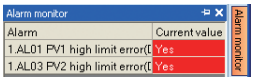
After either operation, the window is displayed in the regular position.

Note

- In the initial status, the [Logical operation] window is not displayed.
- When a module that supports logical operation is selected from the monitor data tree, the [Logical operation monitor] window becomes effective. For example, if a workgroup is selected from the monitor data tree or if the version of the selected module does not support logical operation, only the window is displayed while the contents are not.

■ [Alarm monitor] window

The [Alarm monitor] window is displayed in the following way.



When an alarm occurs, the [Alarm Monitor] window is displayed in front.
Set the integral multiple of the monitor cycle as the alarm cycle. The default value is 5,200 msec. The cycle can be changed in the [Monitor settings] dialog box by selecting [Settings] → [Monitor settings] from the menu bar of the [Universal monitor] window.

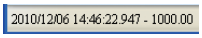
Note

- When no alarm has occurred [Alarm monitor] tab will be displayed.
  [Alarm monitor] tab display
  ☞ 7- 3 Universal Monitor Window (P. 7-3)

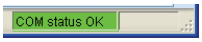
■ Status bar

The following information is displayed in the status bar of the [Universal monitor] window.

● Monitor time display

At the left end of the status bar, the most recent time of data sampling based on the monitoring cycle is displayed in the "YYYY/MM/DD hh:mm:ss.msec" format.
The difference between the time of the previous data sampling and the current time is displayed following the hyphen in msec.
Display example: 

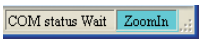
● Monitor COM status display

The communications status is displayed at the right end of the status bar.
The following three types of status are displayed.
[Wait] : Monitoring is stopped
[OK] : Monitoring is started
[Break] : Response stopped due to a communications error when monitoring is started
Display example: 

● Zoom status display

The zoom status of Trend monitor is displayed at the right end of the status bar.
Operations for which [ZoomIn] is displayed are as follows.

- Zooming while dragging and dropping within the trend monitor
- When trend group header is right-clicked and [End full-screen display] is selected
- When the zoom in icon on the toolbar  is selected

Display example: 

Operations for which [ZoomOut] is displayed are as follows.

- When the zoom out icon on the toolbar  is selected

Display example: 

[FullScreen] is displayed in the following situations.

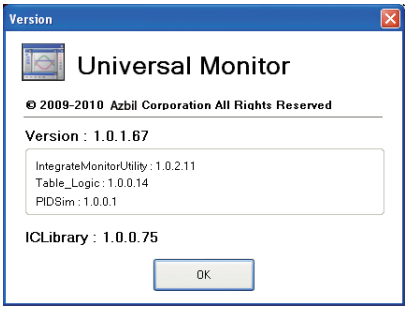
- When the [Trend group] window is right-clicked and [End full-screen display] is selected.
- When a trend group that was zoomed-in returns to full-screen status.

Zoomed-in or zoomed-out status has priority over full-screen status.
Display example: 

■ Version information

To display the version information of the Universal monitor, select [Help] → [About (version info)] from the menu bar of the [Universal monitor] window.

>>The version information of universal monitor is displayed as follows.

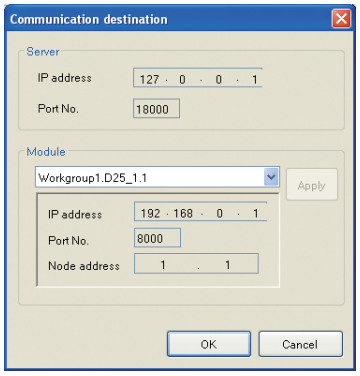


7 - 6 Settings

■ Communication destination

[1] Select [Settings] → [Communication destination] from the menu bar of the [Universal monitor] window.

>>The [Communication destination] dialog box is displayed.



[2] The displayed content is as follows.

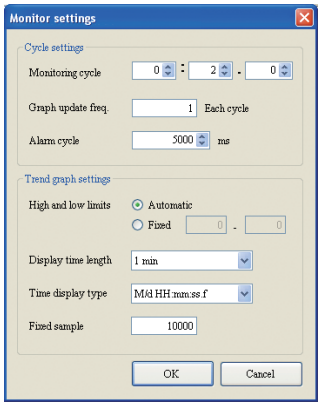
- [Server]
  The set IP address and port number are displayed.
- [Module]
  Select the module to be edited from the combo box and confirm the IP address, port number and node address.

[3] After confirming, click the [OK] button.

■ Monitor settings

[1] Select [Settings] → [Monitor settings] from the menu bar of the [Universal monitor] window.

>>The [Monitor settings] dialog box is displayed.



[2] The displayed content is as follows.

- [Monitoring cycle]
  Set the monitor data sampling cycle in msec.
  The initial value is as follows, depending on the number of modules that are targeted for communication.

For Ethernet communication

1 module:	0.4 sec
Up to 4 modules:	1 sec
Up to 16 modules:	2 sec
Up to 31 modules:	4 sec

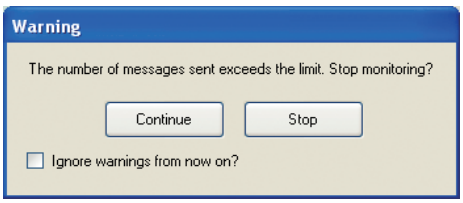
For loader jack communication 2 sec

- [Graph update freq.]
  Select how frequently to update (per number of monitoring cycles). The initial value is "1" cycle.
- [Alarm cycle]
  Set the alarm information data sampling cycle in msec.
  The initial value is "5,000" msec.
- [High and low limits]
  Set the high and low limit values for data displayed in the graph area.
  The Y axis of the trend graph will be fixed within the range of set values if fixed values are selected.
  The initial setting is "Automatic."
- [Display time length]
  Set the time range for data displayed in the graph area.
  The X axis displayed in the trend graph is determined according to the value selected in the combo box.
  The initial value is "1 min."
- [Display time format]
  Sets the format of the time displayed on the trend graph's X axis.
  The default value is "M/d HH:mm:ss.f."
- [Fixed Sample]
  Specify the number of data to be held in one graph area.
  The initial value is "10,000."

[3] After making the settings, click the [OK] button.

Handling Precautions

- The following message may be displayed, depending on load conditions such as the computer load, number of modules, data sampling from monitors, and trend log writing.



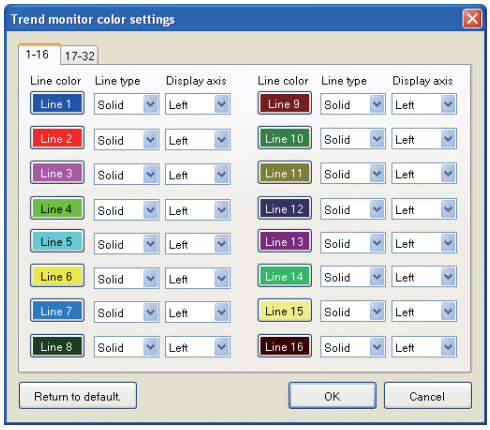
If this message is displayed, take action to restore monitor operation as follows.

- Change the monitoring cycle
- Reduce the number of modules monitored by removing the check mark from monitor tree or trend group check boxes.

■ Trend monitor color settings

[1] Select [Settings] → [Trend color settings] from the menu bar of the [Universal monitor] window.

>>The [Trend monitor color settings] dialog box is displayed.



[2] The displayed content is as follows.

- [Line color]
  Select the graph's line color.
  Clicking the target displays the [Color settings] dialog box.
- [Line type]
  Select the graph's line type.
  The six types of line are continuous, dashed, dotted, continuous (thick), dashed (thick), and dotted (thick).
- [Display axis]
  Select the display axis for the graph's line.
  Two types of axis (right, left) may be selected.

Note

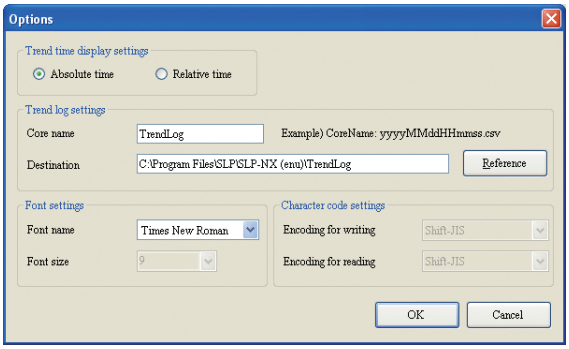
- To return all 32 colors to the default settings, click the [Return to default.] button.
  Initial line types are continuous for tabs [1-16] and dashed for tabs [17-32].
  Initial display axes are the left axis for tabs [1-16] and the right axis for tabs [17-32].

[3] After making the settings, click the [OK] button.

■ Options

[1] Select [Settings] → [Options] from the menu bar of the [Universal monitor] window.

>>The [Options] dialog box is displayed.



[2] The displayed content is as follows.

- [Trend time display settings]
  Set whether the trend monitor graph's X axis will display absolute time or relative time from the start of monitoring.
- [Trend log settings]
  Set the trend log file's core name and output target folder.
  - Output target folder path specification

1. Direct input
   Set the entered folder as the output target.
   * If the entered folder does not exist, a folder will be created with the name entered.

Note

- If "Log" is entered, \Log in the loader installation folder will be set as the output target.

2. If the [Browse] button is clicked to select a folder
   The output target will be set to the location selected.

Handling Precautions

- Do not set a folder on the network as the output target folder. Writing may not be done correctly due to temporary changes in the communication status.

- [Font settings]
  Set the font displayed in the [Universal monitor] window. Character size is fixed.
- [Character code settings]
  Displays the character code for writing and reading.

[3] Once the settings have been made, click the [OK] button.

>>The data sampled in the trend monitor is written to an external file as a log.
The file name is [core name]_[time stamp].[file extension].
The time stamp format is "YYYYMMDDhhmmss".
The data written to the log file can be read [Offline] later and displayed in a graph.

■ Other settings

The docking state of each window in the [Universal monitor] window can be saved and called up.

● Positionally fix window

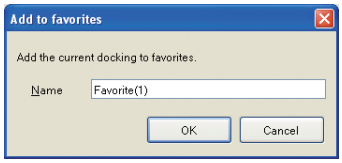
Select [Window] → [Fixed-position window] from the menu bar of the [Universal monitor] window. The docking status, position, and size of each window in Universal monitor is fixed.
Floating windows are locked in the front position even if the [Universal monitor] window is moved.
To release a fixed window, select [Window] → [Fixed-position window] again from the menu bar of the [Universal monitor] window.

● Return windows to standard positions

Select [Window] → [Return to standard position] from the menu bar of the [Universal monitor] window. The docking status, position, and size of each window in the Universal monitor are returned to standard.

● Save current window status

Select [Window] → [Favorite] → [Add to favorites] from the menu bar of the [Universal monitor] window. The [Add to favorites] dialog box will be displayed, and with the specified name, the window position, size, and docking status will be saved. The initial setting is "Favorite".
Data is saved in the loader installation folder.



● Organize items registered to favorites

Select [Window] → [Favorite] → [Organize favorites] from the menu bar of the [Universal monitor] window.
Registered items will be displayed in a list and can be organized (renamed or deleted).

● Call up window docking status registered to favorites

Select [Window] → [Favorite] from the menu bar of the [Universal monitor] window and select the name of the window settings to call up.
The window will be displayed in the saved status.

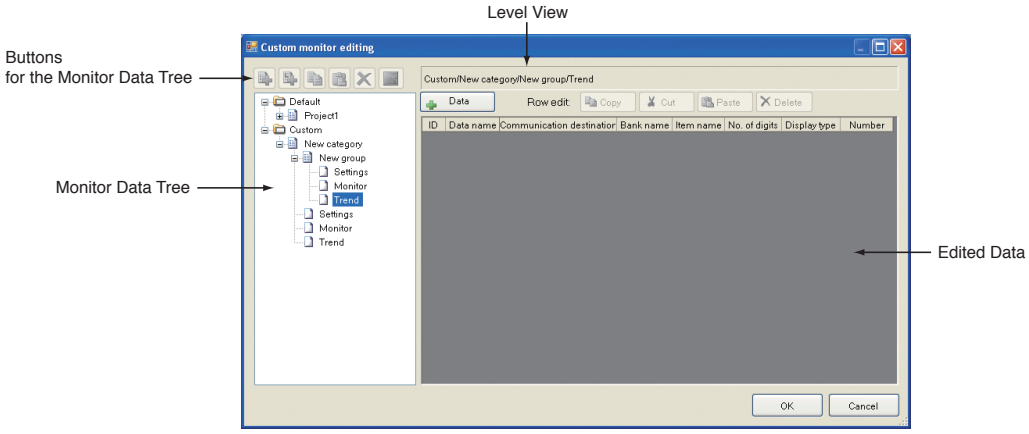
7 - 7 Custom Monitoring

The custom monitoring function is used when customizing monitored items. This section explains the editing method for custom monitoring and the corresponding operations in universal monitor. Select the [Custom] tab in the [Monitor tree] window to monitor items registered to custom monitoring in the Numeric monitor, etc. Also, standard items (models) corresponding to the model numbers and the number of modules in use are automatically registered in the [Default] tab of the [Monitor tree] window. The items that can be registered to custom monitoring vary depending on user level settings.

■ [Custom monitor editing] dialog box

To edit custom monitoring, select [Settings] [Edit monitoring data] from the menu bar of the [Universal monitor] window.

>>The following [Custom monitor editing] dialog box is displayed.



Handling Precautions

- To use content registered to custom monitoring offline (“7-9 Offline”, 7-41), register it as a trend (trend group). Settings for numeric monitoring cannot be used, or this cannot be used offline even if registered to a monitor.

● Monitor data tree

Displays the tree configuration displayed in the [Monitor tree] window of the [Universal monitor] window.

● Monitor data tree button

The custom levels of the monitor data tree can be edited.

Button	Icon	Functions
Add category		Creates a new category Enabled when a custom level is selected in the monitor data tree
Add group		Creates a new group Enabled when a category of a custom level in the monitor data tree is selected, adds the group to the selected category level
Copy		Copies the level and all settings targeted for monitoring of the selected category of group. Enabled when a category or group is selected
Paste		Pastes the copied category or group information
Delete		Deletes the category or group selected in the monitor data tree
Digital trend		Sets the items registered to a category or group as a digital trend

● **Right-click menu for monitor data tree**

Menu	Submenu	Functions	Remarks
New	Category	Creates a new category. Enabled when a custom level is selected in the monitor data tree.	—
	Group	Creates a new group. Enabled when a category is selected in the monitor data tree, and the group is added to the selected category.	—
Copy	—	Copies the level of the selected category or group and the setting items targeted for monitoring. Enabled when a category or group is selected in the monitor data tree.	—
Paste	—	Pastes the copied category or group information Enabled when a custom level item is selected in the monitor data tree.	—
Change name	—	Renames the selected category or group. Selecting a category or group enables editing of the name. Enter the new name and press the [Enter] key. The name of the category or group is renamed. Pressing the [ESC] key cancels editing without changing the name.	—
Delete	—	Deletes the category or group selected in the monitor data tree.	—
Trend monitor settings	—	Switches whether or not to view in the trend monitor. The icons of tree items that are set to be viewed in the trend monitor are changed, and the background color is highlighted in blue.	—
	Digital trend	Sets or cancels the items registered to a category or group as a digital trend.	A check mark on the menu indicates that the item is set.
View/Hide	—	Views or hides the category or group in the [Monitor tree] window of the [Universal monitor] window. When hide is selected (there is no check mark to the left of [View/hide] on the right-click menu), the applicable level is not displayed in the monitor data tree.	—
Register trends by row	—	Enabled when a category is right-clicked in the monitor data tree. The [Trend registration by column] dialog box is displayed, and registration to the trend group is performed.	See also the [Trend registration by column] dialog box items.

● **Edit data**

This is enabled by selection of category items (settings, monitors, trends).
Category items are registered as follows.

- Settings
  Registered on the [Setting] tab of the [Numeric monitor] window. Registered data can be written to modules during monitoring.
- Monitor
  Registered on the [Monitor] tab of the [Numeric monitor] window. Registered data can be checked during monitoring.
- Trend
  Registered on the [Trend group] window, and can be displayed in the [Trend monitor] window.

The upper limit for number of data that can be added is 64 for settings and monitors and 32 for trends.
To edit setting content, click the [Data] button with a category item (setting, monitor, trend) selected, or copy items existing in another category and register them.
Add, delete, or copy data as in ■ [Select data] dialog box (P. 7-36) ,
or select a row header from the edit data grid in the [Custom monitor editing] dialog box, and edit using the right-click menu or the shortcut button.

● **Level display**

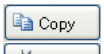
Currently, levels of the nodes selected in the monitor data tree are displayed.

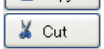
● **Right-click menu for edit data**

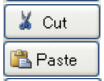
Menu	Functions	Remarks
Copy row	Copies one or more selected rows	Enabled when a row header is selected
Cut row	Cuts one or more selected rows	Enabled when a row header is selected
Insert copied row	Inserts the copied row data above the selected row	Enabled only when copied or cut row data exists
Delete row	Deletes one or more selected rows	Enabled when a row header is selected
Copy column data	Copies the data of the selected cell	Enabled when column data or a single cell is selected
Paste column data	Pastes the copied column data	Enabled when column data or a single cell is selected

● **Shortcut buttons for edit data**

Shortcut buttons that can perform the same operation as the edit data right-click menu are displayed.
From the left, the buttons shown below are displayed.

- Copy 

button
- Cut 

button
- Paste 

button
- Delete

button

These buttons are enabled when a row header is selected.

● **[Data] button**

This button is enabled when selecting category items (settings, monitors, trends) in the monitor data tree.
Custom data monitor parameters are displayed in the New list of the custom editor.
The range displayed in the [Custom monitor editing] dialog box differs depending on user level settings.
Click the [Data] button.
>>The [Select data] dialog box is displayed.
☞■ [Select data] dialog box (P. 7-36).

● **[OK] button**

Clicking this confirms edited items and data and closes the [Custom monitor editing] dialog box.

● **[Cancel] button**

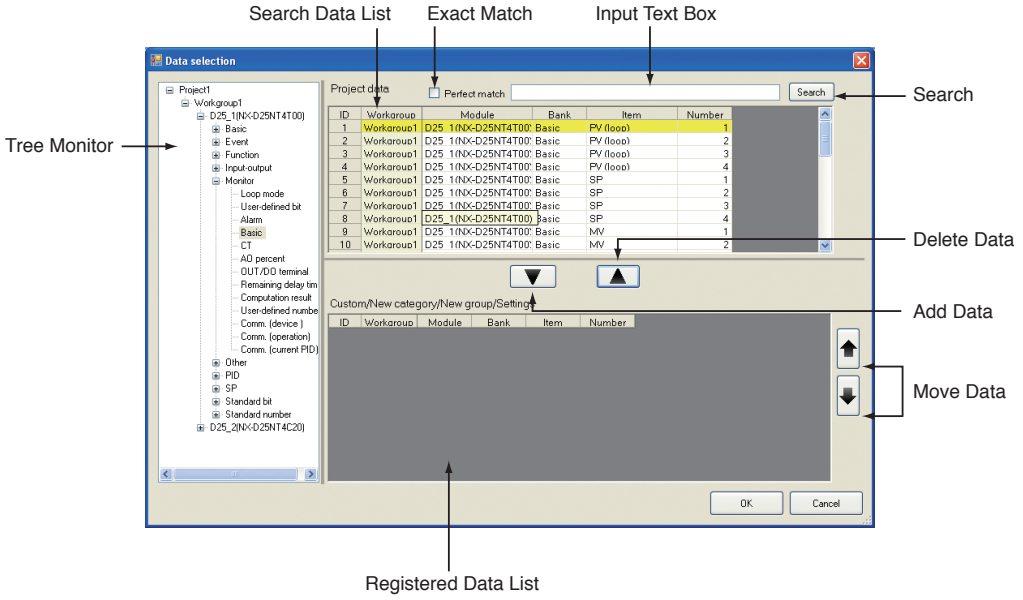
Clicking this discards edited items and data and closes the [Custom monitor editing] dialog box.

■ [Select data] dialog box

Selecting category items (settings, monitors, trends) in the Monitor data tree of the [Custom monitor editing] dialog box and clicking the [Data] button call up the [Select Data] dialog box.
Items set in the [Select Data] dialog box are set as monitor display item candidates for new registration in relation to the [Custom monitor editing] dialog box selection items.

Handling Precautions

- The items set in the [Select Data] dialog box are display candidates, and clicking the [OK] button in the [Custom monitor editing] dialog box confirms them as display items.



- [Tree Monitor]
  Displays data searched for in the database in a tree format.

- [Search Data list]
  Displays all data in the levels selected in the tree monitor.

- [Registered Data list]
  Displays a list of data registered to items selected in the monitor data tree of the [Custom monitor editing] dialog box.

- [Search]
  It is possible to narrow down the data search list with specified conditions ([Perfect match] check box, [Text box for input]).

- [Exact Match] check box
   : Displays only data that perfectly match the data in the data search list and the text input in the text box.
   : Displays data in the data search list that include the text input in the text box.
- [Input Text Box]
  Character strings for workgroup, category, type, and property can be input.

- [Add Data] button
  Adds data selected in the data search list to the registered data list.

- [Delete Data] button
  Removes data selected from the registered data list from the registered data list.

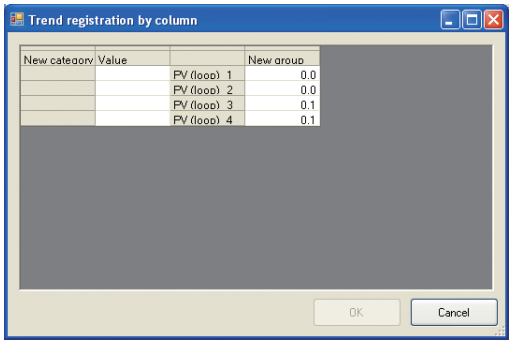
- [Move Data] button
  Moves data specified in the registered data list up or down.
  Multiple items can be selected.

- [OK] button
  Adds items in the registered data list to items selected in the monitor data tree of the [Custom monitor editing] dialog box and closes the dialog box.

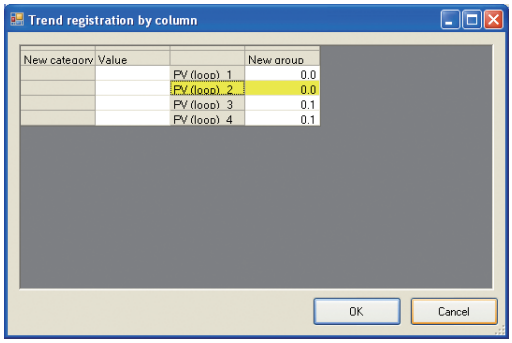
- [Cancel] button
  Interrupts the operation and closes the dialog box.

■ [Trend registration by column] dialog box

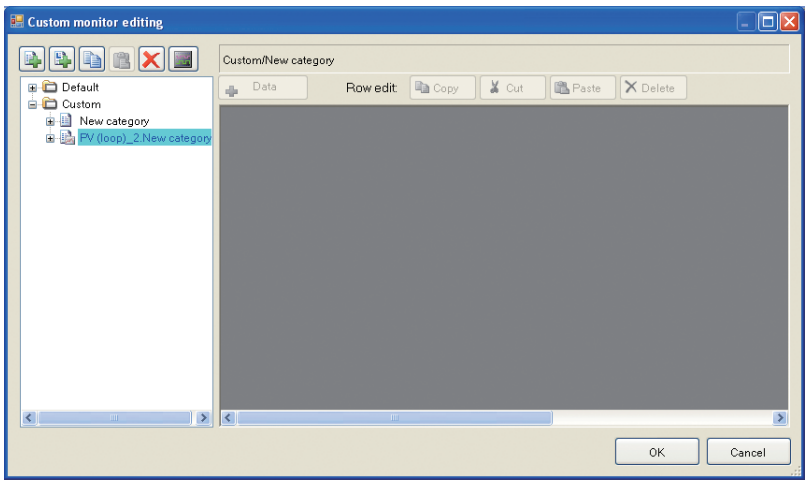
Right-clicking a category in the monitor data tree of the [Custom monitor editing] dialog box enables the [Register trends by row] menu. Selecting the [Register trends by row] menu displays the [Trend registration by column] dialog box, and registers the items registered in the [Setting] tab of the [Numeric monitor] of the applicable tree level as a trend group.



Select the row header of the item name and click the [OK] button.



>>Registered to the monitor data tree as a trend group candidate.



7 - 8 Trend Memo

■ Overview

Trend memo records comments from users and the history of PID parameter change.
Trend memo data is linked with a trend log file and saved (The file name is written to a trend log in the same way as a PID log).
Trend memos can be recorded by selecting [Record] from the menu bar of the [Universal monitor] window or using the right-click menu in the [Trend monitor] window.

■ Register a trend memo

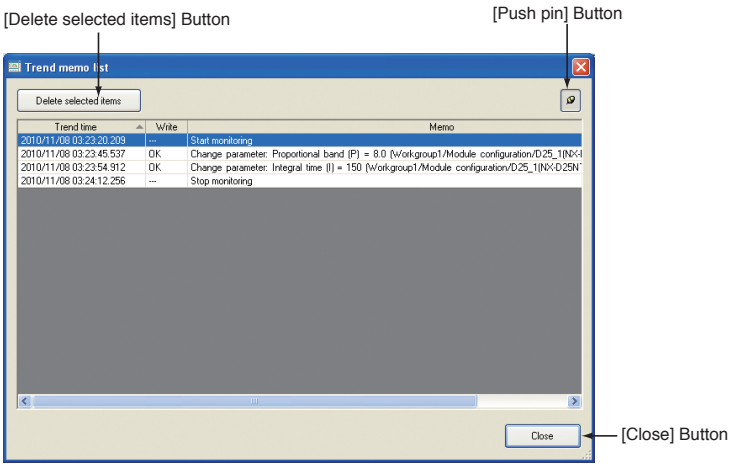
Trend memos can be registered by selecting [Trend memo registration] from the right-click menu in the [Trend] window, or by selecting [Record] → [Trend memo registration] from the menu bar of the [Universal monitor] window.
The [Register Trend Memo] dialog box is displayed.

Handling Precautions

- Trend memo registration is enabled during monitoring after receiving the first trend data. If a trend memo is registered from the menu of the [Universal monitor] window, the latest value on the trend graph's X axis (absolute time) is the registration time.
  If registration is done from the right-click menu of the [Trend monitor] window, the time at the mouse position will be the registration time.

■ Display a trend memo

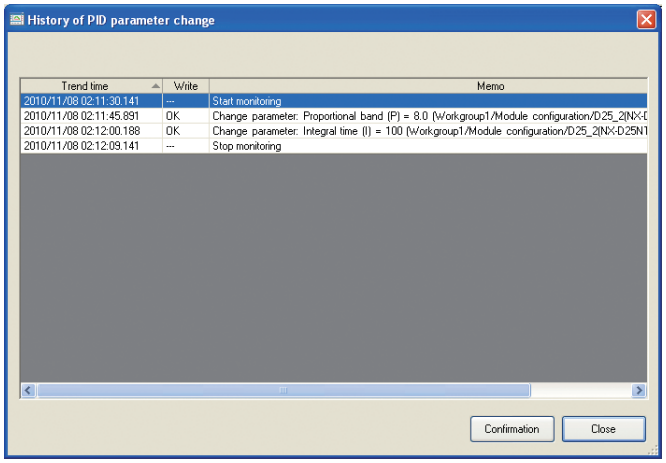
To display a trend memo select [Record (R)] → [Trend Memo List (V)] from the menu bar of the [Universal monitor] window, or select [Trend Memo List (V)] from the right-click menu of the [Trend monitor] window.
>>The [Trend memo list] dialog box is displayed.



- [Delete selected items] button
  Select one or more row information items and delete them from the trend memo.
- [Pushpin] button
  While the pin is pushed in , the [Trend memo list] dialog box will be displayed in front on the [Universal monitor] window.
- [Close] button
  Closes the [Trend memo list] dialog box.

■ History of PID parameter change

Select groups in Numeric monitor column units and click [History of PID parameter change] on the right-click menu.
>>The [History of PID parameter change] dialog box is displayed.



The [History of PID parameter change] dialog box displays only data related to the selected data.

- [Confirm] button
  Allows checking of the PID parameter values for the selected time.
- [Close] button
  Closes the [History of PID parameter change] dialog box.

7 - 9 Offline

■ Offline overview

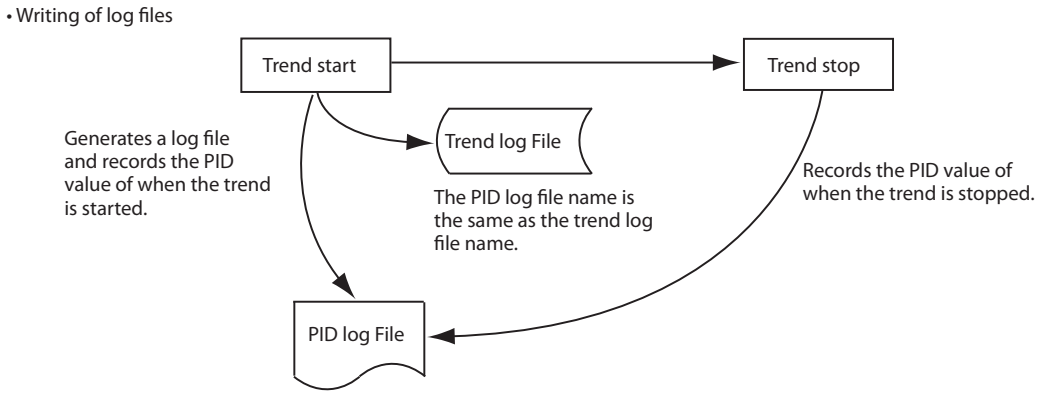
The offline function can be used to redisplay registered past trend graphs and numeric data. Graphs from multiple points in the past can also be displayed at the same time.

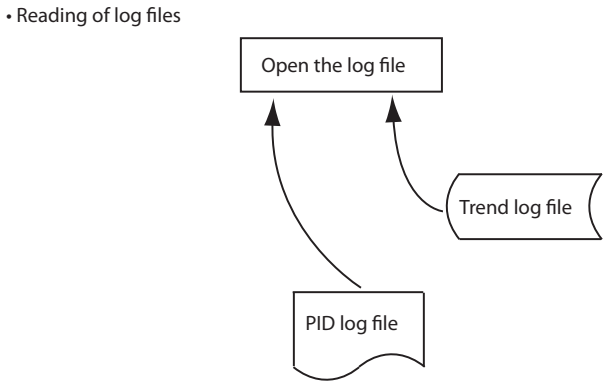
PID logs are log files storing data (settings and monitors) targeted to be displayed in the [Numeric monitor] window in a time sequence.
Trend data and PID logs are linked by units of groups or categories.
Read PID logs are displayed in the Numeric monitor window of Universal monitor [Offline] window.
In the same manner as online mode, the applicable log of the category selected in the [Monitor tree] window is displayed.
You can check the settings of log readouts and recorded PID parameters.

Note

- The offline function cannot be used to write data to modules.
- In the offline function, the values displayed for the numeric monitor are the values recorded when the monitor stopped, and the crossline data shows the values at the time when perpendicular lines are drawn on the trend graph.

The relationship of files and the writing and reading of log files is as follows.





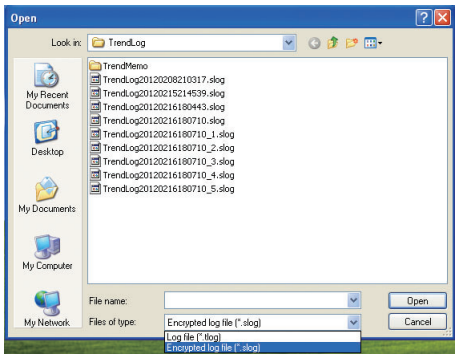
■ Log File Conversion

Data collected by the trend monitor is saved to a file as a trend log. For SLP-NX version 3 and later, a compressed file called a slog file is usually selected as the output file for monitoring results. Stored trend log files can be converted into other file formats.

To convert a trend log file, select [File] → [Log file conversion] from the [Universal monitor] window menu bar.

[1] The [Open] dialog box is displayed. Select either of the following file formats and the desired file name.

- Encrypted log file (*.slog)
- Log file (*.tlog)

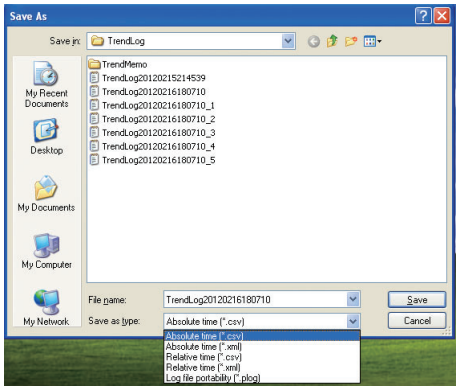


Note

- Log file (*.tlog) was the standard file format for SLP-NX Ver. 2 and earlier. It is still used for compatibility with older versions.

[2] Clicking the [Open] button displays the [Save As] dialog box. Select one of the following file formats and the desired file name.

- Absolute time (*.csv)
- Absolute time (*.xml)
- Relative time (*.csv)
- Relative time (*.xml)
- Log file portability (*.plog)



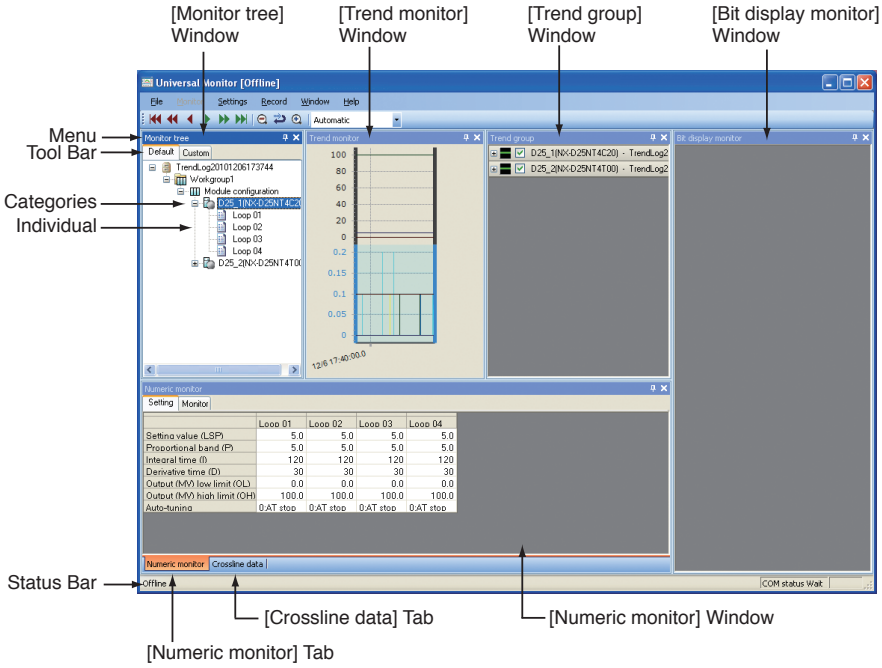
[3] The selected file is output to the directory specified as the trend log directory.

The following types of log file can be opened in the universal monitor [Offline] window.

- Log file (*.tlog)
- Encrypted log file (*.slog)
- Log file portability (*.plog)

The log file portability (*.plog) format, in which trend logs, PID parameter change history, and trend memos from the start to the end of monitoring are combined and stored in a file, can be used for data sharing, etc.

■ Viewing Universal monitor [Offline] window



The name of each window are as follows.

- [Monitor tree] window
- [Trend monitor] window
- [Trend group] window
- [Numeric monitor] window
- [Crossline data] window
- [Bit display monitor] window

Note

- ☞ The names and functions are described in "7- 3 Universal Monitor Window (P. 7-3)".

■ Window docking functions

The window docking functions are the same as those of the [Universal monitor] window.

☞ ■ Window configuration operations (P. 7-6)

The docking functions can be set using [Window] from the menu and the mouse operations.

■ Status bar

The following information appears in the status bar.

- Monitor time display
  Displays [Offline].
- Communication status display
  There is no communication in offline mode. [Wait] is displayed at the right end of the status bar.
- Zoom status display
  The zoom status display is the same as that in online mode.

■ Menu configuration list of the Universal monitor [Offline] window

The menu configuration in offline mode is as follows.

Menu	Submenu 1	Submenu 2	Description	Remarks
File	Log file	—	Select [Open log file] or [Open log file [multi-time mode](M)].	—
	Log file conversion	—	Always disabled	—
	Copy graph to clipboard	—	Copies the graph displayed in the trend monitor to the clipboard.	—
	Start control profile	—	Not supported	—
	Exit	—	Closes the Universal monitor [Offline] window.	—
Monitor	—	—	Always disabled	—
Settings	Edit monitoring data	—	Always disabled	—
	Communication destination	—	Always disabled	—
	Monitor settings	—	Configures the display of the trend time on the trend monitor. ☞■ Monitor settings dialog box (P. 7-47)	—
	Trend color settings	—	Sets the line types and default colors to use in trend graphs. ☞■ Trend monitor color settings (P. 7-30)	—
	Options	—	Always disabled	—
Record	View trend memo	—	Displays the [Trend memo list] dialog box. ☞7- 8 Trend Memo (P. 7-39)	—
	Trend memo registration	—	Always disabled	—
Window	Fixed-position window	—	Prohibits floating of windows.	Turn ON/OFF by adding/ removing a check mark.
	Return to standard position	—	Returns the position of each window to their standard positions.	Enabled only when the [Fixed-position window] menu item is OFF.
	View	Monitor tree	Displays the [Monitor tree] window.	If the window is already displayed, it becomes active.
		Trend monitor	Displays the [Trend monitor] window.	
		Crossline Data	Displays the [Crossline data] window.	
		Trend Group	Displays the [Trend group] window.	
		Numeric monitor	Displays the [Numeric monitor] window.	
		Alarm monitor	Always disabled	
		Bit display Monitor	Displays the [Bit display monitor] window.	
		Logical operation monitor	Always disabled	
	Favorite	—	Always disabled	—
Help	Show help	—	—	Nothing is displayed.
	About (version info)	—	Displays the [Version] dialog box.	—

■ Reading trend logs

Data collected at different times can be viewed on the same trend group with the offline function.
Select [File (F)] → [Log file (L)] → [Open log file (O)] or [File (F)] → [Log file (L)] → [Open log file [Multi-point mode] (M)] from the menu bar of the [Universal monitor] window.
When a trend log is read, the Universal monitor [Offline] window is displayed, and the data of the applicable log is displayed in the [Trend] window along with the trend group.
The date of an offline group data can be superimposed on a trend group in the Universal monitor [Offline] window.
When the data is copied, the data for the graph line are also copied.
No data can be added from the Numeric monitor or the Bit display monitor to the Trend group in the Universal monitor [Offline] window.
In addition, monitor execution is not possible in the Universal monitor [Offline] window.

Note

- If a log file portability file (*.plog) is opened by selecting [File] → [Log file] → [Open log file], the following message may appear.

This message will be shown if the trend collection exceeded the number of fixed samples set for monitoring so that the trend logs are divided into multiple files.

■ Displaying the numeric monitor

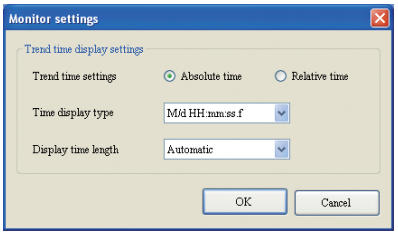
You can check the recorded parameter values.
You cannot edit values displayed on the Numeric monitor, register data by drag and drop to a trend group, or write data to modules.

■ Monitor settings dialog box

This allows you to change the display settings for the trend graphs that are shown in the offline function.

[1] Select [Settings] → [Monitor settings] from the menu bar of the [Universal monitor] window.

>> The [Monitor settings] dialog box is displayed.

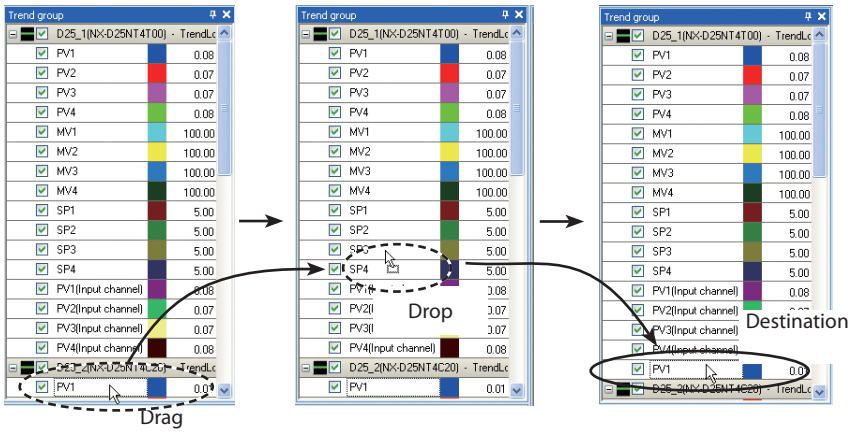


[2] The following items are displayed.

- [Trend time setting]
  Determines whether the trend graph's X axis shows absolute time or time relative to the start of monitoring. The default is absolute time.
- [Display time format]
  Sets the format for the time displayed on the trend monitor graph's X axis. The default value is "M/d HH:mm:ss.f" if the trend time is set for absolute time, and "H:m:s.fff" if the trend time is set for relative time.
- [Display time length]
  Sets the time range for data displayed in the graph area. The X axis of the trend graph is determined according to the value selected here. The initial setting is "Automatic".

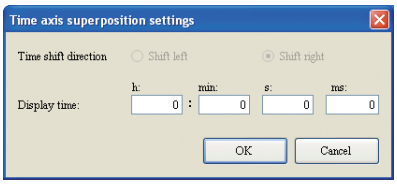
■ Trend group display

- You can move parameters from a group to another by dragging and dropping. Once data is moved, it is linked to the destination.

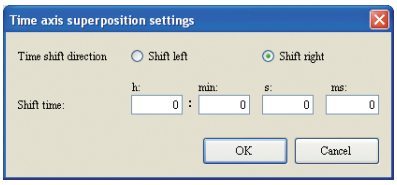


- Time axis superimposition
  The X-axis time can be changed and superimposed on another axis.
  Display the [Time axis superposition settings] dialog box from the right-click menu of the Trend group.
  According to the log read mode, the format differs depending on whether the value of the X axis is an absolute time or relative time.
  You can operate and compare the values in real time.

Absolute time: The selected start time is displayed with the time entered.

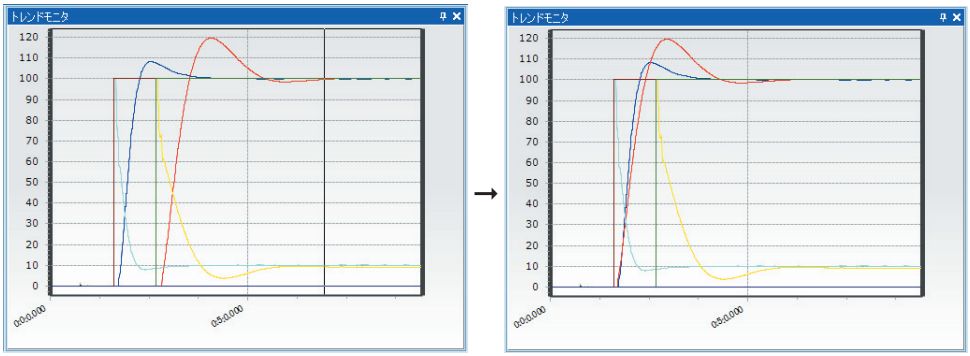


Relative time: The selected start time is displayed with the time entered and shift direction.



Both the trends collected at an absolute time and at a relative time are displayed with the recording start time of collection as the start point of the [Trend Monitor] window.
After a trend log is opened, the graph is shifted at the time interval specified with the shift time and shift direction settings.

Examples of trend graph superimposition



- Display PID value on Numeric monitor
  Right-click the group item provided as standard among the trend groups and select [Display PID value on numeric monitor] from the submenu. The applicable loop is selected in the Monitor tree and the applicable loop value is displayed in the Numeric monitor.

■ Displaying the Bit display monitor

The Bit display monitor information cannot be displayed in offline mode.

■ Displaying the crossline data

[Crossline data] tab displays the [Crossline data] window. The crossline cursor value on the Trend monitor is displayed.
The window can be switched between floating and docking modes.
☞ ■ Crossline data window (P. 7-23)

Chapter 8. PID Simulator

8 - 1 Overview of PID Simulator

■ Features

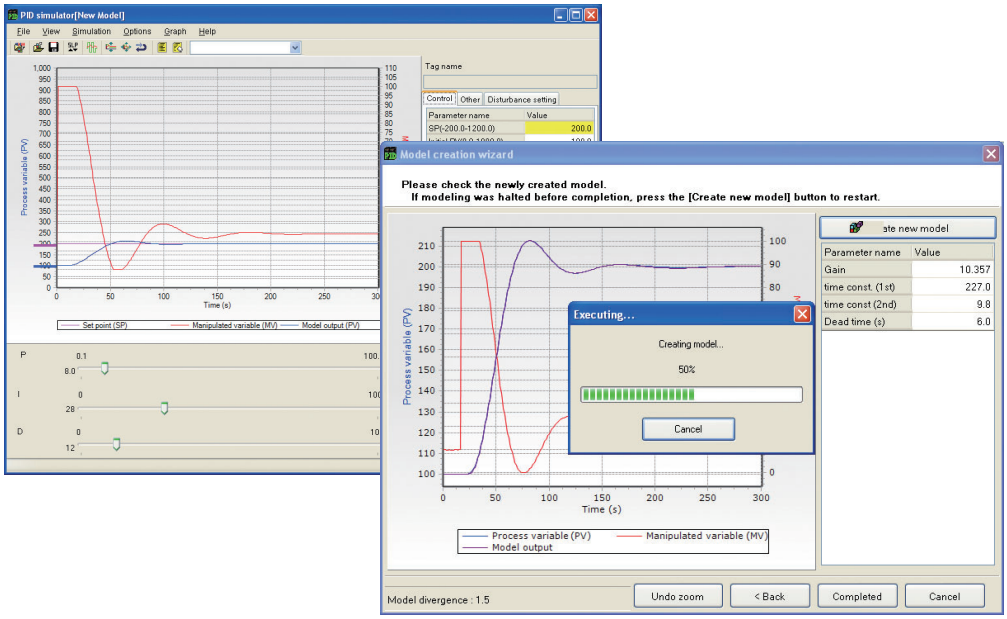
PID Simulator, which makes use of Azbil Corporation's proprietary simulation technology, provides PID tuning functions and is used with SLP-NX professional versions only.

This product has the following features.

- Creates a model of the control target with simple operation
  Using the model creation wizard, a model of the control target can be created easily.
- PID tuning by means of direct user interface
  Users of PID Simulator can adjust the PID using only the mouse. Because the control process graph is smoothly updated in response to movement of the mouse, the effectiveness of PID tuning can be grasped intuitively.
- Checks the effectiveness of functions like Just-FiTTER.
  Before actual operation, users can check the effectiveness of various functions including Azbil Corporation's unique control algorithm, Just-FiTTER.

Note

- A control model expresses in mathematical form the physical phenomena (such as heating, cooling, and changes of flow rate or pressure) which occur at the actual facility (the control target).



Handling Precautions

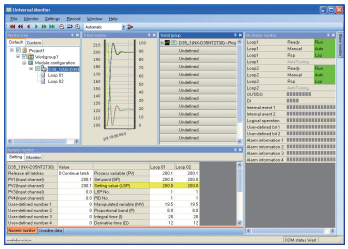
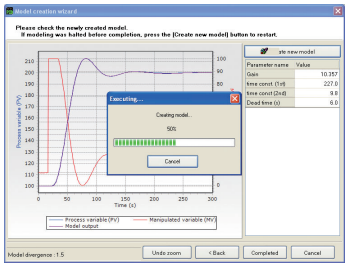
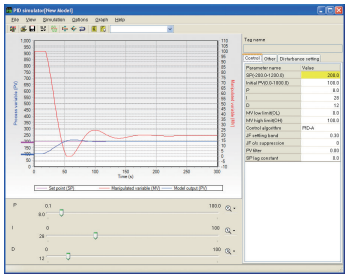
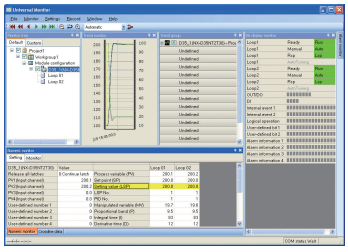
- To use PID Simulator, first install the USB protection key driver.
  ☞ 1- 5 Installing the USB Protection Key Driver (P. 1-11)
- PID Simulator operates only in conjunction with the NX-D25/35. It cannot be used for the NX-D15.
- PID Simulator results and actual control results may not match depending on the characteristics of the equipment (for example, equipment with very strong non-linear characteristics or a master loop for cascade control).
- PID Simulator does not support tuning for cascade control and cooling/heating control.

Note

- "Very strong non-linear characteristics" means that the PV does not bear a linear relationship to the MV. Examples of a control target with very strong non-linear characteristics include temperature control accompanied by self-heating when chemicals are mixed, and pH control at the equivalence point.

■ Procedure for Tuning using PID Simulator

Adjust PID parameters using PID Simulator as follows.

Operation screen	Procedure for tuning	Reference chapter
	Retrieve PV and MV trend data from the equipment during operation.	Chapter 7. UNIVERSAL MONITOR 8 - 6 How to Collect Trend Data (P. 8-23)
	Activate PID Simulator to create a control model from the collected trend data.	8 - 2 Starting PID Simulator (P. 8-4) 8 - 5 Creating a Control Model (P. 8-18)
	Calculate PID values in a PID control simulation.	8-3 PID Simulator window (P. 8-6) 8 - 4 Useful Features (P. 8-13)
	Apply the calculated PID values to the actual device and examine the control result.	Chapter 7. UNIVERSAL MONITOR

Handling Precautions

- Due to disturbance or measurement error included in the trend data for creating the control model, the control result may not match the simulation. In that case, after taking countermeasures against measurement error and disturbance, try the procedure again.

8 - 2 Starting PID Simulator

PID Simulator can be activated in the following ways.

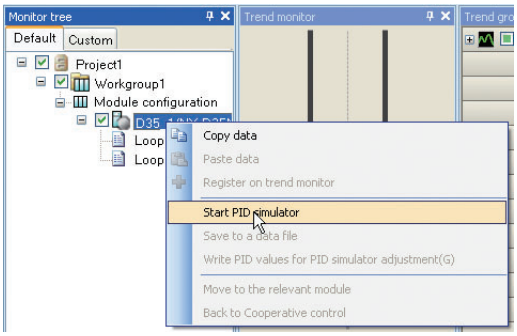
● **Direct activation**

Select [SLP] → [PID Simulator] from the Windows Start menu. If the program is activated in this way, the following restrictions apply to operation.

- Trend data cannot be read directly from the universal monitor without using a data file.
- Parameters cannot be read/written from/to controller modules.

● **Activation from the universal monitor**

Right-click on the module name or a loop name under "Module configuration" in the monitor tree of the universal monitor. Then select [Start PID Simulator] from the menu.



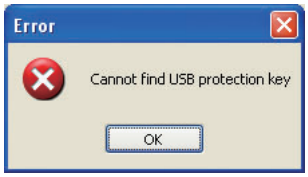
If the program is activated from the universal monitor, it is possible to use not only trend data stored in files but also trend data collected by the universal monitor.

☞ 8 - 6 How to Collect Trend Data (P. 8-23)

The number of trend data records usable for model creation varies depending on the right-click location. In the monitor tree, if the program is activated by right-clicking the controller module name, the trend data for all loops can be used. If the loop name is right-clicked, that loop's trend data can be used.

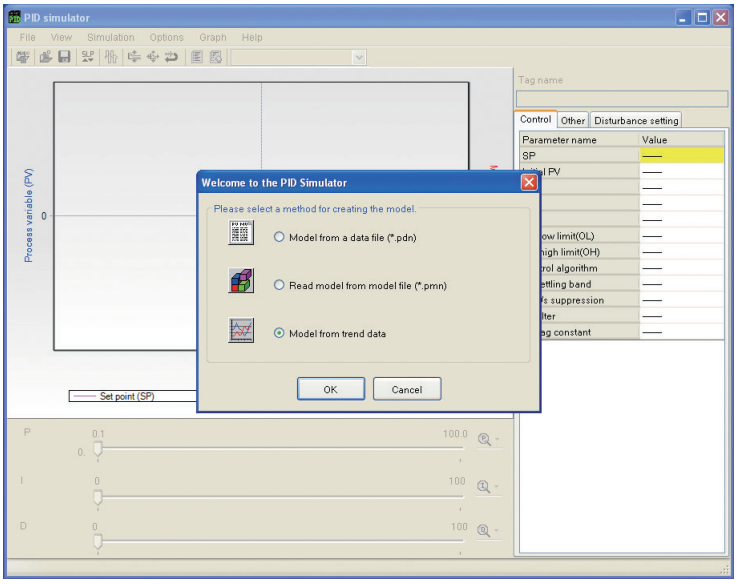
Handling Precautions

- PID Simulator can be activated only when the monitor is not running.
- The program can be activated from the universal monitor [Offline] window.
- Before activating PID Simulator, make sure that the USB protection key is securely inserted in the PC. If the PC does not recognize the key, the following error message appears.



■ Startup window

When PID Simulator is activated, the [Welcome to PID Simulator] dialog box appears. Select a method for creating a control model here. To terminate PID Simulator, click the [Cancel] button to close the dialog box.



There are 3 model creation methods, as described below.

● **Creating a model from a data file (*.pdn).**

Reading a dedicated data file (*.pdn) activates the model creation wizard. Or use the menu to select [File] → [Create model from data file...].

☞ 8 - 6 How to Collect Trend Data (P. 8-23)
☞ 8 - 5 Creating a Control Model (P. 8-18)

● **Reading model data from a model file (*.pmn)**

Reading a model file (*.pdn) which stores model data and simulation data starts PID control simulation. A previous simulation can be resumed by reading a model file.

Or, use the menu to select [File] → [Read model from model file...].

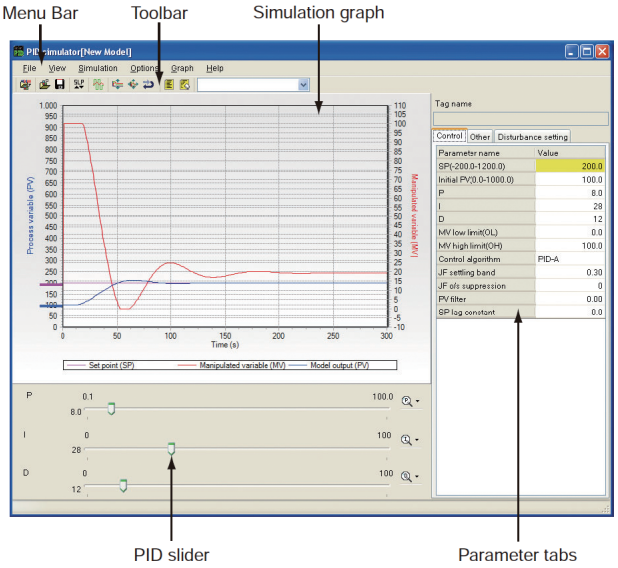
● **Creating a model from trend data**

Directly loading data which is collected by the universal monitor without using a data file activates the model creation wizard. This method is available only if PID Simulator was activated from the universal monitor after the universal monitor collected trend data properly.

☞ 8 - 6 How to Collect Trend Data (P. 8-23)
☞ 8 - 5 Creating a Control Model (P. 8-18)

8 - 3 PID Simulator window

This section describes the structure of PID Simulator window.



■ Menu Bar and Toolbar

The table below describes the menu items and tool buttons.

Menu	Button	Submenu	Description	Shortcut Keys
File		Create model from data file...	Opens a data file (*.pdn) to create a control model.	[CTRL]+[M]
		Read model from model file	Reads a model file (*.pmn).	[CTRL]+[L]
		Save Model	Saves data into an existing model file (overwriting the old file).	[CTRL]+[S]
		Save model as...	Specify a model file name to which to save the data.	
		Save simulation data...	Saves the trend data (PV) displayed in the simulation graph to a file in CSV format.	
		Copy graph to clipboard	Copies the simulation graph to the clipboard.	
		Convert PDN to CSV	Converts a *.pdn data file to a CSVfile and saves it.	
		Quit	Terminates PID Simulator.	[CTRL]+[Q]
View		Toolbar	Switches the toolbar view/hide status.	
		Show PID Slider	Shows or hides the PID slider.	

Menu	Button	Submenu	Description	Shortcut Keys
Simulation		Auto-tuning...	Executes auto-tuning	[CTRL]+[T]
Options		Add current parameters to a memo...	Saves the currently used parameters to a memo.	[CTRL]+[A]
		Delete selected memo	Deletes the currently selected memo.	
		Rename selected memo...	Changes the name of the currently selected memo.	
		Load/Save Parameters	Writes parameters such as PID values to a controller.	[CTRL]+[P]
Graph		Auto-adjustment of PV axis	Adjusts Y-axis (PV axis) automatically.	[CTRL]+[J]
		Adjustment of Y-axis...	Displays the dialog box for adjusting the Y-axis (PV/MV axis).	[CTRL]+[Y]
		Undo Zoom	Undoes the graph zoom.	[CTRL]+[U]
		Properties...	Shows the [Properties] dialog box to change graph colors.	
Help		Version information...	Displays PID Simulator version information.	

The following functions can be used on the toolbar only.

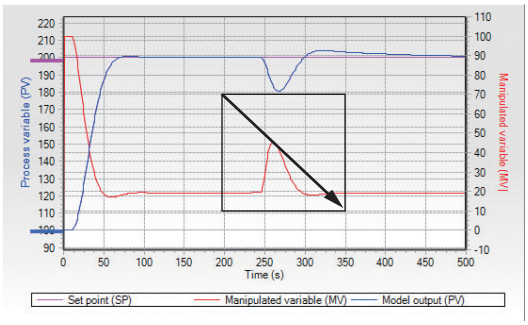
Control	Description
	Selects a registered memo.

■ Simulation Graph Functions

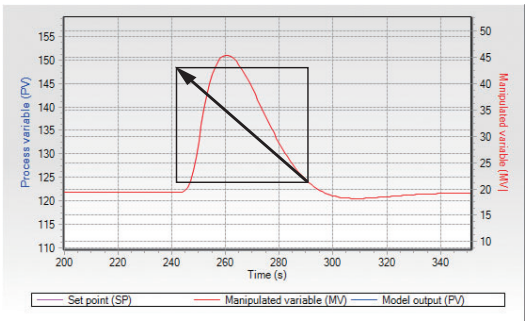
The simulation graph shows the result of PID control simulation. The graph includes the following functions.

● Zoom function

Enlarges the area defined by the mouse. Position the mouse cursor at the top left of the desired area to be enlarged. While holding down the left mouse button, drag the mouse diagonally to the bottom right of the area. When the button is released, the area will be enlarged.



To cancel the zoom operation, press the left mouse button at any point in the graph area and keep it pressed, and drag the mouse cursor toward the top left and release it at the desired point.

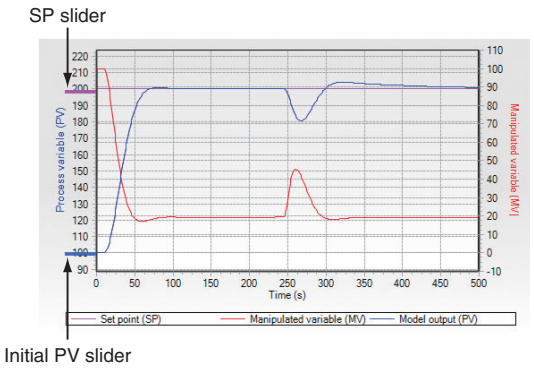


Alternatively, use one of the following methods.

- On the menu bar, select [Graph] → [Undo zoom].
-  Click the button on the toolbar.
- Press the [U] key while holding down the [Ctrl] key.

● SP / initial PV change function

To change the SP or initial PV, position the mouse cursor over the SP slider or the initial PV slider on the simulation graph and drag the slider up or down, keeping the left mouse button pressed.

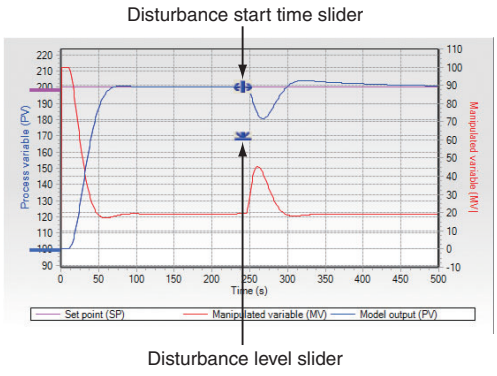


Handling Precautions

- When changing a value using the SP slider or the initial PV slider, depending on the size of the simulation graph it may not be possible to set the desired value (for example, the SP may increase from100 to 102, skipping 101). In this case, make the change using the [Parameter] tab.
- These sliders are not displayed when the graph is enlarged using the zoom function.
- The simulation graph update time varies in proportion to the simulation period. Set the period length so that it is suitable for practical use.

● Disturbance setup function

If the [Disturbance setting] tab is selected in the parameter tab, the sliders shown below are displayed on the simulation graph so that the disturbance settings can be changed. The disturbance start time slider can be moved horizontally and the disturbance level slider can be moved vertically.



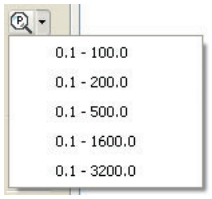
Handling Precautions

- When changing a value using these sliders, depending on the size of the simulation graph it may not be possible to set the desired value (for example, the disturbance start time may increase from 100 to 102, skipping 101). In this case, make the change using the [Parameter] tab.
- These sliders are not displayed when the graph is enlarged using the zoom function.

■ PID slider

Changes the PID using the mouse.

Sliders
Slider range setting buttons
The slider ranges can be changed using the buttons.
If one of these buttons is clicked, the maximum value of the slider range increases in steps. If the value exceeds the high limit, it returns to the minimum value in the setting range. If the [▼] button on the right of the setting button is clicked, the following menu appears so that the range can be directly specified.



Note

- The slider value can be changed using arrow keys. To increase the value, press the [↑] or [→] key. To decrease the value, press the [↓] or [←] key. Additionally, if the [→], [↓], [←], or [↑] key is pressed simultaneously with the [Shift] key, the amount of increase or decrease is 10 times larger.
- When the [→] or [↑] key is used to increase the PID, if the value exceeds the high limit of the current range, the range is automatically set to the next higher range. When the [↓] or [←] key is used to decrease the PID, if the value decreases below the high limit of the next lower range, the current range is automatically set to the next lower range. For example, if the proportional band has a range of 0.1-200.0 and the value is increased beyond 200.0 using the [→] or [↑] key, the range automatically changes to 0.1-500.0. If the value is decreased below 100.0 using the [↓] or [←] key, the range automatically changes to 0.1-100.0.

Handling Precautions

- If the range is changed to another range whose high limit is smaller than the current slider value, the value is forcibly set to the high limit of the new range. For example, when the proportional band is set to 150.0 %, if the slider range is changed to 0.1-100.0, the proportional band is forcibly changed to 100.0 %.

If the slider range is changed, the minimum amount of slider travel (the amount of increase/decrease by moving the slider 1 unit) also changes as shown in the tables below.

Proportional band (P)

Setting range	0.1-100.0	0.1-200.0	0.1-500.0	0.1-1600.0
Min. travel	0.5	1.0	5.0	10.0
Setting range	0.1-3200.0			
Min. travel	20.0			

Integral time (I) / Derivative time (D)
(when the control parameter has no decimal point)

Setting range	0-100.0	0-200.0	0-500.0	0-1000
Min. travel	1	1	5	5
Setting range	0-2000	0-5000	0-16000	0-32000
Min. travel	10	25	100	200

Integral time (I) / Derivative time (D)
(when the control parameter has 1 digit after the decimal point)

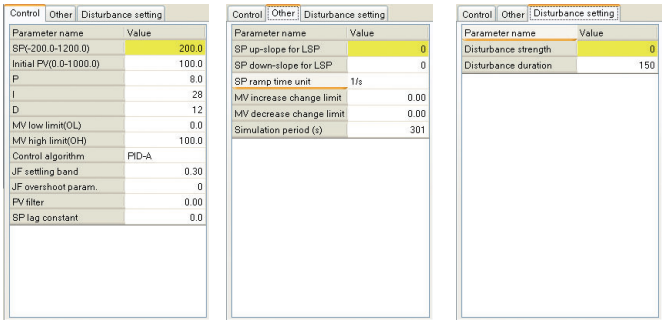
Setting range	0.0-100.0	0.0-200.0	0.0-500.0	0.0-1600.0
Min. travel	0.5	1.0	5.0	10.0
Setting range	0.1-3200.0			
Min. travel	20.0			

Integral time (I) / derivative time (D)
(when the control parameter has 2 digits after the decimal point)

Setting range	0.00-10.00	0.00-20.00	0.00-50.00	0.00-160.0
Min. travel	0.05	0.10	0.50	1.00
Setting range	0.00-320.00			
Min. travel	20.0			

■ Parameter tabs

Parameters can be changed using the parameter tabs. There are tree tabs: [Control], [Other], and [Disturbance setting].



● Control tab

Sets parameters for control such as the PID and the set point.

● Other tab

Sets SP ramp parameters as well as the MV change rate limit and the simulation period.

● **Disturbance setting tab**

Sets parameters for disturbance simulation.

Note

- To change parameters, use either of the following methods.
- Enter values directly using the keyboard.
- Change values using the [→] or [←] key.
- If the [→] or [←] key is used, it is possible to increase or decrease values in increments of the minimum unit (for example, in the case of 1 digit after the decimal point, 0.1). If the [→] or [←] key is pressed simultaneously with the [Shift] key, the amount of increase or decrease is 10 times larger.

Handling Precautions

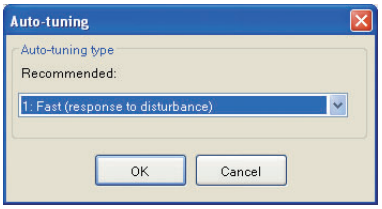
- ☞ Network Instrumentation Module Controller module NX-D15/25/35 User's Manual of Function (CP-SP-1308E).
- PID Simulator does not support SP groups and PID groups.
- PID Simulator does not support changing the manual reset value. For the manual reset value, the trend data collected by the controller is used.

8 - 4 Useful Features

■ Auto-tuning

This function automatically calculates the PID for the control model.

-  Click the icon.
  Or, select [Simulation] → [Auto-tuning...]. Alternatively, press [Ctrl]+[T].



>> The [Auto-tuning] dialog box is displayed.

For PID Simulator, as also for controllers, the auto-tuning type can be chosen from the following 3 types.
0: Normal (regular control characteristics)
1: Fast (response to disturbance)
2: Stable (minimal up/down PV fluctuation)

When the [Auto-tuning] dialog box appears, PID Simulator automatically chooses and shows the optimum type below "Recommended." To change the PID and update the simulation graph, click the [OK] button.

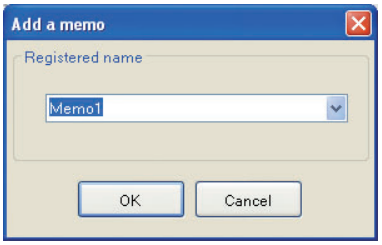
■ Memo

This function saves all parameters specified on the parameter tabs ([Control], [Other], and [Disturbance setting]) as a memo. One memo can store up to 256 parameters.

● Memo creation

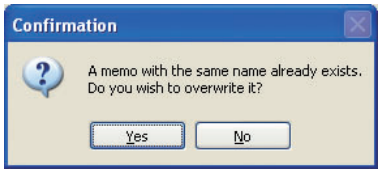
Adds a memo to the list.

-  Click the icon.
  Alternatively, select [Options] → [Add current parameters to memo...]. Or, press [Ctrl]+[A].



>> The [Add a memo] dialog box appears.
Enter the desired name and click the [OK] button.
The memo will be added.

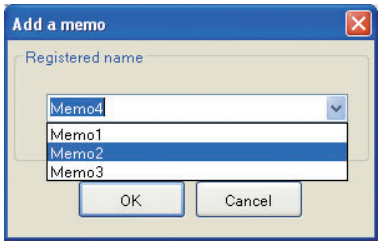
>> If the name has already been used, a [Confirmation] dialog box appears.



Click the [Yes] button.

Note

- To replace an existing memo, select the memo name from the drop-down list in the [Add a memo] dialog box.

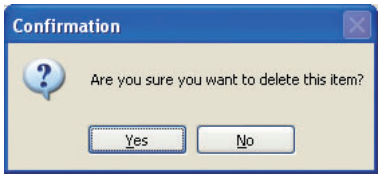


● **Memo deletion**

Deletes the currently selected memo

-  Click the icon.
  Alternatively, select [Options] → [Delete selected memo].

>> A [Confirmation] dialog box appears.



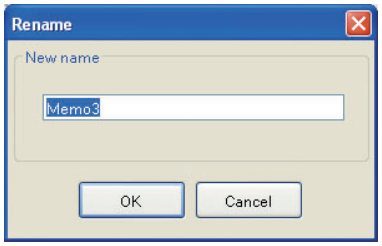
Click the [Yes] button.

● **Memo name change**

Changes the name of the currently selected memo

- Select [Options] → [Rename selected memo...] from the menu.

>> The [Rename] dialog box appears.

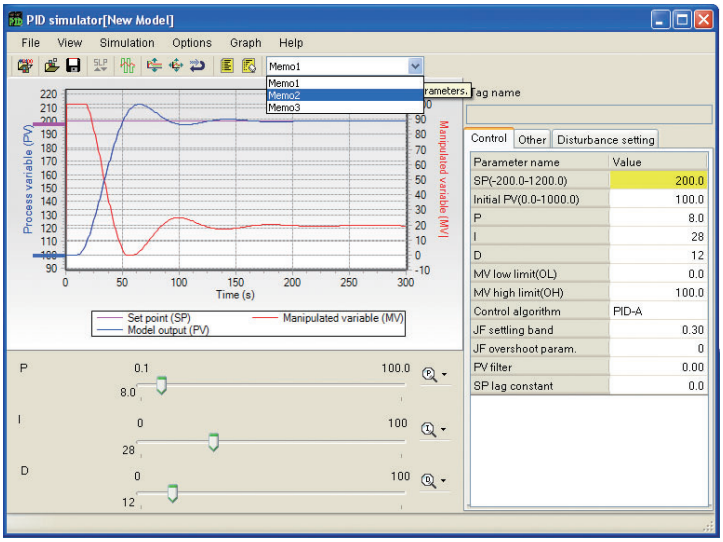


Input a new name and click the [OK] button.

● Selection of a saved memo

Allows selection of a memo from a list and restoring of parameters

- Select the memo name from the drop-down list on the toolbar.



■ Simulation Graph Setup

● Auto-adjustment of the PV axis

This function automatically adjusts the high and low limits of the PV axis (left Y-axis) on the simulation graph to make the PV data on the graph easy to see.

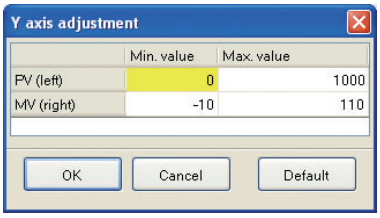
-  Click the icon.
  Alternatively, select [Graph] → [Auto-adjustment of PV Axis] from the menu. Or, press [Ctrl]+[J].

● Y-axis adjustment

Specifies the display range for the PV-axis (left Y-axis) and the MV-axis (right Y-axis) in the simulation graph.

-  Click the icon.
  Alternatively, select [Graph] → [Adjustment of Y axes] from the menu. Or, press [Ctrl]+[Y].

>>The [Y-axis adjustment] dialog box appears.



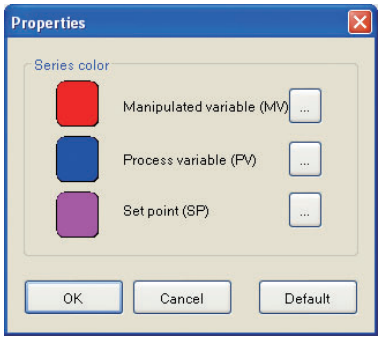
Input the high and low limits for each axis and click the [OK] button.
Clicking the [Default] button resets the high and low limit settings for the PV and MV axes to the default. The default minimum and maximum values for the PV axis and the MV axis are the high and low limits of the PV range and the high limit (110%) and low limit (-10%) of the MV settings, respectively.

● Line color change

Changes the color of lines on the simulation graph.

- Select [Graph] → [Properties...] from the menu.

>>The [Properties] dialog box appears.



Press the button located on the right of the desired line. The [Color] dialog box will appear.

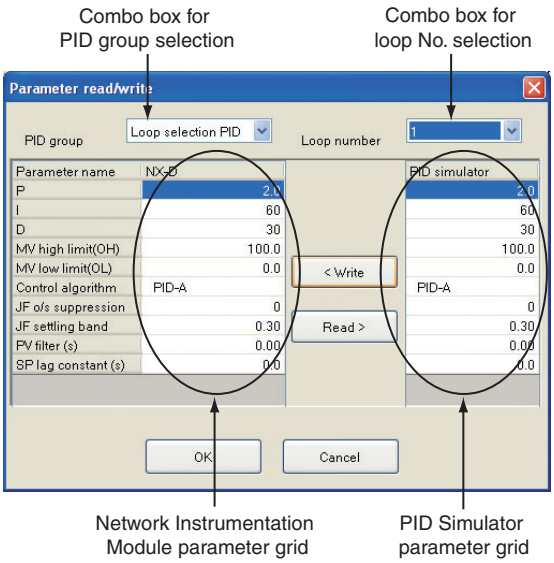
Specify the color and click the [OK] button, and then click the [OK] button in the [Properties] dialog box. The color of the line on the simulation graph will change. If the [Default] button in the [Properties] dialog box is clicked, the color of each line will be reset to the default.

■ Parameter read/write

This function reads/writes parameters like PID values from/to a controller.

- Click the icon.
  Or, select [Options] → [Read/write parameters] from the menu. Alternatively, press [Ctrl]+[P].

>>The [Parameter read/write] dialog box will be displayed.



To write the PID Simulator parameters listed in the grid to the Network Instrumentation Module parameter grid, select a PID group and click the [<Write] button. To write the Network Instrumentation Module parameters listed in the grid to the PID Simulator parameter grid, select a PID group and click the [Read>] button. Clicking the [OK] button sends the parameters that were written to the module parameter grid to the controller, or causes the parameters that were written to the PID Simulator parameter grid to be read in by PID Simulator. Parameters can be written to any PID group in any loop. The PID group and a loop number are changed using the combo box for PID group selection and the combo box for loop No. selection, respectively.

Handling Precautions

- If there is a difference in derivative time, integral time, or decimal point position between PID Simulator and the Network Instrumentation Module, parameter read and write are not possible.
- If PID Simulator is directly activated, this function cannot be used.
- ☞ 8-2 Starting PID Simulator (P. 8-4)
- Before using this function, make sure that the PC and controller module are connected.
- Parameter settings cannot be written unless the universal monitor is running.
  To write parameters, activate the universal monitor.
- The SP and ramp settings cannot be read or written.

8 - 5 Creating a Control Model

This section describes how to create a model for control that is used for PID control simulation, using MV and PV trend data collected from the control target.
☞ 8 - 6 How to Collect Trend Data (P. 8-23)

■ Model Creation Wizard

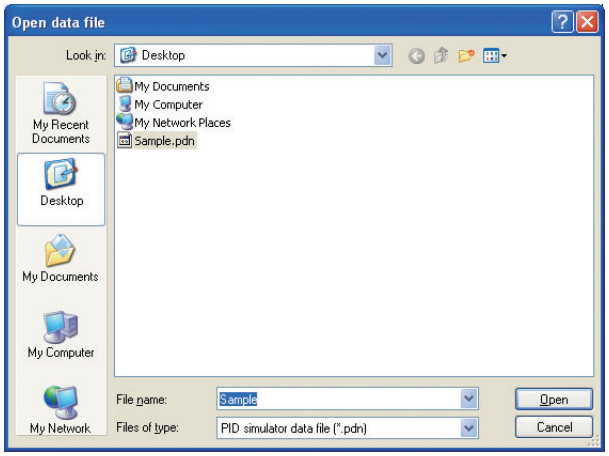
A control model can be created easily using PID Simulator's model creation wizard.

● Start-up methods

There are 3 ways of starting the model creation wizard.

- Select [Model from a data file (*.pdn)] in the [Welcome to the PID simulator] dialog box.
- Select [Model from trend data] in the [Welcome to the PID simulator] dialog box.
- Or, select [File] → [Create model from data file] from the menu.

If [Model from trend data] is selected in the [Welcome to the PID simulator] dialog box, trend data is read directly from the universal monitor to start the model creation wizard. With the other methods of starting the wizard, the [Open data file] dialog box is displayed for selection of data files to read.



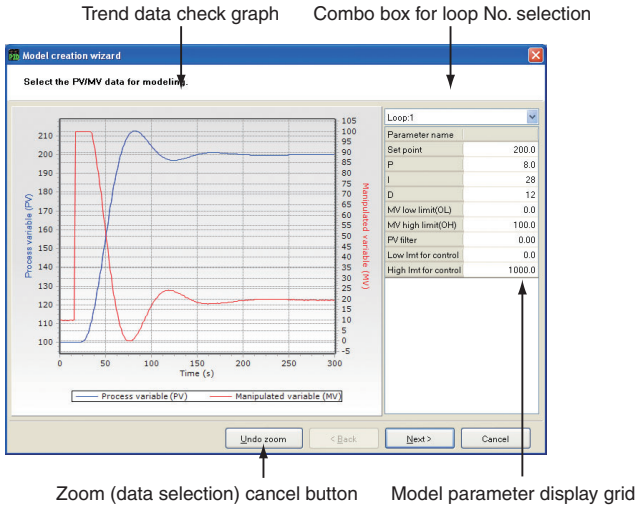
To start the model creation wizard, enter a pdn file name and click the [Open] button.

Note

- ☞ 8 - 2 Starting PID Simulator (P. 8-4)

● Startup window

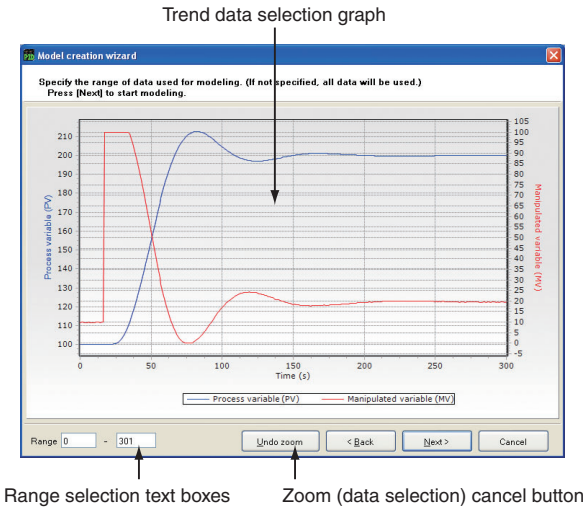
When the model creation wizard is activated, the following items are displayed.



On this window the user can select a loop and check trend data and parameters. On the trend data check graph, the display area can be enlarged or moved. The methods of zooming and moving are the same as on the simulation graph.
☞ 8- 2 Starting PID Simulator (P. 8-4) To cancel the zoom function, click the [Undo zoom] button or press [Ctrl]+[U].
After checking the trend data and parameters, click the [Next] button.

● Data selection window for model creation

This window is for selection of the area to be used for creating a model from the trend data.



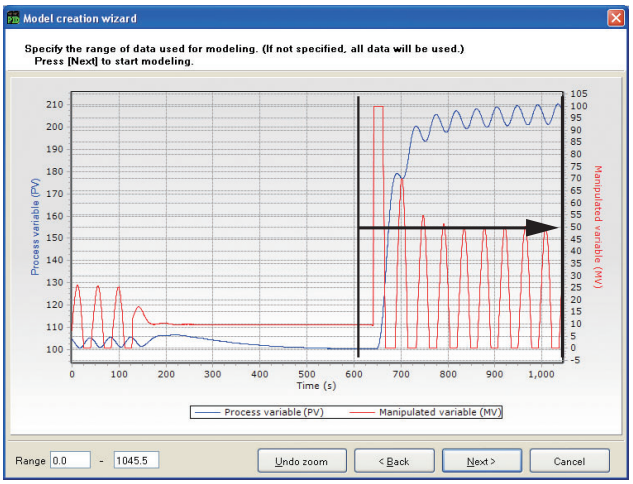
There are 2 methods of determining the trend data range: entering the values into the text boxes for range selection, and specifying the range directly using the mouse on the trend data selection graph.

● **Range selection text boxes**

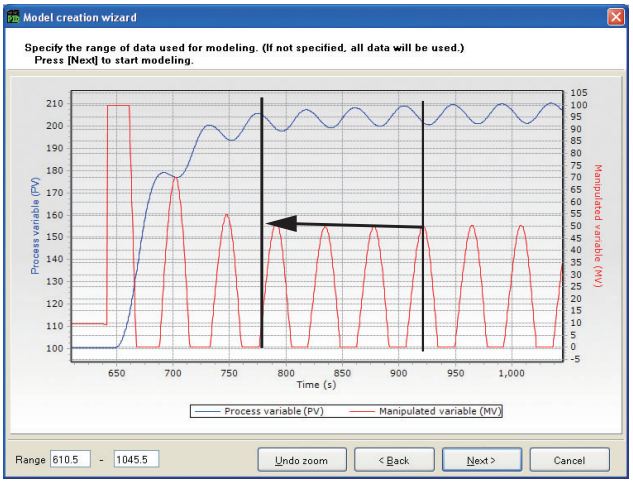
The trend data range can be specified by inputting the start and end times into the range selection text boxes.

● **Trend data selection graph**

Pressing the left mouse button at the left end of the desired selection area shows a vertical line that indicates the left end of the area. If the mouse is moved to the right while holding down the left mouse button, a vertical line that indicates the right end of the area is shown. Move this line to the right end of the desired area and release the button.



To cancel the selection, press the left mouse button anywhere on the graph, move the mouse to the left while holding down the button, and release the button anywhere. Alternatively, click the [Undo zoom] button or press [Ctrl]+[U].



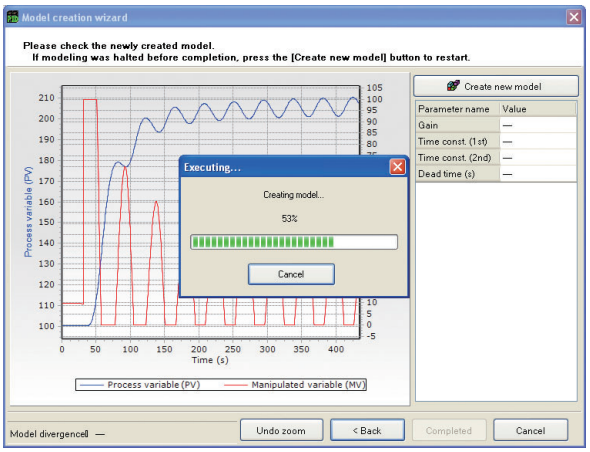
After selecting the trend data range, click the [Next] button.

Handling Precautions

- Select a trend data range in which the PV and MV of the first 10 data records are stable at a constant value.
  ☞ 8-6 How to Collect Trend Data (P. 8-23)

● Model creation window

When the [Executing...] dialog box appears, model creation starts automatically.



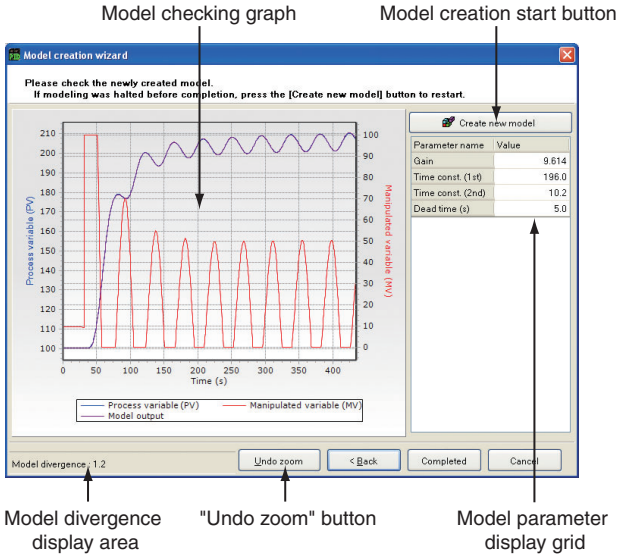
To cancel the operation, click the [Cancel] button in the [Executing...] dialog box.

Handling Precautions

- If modeling has not been completed, cancellation of modeling disables the [Completed] button. In this case, click the [Create new model] button to complete modeling.

● Model creation completion window

When modeling is complete, the following window appears. On this window the created control model can be checked.



● **Model checking graph**

Shows the PV and MV trend data that was read from the data file, as well as the control model outputs corresponding to the MV.
The graph can zoom in on any area. The zoom and zoom cancel functions operate the same way as those on the simulation graph of the main window.
☞8-2 Starting PID Simulator (P. 8-4) To cancel the zoom function, click the [Undo zoom] button or press [Ctrl]+[U].

● **Model divergence display area**

Shows the model divergence (a value that represents the difference in trend data between the PV and the model output). The smaller the divergence, the better the control model recreates the characteristics of the equipment. As a guideline, model divergences are classified as follows.

0 to 0.25: Adequate model
0.25 to 1.00: So-so model
1.00 or more: Inadequate model

In the case of an inadequate model, there could be a large difference in results between the PID simulation and the actual control.

Handling Precautions

- Model divergence is just a guideline and does not guarantee the accuracy of a control model or PID control simulation.

● **Model parameter display grid**

Shows the control model parameters. This control model can be expressed in the transfer function shown below.

$$G(s) = \frac{Kp \cdot e^{-Lp \cdot s}}{(1+T_1 \cdot s)(1+T_2 \cdot s)}$$

Kp: Gain
T_1: Primary time constant
T_2: Secondary time constant
Lp: Dead time

● **Model creation start button**

Executes model creation. Used to resume modeling if it is interrupted or to create a model after initializing the current model's parameters.

8 - 6 How to Collect Trend Data

■ Overview

To create a control model, it is necessary to obtain the following MV and PV trend data.

- Step response when the SP is changed
- Step response when the MV is changed

This section describes how to collect the trend data during step response if the SP is changed. The procedure is as follows.

- Step 1: Specify the initial PV and the SP.
- Step 2: Stabilize the PV and MV.
- Step 3: Start collecting trend data.
- Step 4: Start the step response.
- Step 5: Stop collecting trend data.
- Step 6: Save the collected trend data.

Use the SLP-NX universal monitor for trend data collection.

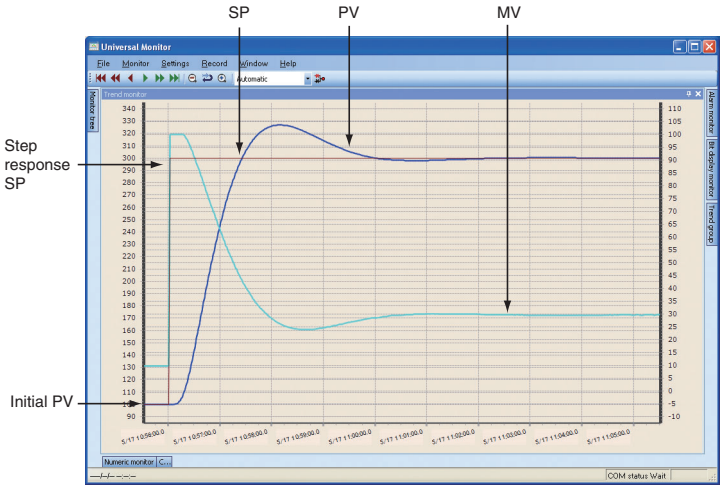
☞ Chapter 7. UNIVERSAL MONITOR

Handling Precautions

- Follow the steps above very carefully. If trend data collection is not done properly, the control result may not match the simulation.
- If the sampled data exceeds the specified number of records (10000 records or 10000 s at a 1 s sampling cycle), the SLP-NX universal monitor will create another file and begin again to collect trend data. In this case, the data stored in the older file cannot be used for PID Simulator. Take this into account.

■ Step 1: Specify the initial PV and the SP.

As shown below, the collected trend data must be stable at around a constant value and must include the step response when the SP is changed.



For preparations for trend data collection, specify the initial PV (PV under stable conditions) and the step response SP so that the following conditions are met.

● Step response SP

Unless there are restrictions on the step response SP, set the same SP that is used in actual operation.

Handling Precautions

- If the settings for model creation in the trend data differ from those for actual operation, the control result may not match the simulation.

● Initial PV

The initial PV must meet the conditions below.

- Use an initial PV with which outputs greater than 0.0 % can be generated continuously and steadily.
- If the PV is a temperature, use one that is above the ambient temperature.
- Configure the initial PV as shown below.

  If the equipment takes the reverse action (heating):

  Initial PV < Step response SP.

  If the equipment takes the direct action (cooling):

  Initial PV > Step response SP.

- Specify the initial PV using the formula below as a guideline so that the difference between the initial PV and step response SP is not too small.

  | Step response SP – Initial PV value |
  ≥ (5 % of the PV range)

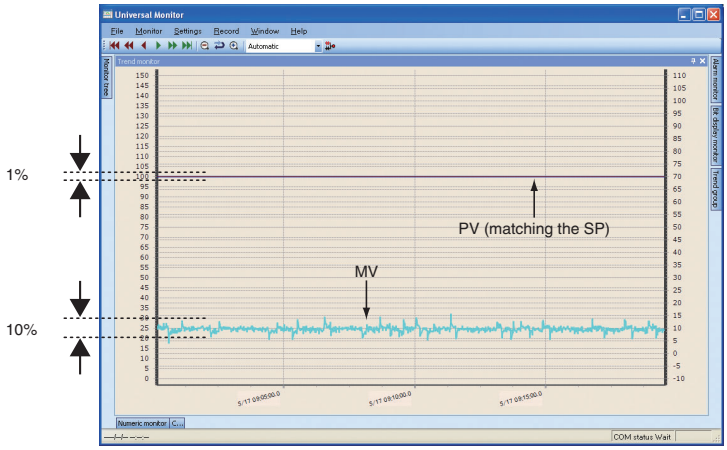
  For example, if the step response SP is 200 and the PV range is –200 to +400, set the initial PV to less than 170.
- If the sensor or the actuator has a dead zone (a range that prevents normal operation of the equipment), set an initial PV which will not cause the PV or MV to enter the dead zone.

■ Step 2: Stabilize the PV and MV.

Stabilize the PV and MV at around the initial PV value specified in step 1.

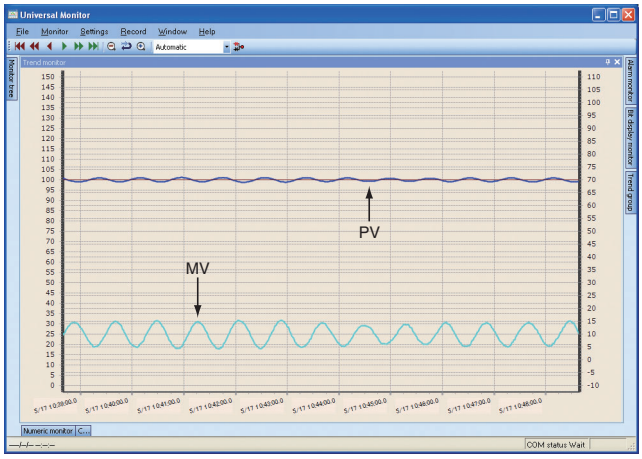
● Guidelines for stable conditions

"Stable conditions" means that variation in the PV and MV are within a certain range. As shown below, a guideline for stable conditions is that variation of the MV is 10 % or less, and variation of the PV is 1 % or less of the PV range (for example, 6 or less if the PV range is –200 to +400) in PV.

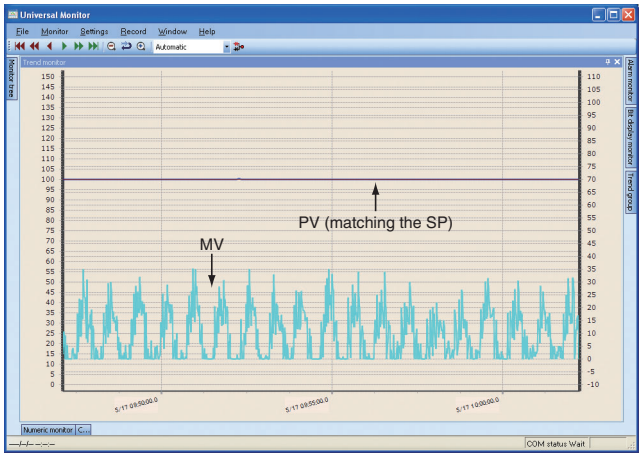


The following are not suitable conditions for trend data.

- Both PV and MV fluctuate greatly.
- The PV is almost stable, but the MV fluctuates greatly (by 10 % or more).



Both PV and MV fluctuate greatly.



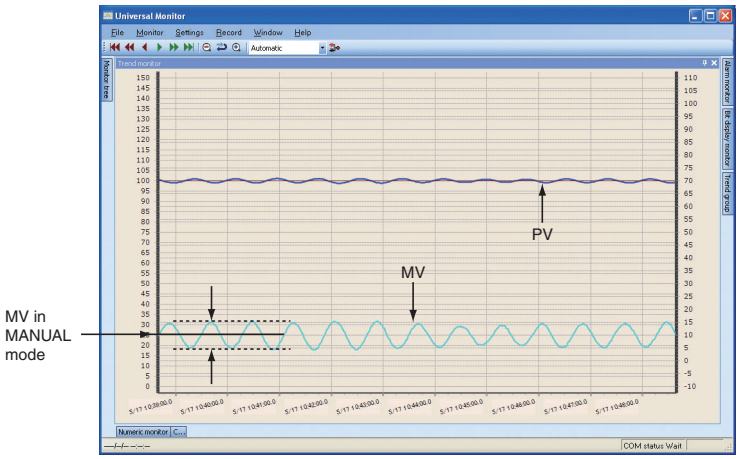
The PV is almost stable, but the MV fluctuates greatly.

● Stabilizing the PV and MV

If the PV and MV fluctuate, try the following measures.

- Make the proportional band larger (2 or 3 times larger than the current value).
- Make the integral time larger (2 or 3 times larger than the current value).
- Do both of the above.

If the PV and MV still fluctuate, change the loop mode to MANUAL to make the PV and MV stable. Then, if the PV and MV behave as shown below, set the MV to near the middle between its high and low limits.

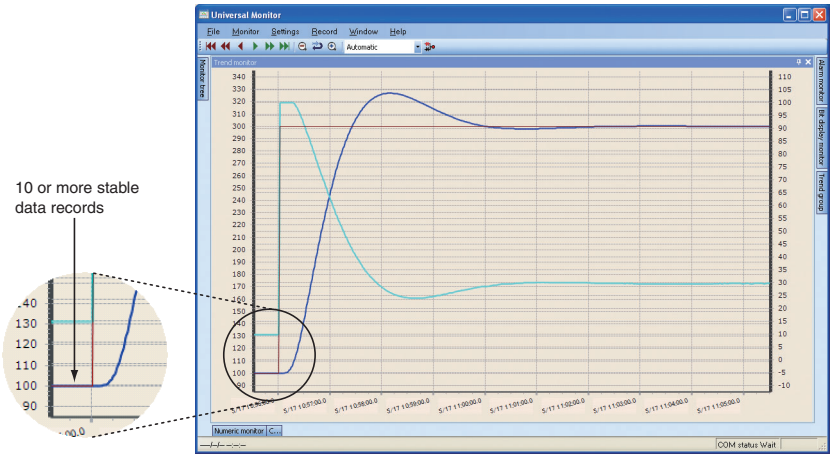


Handling Precautions

- If the loop mode is changed to MANUAL, allow sufficient time for the PV to stabilize.
- It is not a problem if the PV differs from the initial PV after the loop mode is changed to MANUAL. However, if the conditions for the initial PV stated in step 1 are not met, change the MV.

■ Step 3: Start collecting trend data.

When the PV and MV are stable, select [Monitor] → [Start] from the universal monitor menu to start trend data collection. After the monitor has started, collect 10 or more data records as shown below (for 10 s or more if the sampling cycle is 1 s) before step response while the PV and MV are stable.



■ Step 4: Start the step response.

After collecting 10 or more trend data records of the PV and MV, start the step response. The step response starting procedure may vary depending on the operation mode.

● In AUTO mode

1. Change the PID values if needed.
2. Change the controller's SP to the step response SP.

● In MANUAL mode

1. Change the PID values if needed.
2. Change the controller's SP to the same value as the current PV. For example, if the current PV is 60.5 °C, change the controller SP to 60.5.
3. Change MANUAL mode to AUTO.
4. Change the controller SP to the step response SP.

Note

- After the PID values have been changed, the MV or the PV may fluctuate until the SP changes. However, if step 3 is complete, that is not a problem.

Handling Precautions

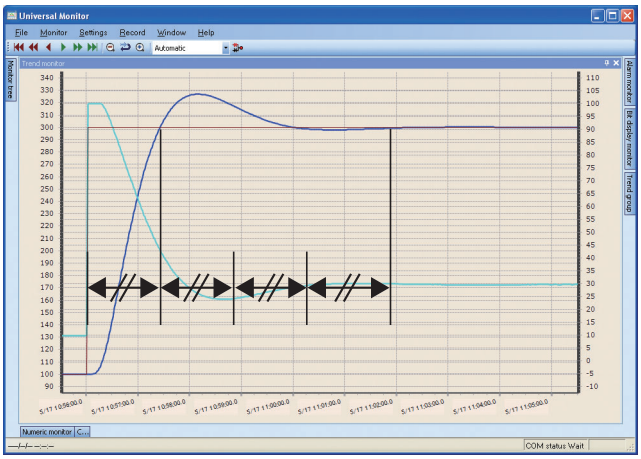
- If there are particular PID values connected with a problem to be solved, execute the step response using those PID values.

■ Step 5: Finish collecting trend data.

When the step response is complete, finish trend data collection. The guidelines for completion timing vary depending on the step response result.

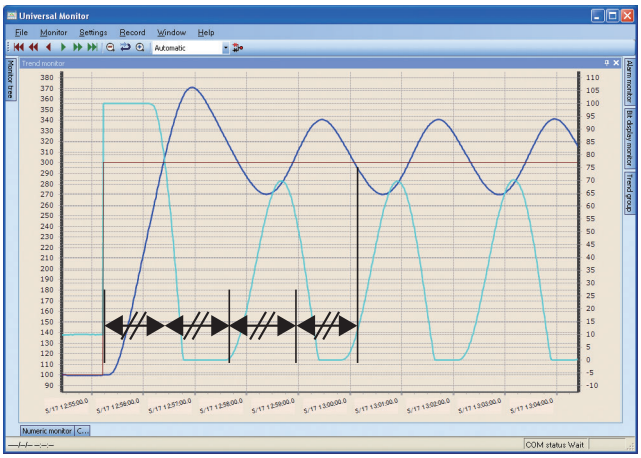
● If overshoot occurs:

As shown below, collect data for 3 times longer than the period when the PV reaches the SP after the SP was changed.



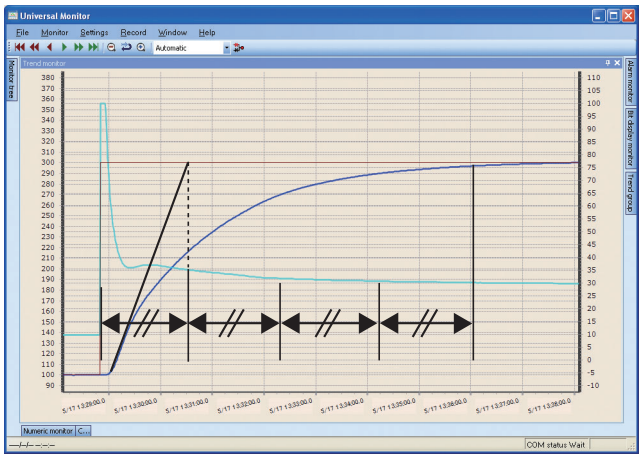
● If hunting occurs:

As shown below, collect data for 3 times longer than the period when the PV reaches the SP after the SP is changed.



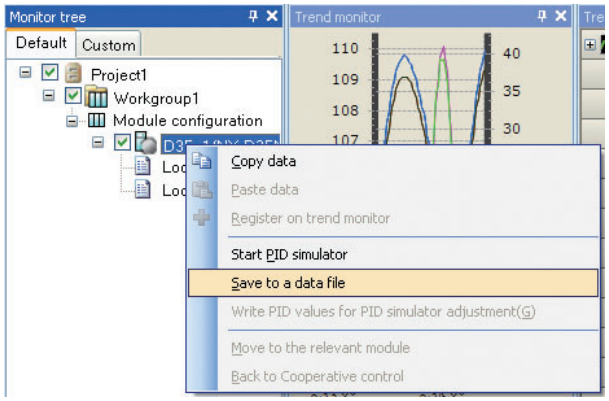
● **If the PV is slow to reach the SP:**

As shown below, collect data for 3 times longer than the period between the time when the SP is changed and the time of intersection of the SP and the tangent of the PV immediately after the PV begins to change toward the SP.

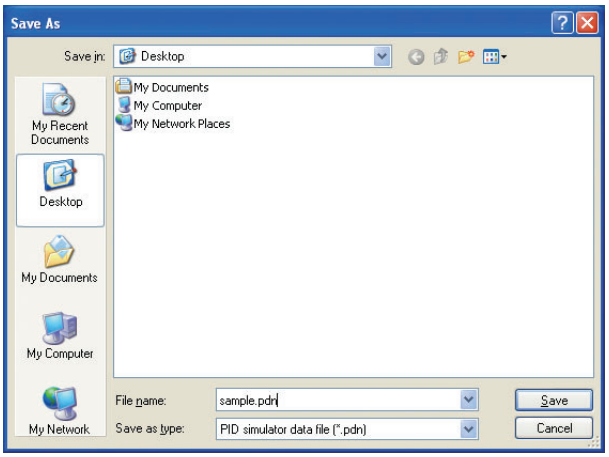


■ Step 6: Save the collected trend data.

The collected trend data is saved in a data file format specially designed for PID Simulator. In the monitor tree of the universal monitor, under Module configuration, right-click the controller module name or the loop name to open the menu.



To open the [Save As] dialog box, select [Save to a data file].



Enter a file name and click the [Save] button to save the file.

■ Summary of the procedure

Steps 3 to 6 are summarized in the table below.

Procedure for trend data collection	Universal monitor / numeric monitor operation	
	AUTO mode	MANUAL mode
Start trend data collection	Start the universal monitor	Start the universal monitor
Collection of 10 data records under stable conditions		SP = current PV Change PID values if necessary.
Start the step response.	Change PID values if necessary. SP = step response SP	MANUAL → AUTO SP = step response SP
Step response in progress		
Finish trend data collection	Stop the universal monitor Save the data	Stop the universal monitor Save the data

8 - 7 Error Messages

■ PID Control Simulation Error Message

Type	Message	Description	Countermeasures
Function error	Auto-tuning was not successful.	PID values cannot be calculated because auto-tuning was not successful.	Tune the PID values manually.
	Can not add any more notes.	The number of saved notes exceeds maximum limit.	Remove the unnecessary notes.
Internal processing error	Process was not successful due to lack of memory.	The PC memory is insufficient.	Close any applications not in use to increase available memory.

■ Data file error

Type	Message	Description	Countermeasures
Data saving error	At least 20 data items are required.	Sufficient trend data records for pdh file creation were not collected.	Collect 20 or more trend data records.
	Either manipulated variable (MV) data or process variable (PV) data could not be collected.	The collected trend data does not include MV or PV trend data.	Collect both MV and PV trend data.
Data read error	All trend data values are identical.	All PV or MV trend data records have the same value.	☞ 8- 6 How to Collect Trend Data (P. 8-23)

Chapter 9. RESTRICTIONS AND IMPORTANT NOTES ON USE

■ PC Power Management

In [PC Power Management] (the power conservation function), if the [Turn Off Monitor] option has been selected, errors may occur while monitoring using the Universal Monitor.
Do not select the [Turn Off Monitor] option while monitoring.
In addition, make sure that the hard disk does not go into the hibernation or standby mode,

■ Infrared Devices

If any infrared device is installed on your PC and [Use Infrared Communication] is selected, errors may occur while monitoring with the Universal Monitor.
Do not select the [Use Infrared Communication] option while monitoring.

■ Restrictions on Using Actual Module Configuration Scan

If modules and external devices are connected via no communication boxes when an actual module configuration scan is executed, diagnostic frames (Ethernet multicast frames) are sent to the external network for about 6 seconds every 2 msec. If any devices other than the module on the external network cannot handle frames at that frequency, be sure to install a communication box in between.

■ Restrictions (IP Addresses) on Using Actual Module Configuration Scan

If an incorrect address has been set in a module using a process other than the loader, it may not be possible to scan the actual module configuration correctly. Connect to each module individually using a serial port, and perform the actual module configuration scan and IP address numbering again.

■ Windows Firewall

If you cannot scan the actual module configuration despite a correct network connection the loader environment may not be registered correctly with Windows Firewall.
If this happens, open the Windows Control Panel, click [Security Center], and select [Windows Firewall]. In the displayed [Windows Firewall] dialog box, click the [Exceptions] tab and, register the [ICServer.exe] directory path name in the loader directory by clicking the [Add Program] button.

■ Prohibited Usage of Compressed Folders

Do not use Windows folder compression. Doing so may cause loader malfunction.

■ List of Value Limits

Data	Unit	Limit
Project name and mapping name	Characters	Not exceeding 20 characters
Workgroup name, node name, and chain name	Bytes	Not exceeding 16 bytes
Comments	Characters	255 characters
Chain ID, workgroup ID, and node ID	Range	1 - 65535
No. of project modules	No. of modules	31 or less
No. of workgroup modules	No. of modules	31 or less
No. of simultaneous trend monitor data packets	Data packets	256 or less
1 logging file and No. of image samples (No. of fixed samples)	Samples	100 to 60000 or less *1
Monitor cycle	Milliseconds	400 msec or more *2
Minimum communication interval	Milliseconds	0-1000 *3
Timeout	Milliseconds	10-10000 *3
No. of resend times	No. of times	0-10 *3
Graph update cycle	n times the monitor cycle	1 or more
Alarm cycle	Milliseconds	Not less than the monitor cycle
No. of custom monitor registrations	No. of data packets	64 per grid
No. of custom trend registrations	No. of data packets	32 per group
No. of trend monitor simultaneous displays	No. of trend groups	8
No. of supervisor modules per workgroup	No. of modules	1

*1. Once a value has reached the upper limit, logging files are moved to a different file and the graph display is cleared. Samples may not be created to a maximum number depending on environment factors such as the PC load and the number of modules.

*2. Data sampling may not be performed in accordance with the monitor cycle setting, depending on environment factors such as the PC load and the number of modules.
The recommended monitor cycle settings according to the number of modules are shown below.
Recommended settings:
(for Ethernet communication)
1 module : 400 msec
2-4 modules : 1 sec
5-16 modules : 2 sec
17 modules or more : 4 sec
(for loader jack communication)
2000 msec

*3. These are the settings for loader communication (Ethernet and serial).
(The parameter read/write timeout values are fixed at Ethernet: 50 sec and Serial: 40 sec)

■ Monitoring of Modules with Error Status through Universal Monitor

If normal modules are combined with abnormal modules (unable to communicate with the loader) in the [Trend group] window in the [Universal monitor] window, change the settings so that data is not sampled for abnormal modules. If the system is trying to sample data for modules that cannot be communicated with, many timeouts will occur. This will affect communication (monitoring) with normal modules. The communication status displayed in the status bar in the [Universal monitor] window will alternate between [OK] and [Break].

■ Coexistence with Virus Security Software

If your PC is installed with security software that has functions such as personal firewalls, loader Ethernet communication will be limited and it may not be possible to read/write module parameters or execute monitoring through the Universal Monitor.

If you do not disable the Windows Firewall function or stop security software operations when using the loader, unexpected errors might occur.

However, if you do disable firewall functions or stop security software, you need to consider the risk of computer viruses penetrating the system. We ask you to carefully consider this risk and assume full responsibility for any actions that you take.

Azbil Corporation is not responsible for any damages or errors that occur as a result of changing these settings.

■ Communication Boxes for Ring Communications in Chain Connections

Communication boxes for ring communication in a chain connection are displayed in the [Module configuration] window using the actual module configuration scan function in the loader. Communication boxes, terminal adapters, and communication adapters not used for ring communication in a chain connection are not displayed in the [Module configuration] window.

■ Write Errors in Actual Module Communication Settings Using Saved Projects

Projects that have acquired module configuration information read the MAC address information in actual devices. If you want to write actual module communication settings or replace a module that has failed when there are multiple sets of modules with the same configuration, perform an actual module configuration scan in the [Actual module configuration] window.

■ When PC Has Multiple User IDs with Administrator Privileges

If a PC has multiple user IDs with administrator privileges (administrator group), an error might be displayed when a different user ID with administrator privileges is used to log on to the PC and to run the loader.

Error message examples: Failed to create new (1)
Failed to open system database (401)
Failed to connect to database (411)

When there are multiple user IDs with administrator privileges, specify the user ID with administrator privileges to log on to the PC and to use the loader.

■ When PC Has Multiple Network Interface Cards of the Same Type

(Restriction only for version 2 and earlier)

If multiple network interface cards of the same type are installed in the PC, or a network interface card have multiple ports, the loader cannot be used.

■ Prohibition of network setting changes while SLP-NX is running

While SLP-NX is running, please do not modify the computer's network settings such as IP address, etc.

■ Prohibition of file creation in the SLP-NX log directory

SLP-NX creates a log directory in the SLP-NX installation directory. Seven days after it is created, the log directory is automatically deleted. Do not create any files manually in the SLP-NX log directory because doing so may cause an error in the automatic deletion process.

■ Access rights for the installation destination folder

The SLP-NX installer checks beforehand whether the user has the appropriate access rights for the folder selected as the installation destination. If not, the user is prompted to use a different folder.

■ Changing the IP Address, etc. of a Module That Is Using Data Transfer Function between Modules or Multi-Loop Cooperative Control

The following precaution applies when changing an IP address, node ID, workgroup ID or chain ID communication setting after setting data transfer function between modules or multi-loop cooperative control for a module.

Data transfer between modules and multi-loop cooperative control create internal parameters that are linked to the IP address, node ID, workgroup ID and chain ID. After writing the communication settings to the module, be sure to execute parameter writing.

When using data transfer function between modules or multi-loop cooperative control, after changing the IP address, node ID, workgroup ID and chain ID, write to the communication setting module, and then continue and write to the parameter module. If parameter reading is done before parameter writing, inconsistencies may occur in the settings for data transfer function between modules or multi-loop cooperative control, resulting in unintended operations.

If inconsistencies occur in cooperative control, a message stating, "The corresponding module does not exist in the project database", is displayed during parameter writing, and a message stating, "Cannot monitor Control Group 1 because there is inconsistent information in the control group settings of cooperative control", is displayed during monitoring. In data transfer function between modules, a message stating, "The destination module cannot be found for a communication setting. Do you want to clear the setting?" is displayed during

parameter writing. If such a message is displayed, redo the settings of cooperative control or data transfer function between modules, and then write the parameters to the module again.
If required, read out the module parameter settings before changing the communication settings.

■ Precautions for Module Replacement

If a module is replaced because of a module failure or some other reason, and immediately afterwards reading or writing is done, communications may fail.
This is because updating related to the computer's MAC address and IP address takes several minutes.
After replacing a module, wait several minutes before restart.
Also, after replacing a module, do an actual module configuration scan, and restore the actual module communication settings and various parameter settings to their state before replacement.

■ Decimal Point Position in the Universal Monitor

When values from controller module ROM version 1.xx are displayed in the universal monitor, the numeric data is fixed at two digits after the decimal point.
Beginning with controller module ROM version 2.00, numeric data is displayed according to the decimal point position setting.

■ Changing the Number of Loops for the Control Module Used in Multi-Loop Cooperative Control

Do not change the number of loops for the controller module used in multi-loop cooperative control.
If a change of the number of loops is required, change the number first and redo the control group configuration for multi-loop cooperative control, and then execute parameter writing for the supervisor module and controller module.

■ Precautions for Default Gateway Configuration

Do not set the default gateway for multiple network interface cards when a network profile is configured.
If any network interface card is set to "Obtain an IP address automatically" (the Windows default setting), do not set the default gateway for any other network interface card.

■ Coexistence with network changeover software

If the PC is installed with network changeover software that can store and switch IP addresses, it may not be possible to read/write module parameters or execute monitoring through the universal monitor because IP address modification by the loader is limited.
If network changeover software is running when the loader is used, an unexpected error may occur.

■ Precautions for Setting Font Size for Windows

If "Medium-125 %" or "Large-150 %" is set for "Display" in "Control Panel" in Windows, some window cannot be displayed normally (the right edge or the bottom will be hidden.) In this case, set "Smaller-100 % (default)" and use the loader.

■ Use of Multiple USB Loader Cables

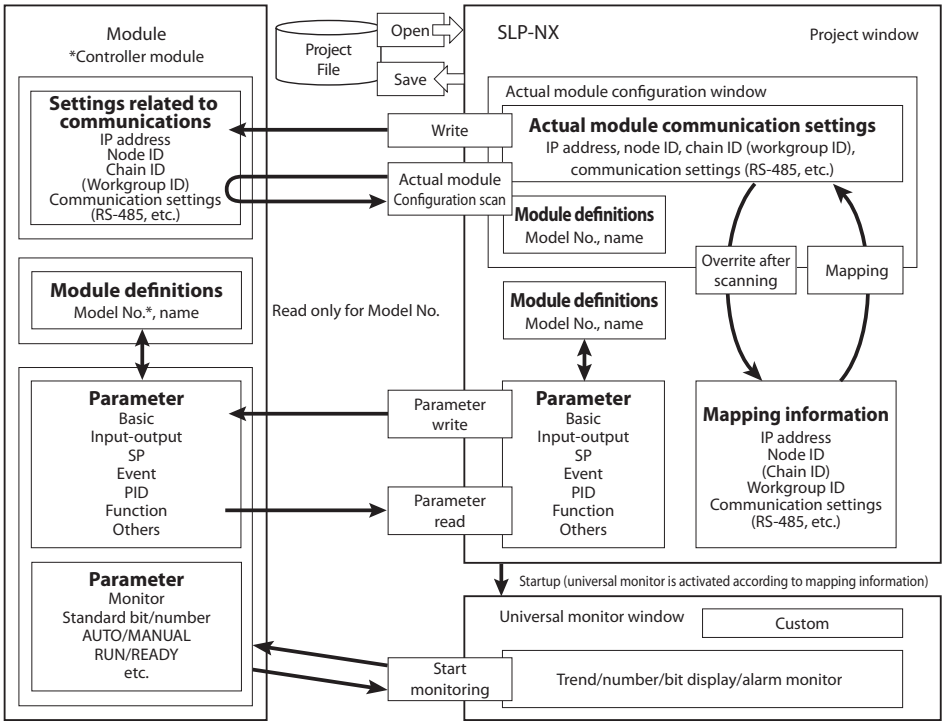
If multiple USB loader cables are used, they cannot be identified separately on the screen.
If the loader does not work when multiple USB loader cables are connected, try changing the cables.

■ Installation of Professional and Standard Versions on the Same PC

The standard SLP-NX and the SLP-NX Professional cannot be installed on the same PC.
If the professional version is installed on a PC on which the standard version has already been installed or vice versa, temporarily uninstall the loaders using [Add or Remove Programs] and then install the desired loader.

Appendix

Appendix - 1 Explanation of Terminology



Project	An item handled by the loader, such as the parameter settings for modules, is called a Project.
Workgroup	A group of modules handled by the loader is called a Workgroup. Each workgroup is assigned a unique number that is known as the Workgroup ID. The workgroup is a logical grouping of modules.
Chain	A group of modules physically connected in a daisy chain is called a Chain. Each chain is assigned a unique number that is known as the Chain ID. Multiple chains are separated using devices such as communication boxes.
Actual Module Communication Settings	Ethernet communication settings and RS-485 settings such as IP addresses for actual modules are called Actual Module Communication Settings. Communication settings for modules are scanned and written to modules through the [Actual module configuration] window.
Mapping	Associating a module configured in a workgroup with an actual module is called Mapping.
Node ID	A Node ID is an identifier for each module when the data transfer function between modules is used.
Parameter	The settings required to operate modules are called Parameters.
Node Address	An ID that combines the Workgroup ID and Node ID is called a Node Address.

Appendix - 2 Version History

This section describes the functions added and the specifications changed for the new version.

■ Version 2.00 (support start date: January 2011)

● Added functions

Description
Support for NX-DX1/DX2
Support for NX-S11/S12/S21
A logical operation window
A line graph window
[Data sampling switchover] check box in the monitor tree window of the universal monitor
[Module communication status] icon in the monitor tree window of the universal monitor
Date and time setting change function for the supervisor module in the universal monitor
Flash ROM backup and restore function for the supervisor module in the universal monitor

● Specification changes

Description
Changed so that a reset occurs only when required during parameter writing if the NX-D15/D25 ROM version is 2.00 or later.

■ Version 3.00 (support start date: April 2012)

● Added functions

Description
Compatible with Windows 7
PID Simulator
Support for NX-D35
Support for NX-DY1/DY2
[List for data transfer between modules] window.
Module version processing (Reading Parameters, Writing Parameters, [Compare module versions] dialog box, and offline version change using [Change module version] dialog box)
[Logical operation monitor] window added to the universal monitor

● Specifications change

Description
SQL Server 2008 Express SP1 was changed to SQL Server 2008 Express SP3.
Compatible with functional extension of NX-D15/D25/DX1/DX2/S21

■ Version 4.00 (available June 2013)

● Added functions

Description
Support for NX-S01

● Specifications change

Description
Compatible with functional extension of NX-D15/D25/D35/S11/S12/S21

■ Version 4.01 (available Aug. 2015)

● Added functions

Description
Compatible with Windows 8.1

■ Version 5.00 (avaliable: Mar.2017)

● Added functions

Description
Compatible with Windows 10 .NET Framework 3.5.1 → 4.6.2 SQL Server 2008 Express → 2014 Express Local DB SP2 File extension was changed from SLX to SLX2 (no compatibility with SLP-NX 4.01 and earlier versions).

Appendix - 3 Loader Support Corresponding to Module Versions

The table below shows loader support corresponding to module versions.

	NX-D15/D25	NX-D35	NX-DX1/DX2	NX-DY1/DY2	NX-S11/12/21
SLP-NX Version 1	1_0_0	Unsupported	Unsupported	Unsupported	Unsupported
SLP-NX Version 2	1_0_1	Unsupported	2_0_0	Unsupported	1_0_0
SLP-NX Version 3	1_0_3	1_0_3	2_0_1	1_0_0	1_0_2
SLP-NX Version 4 ~	1_0_4	1_0_4	2_0_1	1_0_0	1_0_3
Module Version	1_0_0 1_0_1 1_0_2 1_0_3 1_0_4	1_0_3 1_0_4	2_0_0 2_0_1	1_0_0	1_0_0 1_0_1 1_0_2 1_0_3

Revision History

Printed	Edn.	Revised pages	Description
Aug. 2010	**1**		
Jun. 2011	**2**		Overall revision
Apr. 2012	**3**		A new model (NX-D35) was added. Fully revised due to function enhancements.
June 2013	**4**		The 4th Engl. ed. corresponds to the 4th Jp. ed.
Sep. 2015	**5**	ii 1-2 1-4 1-11 1-11 to 1-17 1-12 to 1-17 1-18 3-8 5-10 7-12 9-5 App-3 App-4 End of the manual	The Role of This Manual section was changed. The table in the System Requirements section was changed. The Handling Precautions section was changed. Windows XP → Windows 7 The Handling Precautions section was changed: "Windows XP" was deleted, and "Windows 7" was changed to "Windows 7/8." Descriptions and images were changed. Old pages 1–12 to 1-16 became pages 1–12 to 1-17. "Windows XP (32-bit)" was deleted, and "Windows 7" was changed to "Windows 7/8." A handling precaution was added. A note was added. Descriptions were added to the "Settings tab and Monitor tab" section. Windows 7 → Windows 7/8.1 ■ Version 4.01 (available Aug. 2015) was added. The note was deleted. The version of Terms and Conditions was updated to AAS-511A-014-05.
Feb. 2016	**6**	i 1-6 End of the manual	Explanation about customer registration card was deleted. The explanation was deleted. AAS-511A-014-06
Apr. 2017	**7**	1-2 6-66 App-3 End of the manual	▪ System Environment table was changed. A handling precaution was changed. The explanation was added. ■ Version 5.00 (avaliable: Feb.2017) was added. AAS-511A-014-09

Terms and Conditions

We would like to express our appreciation for your purchase and use of Azbil Corporation's products.
You are required to acknowledge and agree upon the following terms and conditions for your purchase of Azbil Corporation's products (system products, field instruments, control valves, and control products), unless otherwise stated in any separate document, including, without limitation, estimation sheets, written agreements, catalogs, specifications and instruction manuals.

1. Warranty period and warranty scope

1.1 Warranty period

Azbil Corporation's products shall be warranted for one (1) year from the date of your purchase of the said products or the delivery of the said products to a place designated by you.

1.2 Warranty scope

In the event that Azbil Corporation's product has any failure attributable to azbil during the aforementioned warranty period, Azbil Corporation shall, without charge, deliver a replacement for the said product to the place where you purchased, or repair the said product and deliver it to the aforementioned place.
Notwithstanding the foregoing, any failure falling under one of the following shall not be covered under this warranty:

(1) Failure caused by your improper use of azbil product
(noncompliance with conditions, environment of use, precautions, etc. set forth in catalogs, specifications, instruction manuals, etc.);
(2) Failure caused for other reasons than Azbil Corporation's product;
(3) Failure caused by any modification or repair made by any person other than Azbil Corporation or Azbil Corporation's subcontractors;
(4) Failure caused by your use of Azbil Corporation's product in a manner not conforming to the intended usage of that product;
(5) Failure that the state-of-the-art at the time of Azbil Corporation's shipment did not allow Azbil Corporation to predict; or
(6) Failure that arose from any reason not attributable to Azbil Corporation, including, without limitation, acts of God, disasters, and actions taken by a third party.

Please note that the term "warranty" as used herein refers to equipment-only-warranty, and Azbil Corporation shall not be liable for any damages, including direct, indirect, special, incidental or consequential damages in connection with or arising out of Azbil Corporation's products.

2. Ascertainment of suitability

You are required to ascertain the suitability of Azbil Corporation's product in case of your use of the same with your machinery, equipment, etc. (hereinafter referred to as "Equipment") on your own responsibility, taking the following matters into consideration:

(1) Regulations and standards or laws that your Equipment is to comply with.
(2) Examples of application described in any documents provided by Azbil Corporation are for your reference purpose only, and you are required to check the functions and safety of your Equipment prior to your use.
(3) Measures to be taken to secure the required level of the reliability and safety of your Equipment in your use
Although azbil is constantly making efforts to improve the quality and reliability of Azbil Corporation's products, there exists a possibility that parts and machinery may break down.
You are required to provide your Equipment with safety design such as fool-proof design, *1 and fail-safe design*2 (anti-flame propagation design, etc.), whereby preventing any occurrence of physical injuries, fires, significant damage, and so forth. Furthermore, fault avoidance, *3 fault tolerance,*4 or the like should be incorporated so that the said Equipment can satisfy the level of reliability and safety required for your use.

*1. A design that is safe even if the user makes an error.
*2. A design that is safe even if the device fails.
*3. Avoidance of device failure by using highly reliable components, etc.
*4. The use of redundancy.

3. Precautions and restrictions on application

Azbil Corporation's products other than those explicitly specified as applicable (e.g. azbil Limit Switch For Nuclear Energy) shall not be used in a nuclear energy controlled area (radiation controlled area).
Any Azbil Corporation's products shall not be used for/with medical equipment.
The products are for industrial use. Do not allow general consumers to install or use any Azbil Corporation's product. However, azbil products can be incorporated into products used by general consumers. If you intend to use a product for that purpose, please contact one of our sales representatives.
In addition,
you are required to conduct a consultation with our sales representative and understand detail specifications, cautions for operation, and so forth by reference to catalogs, specifications, instruction manual, etc. in case that you intend to use azbil product for any purposes specified in (1) through (6) below.
Moreover, you are required to provide your Equipment with fool-proof design, fail-safe design, anti-flame propagation design, fault avoidance, fault tolerance, and other kinds of protection/safety circuit design on your own responsibility to ensure reliability and safety, whereby preventing problems caused by failure or nonconformity.

(1) For use under such conditions or in such environments as not stated in technical documents, including catalogs, specification, and instruction manuals
(2) For use of specific purposes, such as:
* Nuclear energy/radiation related facilities
[For use outside nuclear energy controlled areas] [For use of Azbil Corporation's Limit Switch For Nuclear Energy]
* Machinery or equipment for space/sea bottom
* Transportation equipment
[Railway, aircraft, vessels, vehicle equipment, etc.]
* Antidisaster/crime-prevention equipment

* Burning appliances
* Electrothermal equipment
* Amusement facilities
* Facilities/applications associated directly with billing

(3) Supply systems such as electricity/gas/water supply systems, large-scale communication systems, and traffic/air traffic control systems requiring high reliability
(4) Facilities that are to comply with regulations of governmental/public agencies or specific industries
(5) Machinery or equipment that may affect human lives, human bodies or properties
(6) Other machinery or equipment equivalent to those set forth in items (1) to (5) above which require high reliability and safety

4. Precautions against long-term use

Use of Azbil Corporation's products, including switches, which contain electronic components, over a prolonged period may degrade insulation or increase contact-resistance and may result in heat generation or any other similar problem causing such product or switch to develop safety hazards such as smoking, ignition, and electrification.
Although acceleration of the above situation varies depending on the conditions or environment of use of the products, you are required not to use any Azbil Corporation's products for a period exceeding ten (10) years unless otherwise stated in specifications or instruction manuals.

5. Recommendation for renewal

Mechanical components, such as relays and switches, used for Azbil Corporation's products will reach the end of their life due to wear by repetitious open/close operations.
In addition, electronic components such as electrolytic capacitors will reach the end of their life due to aged deterioration based on the conditions or environment in which such electronic components are used.
Although acceleration of the above situation varies depending on the conditions or environment of use, the number of open/close operations of relays, etc. as prescribed in specifications or instruction manuals, or depending on the design margin of your machine or equipment, you are required to renew any Azbil Corporation's products every 5 to 10 years unless otherwise specified in specifications or instruction manuals.
System products, field instruments (sensors such as pressure/flow/level sensors, regulating valves, etc.) will reach the end of their life due to aged deterioration of parts.
For those parts that will reach the end of their life due to aged deterioration, recommended replacement cycles are prescribed. You are required to replace parts based on such recommended replacement cycles.

6. Other precautions

Prior to your use of Azbil Corporation's products, you are required to understand and comply with specifications (e.g., conditions and environment of use), precautions, warnings/cautions/notices as set forth in the technical documents prepared for individual Azbil Corporation's products, such as catalogs, specifications, and instruction manuals to ensure the quality, reliability, and safety of those products.

7. Changes to specifications

Please note that the descriptions contained in any documents provided by azbil are subject to change without notice for improvement or for any other reason.
For inquires or information on specifications as you may need to check, please contact our branch offices or sales offices, or your local sales agents.

8. Discontinuance of the supply of products/parts

Please note that the production of any Azbil Corporation's product may be discontinued without notice.
For repairable products, we will, in principle, undertake repairs for five (5) years after the discontinuance of those products. In some cases, however, we cannot undertake such repairs for reasons, such as the absence of repair parts.
For system products, field instruments, we may not be able to undertake parts replacement for similar reasons.

9. Scope of services

Prices of Azbil Corporation's products do not include any charges for services such as engineer dispatch service.
Accordingly, a separate fee will be charged in any of the following cases:

(1) Installation, adjustment, guidance, and attendance at a test run
(2) Maintenance, inspection, adjustment, and repair
(3) Technical guidance and technical education
(4) Special test or special inspection of a product under the conditions specified by you

Please note that we cannot provide any services as set forth above in a nuclear energy controlled area (radiation controlled area) or at a place where the level of exposure to radiation is equivalent to that in a nuclear energy controlled area.

azbil

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1st edition: Aug. 2010 (T)
7th edition: Apr. 2017 (V)