

mitsubishi



Integrated FA Software

GX Works2 Version 1

Operating Manual

Common



MELSOFT
Integrated FA Software

■ SW1DNC-GXW2-E

● SAFETY PRECAUTIONS ●

(Always read these instructions before using this product.)

Before using this product, thoroughly read this manual and the relevant manuals introduced in this manual and pay careful attention to safety and handle the products properly.

The precautions given in this manual are concerned with this product. For the safety precautions of the programmable controller system, refer to the User's Manual for the CPU module.

In this manual, the safety precautions are ranked as 'DANGER' and 'CAUTION'.



DANGER

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Note that the  CAUTION level may lead to serious consequences according to the circumstances. Always follow the precautions of both levels because they are important for personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

[Design Instructions]

DANGER

- When data change, program change, or status control is performed from a personal computer to a running programmable controller, create an interlock circuit outside the programmable controller to ensure that the whole system always operates safely.
Furthermore, for the online operations performed from a personal computer to a programmable controller CPU, the corrective actions against a communication error due to such as a cable connection fault should be predetermined as a system.

[Startup/Maintenance Instructions]

CAUTION

- The online operations performed from a personal computer to a running programmable controller CPU (Program change when a programmable controller CPU is RUN, operating status change such as RUN-STOP switching, and remote control operation) have to be executed after the manual has been carefully read and the safety has been ensured.
When changing a program while a programmable controller CPU is RUN, it may cause a program corruption in some operating conditions. Fully understand the precautions described in Section 12.8 before use.

REVISIONS

The manual number is written at the bottom left of the back cover.

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INTRODUCTION

Thank you for purchasing the Mitsubishi integrated FA software, MELSOFT series.
Before using the product, thoroughly read this manual to develop full familiarity with the functions and performance to ensure correct use.

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INDEX

■ MANUALS

Related manuals are separately issued according to the purpose of their functions in GX Works2.

● Related manuals

The manuals related to this product are shown below.

Refer to the following tables when ordering required manuals.

1) Operation of GX Works2

Manual name	Manual number (Model code)
GX Works2 Version1 Operating Manual (Simple Project) Explains operation methods such as creating and monitoring programs in Simple project of GX Works2. (Sold separately)	SH-080780ENG (13JU64)
GX Works2 Version1 Operating Manual (Structured Project) Explains operation methods such as creating and monitoring programs in Structured project of GX Works2. (Sold separately)	SH-080781ENG (13JU65)
GX Works2 Beginner's Manual (Simple Project) Explains fundamental operation methods such as creating, editing, and monitoring programs in Simple project for users inexperienced with GX Works2. (Sold separately)	SH-080787ENG (13JZ22)
GX Works2 Beginner's Manual (Structured Project) Explains fundamental operation methods such as creating, editing, and monitoring programs in Structured project for users inexperienced with GX Works2. (Sold separately)	SH-080788ENG (13JZ23)

2) Structured programming

Manual name	Manual number (Model code)
QCPU Structured Programming Manual (Fundamentals) Explains the programming method, types of programming languages, and other information required to create structured programs. (Sold separately)	SH-080782ENG (13JW06)
QCPU Structured Programming Manual (Common Instructions) Explains the specifications and functions of sequence instructions, basic instructions, and application instructions that can be used in structured programs. (Sold separately)	SH-080783ENG (13JW07)
QCPU Structured Programming Manual (Application Functions) Explains the specifications and functions of application functions that can be used in structured programs. (Sold separately)	SH-080784ENG (13JW08)
QCPU Structured Programming Manual (Special Instructions) Explains the specifications and functions of instructions for network modules, intelligent function modules, and PID control functions that can be used in structured programs. (Sold separately)	SH-080785ENG (13JW09)

Point

The Operating Manual is included in the CD-ROM with the software package.
Manuals in printed form are sold separately for single purchase. Order a manual by quoting the manual number (model code) listed in the table above.

● Purpose of this manual

This manual explains the functions that are common to Simple project and Structured project, including system configuration, parameter settings, and operation methods for online functions of GX Works2. Manuals for reference are listed in the following table according to their purpose.

For information such as the contents and number of each manual, refer to the list of 'Related manuals'.

1) Operation of GX Works2

Purpose		GX Works2 Installation Instructions	GX Works2 Beginner's Manual		GX Works2 Version1 Operating Manual		
							
		—	Simple Project	Structured Project	Common	Simple Project	Structured Project
Installation	Learning the operating environment and installation method						
Operation of Simple project	Learning the basic operations and operating procedures						
	Learning the functions and operation methods for programming						
	Learning all functions and operation methods except for programming						
Operation of Structured project	Learning the basic operations and operating procedures						
	Learning the functions and operation methods for programming						
	Learning all functions and operation methods except for programming						

2) Programming

Purpose		QCPU Structured Programming Manual				QCPU(Q mode)/QnACPU Programming Manual		User's Manual for intelligent function module/ Reference Manual for network module
								
		Fundamentals	Common Instructions	Special Instructions	Application Functions	Common Instructions	PID Control Instructions	—
Programming in Simple project	Learning the types and details of common instructions, descriptions of error codes, special relays, and special registers							
	Learning the types and details of instructions for intelligent function modules							
	Learning the types and details of instructions for network modules							
	Learning the types and details of instructions for the PID control function							
Programming in Structured project	Learning the fundamentals for creating a structured program for the first time							
	Learning the types and details of common instructions							
	Learning the types and details of instructions for intelligent function modules							
	Learning the types and details of instructions for network modules							
	Learning the types and details of instructions for the PID control function							
	Learning the descriptions of error codes, special relays, and special registers							
	Learning the types and details of application functions							

● How to read this manual

Supported CPU

Supported programmable controller CPUs are shown in icons under the section title.

Screen display

Describes the screen display procedure. Follow the ⇒ and select [(menu)] to open the screen. *Screen display may depend on the CPU. In that case, typical example is described.

Display contents

Describes the display contents in the screen.

Reference location

leads to the reference location and reference manual.

Section title

Clarifies the section of currently open page.

Chapter heading

Index on the right of the page number clarifies the chapter of currently open page.

Screen button

Describes the buttons in the screen.

Operating procedure

Describes the operating procedure of the function.



6 SETTING PARAMETERS

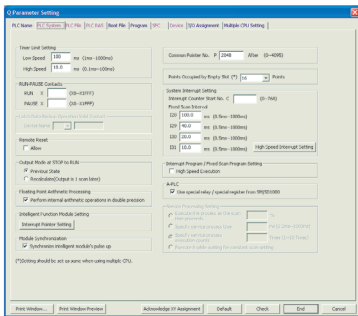


6.1 Setting PLC Parameter

This section explains the method for setting PLC parameter.

Screen display

Select Project window ⇒ "Parameter" ⇒ "PLC Parameter".



Display contents

Item	Description										
Tab	The setting items are categorized under tabs according to their purpose. The parameter setting status is displayed by different font colors of the tab names. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Font color</th> <th style="width: 80%;">Setting status</th> </tr> </thead> <tbody> <tr> <td>Red</td> <td>Status that data is not set under the tab (Data must be set under the tab for operation.)</td> </tr> <tr> <td>Blue</td> <td>Status that data is set under the tab (A red tab name changes to blue after data is set.)</td> </tr> <tr> <td>Magenta</td> <td>Default values (The user has not made settings under the tab.)</td> </tr> <tr> <td>Dark blue</td> <td>Values other than default values (A magenta tab name changes to dark blue after data is set.)</td> </tr> </tbody> </table>	Font color	Setting status	Red	Status that data is not set under the tab (Data must be set under the tab for operation.)	Blue	Status that data is set under the tab (A red tab name changes to blue after data is set.)	Magenta	Default values (The user has not made settings under the tab.)	Dark blue	Values other than default values (A magenta tab name changes to dark blue after data is set.)
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Dark blue	Values other than default values (A magenta tab name changes to dark blue after data is set.)										

• Details of the setting items: Section 6.1.1

6 - 2
6.1 Setting PLC Parameter

4.7 Setting Security for Projects

Screen button

-  **Add...**
Adds a user. ( ■ Adding users)
-  **Delete...**
Deletes a user selected in the list.
The current login user cannot be deleted. If registered users are only 'Administrators' and there are no other users to be deleted, deletion of the current login user is possible.
If 'Administrators' level users are deleted, security is reset.
-  **Change...**
Changes the information of the user selected in the list. ( ■ Changing user information)
-  **Password Set...**
Changes the password of the user selected in the list. ( ■ Changing passwords)
The password of the current login user cannot be changed using this function. To perform this change, use the Change password function by selecting [Project] ⇒ [Security Level] ⇒ [Change Password].

■ Adding users

This function adds a user to a project with security.
A user whose access level is higher than the access level of login user cannot be added.

Operating procedure

- Click the  **Add...** button on the **User Addition** screen.
The **User Addition** screen is displayed.

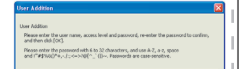
1 OVERVIEW

2 SYSTEM CONFIGURATION

3 PROJECT CONFIGURATION AND BASIC

4 PROJECT MANAGEMENT

5 EDITING PROGRAMS



This manual also uses the following columns:

Point?

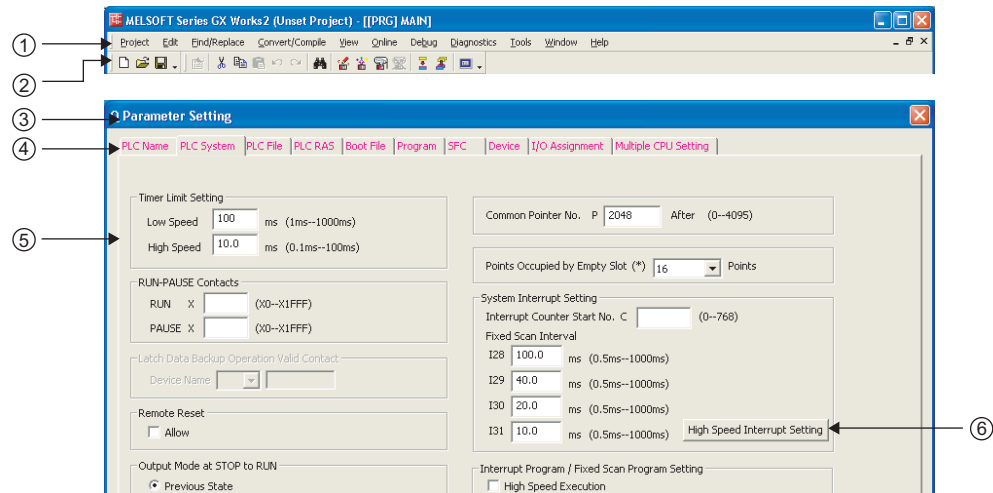
This explains notes requiring attention or useful functions relating to the information given on the same page.

Restrictions?

This explains restrictions relating to the information given on the same page.

● Symbols used in this manual

The following shows the symbols used in this manual with descriptions and examples.



■ GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL

This manual uses the generic terms and abbreviations listed in the following table to discuss the software packages and programmable controller CPUs. Corresponding module models are also listed if needed.

Generic term and abbreviation	Description
GX Works2	Generic product name for the SWnDNC-GXW2-E (n: version)
Existing application	–
GX Developer	Generic product name for the SWnD5C-GPPW-E, SWnD5C-GPPW-EA, SWnD5C-GPPW-EV, and SWnD5C-GPPW-EVA (n: version)
GX IEC Developer	Generic product name for the SWnD5C-MEDOC3 (n: version)
GX Configurator	Generic product name for the GX Configurator-AD/DA/SC/CT/TC/TI/FL/PT/AS/QP
Personal computer	Generic term for personal computer on which Windows® operates
Basic model QCPU	Generic term for the Q00J, Q00, and Q01
High Performance model QCPU	Generic term for the Q02, Q02H, Q06H, Q12H, and Q25H
Process CPU	Generic term for the Q02PH, Q06PH, Q12PH, and Q25PH
Redundant CPU	Generic term for the Q12PRH and Q25PRH
Universal model QCPU	Generic term for the Q02U, Q03UD, Q03UDE, Q04UDH, Q04UDEH, Q06UDH, Q06UDEH, Q13UDH, Q13UDEH, Q26UDH, and Q26UDEH
Built-in Ethernet port QCPU	Generic term for the Q03UDE, Q04UDEH, Q06UDEH, Q13UDEH, and Q26UDEH
QCPU (Q mode)	Generic term for the High Performance model QCPU and the Universal model QCPU
CPU module	
Q series-compatible C24	Generic term for the QJ71C24, QJ71C24-R2, QJ71C24N, QJ71C24N-R2, and QJ71C24N-R4
CC-Link IE controller network module	Generic term for the QJ71GP21-SX and QJ71GP21S-SX
MELSECNET/H network module	Generic term for the QJ71LP21, QJ71LP21-25, QJ71LP21S-25, QJ71LP21G, QJ71BR11, QJ72LP25-25, QJ72LP25G, and QJ72BR15
Q series-compatible E71	Generic term for the QJ71E71-100, QJ71E71-B5, QJ71E71-B2, and QJ71E71
QE71	Generic term for the AJ71QE71, AJ71QE71-B5, A1SJ71QE71-B2, A1SJ71QE71-B5, AJ71QE71N-T, A1SJ71QE71N-T, AJ71QE71N-B5, A1SJ71QE71N-B5, AJ71QE71N-B2, A1SJ71QE71N-B2, AJ71QE71N-B5T, A1SJ71QE71N-B5T, AJ71QE71N3-T, and A1SJ71QE71N3-T
A series-compatible E71	Generic term for the AJ71E71-S3, A1SJ71E71-B2-S3, A1SJ71E71-B5-S3, AJ71E71N-B2, AJ71E71N-B5T, A1SJ71E71N-B2, A1SJ71E71N-B5T, AJ71E71N-T, A1SJ71E71N-T, AJ71E71N-B5, A1SJ71E71N-B5, AJ71E71N3-T, and A1SJ71E71N3-T
Ethernet module	Generic term for the Q series-compatible E71, QE71, and A series-compatible E71
CC-Link module	Generic term for the QJ61BT11 and QJ61BT11N
CC-Link bridge module	Abbreviation for the AJ65SBT-CLB CC-Link - CC-Link/LT bridge module
G4 module	Abbreviation for the AJ65BT-G4(-S3) peripheral connection module
MELSECNET/H board	Generic term for the Q80BD-J71BR11, Q80BD-J71LP21-25, and Q80BD-J71LP21G
CC-Link IE controller network board	Generic term for the Q0BD-J71GP21-SX and Q0BD-J71GP21S-SX Abbreviation for the CC-Link IE controller network module interface board
Ethernet board	Generic term for Ethernet cards for personal computer and Ethernet interface boards
CC-Link board	Generic term for CC-Link Ver.1 board and CC-Link Ver.2 board
CC-Link Ver.1 board	Generic term for the A80BD-J61BT11 and A80BD-J61BT13
CC-Link Ver.2 board	Generic term for the Q80BD-J61BT11N
GOT	Generic term for Mitsubishi Graphic Operation Terminal GOT1000 series, GOT-A900 series, and GOT-F900 series
Common instruction	Generic term for the sequence instructions, basic instructions, and application instructions
Special instruction	Generic term for the PID control instructions and module dedicated instructions

Generic term and abbreviation	Description
Windows Vista®	Generic term for Microsoft® Windows Vista® Home Basic Operating System, Microsoft® Windows Vista® Home Premium Operating System, Microsoft® Windows Vista® Business Operating System, Microsoft® Windows Vista® Ultimate Operating System, and Microsoft® Windows Vista® Enterprise Operating System
Simple project	Generic term for the projects created using the ladder/SFC language
Without labels	Generic term for the projects created without selecting "Use Labels" when creating new projects
With labels	Generic term for the projects created with selecting "Use Labels" when creating new projects
Structured project	Generic term for the projects created using the ladder/SFC/ST/structured ladder language
Project without labels	Generic term for the Simple projects (without labels)
Project with labels	Generic term for the Simple projects (with labels) and Structured projects
Project with security	Generic term for the projects whose securities are set

[illegible]



1 OVERVIEW

This chapter explains an overview of GX Works2.

1.1	Product Overview	1-2
1.2	Features	1-4
1.3	List of Functions	1-8

1	OVERVIEW
2	SYSTEM CONFIGURATION
3	SCREEN CONFIGURATION AND BASIC OPERATIONS
4	PROJECT MANAGEMENT
5	EDITING PROGRAMS
6	SETTING PARAMETERS
7	SETTING DEVICE MEMORY
8	SETTING DEVICE INITIAL VALUES

1.1 Product Overview

GX Works2 is a programming tool for designing, debugging, and maintaining programs on Windows®. GX Works2 has improved functionality and operability, with easier-to-use features compared to existing GX Developer.

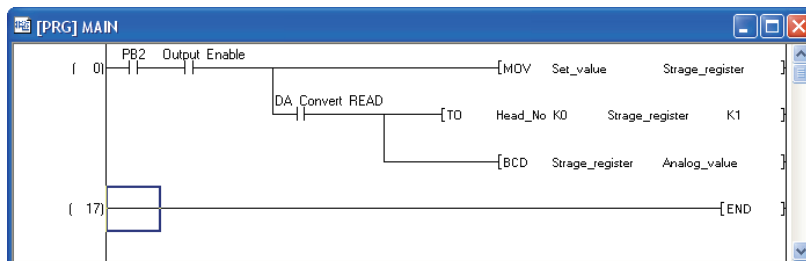
■ Main functions of GX Works2

GX Works2 can manage programs and parameters in units of projects for each programmable controller CPU.

The following explains the main functions.

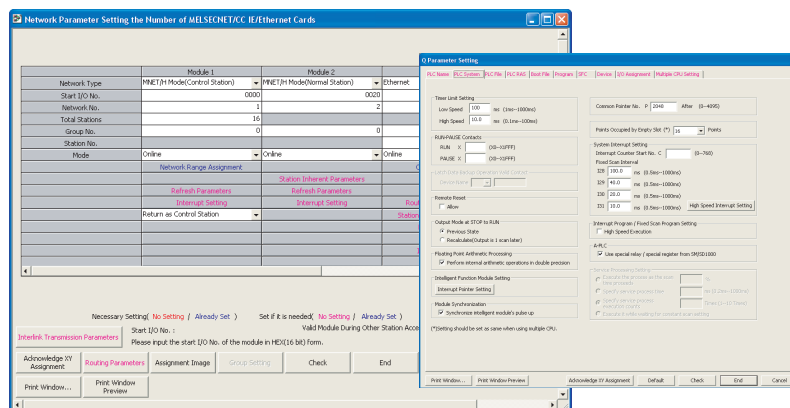
● Programming

Programs can be created in a Simple project in a similar way with existing GX Developer. Structured programming in a Structured project is also available with GX Works2.



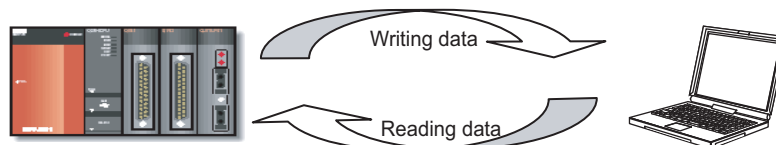
● Setting parameters

Programmable controller CPU parameter and Network parameter can be set with GX Works2. Intelligent function module parameter can be set as well.



● Writing/reading data to/from a programmable controller CPU

Created sequence programs can be written to/read from a programmable controller CPU using the Read from PLC/Write to PLC function. Also, using the Online program change function, the sequence programs can be changed even when the programmable controller CPU is in RUN.



● Monitoring/debugging

Created sequence programs can be written to the programmable controller CPU and device value at operation can be monitored online/offline.

Programs can be monitored and debugged.

● Diagnostics

The current error status and error history of the programmable controller CPU can be diagnosed. Using the diagnostics function, the recovery work is completed in a short time. Using the System monitor (QCPU (Q mode) only) function, detailed information on such as intelligent function modules can be obtained. This helps to shorten the recovery work time at error occurrence.

Diagnosing the programmable controller CPU status

Diagnosing the programmable controller CPU status (PLC diagnostics screen)

1.2 Features

This section explains the features of GX Works2.

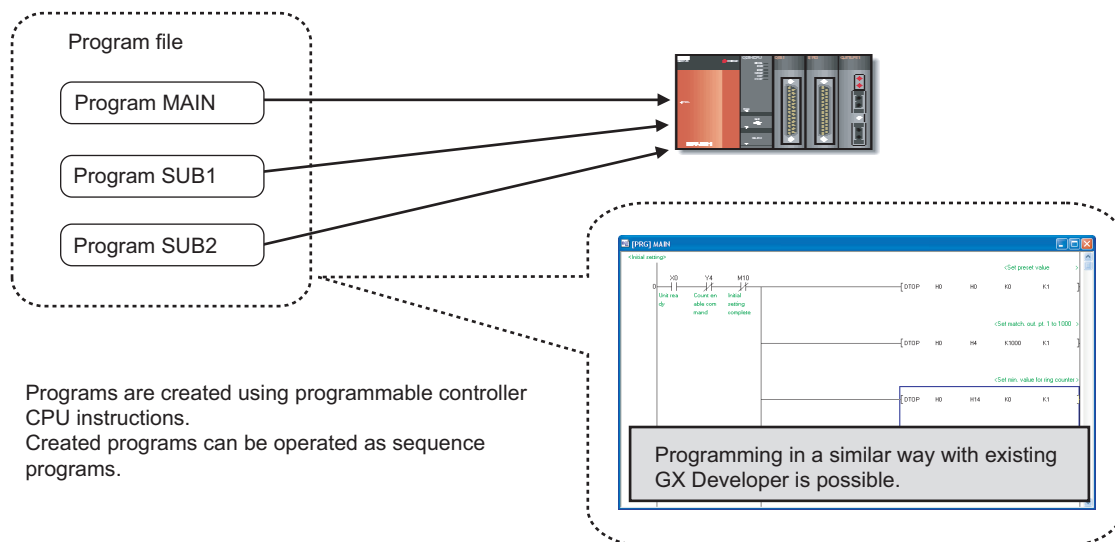
■ Project types in GX Works2

In GX Works2, the project type can be selected from either of Simple project or Structured project.

● Simple project

The Simple project creates sequence programs using instructions for Mitsubishi programmable controller CPU.

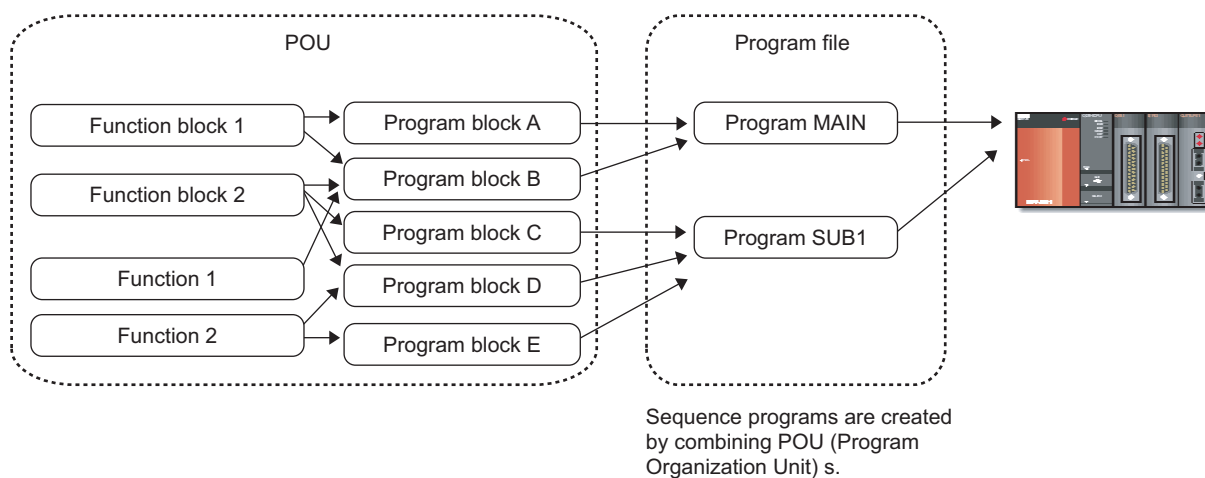
Programs in a Simple project can be created in a similar way with existing GX Developer.



● Structured project

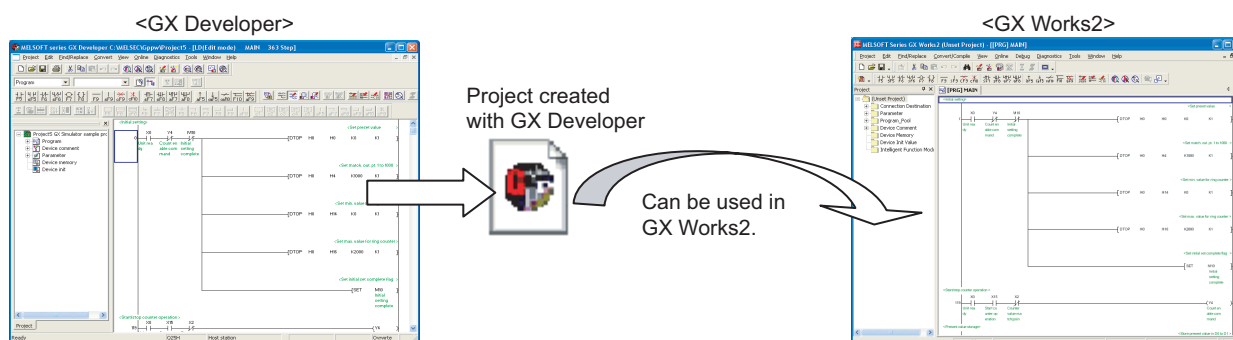
In a Structured project, programs can be created by structured programming.

By segmenting a whole control process program into common program parts, highly manageable and usable programming (structured programming) is possible.



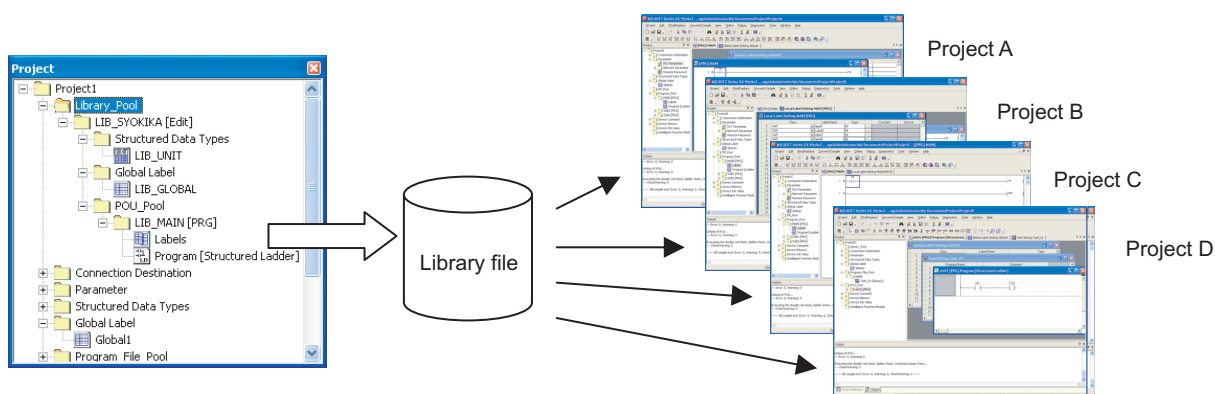
Enhanced use of program assets

Projects created with existing GX Developer can be utilized in a Simple project. Utilizing the past assets improves the efficiency of program design.



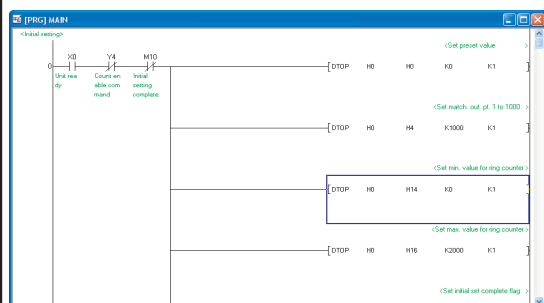
Sharing Program Organization Unit (POU) registered as libraries

In a Structured project, programs, global labels, and structures frequently used can be registered as libraries. Utilizing these libraries reduces time required for creating programs.

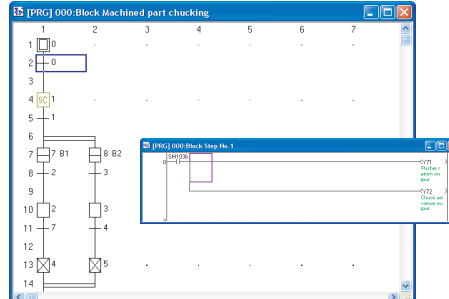


The wide variety of programming languages available with GX Works2 enables to select the optimum programming language depending on control.

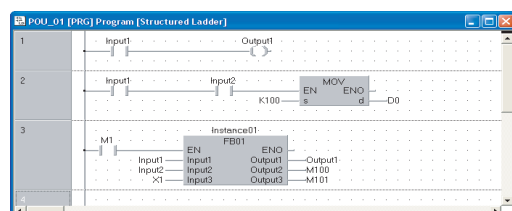
Programming similar to existing GX Developer



Programming to clarify the procedure



Programming a ladder program graphically



Programming in a text language similar to C language

```

POU_01 [PG] Program [S7]
IF SHOKKA THEN
    RYOHUINH = 0; FURYOHUINH = 0; BUDOMARI = 0.0;
ELSE
    IF KENSA THEN
        RYOHUINH = RYOHUINH * 1;
    ELSE
        FURYOHUINH = FURYOHUINH * 1;
    END_IF;
    BUDOMARI = DINT_TO_REAL(RYOHUINH)/DINT_TO_REAL(RYOHUINH+FYUO);
END_IF;

IF SHOKKA_B THEN
    RYOHUINH = 0; FURYOHUINH = 0; BUDOMARI = 0.0;
    TIMECHANGE = TIMECHANGE + 1;
    TIMECHANGE <= 100 THEN
        TIMECHANGE = 0;
        TIMECHANGE = TIMECHANGE + 1;
    END_IF;
END_IF;

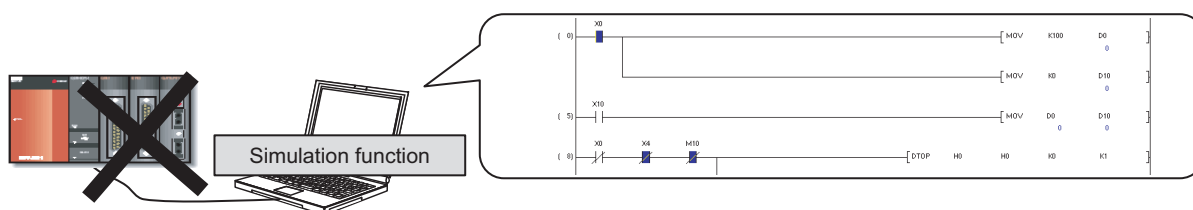
IF TIMECHANGE >= 1000 THEN
    FLUG = TRUE;
ELSE
    FLUG = FALSE;

```

Other features

Offline debugging

Offline debugging using the simulation function is possible with GX Works2. This enables debugging to ensure the normal operation of created sequence programs without connecting GX Works2 to the programmable controller CPU.

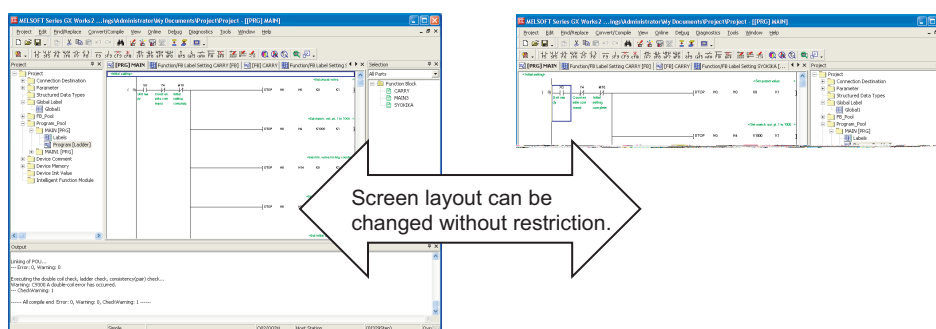


Connecting to the programmable controller is unnecessary.

Without connecting to the programmable controller CPU, programs can be monitored and debugged in the same way with debugging by the programmable controller CPU.

The screen layout can be customized to the user's preference

The docking windows enable to change the screen layout of GX Works2 without restriction.



1.3 List of Functions

This section shows the list of functions of GX Works2.

The functions are divided into common functions available (Project, Online, Debug, Diagnostics, Tools, Window, and Help) and functions used for each editing or setting target (Edit, Find/Replace, Convert/Compile, and View).

For (Simple) and (Structured) indicated in the Reference column, refer to the following manuals respectively:

(Simple).....GX Works2 Version1 Operating Manual (Simple Project)

(Structured) GX Works2 Version1 Operating Manual (Structured Project)

1.3.1 List of functions common to Simple project and Structured project

This section explains the functions common to a Simple project and a Structured project.

■ List of common functions

The following tables show functions that are always available regardless of the type of editing or setting target.

Project (common function)		Reference
New	Creates a new project.	Section 4.1.1
Open	Opens an existing project.	Section 4.1.2
Close	Closes an open project.	Section 4.1.5
Save	Saves a project.	Section 4.1.3
Save As	Names and saves a project.	Section 4.1.3
Delete	Deletes an existing project.	Section 4.1.4
Verify	Verifies between two project data.	Section 4.1.6
Project Revision		—
Revision Entry	Registers the project change history.	Section 4.5.1
Revision List	Displays the list of project change history.	Section 4.5.2
Change PLC type	Changes the programmable controller CPU type.	Section 4.1.7
Change Project Type	Changes the project type from a Simple project to a Structured project.	Section 4.4
Object		—
New	Adds data to a project.	Section 4.2.1
Rename	Renames the selected data.	Section 4.2.3
Delete	Deletes the selected data.	Section 4.2.4
Data Copy	Copies the selected data.	Section 4.2.2
Data Paste	Pastes the copied data.	
Set as Default Connection	Specifies data in selected connection target as a connection target for regular use.	Section 11.1.2
Property	Displays the selected data properties.	Section 4.2.5

Project (common function)		Reference
Intelligent Function Module		–
Add New Module	Adds new intelligent function module data.	Section 4.3.1
Delete Module	Deletes intelligent function module data.	Section 4.3.3
Property	Displays properties of an intelligent function module data.	Section 4.3.4
Intelligent Function Module Parameter List	Displays a list of set/unset parameters of an intelligent function module.	Section 4.3.5
Open Other Data		–
Open Other Project	Opens a project created with GX Developer.	Section 4.6.1
Read GX IEC Developer Data	Reads a project created with GX IEC Developer.	Section 4.6.2
Read GX Configurator-QP Data	Reads a project created with GX Configurator-QP.	Section 4.6.3
Export to GX Developer Format File	Saves an open project in GX Developer format.	Section 4.6.4
Library		–
Create	Creates a new library.	(Structured)
Install	Imports a created library to the project.	
Deinstall	Deletes a library from the project.	
Update Library	Updates the library imported to the project.	
Rename	Renames a library.	
Open	Enables editing of a library.	
Close	Disables editing of a library.	
Change Password	Sets a password for a library.	
Save as	Names and saves a project.	
Save	Saves a library file.	
Delete	Deletes a library file.	
Help	Displays help information of the library.	
Security Level		–
Change Password	Changes the password of the current login user.	Section 4.7.2
User Management	Manages user information of the project. Adds/deletes a user or changes the user information.	Section 4.7.1 Section 4.7.2
Data Security Setting	Sets the access authorization of each user related to reading/writing data.	Section 4.7.4
Print Window	Prints the open screen.	Section 18.3
Print Window Preview	Displays the print preview of the open screen.	Section 18.2
Printer Setup	Changes the printer settings.	Section 18.1
The Latest File	Displays the recently used GX Works2 project paths and opens the selected project.	–
Quit	Exits GX Works2.	Section 3.1
Edit (common function)		Reference
Cut	Cuts the selected data.	–
Copy	Copies the selected data.	
Paste	Pastes the cut or copied data at the cursor position.	
Delete	Deletes the selected data.	
Find/Replace (common function)		Reference
Find	Searches for a character string.	Section 10.1
Replace	Replaces the character string.	

Find/Replace (common function)		Reference
Cross Reference	Displays the usage of selected device or label.	Section 10.2
List of Used Device	Displays the usage of devices.	Section 10.3

Convert/Compile (common function)		Reference
Build	Compiles (converts) a program being edited.	Section 5.2
Compile + Online Change	Writes a sequence program to the programmable controller CPU after compilation.	
Rebuild All	Compiles (converts) all programs in the project.	
Change SFC All	Converts all SFC programs in the project.	

View (common function)		Reference
Toolbar		—
Toolbar name	Displays/hides the tool bar.	Section 3.2.2
Statusbar	Displays/hides the status bar.	Section 3.2.6
Colors	Sets the display color such as labels, device comments on the work window.	Section 3.2.7
Docking Window		—
Project Window	Displays/hides the Project window. In the Project window, data in the open project is displayed in a list.	Section 3.2.5
Function Block Selection Window	Displays/hides the Function Block Selection window. Select a part such as FB or function on the window for utilizing it to a program.	(Simple) (Structured)
Output Window	Displays/hides the Output window. In the window, the conversion (compilation) result is displayed.	
Cross Reference Window	Displays/hides the Cross Reference window. In the Cross Reference window, devices/labels used in the project are displayed.	Section 10.2
List of Used Device Window	Displays/hides the List of Used Device window. In the List of Used Device List window, the usage of selected device is displayed.	Section 10.3
Watch Window 1 to 4	Displays/hides the Watch window. In the Watch window, the monitoring result is displayed.	Section 14.2
Find/Replace Window	Displays/hides the Find/Replace window. In the Find/Replace window, the search/replace result is displayed.	Section 10.1

Online (common function)		Reference
Read from PLC	Reads data from the programmable controller CPU.	Section 12.1
Write to PLC	Writes data to the programmable controller CPU.	Section 12.1
Verify with PLC	Verifies a project being edited against the data in the programmable controller CPU.	Section 12.2
Start/Stop PLC	Remotely controls RUN/PAUSE/STOP of the programmable controller CPU from GX Works2.	Section 16.1
PLC Keyword		—
New	Sets a password to the programmable controller CPU.	Section 13.1
Delete	Cancels the password set to the programmable controller CPU.	Section 13.2
Disable	Temporarily unlocks the password set to the programmable controller CPU.	Section 13.3

Online (common function)		Reference
PLC Memory Operation		–
Format PLC Memory	Formats the programmable controller CPU memory.	Section 16.2
Clear PLC Memory	Clears the programmable controller CPU memory.	Section 16.3
Arrange PLC Memory	Arranges the programmable controller CPU memory.	Section 16.4
Delete PLC Data	Deletes data in the programmable controller CPU.	Section 12.3
PLC User Data		–
PLC User Data Read	Reads the programmable controller CPU user data.	Section 12.5
PLC User Data Write	Writes the programmable controller CPU user data.	
PLC User Data Delete	Deletes the programmable controller CPU user data.	
Export to ROM Format	Copies the program memory data in the programmable controller CPU to ROM.	Section 12.4
Program Memory Batch Download	Transfers the contents of program cashe memory to program memory in a batch.	Section 12.6
Latch Data Backup		–
Backup	Backs up device memory/file register/error history data in the Universal model QCPU to the standard ROM.	Section 12.7.1
Delete Backup Data	Deletes the backup data in the Universal model QCPU.	Section 12.7.2
Set Clock	Sets the clock in the programmable controller CPU.	Section 16.5
Monitor		–
Start Monitoring (All Windows)	Starts monitoring of all open windows.	Section 14.4
Stop Monitoring (All Windows)	Stops monitoring of all open windows.	Section 14.4
Start Monitoring	Starts monitoring of the open window.	Section 14.1
Stop Monitoring	Stops monitoring of the open window.	–
Start Watch	Starts monitoring the current values of registered devices/labels.	Section 14.2
Stop Watch	Stops monitoring the current values of registered devices/labels.	
Change Value Format (Decimal)	Displays the current device value in decimal in program monitoring.	(Simple) (Structured)
Change Value Format (Hexadecimal)	Displays the current device value in hexadecimal in program monitoring.	
Device/Buffer Memory Batch Monitor	Monitors device/buffer memory in a batch.	Section 14.3
Change Instance (Function Block)	Selects an instance of the function block to be monitored.	(Simple) (Structured)
SFC All Block Batch Monitor	Batch monitors all blocks in the SFC program.	(Simple)
Register to Watch Window	Registers the selected devices to the Watch window.	Section 14.2
Modify Value	Changes the ON/OFF status and values of devices and labels used in the program.	Section 15.1
Debug (common function)		Reference
Start/Stop Simulation	Starts/stops simulation.	Section 15.3.1
Show Restricted Instructions	Displays a list of the instructions and devices used in the program unsupported for the simulation function.	Section 15.3.2
Sampling Trace		–
Open Sampling Trace	Executes sampling trace.	Section 15.2.1
Diagnostics (common function)		Reference
PLC Diagnostics	Diagnoses the operating status of the programmable controller CPU.	Section 17.1
Ethernet Diagnostics	Diagnoses the Ethernet.	Section 17.5
CC-Link IE Control Diagnostics	Diagnoses the CC-Link IE controller network.	Section 17.3

Diagnostics (common function)		Reference
MELSECNET Diagnostics	Diagnoses the MELSECNET/10(H).	Section 17.2
CC-Link / CC-Link/LT Diagnostics	Diagnoses the CC-Link and CC-Link/LT.	Section 17.4
System Monitor	Monitors the system status of the programmable controller CPU	Section 17.6

Tools (common function)		Reference
IC Card		—
Read IC Card	Reads data from the IC memory card.	Section 12.9.1
Write IC Card	Writes data to the IC memory card.	
Parameter Check	Checks parameters and displays errors.	Section 6.4
Options	Sets various options.	Chapter 19
System Label Setting	Sets device range to be automatically assigned to a label.	(Simple) (Structured)
Block Password	Sets a block password to data.	Section 4.8
Intelligent Function Module Parameter Check		—
Auto Refresh Duplication Check	Checks the duplication of devices set in the Auto refresh function and displays the result.	Section 4.3.6

Window (common function)		Reference
Cascade	Tiles windows in overlapping display.	Section 3.2.3
Tile Vertically	Tiles windows vertically.	
Tile Horizontally	Tiles windows horizontally.	
Arrange Icons	Arranges the icons at the bottom of the window.	
Close All	Closes all open windows.	
(Switch to Other Window)	Displays the open window.	
Window	Displays a list of open windows. Also opens or arranges specified windows.	

Help (common function)		Reference
PLC Error	Displays the explanation for each CPU error code.	Section 3.3.1
Special Relay/Register	Displays the explanation for each special relay and special register.	Section 3.3.2
Operating Manual		Section 3.3.3
GX Works2 Beginner's Manual (Simple Project)	Displays the operating manuals.	
GX Works2 Beginner's Manual (Structured Project)		
GX Works2 Operating Manual (Common)		
GX Works2 Operating Manual (Simple Project)		
GX Works2 Operating Manual (Structured Project)		
Changes from GX Developer	Displays the changes from GX Developer to GX Works2.	Section 3.3.4
Connect to MELFANSweb	Connects to the MELFANSweb website.	Section 3.3.5
About GX Works2	Displays product information such as the version.	Section 3.3.6

■ List of functions for setting labels

The following table shows the functions available for setting and editing labels.

Edit (function for label setting)		Reference
Select All	Selects all items.	(Simple) (Structured)
Expand Declaration	Expands the collapsed items.	
Collapse Declaration	Collapses the expanded items.	
New Declaration (Before)	Adds a line above the cursor position.	
New Declaration (After)	Adds a line below the cursor position.	
Delete Line	Deletes a line at the cursor position.	

■ List of functions for editing device comments

The following table shows functions available for editing device comments.

Edit (function for editing device comments)		Reference
Undo	Restores the previous processing status.	–
Redo	Restores the processing deleted with [Undo].	–
Select All	Selects all data being displayed.	–
Import from Sample Comment		–
Special Relay/Register	Utilizes sample comments of SM/SD.	Section 9.4.1
Intelligent Function Module	Utilizes sample comments of intelligent function module device.	Section 9.4.2
Clear All	Deletes all device comment data.	Section 9.3.1

■ List of functions for setting device memory

The following tables show the functions available for setting device memory.

Edit (function for setting device memory)		Reference
Paste Text	Enters a character string.	Section 7.2.3
Insert Row	Inserts a row at the cursor position.	Section 7.2
Insert Device	Enters a device.	Section 7.2.2

Find/Replace (function for setting device memory)		Reference
Find Device	Searches for a device.	Section 7.3

View (function for setting device memory)		Reference
Display Mode		–
Binary	Displays data in binary.	Section 7.2.4
Octal	Displays data in octal.	Section 7.2.4
Decimal	Displays data in decimal.	Section 7.2.4
Hexadecimal	Displays data in hexadecimal.	Section 7.2.4
Float	Displays data in real number.	Section 7.2.4
ASCII	Displays data in character string.	Section 7.2.4
Register		–
16-bit	Displays data in units of words.	Section 7.2.4
32-bit	Displays data in units of double words.	Section 7.2.4
64-bit	Displays data in units of 64 bits.	Section 7.2.4
Setup	Changes the editor size.	Section 7.2.5

Tools (function for setting device memory)		Reference
Upload Device Memory from PLC	Reads device memory data from the programmable controller CPU.	Section 7.4.1
Download Device Memory to PLC	Writes device memory data to the programmable controller CPU.	Section 7.4.1
Import from Excel File	Reads data from an Excel file.	Section 7.4.2
Export to Excel File	Writes data to an Excel file.	Section 7.4.2

■ List of functions for executing sampling trace

The following tables show the functions available for executing sampling trace.

View (function for executing sampling trace)			Reference
Result Display Position			–
	Move to Trigger Position	Displays the trigger position.	–
Switching Display Items			–
	Device	Displays/hides the display item titles.	Section 15.2.3
	Address		
	Comment		
	Data Types		
	Radix		
Timing Chart Scale			–
	Narrow Scale	Changes the display width of the timing chart scale.	Section 15.2.4
	Wide Scale		
Trend Graph Scale			–
	Narrow Scale	Changes the display width of the trend graph scale.	Section 15.2.4
	Wide Scale		
	Initial Display		
Additional Information			–
	Past Time	Displays/hides the additional information.	Section 15.2.2
	Program Name		

Debug (function for executing sampling trace)		Reference
Sampling Trace		–
Trace Settings	Displays the screen on which the sampling trace conditions are set.	Section 15.2.2
Start Trace	Starts sampling trace.	Section 15.2.4
Stop Trace	Suspends sampling trace.	–
Execute Manual Trigger	Generates a trigger at any given timing.	–
Register Trace	Writes trace settings to the programmable controller CPU. Execute this to control the sampling trace start by a sequence program. Sampling trace starts when the Trace start command (SM801) is executed after executing "Register Trace".	Section 15.2.4
Forced Execution Registration Valid	Enables to execute the sampling trace from the peripherals for the Universal model QCPUs.	
Display Trace Buffer Condition	Displays trace data storage status.	
Export CSV Data	Saves the trace data (trace settings + results) to a personal computer in CSV file format.	Section 15.2.5
Upload from PLC	Writes the sampling trace data (trace settings + results) to the programmable controller CPU.	
Download to PLC	Reads the trace data (trace settings + results) from the programmable controller CPU.	
Delete All Data	Deletes all information including the device data registered and the sampling trace result displayed on the <u>Sampling Trace</u> screen.	–

1.3.2 List of functions for editing in ladder language

The following tables show the functions available for editing with the ladder editor.

Edit (function for editing in ladder language)		Reference
Undo	Restores the previous processing status.	(Simple)
Restore after ladder conversion	Returns a ladder being edited to the last converted status.	
Insert Row	Inserts a row at the cursor position.	
Delete Row	Deletes a row at the cursor position.	
Insert Column	Inserts a column at the cursor position.	
Delete Column	Deletes a column at the cursor position.	
NOP Batch Insert	Inserts as NOP in front of the ladder block at the cursor position.	
NOP Batch Delete	Batch-deletes NOPs in the program being edited.	
Edit Line	Enters a line at the cursor position.	
Delete Line	Deletes a line at the cursor position.	
Ladder Symbol		—
Open Contact	Inserts  at the cursor position.	(Simple)
Close Contact	Inserts  at the cursor position.	
Open Branch	Inserts  at the cursor position.	
Close Branch	Inserts  at the cursor position.	
Coil	Inserts  at the cursor position.	
Application Instruction	Inserts  at the cursor position.	
Vertical Line	Inserts  at the cursor position.	
Horizontal Line	Inserts  at the cursor position.	
Delete Vertical Line	Inserts  at the cursor position.	
Delete Horizontal Line	Inserts  at the cursor position.	
Rising Pulse	Inserts  at the cursor position.	
Falling Pulse	Inserts  at the cursor position.	
Rising Pulse Branch	Inserts  at the cursor position.	
Falling Pulse Branch	Inserts  at the cursor position.	
Invert Operation Results	Inserts  at the cursor position.	
Operation Result Rising Pulse	Inserts  at the cursor position.	
Operation Result Falling Pulse	Inserts  at the cursor position.	
Edit FB Instance	Renames a FB instance name.	—
Documentation		—
Device Comment	Edits device comments.	Chapter 9
Statement	Edits statements.	(Simple)
Note	Edits notes.	
Statement/Note Batch Edit	Batch-edits the statements/notes in the program.	

Find/Replace (function for editing in ladder language)		Reference
Jump	Moves the cursor to the specified step position.	(Simple)
Find Device	Searches for a device.	
Find Instruction	Searches for an instruction.	
Replace Device	Replaces a device.	
Replace Instruction	Replaces an instruction.	
Find Contact or Coil	Searches for a contact or coil corresponds to the selected device.	
Device Batch Replace	Batch-replaces multiple devices.	
Change Open/Close Contact	Replaces an open contact with a close contact, and vice versa.	
Change Module Start I/O No.	Replaces the start module I/O number of the buffer memory address instruction.	
Switch Statement/Note Type	Changes the type (PLC/Peripheral) of a statement/note.	

Convert/Compile (function for editing in ladder language)		Reference
Ladder Conversion	Converts a program being edited.	(Simple)
Ladder Conversion (Online Change)	Converts a program and writes it online.	Section 12.8

View (function for editing in ladder language)		Reference
Comment	Displays device comments.	(Simple)
Statement	Displays statements.	
Note	Displays notes.	
Address Display	Displays the device assigned by compilation.	
Zoom	Changes the display magnification of the ladder.	
Text Size		
Bigger	Enlarges the text display size on the editing screen.	
Smaller	Reduces the text display size on the editing screen.	
Open Zoom Source SFC Block	Displays the SFC diagram of the Zoom screen.	
Open Header	Opens the setting screen for the label set for a program being edited.	

1.3.3 List of functions for editing SFC diagrams

The following tables show the functions available for editing SFC diagrams.

Edit (function for editing SFC diagrams)		Reference
Undo	Restores the previous processing status.	(Simple)
Review SFC	Redisplays the SFC diagram.	
Insert Row	Inserts a row at the cursor position.	
Delete Row	Deletes a row at the cursor position	
Insert Column	Inserts a column at the cursor position.	
Delete Column	Deletes a column at the cursor position.	
Edit Line		
Vertical Line	Inserts  at the cursor position.	
Selection Divergence	Inserts  at the cursor position.	
Simultaneous Divergence	Inserts  at the cursor position.	
Selection Convergence	Inserts  at the cursor position.	
Simultaneous Convergence	Inserts  at the cursor position.	
Delete Line	Deletes a line at the cursor position.	
SFC Step Attribute		
Normal	Sets the step attribute to Normal.	
Coil Saving	Sets the step attribute to Stored Coil.	
Action Saving - with no transition check	Sets the step attribute to Stored Operation (SE).	
Action Saving - with transition check	Sets the step attribute to Stored Operation (ST).	
Reset	Resets the step attribute.	
SFC Symbol		
Step	Inserts  at the cursor position.	
Block START Step - with END check	Inserts  at the cursor position.	
Block START Step - with no END check	Inserts  at the cursor position.	
Jump	Inserts  at the cursor position.	
END Step	Inserts  at the cursor position.	
Dummy Step	Inserts  at the cursor position.	
Transition	Inserts  at the cursor position.	
Selection Divergence	Inserts  at the cursor position.	
Simultaneous Divergence	Inserts  at the cursor position.	
Selection Convergence	Inserts  at the cursor position.	
Simultaneous Convergence	Inserts  at the cursor position.	
Vertical Line	Inserts  at the cursor position.	
SFC Step No. Sort	Sorts the SFC step/transition numbers.	
Documentation		
SFC Step/Edit Step Comment	Changes to the SFC step/transition comment entry mode.	

Find/Replace (function for editing SFC diagrams)		Reference
Jump	Moves the cursor to the specified position.	(Simple)
Replace SFC Step No.	Replaces the SFC step number.	

View (function for editing SFC diagrams)		Reference
SFC Step/Display Step Comment	Displays the SFC step/transition comments.	(Simple)
Zoom	Changes the display magnification ratio of the SFC diagram.	
Row of SFC	Sets the number of rows of SFC diagram.	
Open SFC Block List	Displays the SFC block list screen.	
Open Zoom/START Destination SFC Block	Displays the Zoom screen or the start destination block.	
Open START Source SFC Block	Displays the SFC block of the start source.	
Open Header	Opens the setting screen of labels set for the program being edited.	
Online (function for editing SFC diagrams)		Reference
Monitor		—
SFC Auto Scroll Monitor	Scrolls the screen to display active steps automatically when they are out of the screen during monitoring.	(Simple)

1.3.4 List of functions for editing SFC block list

The following tables show the functions available for editing SFC block list.

Find/Replace (function for editing SFC block list)		Reference
Jump	Moves the cursor to the specified block number.	(Simple)
Find Device	Searches for a device.	
View (function for editing SFC block list)		Reference
Display SFC Block List Comment	Displays comments of the SFC block list.	(Simple)
Address Display	Displays devices.	
Open SFC	Opens the SFC diagram.	
Open Header	Displays the label setting screen.	

1.3.5 List of functions for editing in ST language

The following tables show the functions available for editing with the ST editor.

Edit (function for editing in ST language)		Reference
Undo	Restores the previous processing status.	(Structured)
Redo	Restores the processing deleted with [Undo].	
List Operands	Displays the screen for inserting a label by selecting an existing label.	
New Label	Displays the screen for inserting a label by adding a new label setting.	
Create Template	Displays a template of argument defined for each instruction/function.	

Find/Replace (function for editing in ST language)		Reference
Bookmark		(Structured)
Toggle Bookmark	Sets a bookmark at the cursor row. The bookmark is deleted when one is already set at the cursor row.	
Next Bookmark	Displays the next bookmark position.	
Previous Bookmark	Displays the previous bookmark position.	
Delete All Bookmarks	Cancels all bookmarks.	

View (function for editing in ST language)			Reference
Zoom			(Structured)
50%	Displays the screen zoomed out to 50%.		
75%	Displays the screen zoomed out to 75%.		
100%	Displays the screen at the normal size.		
150%	Displays the screen zoomed in to 150%.		
Zoom Header/Body			
Header	Opens the label setting screen in the selected POU.		
Body	Opens the program editor in the selected POU.		
Open Header		Opens the label setting screen for the program being edited.	

Online (function for editing in ST language)		Reference
Monitor		(Structured)
Start Monitoring	Starts monitoring.	
Split Window	Starts monitoring in the split window format that displays the monitor data of numerical values and character strings.	

1.3.6 List of functions for editing in structured ladder language

The following tables show the functions available for editing with the structured ladder editor.

Edit (function for editing in structured ladder language)			Reference
Undo		Restores the previous processing status.	(Structured)
Redo		Restores the operation deleted with [Undo].	
Select Mode		Changes to the contact and coil input mode.	
Interconnect Mode		Changes to the line drawing mode.	
Auto Connect		Specifies and connects the start and end points to draw a line.	
Guided Mode			
Guided Editing	Changes to the keyboard input mode.		
Overwrite Mode	Overwrites the network element entered in Guided editing at the cursor position.		
Insert Mode	Inserts the network element entered in Guided editing at the cursor position.		
Line Mode	Changes the input format to draw lines in Guided editing.		
Auto Comment	Adds a comment entry field at the start of the network added in Guided editing.		
Recalculate Line		Arranges a line automatically to redraw it.	
Insert Row		Inserts a row in a ladder being edited.	
Insert Column		Inserts a column in a ladder being edited.	
New Network			
Top	Inserts a new network at the start of all networks.		
Before	Inserts a new network in front of a network being edited.		
After	Inserts a new network after a network being edited.		
Bottom	Inserts a new network at the end of all networks.		
Network Elements			
Contact	Inserts  at the cursor position.		
Contact Negation	Inserts  at the cursor position.		
Coil	Inserts  at the cursor position.		
Jump	Inserts  at the cursor position.		
Return	Inserts  at the cursor position.		
L-Connect Contact	Inserts  at the cursor position.		
L-Connect Contact Negation	Inserts  at the cursor position.		
Input Variable	Inserts  at the cursor position.		
Output Variable	Inserts  at the cursor position.		
Horizontal Line	Inserts  at the cursor position.		
Vertical Line	Inserts  at the cursor position.		
Comment	Inserts a comment entry field at the cursor position.		
Network Label	Displays the <u>Network Header</u> screen.		

Edit (function for editing in structured ladder language)			Reference
List Operands		Displays the screen for inserting a label by selecting an existing label.	(Structured)
New Label		Displays the screen for inserting a label by adding a new label setting.	
Number of Pins			
Increment	Adds the number of arguments of functions and function blocks.		
Decrement	Deletes the number of arguments of functions and function blocks.		
Network List		Displays a list of networks in a program.	
Signal Configuration			
Configure	Sets the type of a contact and a coil.		
Toggle	Changes the contact and coil type per execution in the following order. • Contact → Contact negation • Coil → Reversal coil → Set → Reset		

View (function for editing in structured ladder language)			Reference
View Mode			(Structured)
Label	Displays a variable by its entered format.		
Device	Displays a device/address in device format. The variable is displayed as an assigned device in device format.		
Address	Displays a device/address in address format. The variable is displayed as an assigned device in address format.		
Comment	Displays a label comment.		
Change Display Label-Device-Address	Switches the display format in order (label, device, address).		
Change Display Label-Comment	Switches the display between label and comment.		
Grid	Shows a grid on the screen being edited to display the start/end positions of a line.		
Zoom			
50%	Displays the screen zoomed out to 50%.		
75%	Displays the screen zoomed out to 75%.		
100%	Displays the screen at the normal size.		
150%	Displays the screen zoomed in to 150%.		
Zoom Header/Body			
Header	Opens the label setting screen in the selected POU.		
Body	Opens the program editor in the selected POU.		
Open Header	Opens the label setting screen for a program being edited.		



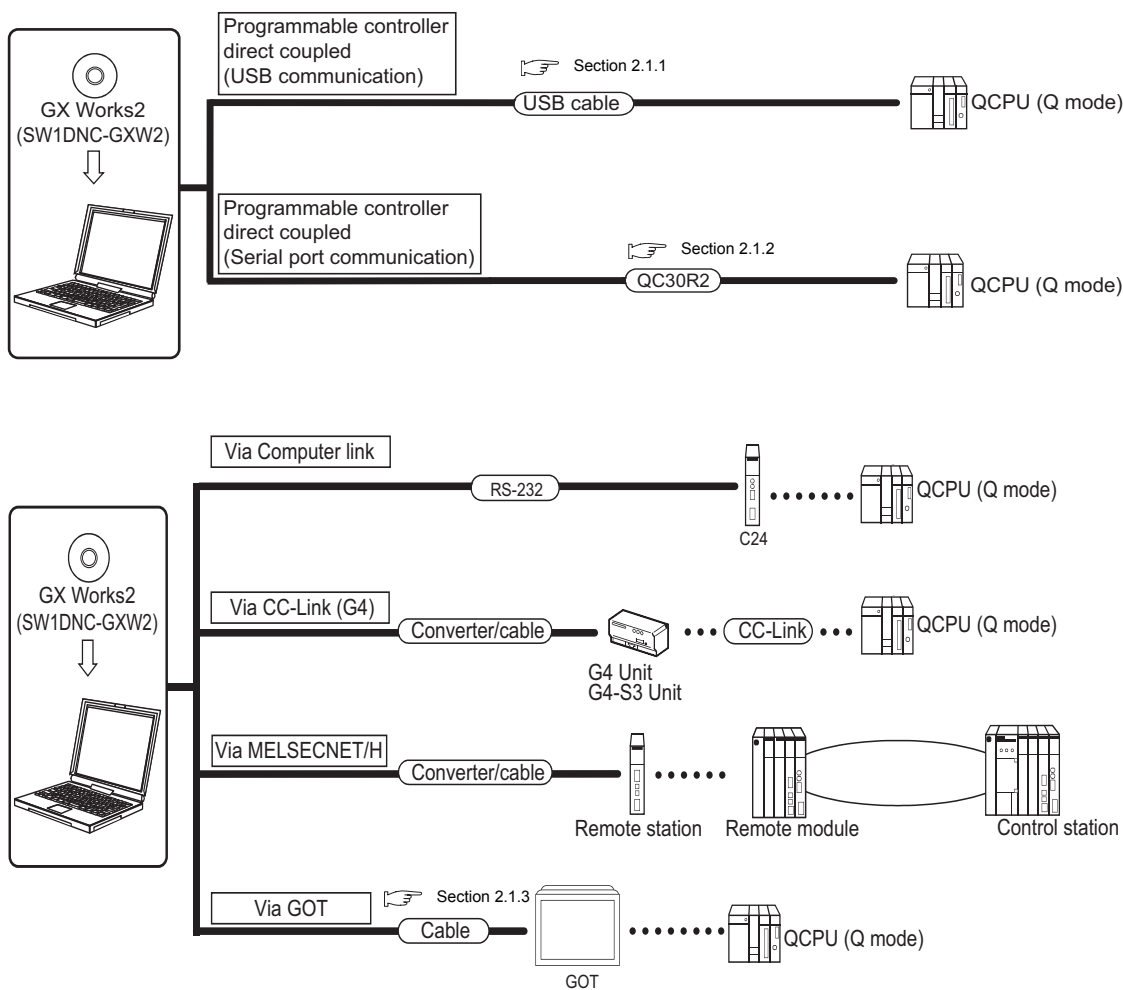
2 SYSTEM CONFIGURATION

This chapter explains the system configuration, configuration devices, and supported languages of GX Works2.

2.1	Connection from USB/Serial Port	2-2
2.2	Connection from I/F Boards	2-5
2.3	Interfaces and Connectable Modules	2-7
2.4	System Configuration with Memory Card in Personal Computer	2-9
2.5	Supported Programming Languages	2-10

2.1 Connection from USB/Serial Port

The following shows the possible system configuration for connecting to the programmable controller CPU using the serial port of a personal computer.



2.1.1 USB cables (compatible with QCPU (Q mode))



The following table shows USB cables and USB adaptors whose operations have been confirmed by Mitsubishi Electric.

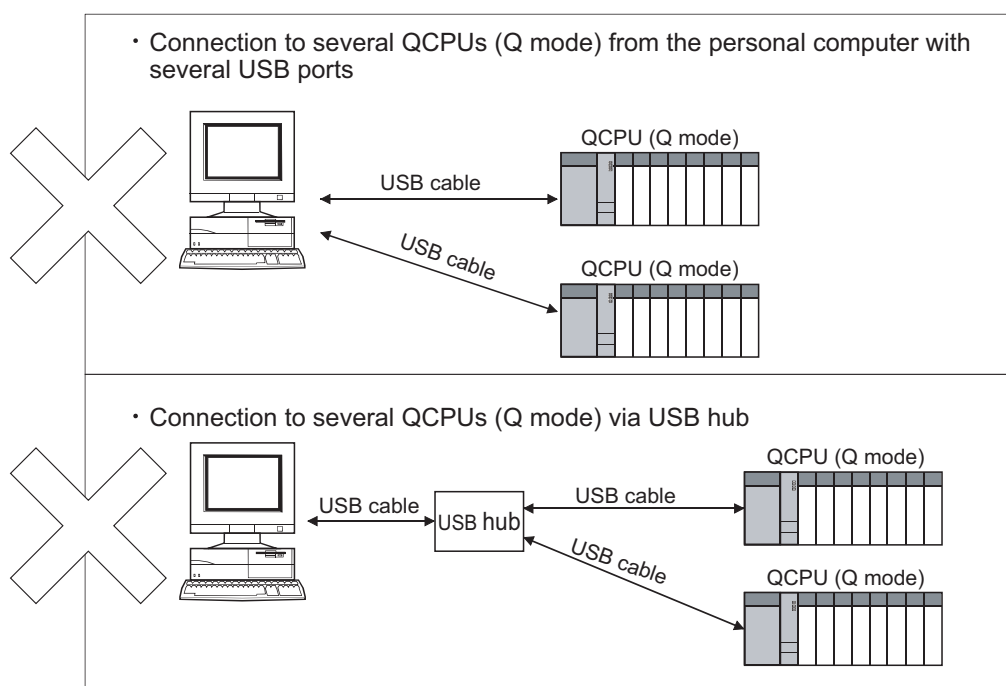
Table 2.1.1-1

Product name	Model name	Maker name
USB cable (USB A type - USB B type)	USB2-30	ELECOM Co., Ltd.
	AU2-30	BUFFALO KOKUYO SUPPLY INC.
USB cable (USB A type - USB miniB type)*1	KU-AMB530	SANWA SUPPLY INC.
	USB-M53	ELECOM Co., Ltd.
	MR-J3USBCBL3M	Mitsubishi Electric Corporation
	GT09-C30USB-5P	Mitsubishi Electric System & Service Co., Ltd.

*1 : Universal model QCPU only

Only one programmable controller CPU can be connected to a personal computer using a USB cable. Connection to a programmable controller CPU is not applicable in the configuration examples below.

<Not applicable configurations>



Point

- **Using a USB cable for the first time**
Install the USB driver. (☞ GX Works2 Installation Instructions)
- **Precautions and restrictions**
For precautions and restrictions when accessing a programmable controller CPU, refer to Section 11.9.

2.1.2 RS-232 cables (compatible with QCPU (Q mode))



The following table shows RS-232 cables whose operations have been confirmed at Mitsubishi Electric.

Table 2.1.2-1

Model name	Maker name
QC30R2 (Personal computer connector: 9-pin D-sub connector) 	Mitsubishi Electric Corporation RS-232 cable

Point

- **High-speed communication**

For high-speed communication (transmission speed: 115.2/57.6kbps), use a personal computer compatible with high-speed communication.

When a communication error occurs, retry the communication after reducing the transmission speed setting.

2.1.3 Connection via GOT



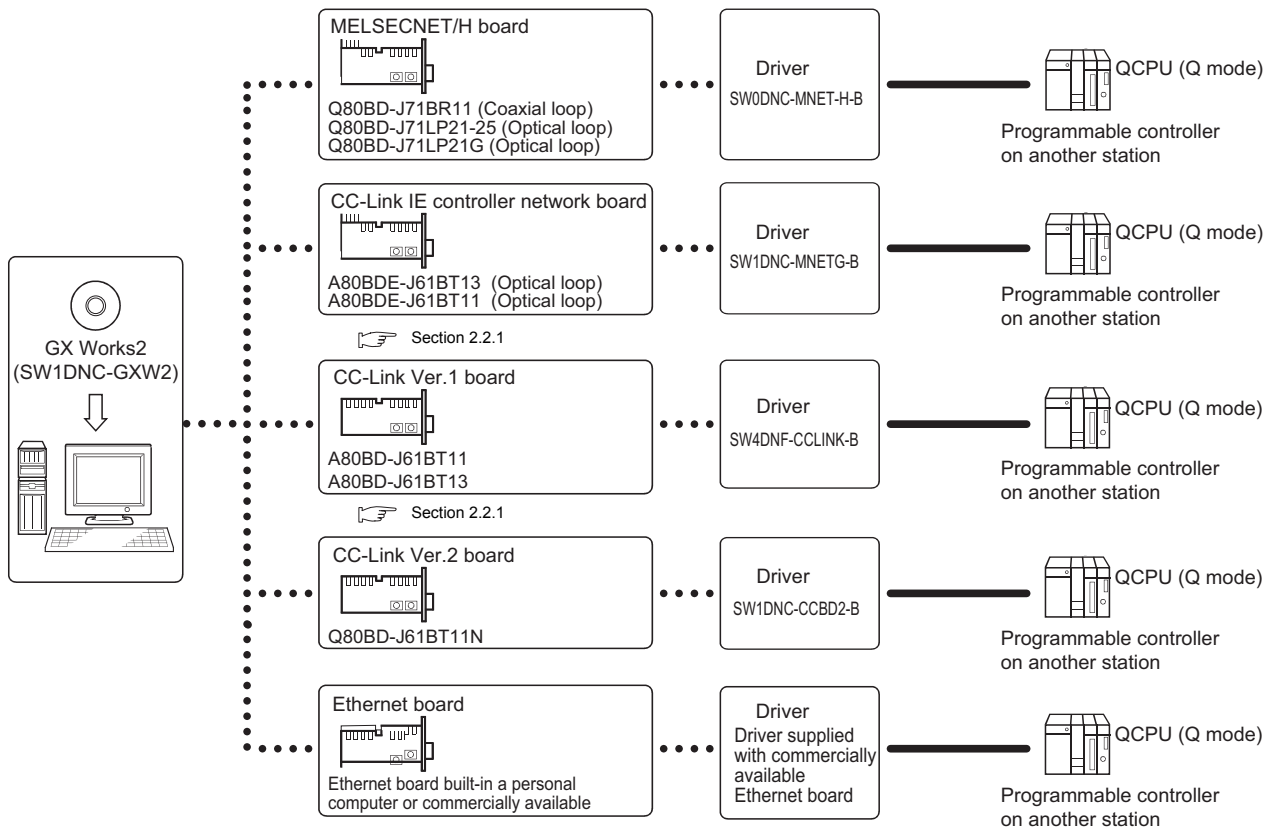
The use of the transparent function of GOT enables the access to a programmable controller CPU via GOT. (☞ Section 11.8)

2.2 Connection from I/F Boards



The following shows the system configuration for connecting to a programmable controller CPU using an I/F board mounted on the personal computer.

For the methods for mounting an I/F board and installing the driver, refer to the manual of each I/F board.



2.2.1 I/F boards

This section explains applications of I/F boards.
For details, refer to the manual of each I/F board.

■ CC-Link Ver.1 board (A80BD-J61BT11, A80BD-J61BT13)

- The A80BD-J61BT11 can be used as a master or local station.
- The A80BD-J61BT13 can be used as a local station.

■ CC-Link Ver.2 board (Q80BD-J61BT11N)

The Q80BD-J61BT11N can be used as a master or local station.

2.3 Interfaces and Connectable Modules



This section explains details of the modules that can be connected from the USB port, serial port, and each I/F board.

■ Modules connectable from USB port

The following table shows the modules that can be connected from the USB port.

Table 2.3-1

Programmable controller series	Module name	Module model
Q series	Programmable controller CPU module	Q02(H), Q02U, Q03UD, Q03UDE, Q04UDH, Q04UDEH, Q06H, Q06UDH, Q06UDEH, Q12H, Q13UDH, Q13UDEH, Q25H, Q26UDH, and Q26UDEH

■ Modules connectable from serial port

The following table shows the modules that can be connected from the serial port.

Table 2.3-2

Programmable controller series	Module name	Module model
Q series	Programmable controller CPU module	Q02(H), Q02U, Q03UD, Q04UDH, Q06H, Q06UDH, Q12H, Q13UDH, Q25H, and Q26UDH
	Serial communication module*3	QJ71C24, QJ71C24-R2, QJ71C24N, and QJ71C24N-R2
	MELSECNET/H network remote I/O module	QJ72LP25 and QJ72BR15
	G4-S3 module	AJ65BT-G4-S3

*1 : When accessing the programmable computer CPU from a personal computer via the serial communication module (for Q series), note that modules that can be connected to the personal computer are limited.

If the module cannot be directly connected to the personal computer, it may be usable as the nth module in multi-dropped connection.

Table 2.3-3

Model	Interface		1:1 system configuration	Multi-dropped connection	
				1st module	nth module
QJ71C24N QJ71C24	CH1	RS-232	○	○	×
	CH2	RS-422/485	×	×	○
QJ71C24N-R2 QJ71C24-R2	CH1	RS-232	○	×	×
	CH2	RS-232	○ (Function version B or later)	×	×
QJ71C24N-R4	CH1	RS-422/485	×	×	×
	CH2	RS-422/485	×	×	×

○: Connectable ×: Not connectable

■ Modules connectable from MELSECNET/H board

The following table shows the modules that can be connected from the MELSECNET/H board.

Table 2.3-4

I/F board model	Programmable controller series	Module model
Q80BD-J71LP21-25 Q80BD-J71LP21G Q80BD-J71BR11	Q series	QJ71LP21, QJ71LP21G, QJ71BR11, QJ71LP21-25, and QJ71LP21S-25

■ Modules connectable from CC-Link IE controller network board

The following table shows the modules that can be connected from the CC-Link IE controller network board.

Table 2.3-5

I/F board model	Programmable controller series	Module model
Q80BD-J71GP21-SX Q80BD-J71GP21S-SX	Q series	QJ71GP21-SX and QJ71GP21S-SX

■ Modules connectable from CC-Link Ver.1 board

The following table shows the modules that can be connected from the CC-Link Ver.1 board.

Table 2.3-6

I/F board model	Programmable controller series	Module model
A80BD-J61BT11 A80BD-J61BT13	Q series	QJ61BT11 and QJ61BT11N

■ Modules connectable from the CC-Link Ver.2 board

The following table shows the modules that can be connected from the CC-Link Ver.2 board.

Table 2.3-7

I/F board model	Programmable controller series	Module model
Q80BD-J61BT11N	Q series	QJ61BT11 and QJ61BT11N

■ Modules connectable from Ethernet board

The following table shows the modules that can be connected from the Ethernet board.

Table 2.3-8

I/F board model	Programmable controller series	Module model
Ethernet board built-in a personal computer or commercially available	Q series	QJ71E71, QJ71E71-B2, QJ71E71-100, QJ71E71-B5, Q03UDE, Q04UDEH, Q06UDEH, Q13UDEH, and Q26UDEH

2.4 System Configuration with Memory Card in Personal Computer

QCPU



This section explains the system configuration when accessing from the personal computer with the memory card in the PC card slot.

● Loading memory card into PC card slot

When loading a Q series memory card into the PC card slot, the following adaptor is required.

Product name	Model name	Manufacture name
PC card adaptor	Q2MEM-ADP	Mitsubishi Electric Corporation

● Writing/reading data to/from memory card

Using the following function, even if a memory card cannot be loaded into the programmable controller CPU, data can be written or read by loading the memory card to personal computer directly.

Function	Memory card	Windows®2000	Windows®XP	Reference
IC memory card data write/read	SRAM card*1	×	×	Section12.9.1
	ATA card	○	○	
	Flash card	×	×	

○: Possible ×: Not possible

*1 : When using a SRAM card, set the driver to CONFIG.NT.

(For details, refer to HELP of Windows®)

When using an ATA card, Windows® recognizes it automatically.

If the ATA card cannot be recognized, select [Control Panel] ⇒ [System] to set the personal computer.

If the driver for SRAM card is set to CONFIG.NT, cancel the setting.

2.5 Supported Programming Languages

QCPU



This section explains details of the programming languages supported in GX Works2.

Table 2.5-1 Programming languages and supported projects

Programming language	Description	Simple project	Structured project
Ladder	A graphic language using ladders composed of contacts and coils. Can be operated in a similar way to existing GX Developer.	○	○
ST	A text language with grammatical structure similar to C language.	×	○
SFC	A graphic language which defines the executing order or condition of a program	○	○
Structured ladder	A graphic language using ladders composed of contacts and coils.	×	○

○: Supported ×: Not supported



3 SCREEN CONFIGURATION AND BASIC OPERATIONS

This chapter explains the screen configuration and basic operations of GX Works2.

3.1	Starting and Exiting GX Works2.	3-2
3.2	Screen Configuration and Basic Operations	3-3
3.3	Help Function	3-22

3.1 Starting and Exiting GX Works2

QCPU



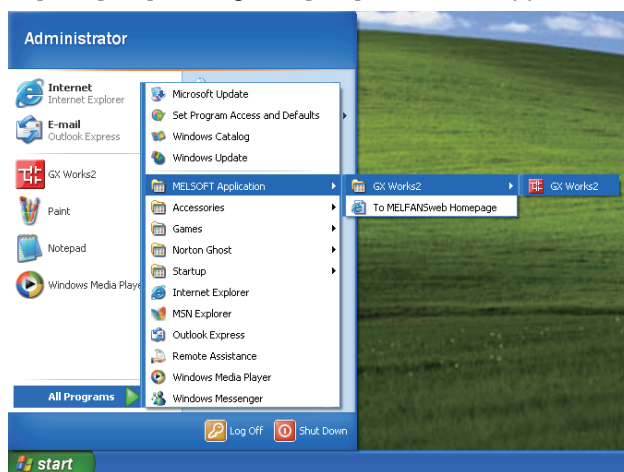
This section explains the operation methods for starting and exiting GX Works2.

Starting up

Starting up GX Works2

Operating procedure

Select [Start] ⇒ [All Programs] ⇒ [MELSOFT Application] ⇒ [GX Works2].



Point

● GX Works2 Startup

When the installation of GX Works2 is completed, the startup process is added in order to optimize GX Works2 under [Start] ⇒ [All Programs] ⇒ [Startup] ⇒ [GX Works2 Startup].
GX Works2 does not start by selecting the above procedure.

Exiting

Exiting GX Works2

Operating procedure

Select [Project] ⇒ [Quit].

3.2 Screen Configuration and Basic Operations

QCPU

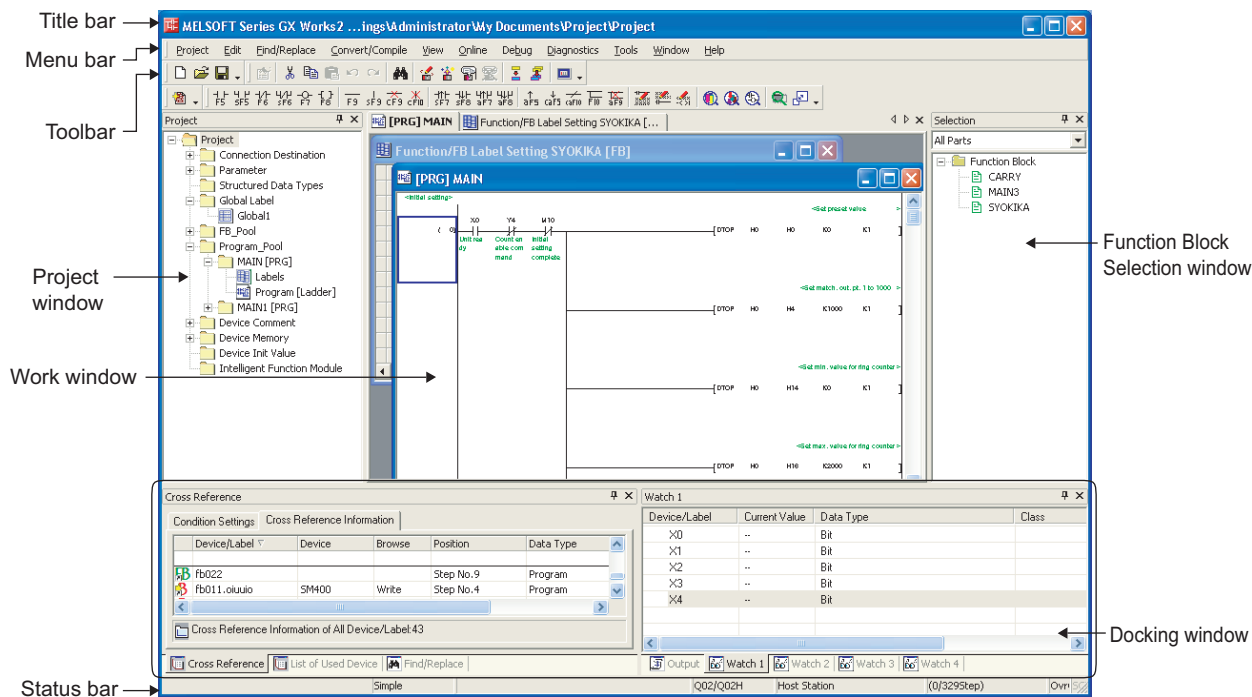


This section explains the main frame (basic screen) of GX Works2 that is displayed when it is started up.

3.2.1 Main frame configuration

The following shows the configuration of the main frame.

Screen display



Display contents

Name	Description	Reference
Title bar	Displays a project name.	—
Menu bar	Displays menu options for executing each function.	—
Toolbar	Displays tool buttons for executing each function.	Section 3.2.2
Work window	A main screen used for operations such as programming, parameter setting, and monitoring	Section 3.2.3

3 SCREEN CONFIGURATION AND BASIC OPERATIONS

Name	Description	Reference
Docking window	A sub screen to support operations performed on a work window	Section 3.2.4
Project window	Displays contents of a project in tree format.	Section 3.2.5
Function Block Selection window	Displays a list of functions (such as function blocks) used for programming.	GX Works2 Version1 Operating Manual (Simple Project) (Structured Project)
Output window	Displays compilation and check results (errors and warnings).	
Cross Reference window	Displays cross reference results.	Section 10.2
List of Used Device window	Displays the device usage list.	Section 10.3
Watch window 1 to 4	A screen used for monitoring and changing current device values.	Section 14.2
Find/Replace window	A screen used for searching and replacing character strings in the project.	Section 10.1
Status bar	Displays information about a project being edited.	Section 3.2.6

3.2.2 Toolbars

A toolbar is a block of on-screen buttons for executing frequently-used functions included in a menu.
(Appendix 1)
The toolbars to be displayed and their display positions in the screen can be set by the user.

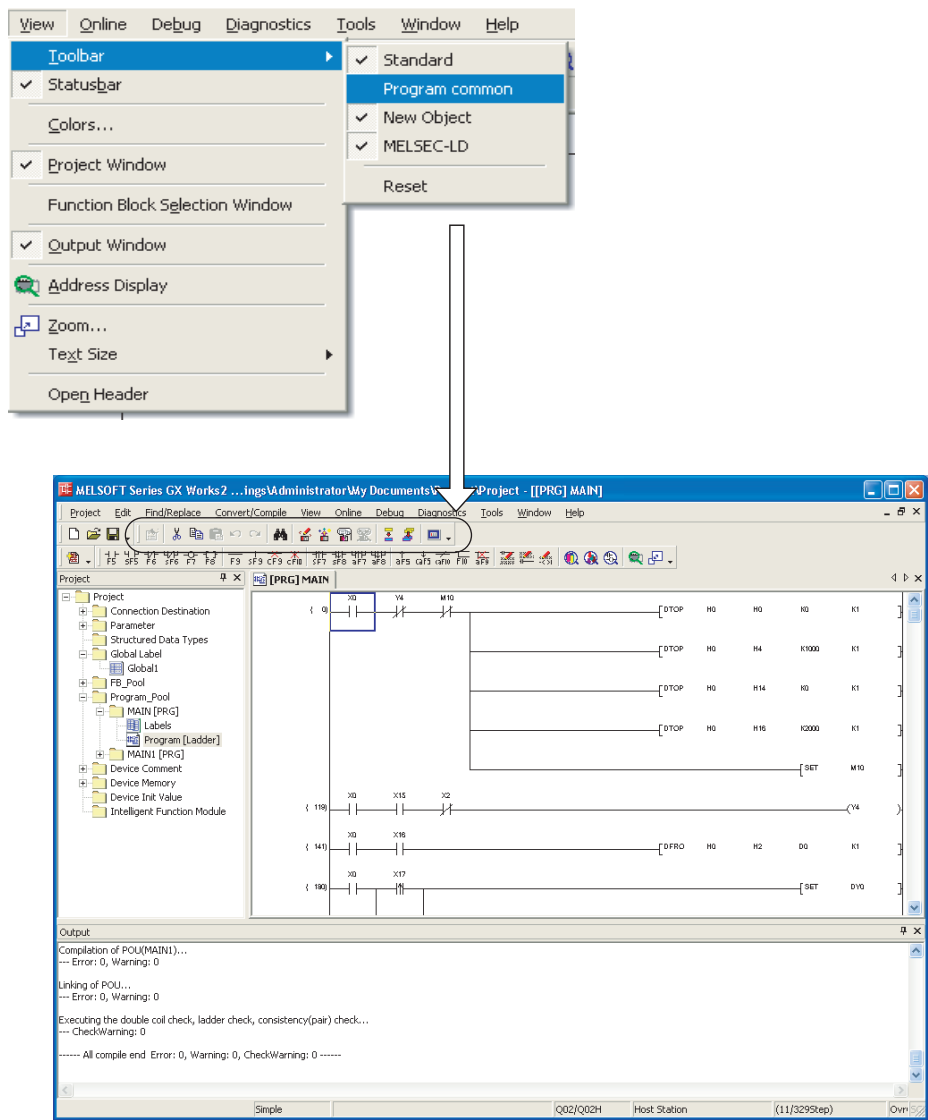
■ Displaying/hiding toolbars

This function selects a toolbar to be displayed.

Operating procedure

1. Select [View] ⇒ [Toolbar] ⇒ [(Toolbar name)].

The selected toolbar is displayed in the screen.



■ Docking/floating toolbars

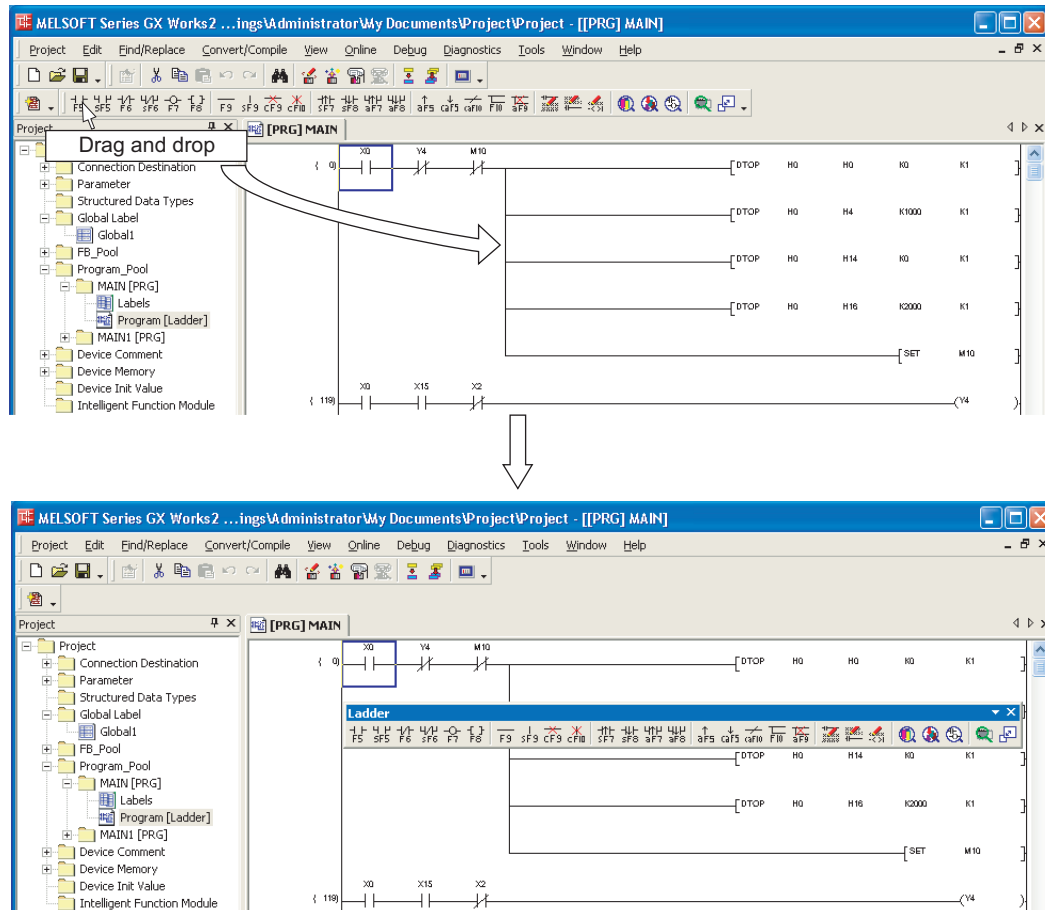
This function switches the display format (docking/floating) of a toolbar.

● Floating a toolbar

Displays a toolbar floating from the main frame.

Operation

- Drag a docked toolbar to the desired position for floating display.

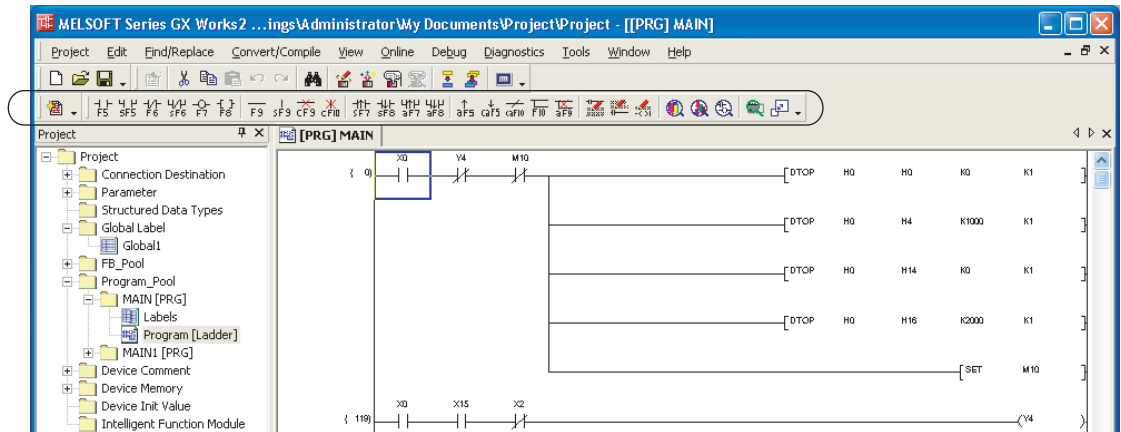
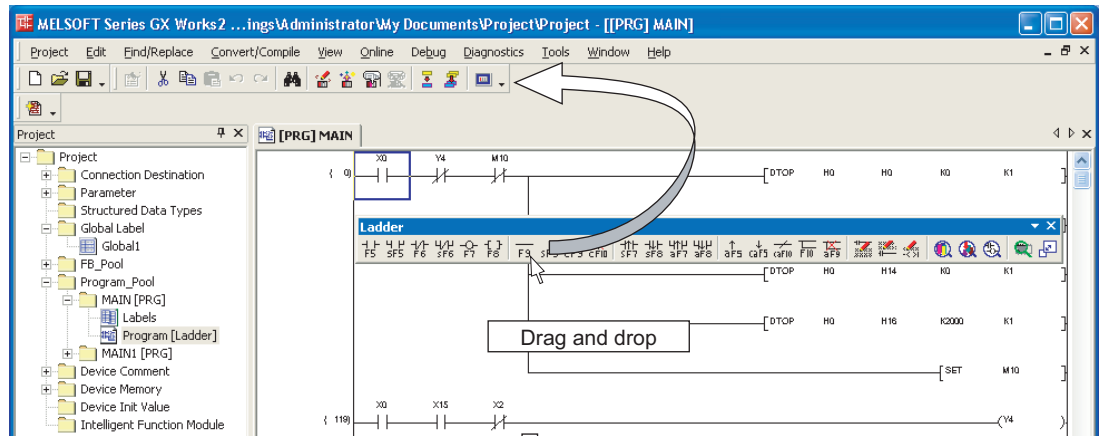


● Docking a toolbar

Displays a toolbar docked to the main frame.

Operation

- Drag the title bar of a floating toolbar and drop it in the main frame.



Point

● Method for docking a toolbar at the original position

To dock a floating toolbar back at the original position, double click on the title bar of the toolbar.

1 OVERVIEW

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3 SCREEN CONFIGURATION AND BASIC OPERATIONS

4 PROJECT MANAGEMENT

5 EDITING PROGRAMS

6 SETTING PARAMETERS

7 SETTING DEVICE MEMORY

8 SETTING DEVICE INITIAL VALUES

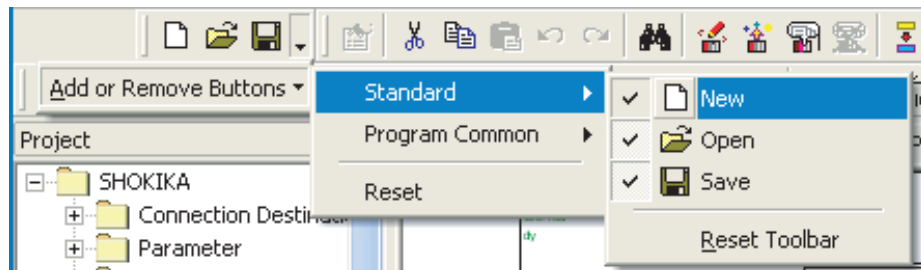
■ Customizing toolbars

This function sets the types of tool buttons to be displayed in each toolbar.

Operating procedure

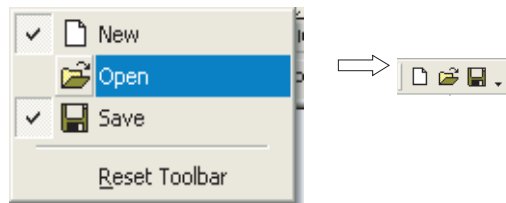
1. Select the Toolbar options button (▼) ⇒ [Add or Remove Buttons].

A list of tool buttons is displayed.



2. Check the check box in front of the tool button to be displayed in the screen.

The checked tool buttons are displayed in the screen.

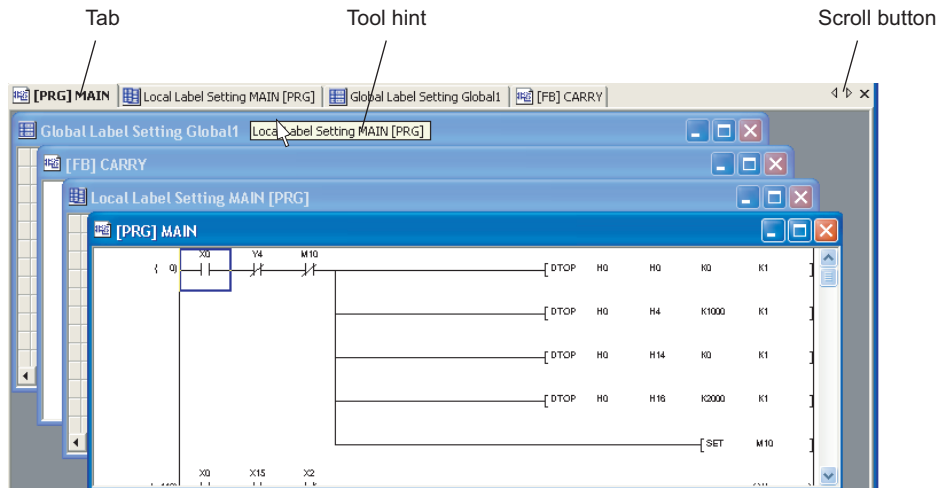


The toolbar configuration returns to the default when [Reset Toolbar] is selected.

3.2.3 Work windows

A work window is a main screen used for operations such as programming, parameter setting, and monitoring in GX Works2.

Screen display



Display contents

Item	Description
Tab	Becomes active when selected. The tab order can be changed by dragging and dropping tabs.
Tool hint	Displays a brief explanation when the cursor is moved onto the selected tab.
Scroll button	Scrolls the tab display to the left and right. Displays hidden tabs.
Display windows	Displays screens such as the program editing screen, label setting screen, and monitoring screen.

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8	SETTING DEVICE INITIAL VALUES

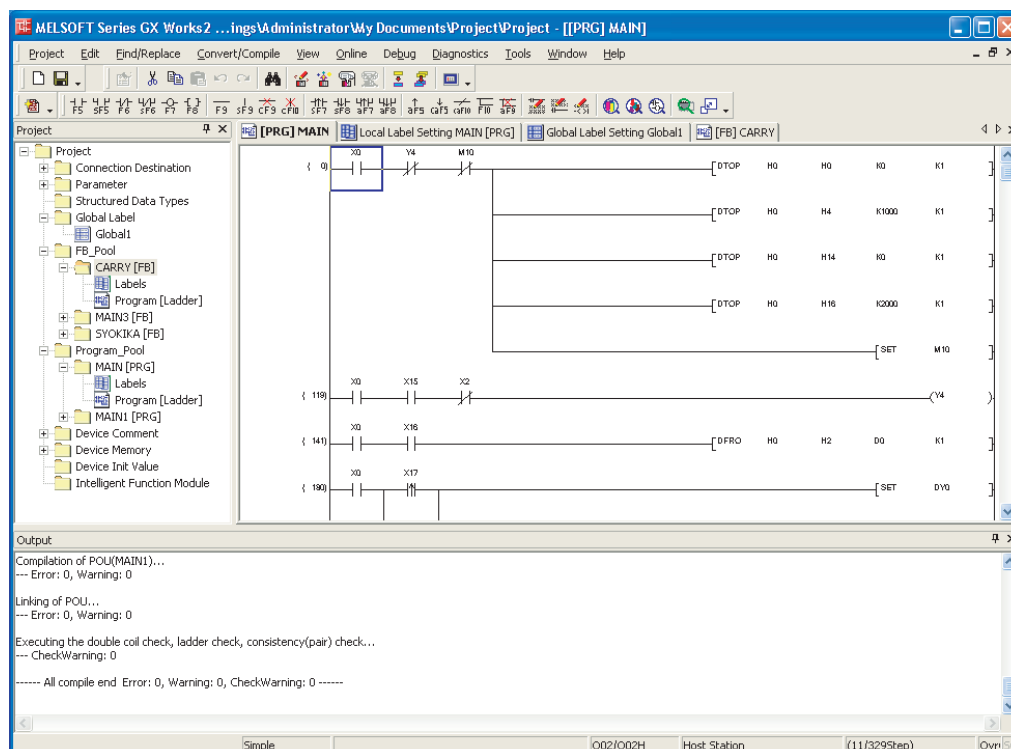
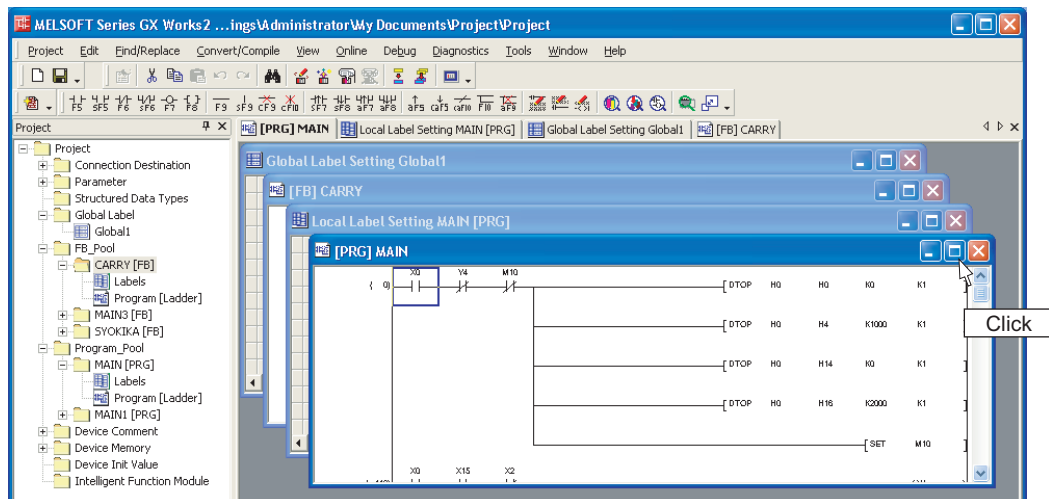
■ Maximizing/minimizing screens

This function maximizes/minimizes the screen size in the work window.

- Maximizing the screen

Operation

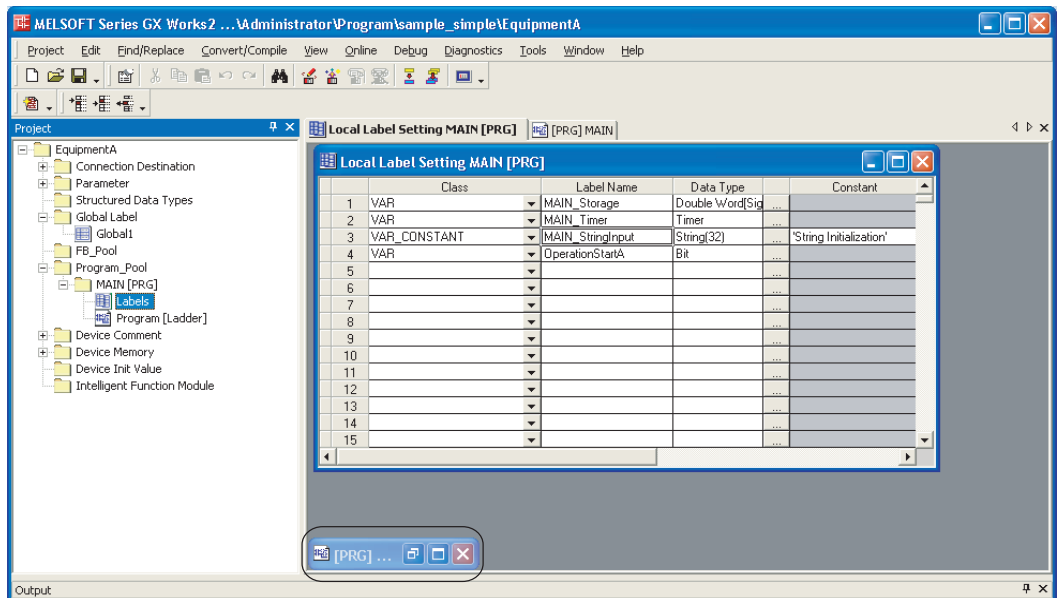
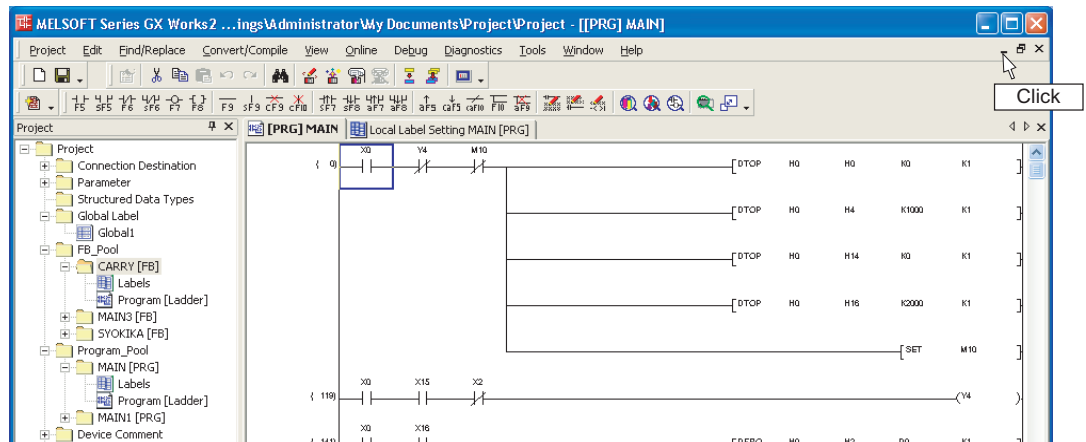
- Click the Maximize button ().



● Minimizing the screen

Operation

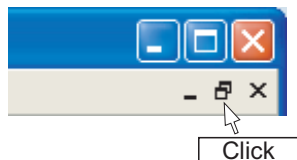
- Click the Minimize button ().



Point

● Restoring the screen size

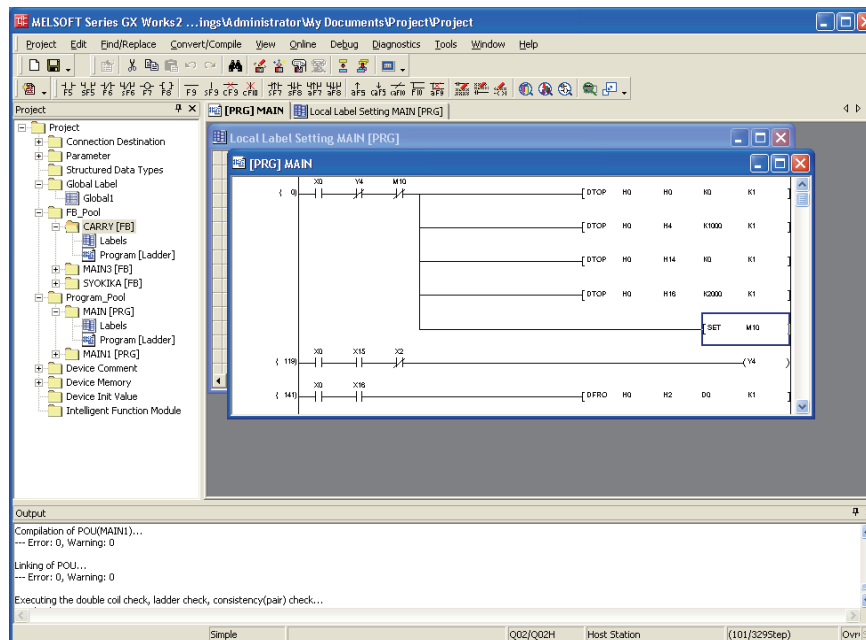
Click  to return the maximized/minimized screen to its previous size.



This function arranges screens for display in the work window.

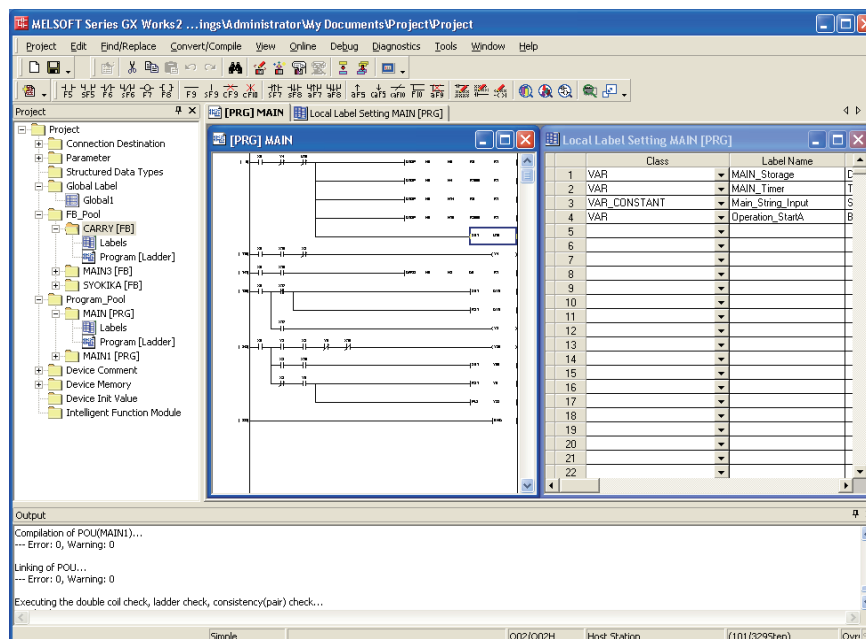
- Cascading screens

Select [Window] $\Rightarrow$ [Cascade].



- Tiling screens vertically

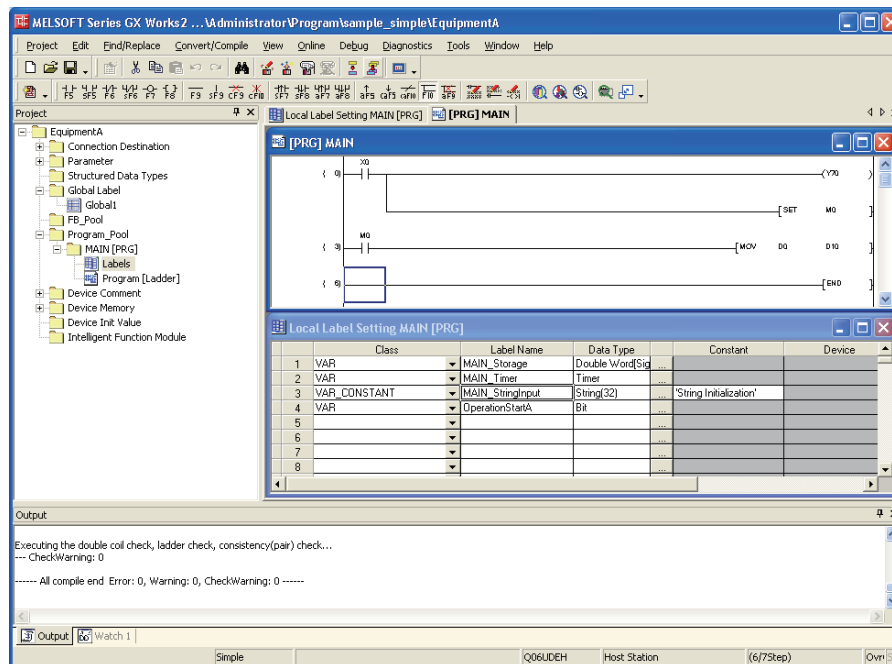
Select [Window] $\Rightarrow$ [Tile Vertically].



- Tiling screens horizontally

Operation

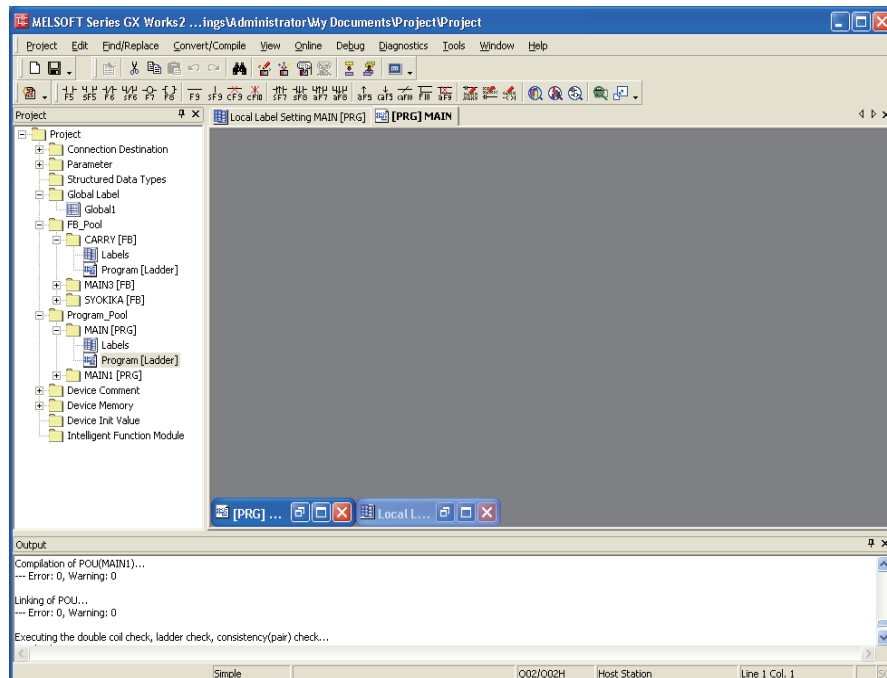
Select [Window] ⇒ [Tile Horizontally].



- Arranging icons (minimized windows) at the bottom of the work window

Operation

Select [Window] ⇒ [Arrange Icons].

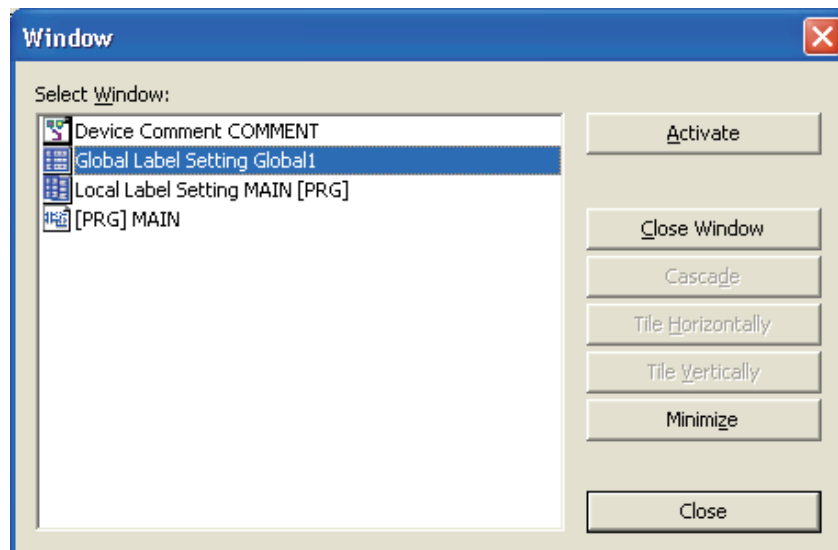
1
OVERVIEW2
SYSTEM
CONFIGURATION3
SCREEN
CONFIGURATION AND
BASIC OPERATIONS4
PROJECT
MANAGEMENT5
EDITING
PROGRAMS6
SETTING
PARAMETERS7
SETTING DEVICE
MEMORY8
SETTING DEVICE
INITIAL VALUES

■ Arranging/displaying windows

This function displays a list of open windows, and also opens and arranges specified windows. This function is useful to display the desired window efficiently when multiple windows are open.

Screen display

Select [Window] ⇒ [Window].



3.2.4 Docking windows

This section explains the operations common to docking windows.

■ Displaying/Hiding docking windows

This function displays/hides a docking window.

Operating procedure

- Select [View] ⇒ [Docking Window] ⇒ [(Target item)].

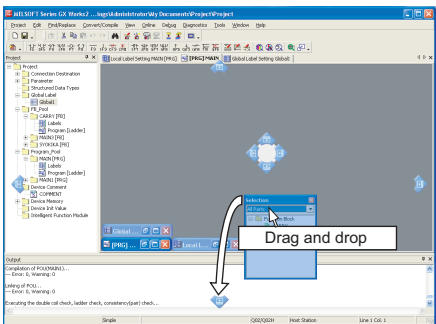
■ Docking/floating docking windows

This function switches the display format of a docking window.

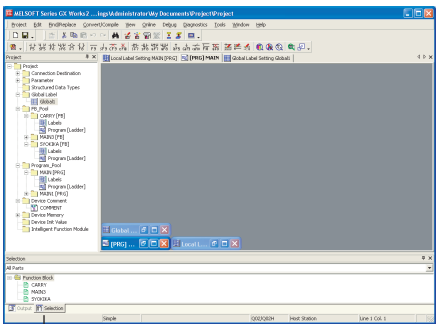
- Docking display
Displays a docking window docked to the main frame.
- Floating display
Displays a docking window floating from the main frame.

Operation

- Drag the title bar of a floating docking window and drop it to the guidance in the main frame.



Drag the docking window to the guidance.



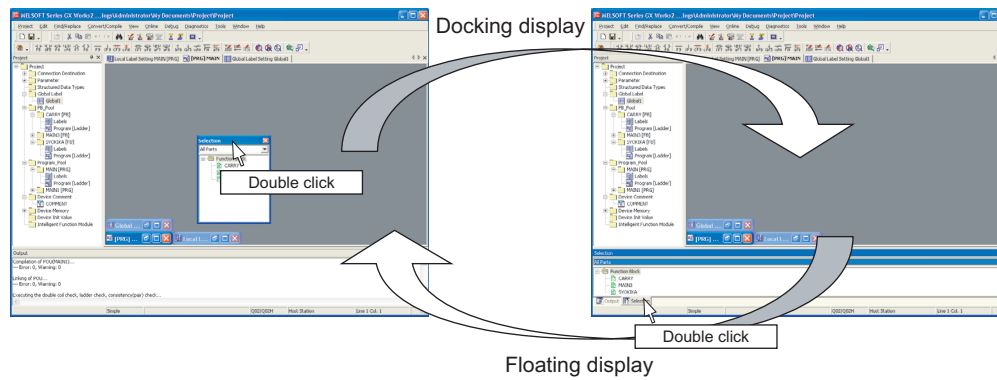
A new tab appears after the window is docked.

The docked window is floated by dragging the title bar to the desired position.

Point

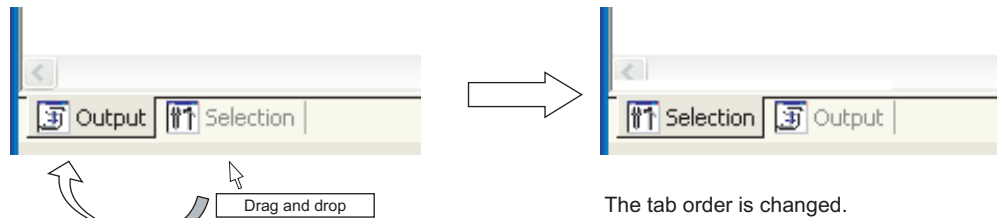
● Operation of docking windows

Docked windows can be switched from docking to floating or vice versa by double-clicking the title bar.



● Changing the tab order

The tab order can be changed by dragging and dropping the desired tab to the left or right when multiple docking windows are docked.

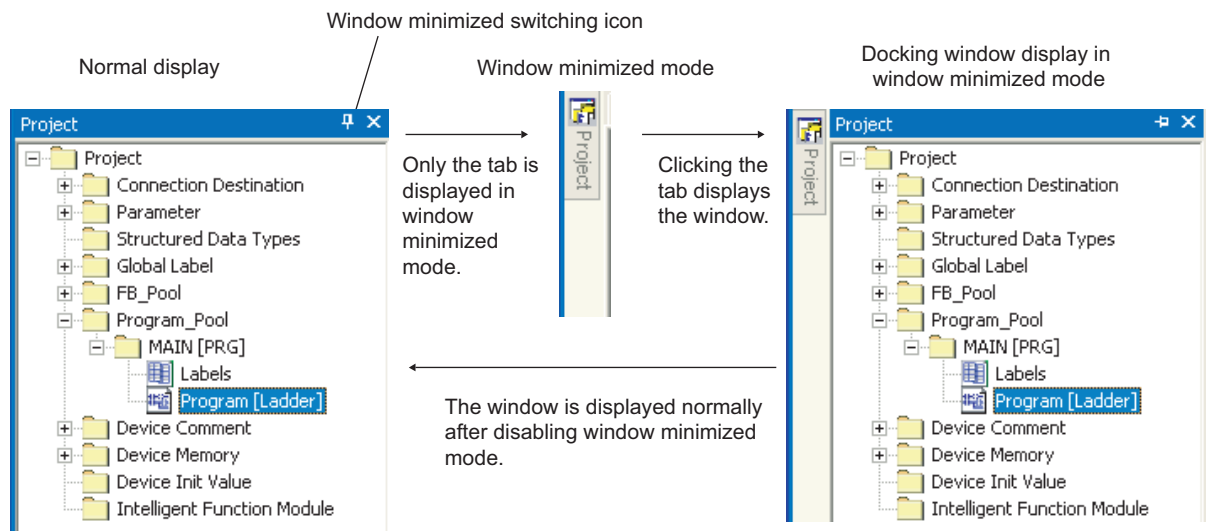


■ Window minimized mode

This function displays a docking window as a tab.
The following procedure is used to set or disable the window minimized mode.

Operating procedure

- Click the window minimized switching icon ( / ).



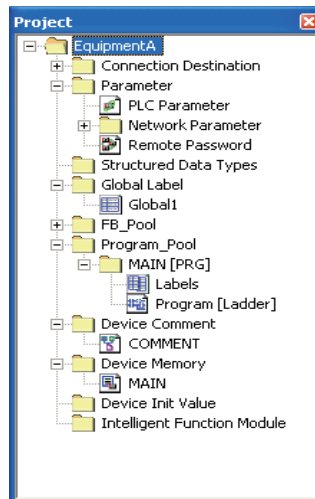
3.2.5 Project window

This section explains the Project window that displays the contents of a project in tree format. Operations such as creating new data or displaying editing screens can be performed in the Project window.

( Chapter 4)

Screen display

Select [View] ⇒ [Docking Window] ⇒ [Project Window].



■ Sorting data

This function sorts data displayed in tree format.

Operating procedure

1. Open a folder in the Project window and select the data for sorting.
2. Right-click and select [Sort] ⇒ [(Sort type)] from the shortcut menu.

The data displayed in tree format are sorted in the ascending order.

When the same operation is performed after sort execution, the sort order is switched between ascending and descending.

The following table shows the sort types.

Table 3.2.5-1 Sort types for tree

Type	Description
Name	Sorts the data in the selected folder according to the name.
Date	Sorts the data in the selected folder according to the update date.
Language	Sorts the data in the selected folder according to the programming language type.
POU Type (Structured projects only)	Sorts the data in the selected folder according to the POU type.

3.2.6 Status bar

The status bar displays information about the current project at the bottom of the screen.

Simple	mitsubishi taro	Q02/Q02H	Host station	(0/1Step)	Overwrite	CAP	NUM	SCRL

Project type	Security information	Programmable controller type	Connection target	Cursor position	Insert/Overwrite	Caps Lock	Num Lock	Scroll Lock

The following shows the information to be displayed.

Item	Description
Project type	Displays the project type. • Unlabeled : Simple project that does not use labels • Simple : Simple project that uses labels • Structured : Structured project
Security information	Displays the login user name when security is set for the project.
Programmable controller type	Displays the programmable controller type of the project.
Connection target	Displays the setting contents of Transfer setup.
Cursor position	Displays the cursor position in the editing screen.
Insert/Overwrite	Displays the current mode (insert or overwrite).
Caps Lock	Displays the effective status of the Caps Lock.
Num Lock	Displays the effective status of the Num Lock.
Scroll Lock	Displays the effective status of the Scroll Lock.

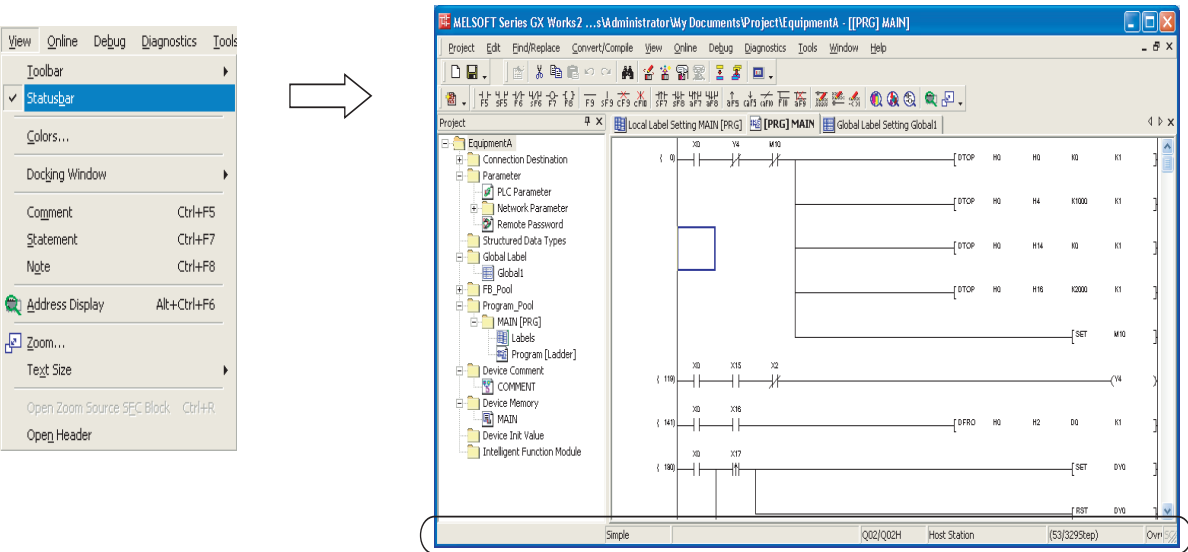
■ Displaying/hiding status bar

This function displays/hides the status bar.

Operating procedure

- Select [View] ⇒ [Statusbar].

A check mark is appended in front of the menu option and the status bar is displayed on the screen.



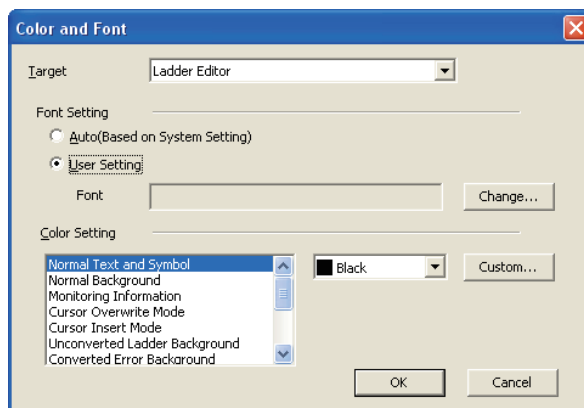
1	OVERVIEW
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3.2.7 Changing colors and fonts

This section explains the method for changing the color and font settings for each program editor and label editor.

Screen display

Select [View] ⇒ [Colors].



Operating procedure

1. Set the items on the screen.

Item	Description
Target	Select the change target work window.
Font Setting	Change font settings.
Auto (Based on System Setting)	Select this to use the font settings in Windows®.
User Setting	Select this to customize the font settings. Click the Change... button to select the desired font.
Color Setting	Select the change target item and color.

2. Click the **OK** button.

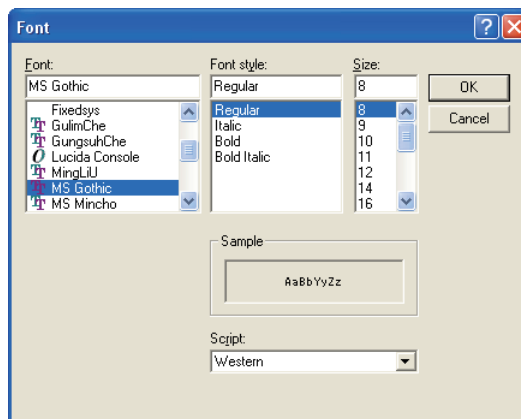
Screen button

● **Change...**

Displays the **Font** screen.

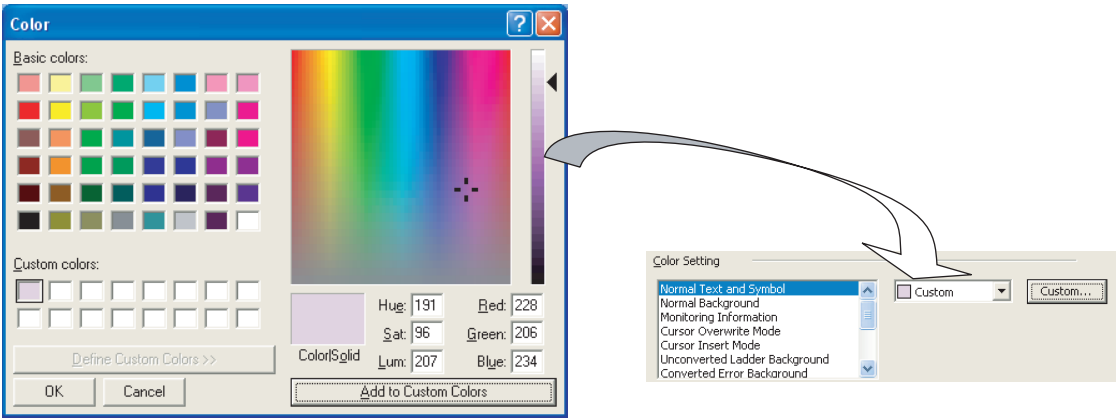
The font type, style, and size can be customized.

Some font styles and sizes, however, cannot be set depending on target work windows.



● **Customs...**

Displays the Color screen.
The color can be customized. The created color is added as "Custom" in the color selection field of the Color and Font screen.



Point

- **Font setting**
Some fonts may be displayed as garbled characters.
Change the setting to another font if this happens.

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3.3 Help Function

QCPU

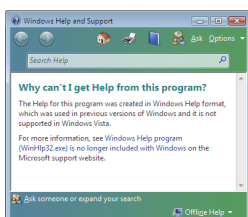


This section explains the method for checking the contents of CPU errors and special relays/registers.

Point

For Windows Vista®, there is the case that the "Windows Help and Support" screen as shown below is displayed and the HELP screen cannot be displayed when HELP is started.

In this case, follow the procedure below to install "WinHlp32.exe", as this is necessary to use HELP function.
(Note: It is necessary to connect the personal computer to the internet when performing this operation.)



- (1) Select [Help] ⇒ [PLC Error].
- (2) The screen shown on the left is displayed. Click the link.
- (3) The following Microsoft technical information page is displayed.
(<http://support.microsoft.com/kb/917607>)

- Follow the instructions to download the Windows help program for Windows Vista®.
- (4) Install the downloaded program.

For the personal computers that are not connected to the internet, copy and install the file downloaded in the procedure 3 with using a personal computer that is connected to the internet.

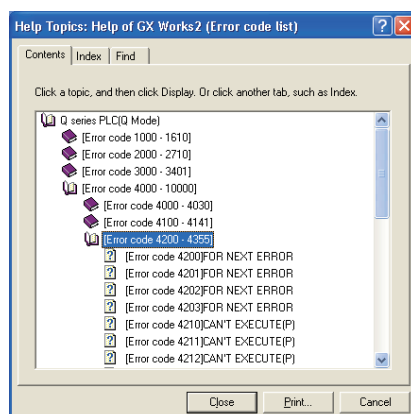
3.3.1 Checking CPU error contents

When an error occurs in a programmable controller CPU, an error code is displayed in the PLC Diagnostics screen.

This function checks the details of the corresponding error code.

Screen display

Select [Help] ⇒ [PLC Error].

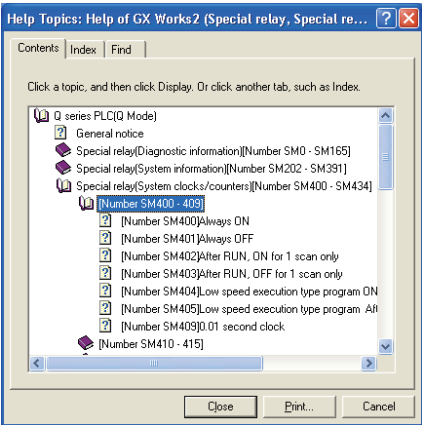


3.3.2 Checking special relay/register contents

This function checks the contents of special relays and special registers during programming or monitoring.

Screen display

Select [Help] ⇒ [Special Relay/Register].



3.3.3 Displaying operating manuals

This section shows the method for displaying the operating manuals of GX Works2 Version1.

Screen display

Select [Help] ⇒ [Operating Manual] ⇒ [(Manual name)].

3.3.4 Displaying changes from GX Developer

This section shows the changes from GX Developer to GX Works2.

Screen display

Select [Help] ⇒ [Changes from GX Developer].



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3.3.5 Connecting to MELFANSweb website

This section explains the method for displaying the MELFANSweb website.
Make the personal computer ready for internet connection in advance.

Operating procedure

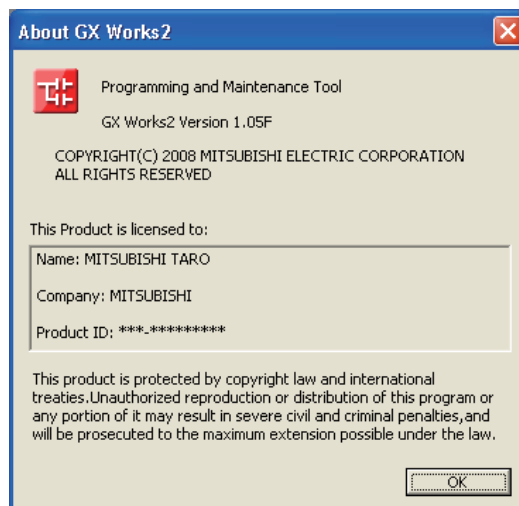
- Select [Help] ⇒ [Connect to MELFANSweb].
The MELFANSweb website is displayed.

3.3.6 Checking version of GX Works2

This section explains the method for displaying information such as the software version of GX Works2.

Operating procedure

- Select [Help] ⇒ [About GX Works2].





4 PROJECT MANAGEMENT

This chapter explains basic operations and management of projects.

4.1	Project Operations	4-2
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4.1 Project Operations

This section explains basic operations of GX Works2 such as creating, opening, and saving projects.

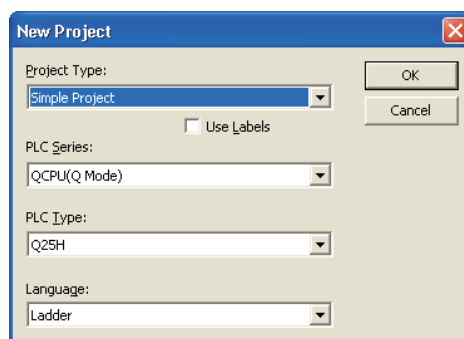
4.1.1 Creating projects



This function creates a new project.

Screen display

Select [Project] ⇒ [New]().



Operating procedure

1. Set the items on the screen.

Item	Description
Project Type	Select the type of the project to be created. Select "Simple Project" or "Structured Project".
Use Labels	Check this to create a project using labels when "Simple Project" is selected.
PLC Series	Select the programmable controller series for the project.
PLC Type	Select the programmable controller type (programmable controller CPU model) used for the project.
Language	Select the language for the program data to be created when creating a new project.

Point

● Creating new projects using Read from PLC function

When performing the Read from PLC function under the condition where no project is created, a project is created using the data read from the programmable controller CPU. (For writing data to the programmable controller CPU Section 12.1)

● Creating new projects

Do not use Windows® Explorer to change the created workspaces, storage location of the project folder or file, and file name.

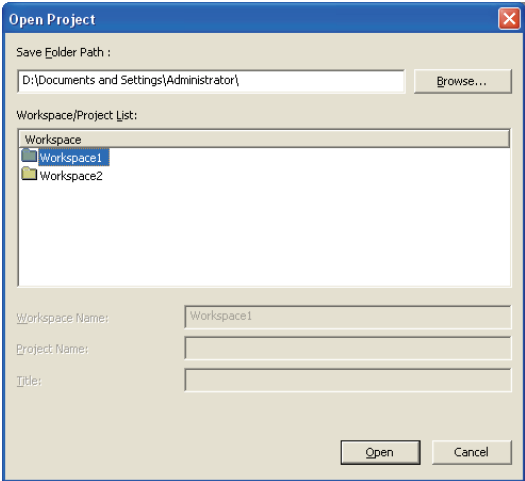
4.1.2 Opening existing projects



This section explains the method for reading a project saved in the hard disk or other memory media of a personal computer.

Screen display

Select [Project] ⇒ [Open]().



Operating procedure

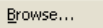
1. Set the items on the screen.

Item	Description
Save Folder Path	Enter the folder (drive/path) where the workspace is saved. The folder can be selected in the <u>Browse For Folder</u> screen by clicking the  button.
Workspace/Project List	Select the workspace or project. The display is switched to the project list by double clicking "Workspace".
Workspace Name	Displays the selected workspace name.
Project Name	Displays the selected project name.
Title	Displays the title of the selected project.

2. Click the button.

The specified project is displayed.

Screen button

-  button
Displays the Browse For Folder screen.

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Point**● Workspace**

A workspace is a special folder of GX Works2 dedicated to managing multiple projects under the same name. Do not change the workspace configuration using the application such as Windows® Explorer.

● Opening Structured projects

When libraries in a Structured project contain common instructions/special instructions/application functions of older versions, the Confirmation of Update Library screen is displayed. The libraries in the project can be updated on the Confirmation of Update Library screen. Update them by following the information displayed on the screen. For details of libraries, refer to the following manual.

☞ GX Works2 Version1 Operating Manual (Structured Project)

● Opening projects being edited by other users

The project being edited can be opened by other users as a read-only project. Note that the following functions cannot be used.

- Saving projects
- Project revision history
- Succeeding project revision history when saving projects with a specific name
- Change PLC type function
- Security function

4.1.3 Saving projects



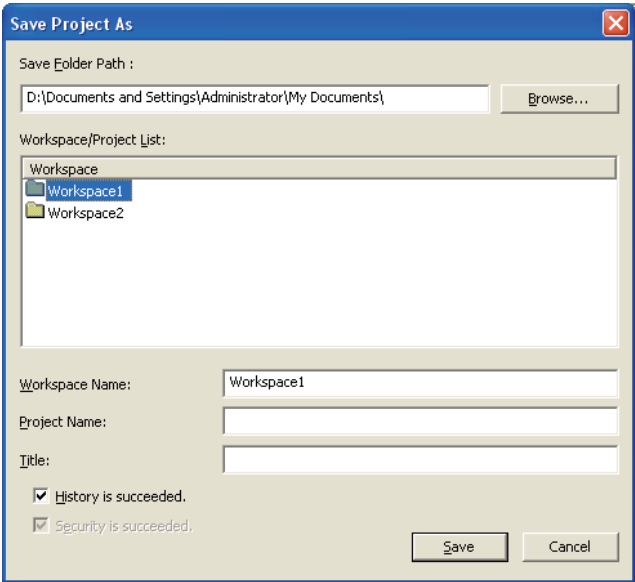
This section explains the method for saving a project in the hard disk or other memory media of a personal computer.

■ Saving projects under the specified name

This function saves the open project under the specified name.

Screen display

Select [Project] ⇒ [Save As].



Operating procedure

1. Set the items on the screen.

Item	Description
Save Folder Path	Enter the folder (drive/path) where the workspace is saved. • The folder can be selected in the <u>Browse For Folder</u> screen by clicking the  button.
Workspace/Project List	Select the workspace or project. • The display is switched to the project list by double clicking "Workspace".
Workspace Name	Enter the workspace name.
Project Name	Enter the project name.
Title	Enter the title of the project.
History is succeeded*1	Check this to succeed and save the revision history of the project. (☞ Section 4.5)
Security is succeeded*1	Check this to succeed and save the security information of the project. (☞ Section 4.7)

*1 : This setting can be set only when saving the already existing project with another name.

2. Click the button.

The project is saved in the specified folder under the specified workspace name, project name, and title.

Screen button

-  button

Displays the Browse For Folder screen.

Point

- **Workspace**
A workspace is a special folder of GX Works2 dedicated to managing multiple projects under the same name.
- **Saving projects in an existing destination**
When saving the project in an existing destination (workspace or project), the destination folder can be selected from the "Workspace/Project List".
- **Number of characters used for workspace name, project name, and title**
Enter each workspace name, project name, and title within 128 characters.
Note, however, that the total number of characters used for the workspace folder path, workspace name, and project name should not exceed 150 characters.

■ Saving projects

This function overwrites and saves the project being edited.

Operating procedure

- Select [Project] ⇒ [Save]().
- The data to be saved is overwritten on the existing project data.

Point

- **Registering project revision history when overwriting**
According to the option setting, the Revision Registration screen for registering the revision history is displayed when overwriting the project.
To display the Revision Registration screen when overwriting the project, select [Tools] ⇒ [Options] ⇒ "Project History" and then select "History is Registered when Save Project".
(For details of project revision history  Section 4.5)

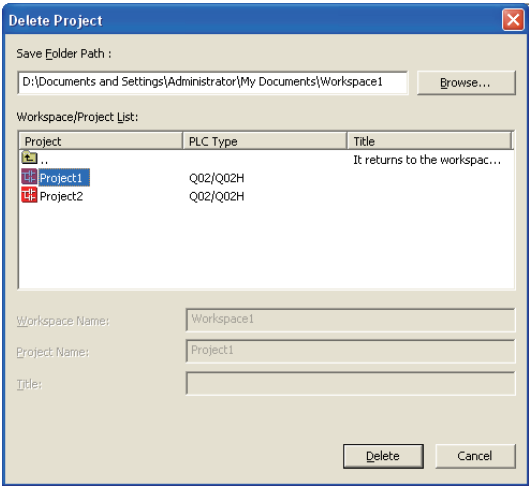
4.1.4 Deleting projects



This section explains the method for deleting a project saved in the hard disk or other memory media of a personal computer.

Operating procedure

- 1. Select [Project] ⇒ [Delete].
The Delete Project screen is displayed.
- 2. Select the project to be deleted.
(Project selecting method  Section 4.1.2)
- 3. Click the Delete... button.
The selected project is deleted.



Point

- **Deleting projects**
Once a project is deleted, it cannot be restored again.

4.1.5 Closing projects



This section explains the method for closing an open project.

Operating procedure

- Select [Project] ⇒ [Close].

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4.1.6 Verifying project data

QCPU



This section explains the method for verifying the data of the open project against the data of another project.

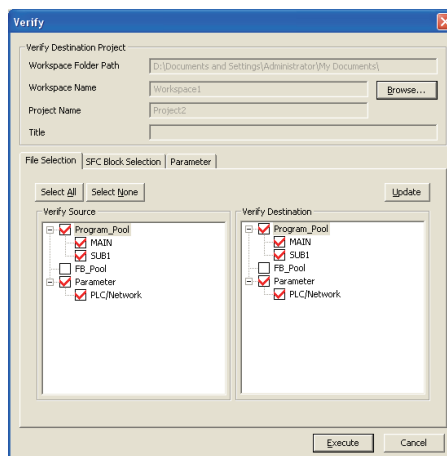
Verification can be performed only when the programmable controller type and project type of the two projects are the same. Verification targets are the programs and parameters of the projects.

This function is used to compare the contents of the two projects or to locate program changes made in the projects.

To verify the data against the data in the programmable controller CPU, use the Verify with PLC function. (☞ Section 12.2)

Screen display

Select [Project] ⇒ [Verify].

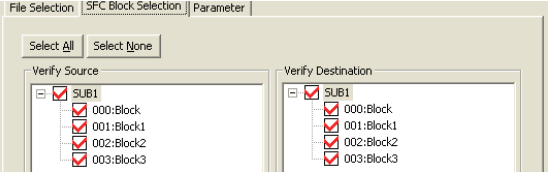
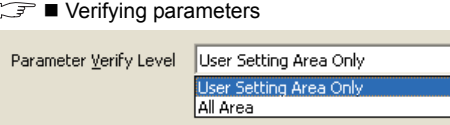


Operating procedure

1. Click the  button to set the verify destination project.

	Item	Description
Verify Destination Project	Workspace Folder Path	Displays the path to the workspace of the verify destination.
	Workspace Name	Displays the workspace name of the verify destination.
	Project Name	Displays the project name of the verify destination.
	Title	Displays the project title of the verify destination.

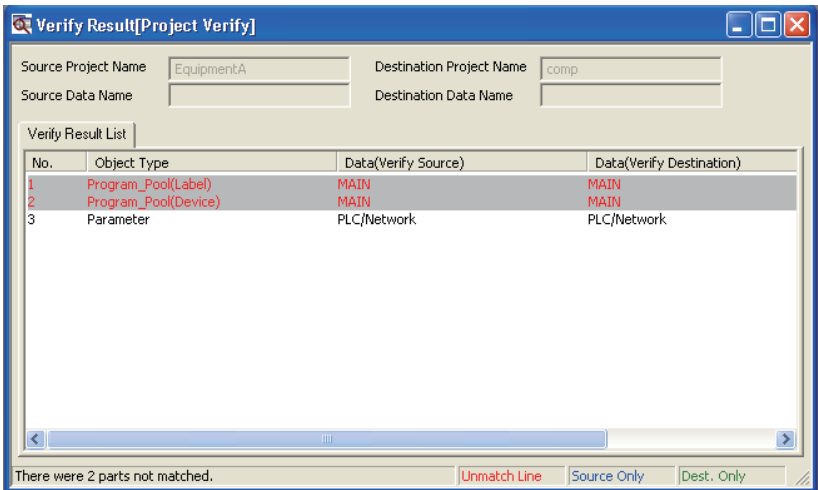
2. Set the items on the screen.

Item		Description
<<File Selection>>	Verify Source (Data being edited)	Selects the data in the project data list.
	Verify Destination (Data stored)	Selects the data in the project data list.
<<SFC Block Selection>> (Simple projects only)		Select SFC blocks in the SFC Block list. 
<<Parameter>>		Select the parameter verification level. 

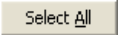
3. Click the button.

The verification result is displayed on the Verify Result screen.

- When ladder programs and parameters are verified, the details of mismatched data are displayed by double-clicking the corresponding line.



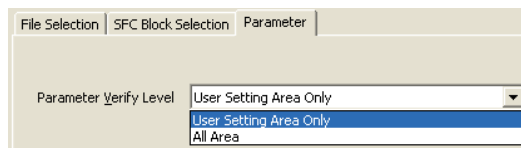
Screen button

-  Selects all the data displayed in the list.
-  Cancels the selection status of all the data selected in the list.
-  Updates the data displayed in the list.

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■ Verifying parameters

The verification range can be selected when verifying parameters.



The following table shows the verification details for each setting item.

Item	Description
User Setting Area Only	Verifies only the parameter area set by the user.
All Area	Verifies all the area including the parameter area set by the system.

● Mismatch in the system area

When a mismatch is detected in the parameter area set by the system in the verification set to "All Area", either of the following messages is displayed.

Take corrective action depending on the message.

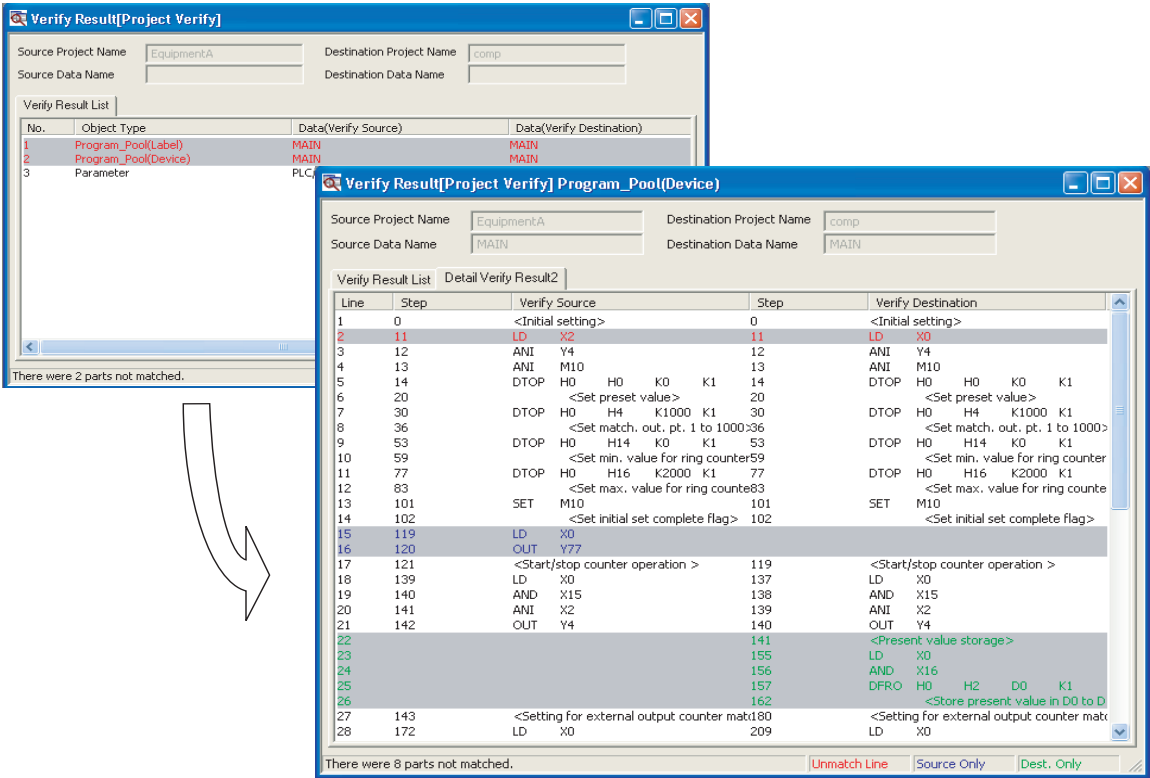
Message	Corrective action
The header information of the parameter blocks is inconsistent.	A mismatch is detected in other than user setting area. Write the parameters, having been written to the programmable controller CPU, to the programmable controller again.
This parameter block can't analyze.	Versions of GX Works2, GX Developer or GX IEC Developer used to create the projects differ between the verify source and the verify destination. The programmable controller CPU operation is not affected.

■ Checking verification result details

The details of mismatched data can be checked in the <<Verify Result List>> tab of the Verify Result screen.
The details can be displayed only for verification of ladder programs and parameters.

Operating procedure

- Double-click the line of the data to display the details on the Verify Result screen.



Point

- **Verifying programs**
The verification function verifies the data created by the compilation. If the program is edited after the compilation, compile the program again before performing the verification.
- **Verifying multiple data**
When multiple data are selected for verification, verification is performed between the source and destination data with the same name.
When only one source program is verified against one destination program, verification can be performed even with different names.
- **Number of verification results displayed**
If the number of mismatches exceeds 1,000, up to 1,000 mismatch results are displayed and verification is suspended after that. The remaining part needs to be verified again after modifying the mismatched data.

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4.1.7 Changing the programmable controller type of projects

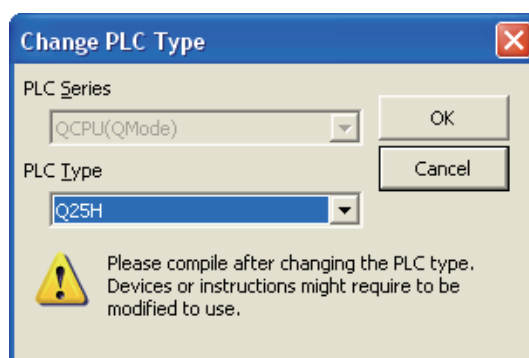


This section explains the method for changing the programmable controller type of the project being edited.

Changing the programmable controller type is possible only for Simple project. Changing the type from the Universal model QCPU to the High Performance model QCPU is not supported.

Screen display

Select [Project] ⇒ [Change PLC Type].

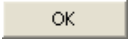


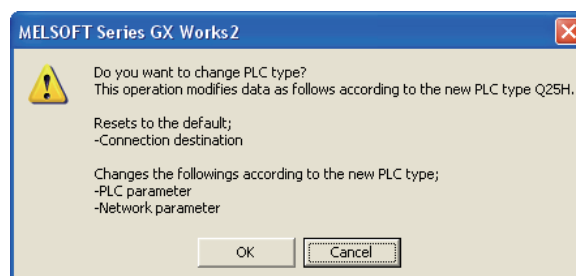
Operating procedure

1. Set the items on the screen.

Item	Description
PLC Series	Select the programmable controller series after change.
PLC Type	Select the programmable controller type after change.

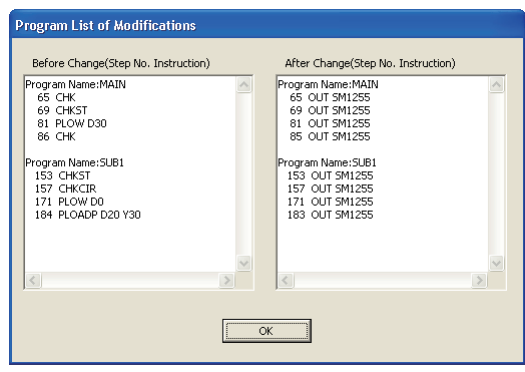
2. Click the button.

The following confirmation message is displayed. Click the  button to execute the function.





- **List of program changes**
After the Change PLC Type function is completed, the following Program List of Modifications screen is displayed, and the changes of the program can be checked.
The items in the following screen can be copied and pasted to the text file using the **Ctrl** + **C** and **Ctrl** + **V** keys.



- **Restrictions on the Change PLC Type function execution**
For the restrictions on the Change PLC Type function execution for each programmable controller series, refer to Appendix 8.
- **Interruption of processing**
If the project of change source includes the data which is neither supported nor able to be modified by any editing operations with the project of the programmable controller type after change, the processing is interrupted. If this happens, modify the data first to correspond with the programmable controller type after change, and then execute the Change PLC Type function.
- **Inexecution of function**
The Change PLC Type function cannot be executed in the following cases:
 - During the execution of the monitoring function such as ladder monitor and device/buffer memory batch monitor.
 - Security is set for the open project and the access level of the user is other than 'Administrators'.
 - During the execution of the simulation function.
- **Data before changing the programmable controller type**
Restoring the data, after executing the Change PLC Type function, to the data before change is not possible. Execute the function after saving the project data. In addition, note that the project is in the unsaved status after the function execution.

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4.2 Operations of Programmable Controller CPU Data



This section explains the method for operating each data in the project.

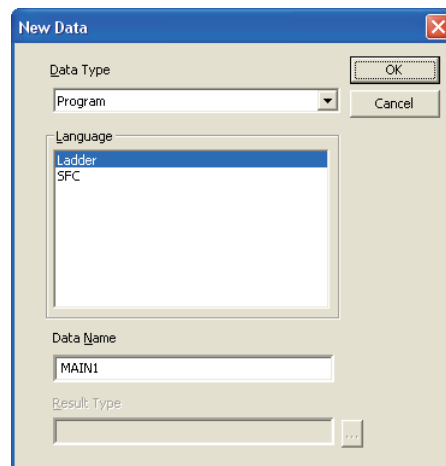
4.2.1 Adding new data to the project

This function adds new data to the project.

The data that can be added depend on the programmable controller type or project type.

Screen display

Select [Project] ⇒ [Object] ⇒ [New] ().



Operating procedure

1. Set the items on the screen.

Item	Description
Data Type	Select the type of the data to be added.
Language	Select the programming language for creating programs. Selection is allowed only when the data type is either of the following: • Program, Function (Structured projects only) or Function block
Data Name	Enter the name of the data to be created.
Result Type	Set the data type of return value of the function. (Structured projects only)

2. Click the button.

The editing screen for the created data is displayed.

Point

● Number of characters for a data name

Depending on the selectable data type, the numbers of characters shown in the following table can be used for data names.

However, some operators such as "-" and "*", and some instruction names such as "MOV", cannot be used. For details of the characters which cannot be used for data names, refer to Appendix 7.

Data type name	Number of characters
Program (program file), global comment, local comment, device memory, and device initial value	8 characters
Other data types	32 characters

● Maximum numbers of data types that can be created

The maximum numbers of data types that can be created are as follows.

Data type name	Maximum number
Connection target	128
SFC block in Simple project	320 (128 for Q02UCPU)
Other data (structures, global labels, etc.)	800

4.2.2 Copying/pasting data in projects

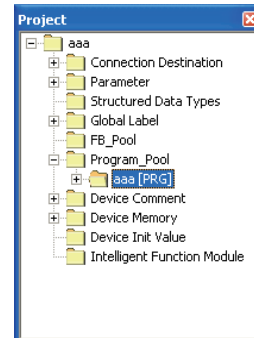
This section explains the method for utilizing data of a project being edited or other projects.

Operating procedure

1. Select a data name to be copied in the Project window.

2. Select [Project] ⇒ [Object] ⇒ [Data Copy].

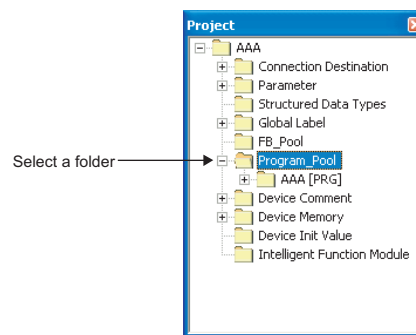
The selected data name is copied.

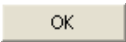


3. Select a folder to paste the data name in the Project window.

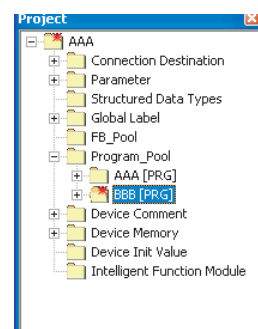
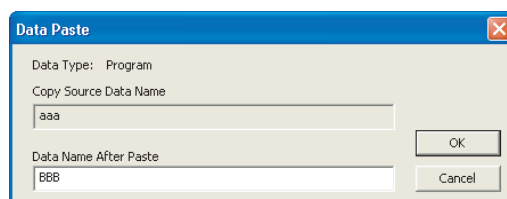
Select [Project] ⇒ [Object] ⇒ [Data Paste].

If the same data name exists in the paste destination, the Data Paste screen is displayed.



4. Enter a new name in the "Data Name After Paste" field, and click the  button.

The data name is pasted.



Point● **Copying/pasting data**

- Only data of the same type can be copied and pasted.
- Multiple data can be copied while they are selected by pressing the **Shift** or **Ctrl** key.
- The data can be pasted using the shortcut menu by right clicking the data or dragging and dropping the data to the paste destination.
- The program is in an uncompiled status after data are pasted. Compile the program again.
- For projects with security, only users whose access level is 'Administrators' can copy/paste data.
- Copying and pasting PLC parameter or Network parameter only is not possible. If they are copied individually, the whole parameter files are copied and the files in the pasted destination are overwritten.

4.2.3 Changing project data names

This function changes the data name of an open project.

Operating procedure

1. Select the data name to be changed in the Project window.
2. Select [Project] ⇒ [Object] ⇒ [Rename].
3. Change the data name.
4. Press the **Enter** key.

The selected data name is changed.

4.2.4 Deleting project data

This function deletes data in an open project.

Operating procedure

1. Select the data name to be deleted in the Project window.
Multiple data names can be selected.
2. Select [Project] ⇒ [Object] ⇒ [Delete].

The selected data is deleted.

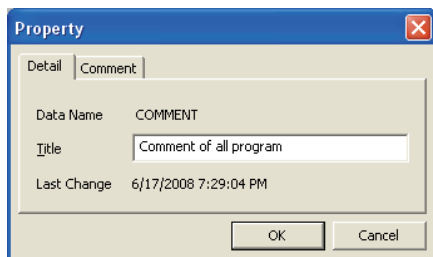
4.2.5 Displaying/editing properties

This function displays data properties of folders, parameters, and programs. A title and/or comment can be set to each data.

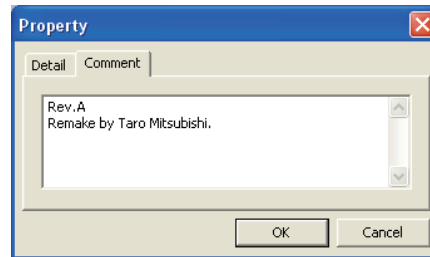
Screen display

Select [Project] ⇒ [Object] ⇒ [Property]()

<<Detail>>



<<Comment>>



Operating procedure

- Set the items on the screen.

Item	Description
Data Name	Displays the data name.
Title	Set a title for the data. (The number of settable characters is 128 for a project and 32 for other data.)
Last Change	Displays the date when the data was updated.
Comment	Set a comment for the data. Press the  and  keys for a line feed. (The number of settable characters is 5,120.)

Point

● Properties of Structured projects

Properties of the following data can be set for Structured projects in addition to those indicated above.

Data	Setting
Task	Priority and executing condition of a task
Function/Function block	Whether to use EN/ENO, or MC/MCR for EN control
Library	Path to a Help file

For details, refer to the explanations of each function.

( GX Works2 Version1 Operating Manual (Structured Project))

● Destinations for saving properties

The 'titles' and 'comments' set to the data properties can be saved as symbolic information.

( Section 12.1)

When reading data from the programmable controller CPU, the symbolic information must be written to/read from the programmable controller CPU in order to restore the settings of the properties.

When data are read without the symbolic information from the programmable controller CPU, the settings of the properties are not restored.

4.3 Operations of Intelligent Function Module Data



This section explains the method for setting the intelligent function module data.

Adding an intelligent function module to a project makes the data settings (parameter and switch settings) of the intelligent function module available.

4.3.1 Adding intelligent function module data

This section explains the method for adding the intelligent function module data to the project being edited.

The installation slot number and start XY address of the added intelligent function module are reflected to the I/O assignment setting of programmable controller parameter.

Screen display

Select [Project] ⇒ [Intelligent Function Module] ⇒ [Add New Module].

Occupied I/O points information

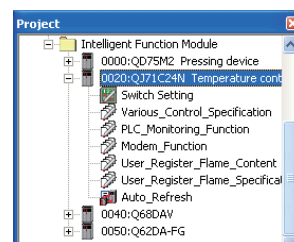
Operating procedure

1. Set the items on the screen.

Item	Description
Module Selection	–
Module Type	Select the type of the intelligent function module to be added.
Module Name	Select the model of the intelligent function module to be added.
Implementation Position	–
Base No.	Specify the base number where the intelligent function module is mounted.
Installation Slot No.	Set the slot number of the intelligent function module.
Specify start XY address	Set the start XY address of the intelligent function module.
Occupied I/O points information	Displays the number of used slots, the number of occupied I/O points, and the number of empty slots (number of occupied I/O points) of the module selected for "Module Type" and "Module Name".
Title Setting	–
Title	Set the title.

2. Click the button.

The specified intelligent function module data are added to the Project window.



Screen button

●

Displays the Acknowledge I/O Assignment screen. On the Acknowledge I/O Assignment screen, the current I/O assignment settings can be checked. The mounting position for the intelligent function module to be added can also be set.

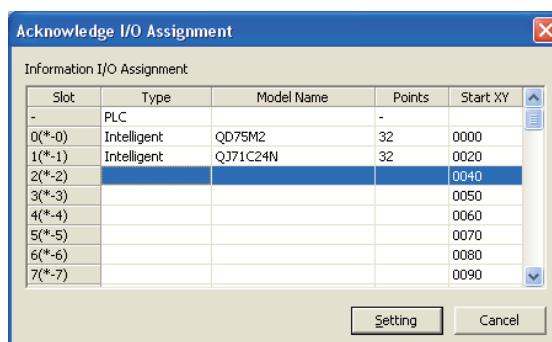
The following explains the method for setting the mounting position.

Operation

1. Select the line of the mounting position for the intelligent function module to be added.

2. Click the  button.

The selected mounting position is set on the New Module screen.



Intelligent function module data

Intelligent function module parameters are created when the intelligent function data are set. The intelligent function module parameters include the data for initial setting and auto refresh.

The following table shows the intelligent function module data and the data registered to the intelligent function module parameters as initial setting and auto refresh.

● Analog I/O modules

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
Analog Module	Q64AD	Switch Setting	Sets the intelligent function module switches.	—	—
	Q68ADV	Parameter	Sets the basic settings and warning output function settings.	○	—
	Q68ADI	Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○
	Q64AD-GH				
	Q62AD-DGH				
	Q68AD-G				
	Q66AD-DG				
	Q62DAN	Switch Setting	Sets the intelligent function module switches.	—	—
	Q64DAN	Parameter	Sets the basic settings and warning output function settings.	○	—
	Q68DAVN	Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○
	Q68DAIN				
	Q62DA				
	Q64DA				
	Q68DAV				
	Q68DAI				
	Q62DA-FG				
	Q66DA-G				

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
Temperature Input Module	Q64RD Q64RD-G Q64TD Q64TDV-GH Q68TD-G Q68RD3-G	Switch Setting	Sets the intelligent function module switches.	—	—
		Parameter	Sets the basic settings, warning output function settings, and scaling function settings.	○	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	—
Temperature Control Module	Q64TCTT Q64TCRT Q64TCTTBW Q64TCRTBW	Switch Setting	Sets the intelligent function module switches.	—	—
		Parameter	Sets the basic settings, control basic parameters, control detailed parameters, warning function settings, and CT settings.	○	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○
	Q62HLC	Switch Setting	Sets the intelligent function module switches.	—	—
		Parameter (MAIN)	Sets the basic setting, control basic parameters, control detailed parameters, warning function settings, and scaling settings.	○	—
		Parameter (Program Control Function)	Sets the program control function settings.	○	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○

● Counter and positioning modules

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
Counter Module	QD62 QD62E QD62D	Switch Setting	Sets the intelligent function module switches.	—	—
		Parameter	Sets the basic settings and counter function settings.	○	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○
	QD63P6	Switch Setting	Sets the intelligent function module switches.	—	—
		Parameter	Sets the basic settings and periodic pulse counter function settings.	○	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○
	QD64D2	Switch Setting	Sets the intelligent function module switches.	—	—
		Parameter	Sets the basic settings, coincidence output function, and continuous comparison function settings.	○	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○
	QD60P8-G	Switch Setting	Sets the intelligent function module switches.	—	—
		Parameter	Sets the basic settings and warning output function settings.	○	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
QD75 Type Positioning Module	QD75P1 QD75P2 QD75P4	Parameter	Sets the basic parameters 1, basic parameters 2, detailed parameters 1, detailed parameters 2, OPR basic parameters, and OPR detailed parameters.	—	—
		Positioning Data Axis #1	Sets the positioning data including the pattern, control method, acceleration/deceleration time, and address for each axis. (n = number of axes)	—	—
		Block Starting Data Axis #1	Sets the execution sequence and execution conditions for the positioning data. (n = number of axes)	—	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○
	QD75D1 QD75D2 QD75D4	Parameter	Sets the basic parameters 1, basic parameters 2, detailed parameters 1, detailed parameters 2, OPR basic parameters, and OPR detailed parameters.	—	—
		Positioning Data Axis #1	Sets the positioning data including the pattern, control method, acceleration/deceleration time, and address for each axis. (n = number of axes)	—	—
		Block Starting Data Axis	Sets the execution sequence and execution conditions for the positioning data. (n = number of axes)	—	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○
	QD75M1 QD75M2 QD75M4	Parameter	Sets the basic parameters 1, basic parameters 2, detailed parameters 1, detailed parameters 2, OPR basic parameters, and OPR detailed parameters.	—	—
		Servo parameter	Sets the servo basic parameters, servo regulation parameters, servo extended parameters, and servo extended parameters 2.	—	—
		Positioning Data Axis #1	Sets the positioning data including the pattern, control method, acceleration/deceleration time, and address for each axis. (n = number of axes)	—	—
		Block Starting Data Axis #1	Sets the execution sequence and execution conditions for the positioning data. (n = number of axes)	—	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○
	QD75MH1 QD75MH2 QD75MH4	Parameter	Sets the basic parameters 1, basic parameters 2, detailed parameters 1, detailed parameters 2, OPR basic parameters, and OPR detailed parameters.	—	—
		Servo Parameter	Sets the basic setting parameters, gain/filter parameters, extension setting parameters, I/O setting parameters, extension settings, and special settings.	—	—
		Positioning Data Axis #1	Sets the positioning data including the pattern, control method, acceleration/deceleration time, and address for each axis. (n = number of axes)	—	—
		Block Starting Data Axis #1	Sets the execution sequence and execution conditions for the positioning data. (n = number of axes)	—	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
QD70 Type Positioning Module	QD70P4 QD70P8 QD70D4 QD70D8 QD72P3C3	Switch Setting	Sets the intelligent function module switches.	—	—
		Parameter	Sets the basic parameters and OPR parameters.	○	—
		Positioning Data Axis #n	Sets the positioning data including the operation pattern, control method, and acceleration/ deceleration time. (n = number of axes)	○	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○

● Communication modules

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
Serial Communication/ Modem Interface Module	QJ71C24N QJ71C24N-R2 QJ71C24N-R4 QJ71C24 QJ71C24-R2 QJ71CM0N QJ71CM0	Switch Setting	Sets the intelligent function module switches.	—	—
		Various Control Specifications	Makes system settings for transmission control, MC protocol, nonprocedural protocol, and bidirectional protocol.	—	—
		PLC Monitoring Function	Makes system settings to use the programmable controller CPU monitoring function.	—	—
		Modem Function	Makes system settings for data communications using the modem function. (Not available for QJ71C24N-R4)	—	—
		User Register Frame Content	Sets the contents of user frames.	—	—
		User Register Frame Specification	Sets the frame numbers for data transmission/ reception.	—	—
		Auto Refresh	Makes settings to automatically store the error information and status information, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○

● Control network modules

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
FL-net (OPCN-2) Interface Module	QJ71FL71-F01 QJ71FL71-T-F01 QJ71FL71-B2-F01 QJ71FL71-B5-F01 QJ71FL71 QJ71FL71-T QJ71FL71-B2 QJ71FL71-B5	Switch Setting	Sets the intelligent function module switches.	—	—
		Parameter	Sets the basic settings.	○	—
		Auto Refresh	Makes settings to automatically store the error information and parameter information for initialization processing or data communication, area for data communication, communication status and communication errors stored in buffer memory, to the specified device in the programmable controller CPU.	—	○
AS-i Master Module	QJ71AS92	Auto Refresh (System Common)	Makes settings to automatically store the error information and I/O data, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○
		Auto Refresh (System Individual)	Makes settings to automatically store the error information and I/O data, stored in buffer memory, to the specified device in the programmable controller CPU.	—	○

Point

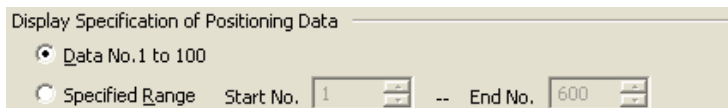
- **Switch setting**

The switch setting of the intelligent function module are reflected to the "Switch Setting" in the <<I/O Assignment>> tab of PLC parameter.

- **Changing the positioning data display range**

Display range of the positioning data can be changed.

Select [Tools] ⇒ [Options] ⇒ "Intelligent Function Module", and make settings for "Display Specification of Positioning Data".

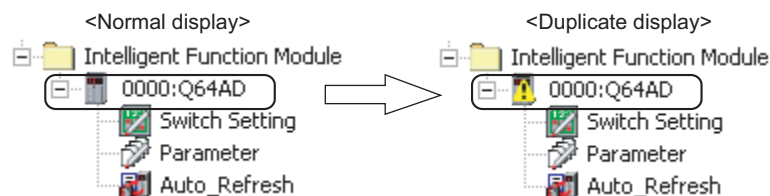


If the display range is enlarged by setting "Display specification of positioning data", it takes longer time to display the positioning data editing window.

When positioning data No.101 and above are not necessary, select "Data No.1 to 100".

- **Display when mismatches of data assignment exist between PLC parameters and intelligent function module data**

When mismatches of data assignment exist between the I/O assignment setting of PLC parameter and the intelligent function module data, the icon in the Project window is displayed as shown below.



- **Opening project data which contain modules not supported by this version**

When project data which contain intelligent function modules that are not supported by this version are opened, "Reserved Module" is displayed in the Project window tree.

It cannot be edited, displayed or printed, however, it can be saved in the project. In addition, intelligent function module parameters can be written to the programmable controller CPU.

(Example of display in the Project window)

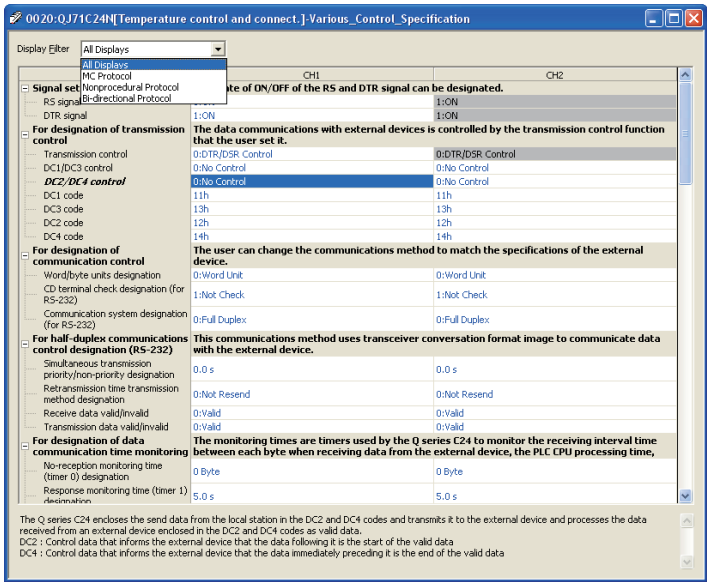


4.3.2 Setting intelligent function module data

This section explains the method for editing the intelligent function module data.

Screen display

Select Project window ⇒ "Intelligent Function Module" ⇒ "(Intelligent function module data)".
The screen image below is an example when the data of QJ71C24N are selected.



Operating procedure

- Set the items on the screen.
For details of the setting items, refer to the manuals of intelligent function modules.
 - Detailed explanation of the item is displayed at the bottom of the screen when it is selected.
 - For the setting items that have multiple choices, double click the cell to show the available choices in a combo box.
 - For the setting items that require entry, double click the cell to enter the setting.
 - "Display Filter" filters the settings so that only those related to the selected item are displayed.

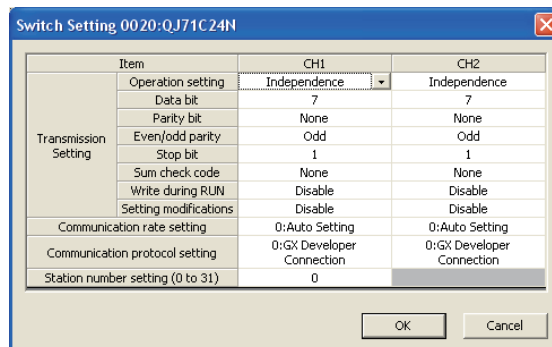
1	OVERVIEW
2	SYSTEM CONFIGURATION
3	SCREEN CONFIGURATION AND BASIC OPERATIONS
4	PROJECT MANAGEMENT
5	EDITING PROGRAMS
6	SETTING PARAMETERS
7	SETTING DEVICE MEMORY
8	SETTING DEVICE INITIAL VALUES

Switch settings

This section explains the method for editing the switch setting of the intelligent function modules.

Screen display

Project window ⇒ "Intelligent Function Module" ⇒ "Switch Setting".



Operating procedure

1. Set the items on the screen

For details of the setting items, refer to the manuals of intelligent function modules.

- Double click a cell to display the list with a combo box.

2. Click the **OK** button

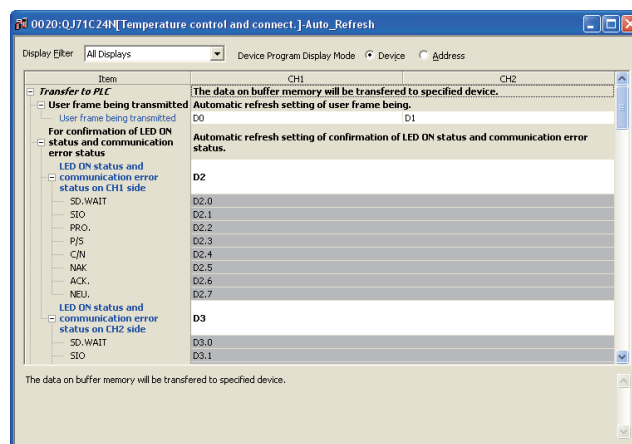
These settings are applied to the switch settings in the <<I/O Assignment>> tab of PLC parameter. The contents of the switch setting in the <<I/O Assignment>> tab of PLC parameter are also applied to these settings.

Auto refresh function

This section explains the method for setting the auto refresh function of the intelligent function module.

Screen display

Project window ⇒ "Intelligent Function Module" ⇒ "Auto Refresh".



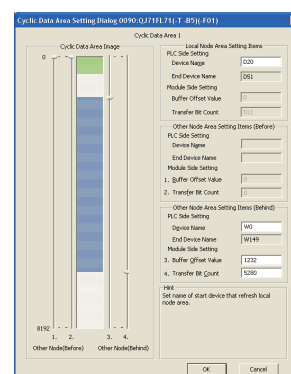
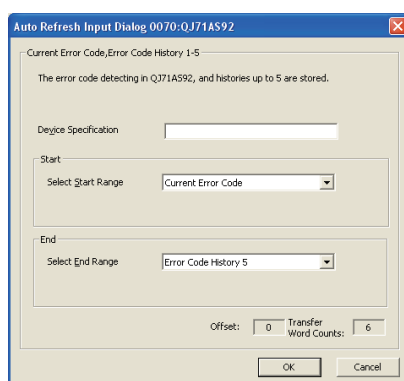
Operating procedure

• Setting devices

For details of the setting items, refer to the manuals of intelligent function modules.

- Detailed explanation of the item is displayed at the bottom of the screen when it is selected.
- For Structured projects, device format and address format can be switched by selecting "Device Program Display Mode".
- "Display Filter" filters the settings so that only those related to the selected item are displayed.
- For the items of which offset values of buffer memory and the transfer word counts can be changed, set auto refresh devices with another screen.

Example) Setting screens of AS-i master module and FL-net (OPCN-2) interface module
 <AS-i master module> <FL-net (OPCN-2) interface module>



1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SCREEN CONFIGURATION AND BASIC OPERATIONS

4 PROJECT MANAGEMENT

5 EDITING PROGRAMS

6 SETTING PARAMETERS

7 SETTING DEVICE MEMORY

8 SETTING DEVICE INITIAL VALUES

Point

● The contents displayed in the explanation field

The following shows the contents displayed in the explanation field.

Item		Description
Transfer Direction	Intelligent Function Module → PLC	Transfers the buffer memory data of the intelligent function module to the specified device of the programmable controller CPU.
	Intelligent Function Module ← CPU	Transfers the specified device data of the programmable controller CPU to the buffer memory of the intelligent function module.
Buffer Memory Address		Displays the buffer memory address of the item to be auto refreshed.
Offset		Displays the offset value according to the target buffer memory address.
Transfer Word Counts		Displays the transfer word counts of the item to be auto refreshed.
Maximum Transfer Word Counts		Displays the maximum transfer word counts of the item to be auto refreshed.
Device Comment		Displays the device comment that is set to the selected device.

● The items of which offset values of buffer memory and the transfer word counts can be changed

The items of which offset values of buffer memory and the transfer word counts can be changed, are displayed as shown below.



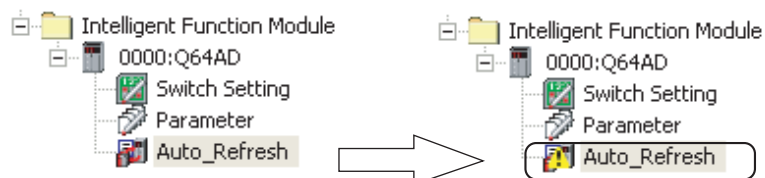
Device number (offset value,
transfer word counts)

● The display of the Project window when the devices set in the auto refresh setting are duplicated in the module

When the screen is closed while the duplicated devices of the auto refresh setting exist, the icon in the Project window is displayed as shown below. For checking the device duplications in multiple intelligent function modules, select [Tools] ⇒ [Intelligent Function Module Parameter Check] ⇒ [Auto Refresh Duplication Check].

<Normal display>

<Display when duplication occurs>



■ Data setting screen of intelligent function modules

On the data setting screen of an intelligent function module, the setting status is identified by colors as shown below.

Color		Setting status
Text	Background	
Blue	White	Default values
Black	White	Values other than default values
White	Red	Items whose values outside the setting range
Red	White	Items for which device is duplicated in auto refresh setting.
Black	Grey	Items for which setting is not required.
Black	Yellow	Items for which setting (partner axis) is not required at the data number specified for axis to be interpolated. (Only for the type QD75 positioning modules)
Green	White	Comments (Only for the positioning modules)
Blue	Gray	Item with the transfer direction of [Intelligent Function Module → PLC]
Green	Gray	Item with the transfer direction of [Intelligent Function Module ← PLC]

4.3.3 Deleting intelligent function modules

This section explains the method for deleting an intelligent function module from the project being edited.

Operating procedure

1. Select the intelligent function module to be deleted from the Project window.
2. Select [Project] ⇒ [Intelligent Function Module] ⇒ [Delete Module].

The selected intelligent function module is deleted.

4.3.4 Displaying properties of intelligent function modules

This section explains the method for checking the setting information of an intelligent function module. This function is also used to change installation slot numbers, start XY addresses, module names, and titles.

Screen display

Select [Project] ⇒ [Intelligent Function Module] ⇒ [Property].

Occupied I/O points information

Operating procedure

1. Set the items on the screen.

Item	Description
Module Selection	—
Module Type	Displays the type of the intelligent function module.
Module Name	Displays the model of the intelligent function module.
Implementation Position	—
Base No.	Displays the base number where the intelligent function module is mounted.
Installation Slot No.	Displays the current slot number.
Specify Start XY Address	Displays the current start XY address.
Occupied I/O points information	Displays the number of used slots, the number of occupied I/O points, and the number of empty slots (number of occupied I/O points) of the module selected for "Module Type" and "Module Name".
Title Setting	—
Title	Displays the current title.

2. Click the button.

For the buttons displayed on the screen, refer to Section 4.3.1.

4.3.5 Checking/changing the number of settable intelligent function module parameters

This section explains the method for displaying a list of the intelligent function module parameters (initial setting/auto refresh) set to the current project.

The setting for enabling/disabling initial setting and auto refresh as intelligent function module parameters is also explained.

■ Enabling/disabling intelligent function module parameters

This function enables/disables initial setting and auto refresh as intelligent function module parameters. Since a programmable controller CPU limits the number of parameters that can be set for the mounted intelligent function modules, check the number of settable parameters using this function and switch enabling/disabling for the parameters so that the number of set parameters is within the allowable range.

For the number of settable parameters, refer to the manual of each intelligent function module.

Screen display

Select [Project] ⇒ [Intelligent Function Module] ⇒ [Intelligent Function Module Parameter List].

XY Address	Module Name	Initialization(Count)	Auto Refresh(Count)
0000	QD75M2	-	✓ Setting Exist(7)
0020	QJ71C24N	-	✓ Setting Exist(6)
0040	Q68DAV	✓ Setting Exist(1)	No Setting
0050	Q62DA-FG	✓ Setting Exist(4)	No Setting

Explanation
 Confirm setting status of the intelligent function module, and switch valid/invalid(*) of intelligent function module parameter if necessary.
 (*Checked items will be created as intelligent function module parameter)

Intelligent Function Module Parameter Setting Count Total

Initial	5 (Max:512)	Auto Refresh	13 (Max:256)

Close

Operating procedure

1. Set the items on the screen.

Item	Description
XY Address	Displays the start XY address of the target intelligent function module.
Module Name	Displays the model of the target intelligent function module.
Initialization (Count)	Select whether to enable/disable initial setting. Uncheck the item if it is not set as an intelligent function module parameter. For a module that has no initial setting, "-" is displayed.
Auto Refresh (Count)	Select whether to enable/disable auto refresh. Uncheck the item if it is not set as an intelligent function module parameter. For a module for which auto refresh is not set, "-" is displayed.
Intelligent Function Module Parameter Setting Count Total	Displays the number of settable intelligent function module parameters.
Initial	Displays the number of initial settings set as intelligent function module parameters.
Auto Refresh	Displays the number of auto refreshes set as intelligent function module parameters.

2. Click the button.

Point

● **When the initial setting and the number of auto refresh settings cannot be changed**

For the following conditions, the initial setting and the number of auto refresh settings are not changed. Even when the "Setting Exist" is selected, the display is masked and the check box is not displayed.

- Reserved module
- The access authority for security is in the write-protected mode.

Intelligent function module parameters

When the intelligent function module data are set, intelligent function module parameters are created. The intelligent function module parameters consist of initial setting and auto refresh.

The intelligent function module parameters, when written to a programmable controller CPU, operate as explained below. Write the intelligent function module parameters to the programmable controller CPU using the Write to PLC function. (➡ Section 12.1.4)

● **Initial setting**

The parameters of the individual intelligent function module data are set as initial setting data. The initial setting data are registered to the programmable controller CPU parameters and automatically written to the intelligent function module when the programmable controller CPU enters the RUN state.

● **Auto refresh**

If auto refresh is set to the buffer memory of an intelligent function module, data are write/read automatically to/from the specified device when the END instruction is executed in the programmable controller CPU.

For the intelligent function module type and initial setting/auto refresh setting availability, refer to Section 4.3.1.

■ Number of parameter settings for intelligent function modules

The number of parameter settings for intelligent function modules (initial setting and auto refresh) are limited depending on the programmable controller CPUs or MELSECNET/H remote I/O modules. In addition, the number of parameter settings are also limited depending on the type of intelligent function modules.

Be sure to set the total number of parameter settings of the intelligent function modules, not exceeding the maximum number of parameter settings of the programmable controller CPUs or MELSECNET/H remote I/O modules.

- Limit for the number of parameter settings of the programmable controller CPUs or MELSECNET/H remote I/O modules

The following table shows the number of parameter settings for the initial setting and the auto refresh that can be set on the programmable controller CPUs or MELSECNET/H remote I/O modules.

Application target of intelligent function module	Maximum number of parameter settings	
	Initial setting	Auto refresh
High Performance model QCPU, MELSECNET/H remote I/O module	512	256
Universal model QCPU (Q02U)	2048	1024
Universal model QCPU (Other than Q02U)	4096	2048

- Limit for the number of parameter settings of the intelligent function modules

The following table shows the number of parameter settings for the initial setting and auto refresh that can be set on the intelligent function modules.

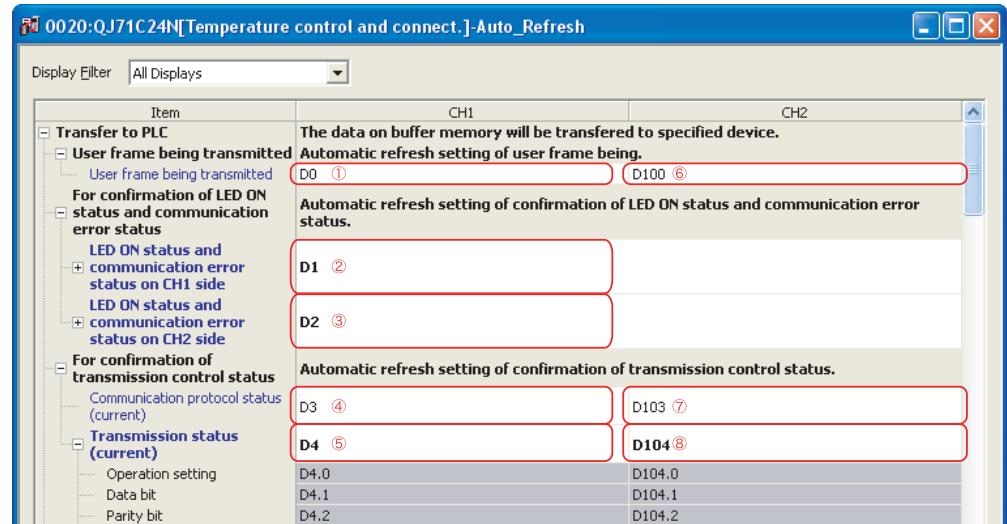
Module type	Module model	Initial setting (Fixed)	Auto refresh (Maximum number of settings)
Analog module	Q64AD	2	13
	Q68ADV	1	25
	Q68ADI	1	25
	Q64AD-GH	4	27
	Q62AD-DGH	8	15
	Q68AD-G	6	36
	Q66AD-DG	10	28
	Q62DAN	1	5
	Q64DAN	1	9
	Q68DAVN	1	17
	Q68DAIN	1	17
	Q62DA	1	5
	Q64DA	1	9
	Q68DAV	1	17
	Q68DAI	1	17
	Q62DA-FG	4	9
	Q66DA-G	5	14
RTD input module	Q64RD	5	18
	Q64RD-G	5	18
	Q64TD	6	13
	Q64TDV-GH	6	13
	Q68TD-G-H01	6	24
	Q68RD3-G	6	24

Module type	Module model	Initial setting (Fixed)	Auto refresh (Maximum number of settings)
Temperature control module	Q64TCTT	21	61
	Q64TCRT	21	61
	Q64TCTTBW	21	73
	Q64TCRTBW	21	73
	Q62HLC	22	52
Counter module	QD62	8	14
	QD62D	8	14
	QD62E	8	14
	QD63P6	6	48
	QD64D2	6	16
	QD60P8-G	24	8
Type QD75 positioning module	QD75D1	-	7
	QD75D2	-	14
	QD75D4	-	28
	QD75P1	-	7
	QD75P2	-	14
	QD75P4	-	28
	QD75M1	-	7
	QD75M2	-	14
	QD75M4	-	28
	QD75MH1	-	7
	QD75MH2	-	14
	QD75MH4	-	28
Type QD70 positioning module	QD70P4	12	26
	QD70P8	24	50
	QD70D4	16	26
	QD70D8	32	50
	QD72P3C3	12	18
Serial communication/modem interface module	QJ71C24N	-	46
	QJ71C24N-R2	-	47
	QJ71C24N-R4	-	46
	QJ71C24	-	46
	QJ71C24-R2	-	47
	QJ71CM0N	-	47
	QJ71CMO	-	47
FL-net (OPCN-2) interface module	QJ71FL71-F01	2	14
	QJ71FL71-T-F01	2	14
	QJ71FL71-B2-F01	2	14
	QJ71FL71-B5-F01	2	14
	QJ71FL71	2	14
	QJ71FL71-T	2	14
	QJ71FL71-B2	2	14
	QJ71FL71-B5	2	14
AS-i master module	QJ71AS92	-	30



● **The number of auto refresh settings**

The number of set device items is counted as the auto refresh settings.
In the following settings, the number of auto refresh settings is 8.

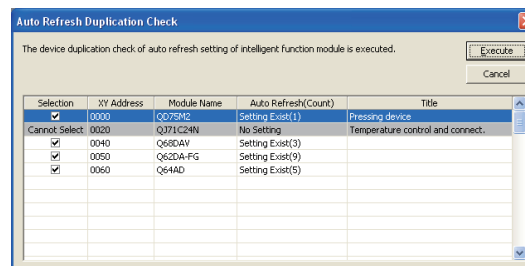


4.3.6 Checking device duplication of auto refresh setting

This section explains the method for checking the device duplication of the auto refresh setting between intelligent function modules.

Screen display

[Tools] ⇒ [Intelligent Function Module Parameter Check] ⇒ [Auto Refresh Duplication Check]

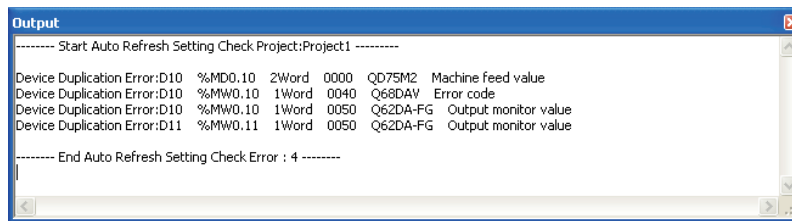


Screen display

1. Select the modules to be checked for device duplication of the auto refresh setting.
2. Click the **Execute** button.

If the duplicated device is found, the check result is displayed in the Output window.

By double clicking the result, the corresponding error location in the program is displayed.



Point

● When the device duplication of auto refresh setting can not be checked

In any of the following conditions, the modules are recognized as a module that cannot check the device duplication of auto refresh setting, and "Cannot Select" is displayed.

- The device is not set on the Auto Refresh screen.
- The check box is not checked for the module in the intelligent function module parameter list.
- The module start XY address is not set.
- Reserved module
- The access authority for security is in the read-protected mode.

4.4 Changing Project Types

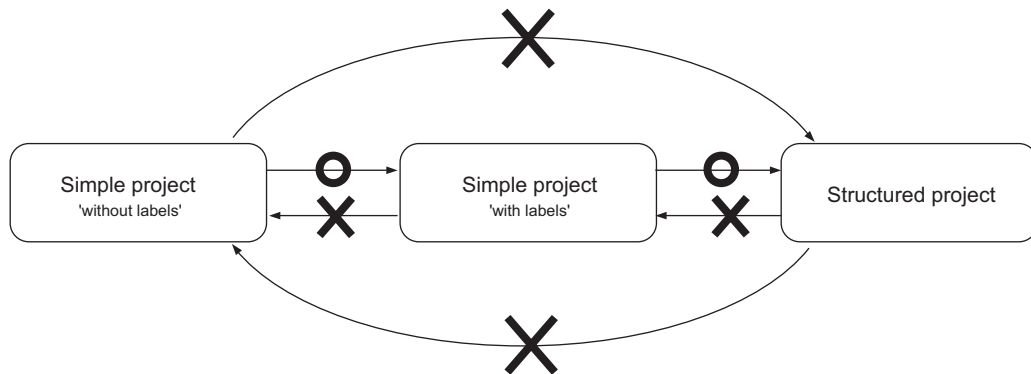
QCPU



This section explains the method for changing the type of an open project.

Using the method explained below, the type of a Simple project is changed from 'without labels' to 'with labels'. In addition, a Simple project 'with labels' can be changed to a Structured project.

Changing from a Simple project 'with labels' to a Simple project 'without labels' or changing a Structured project to a Simple project is not supported.



Operating procedure

- Select [Project] ⇒ [Change Project Type].

Point

- **Operation after changing project type**

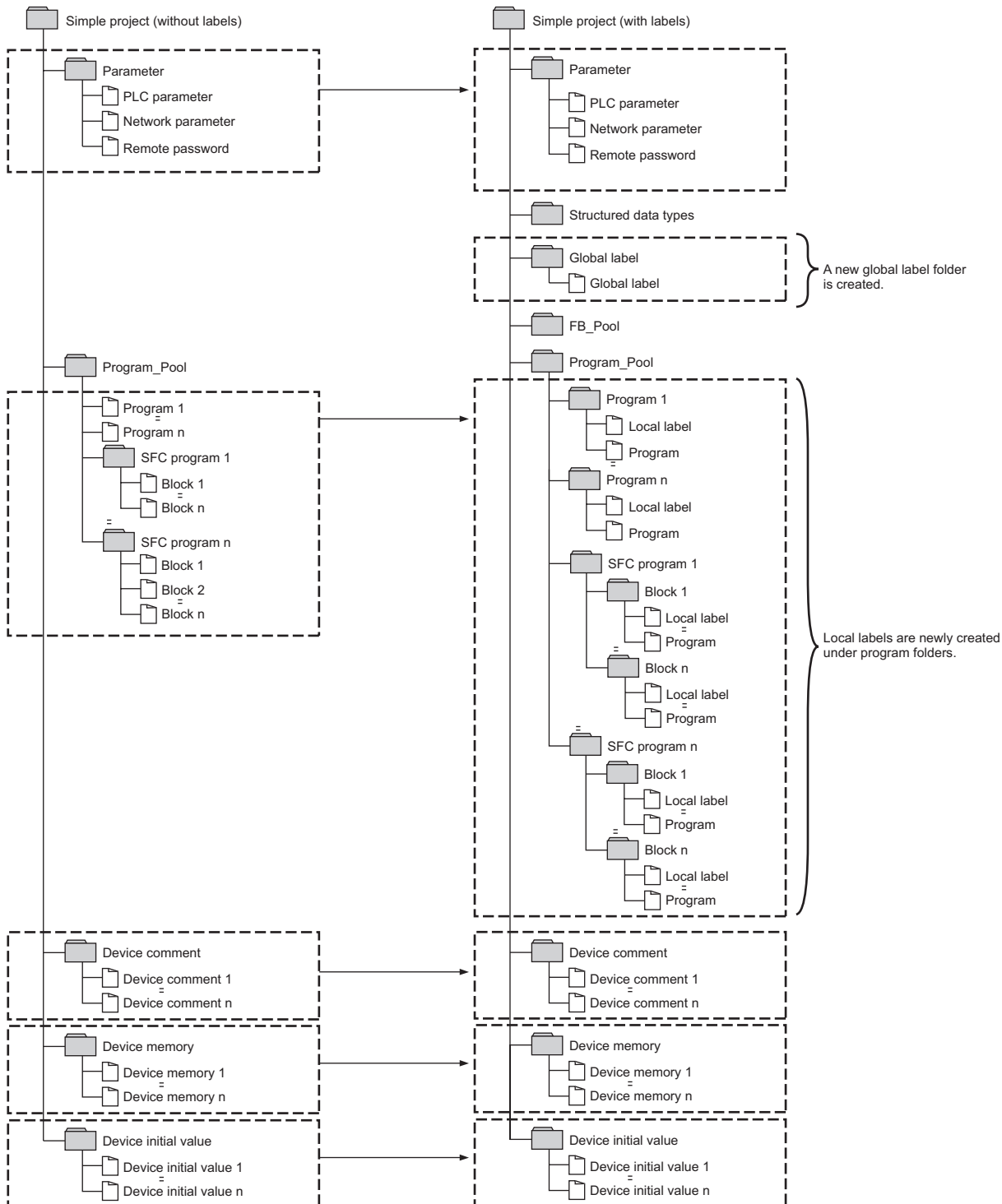
When the project type is changed, programs are in the uncompiled status.

Compile all programs again after changing the project type. (☞ Section 5.2)

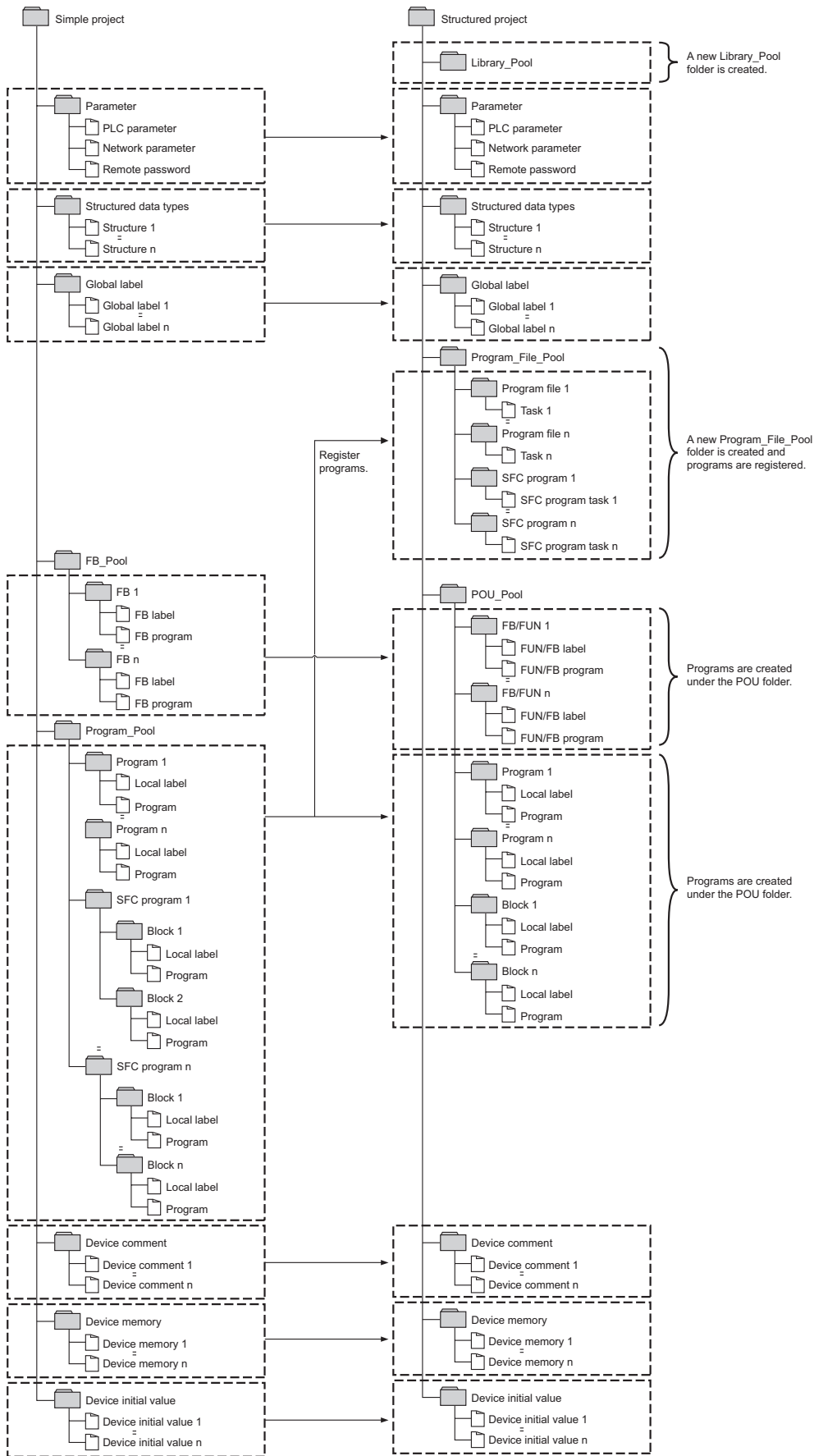
■ Project configuration after changing project type

The following shows how the configuration of project data is changed when a project type is changed from a Simple project to a Structured project.

● Changing a type of Simple project from 'without labels' to 'with labels'



● Changing a Simple project 'with labels' to a Structured project



1 OVERVIEW

2 SYSTEM CONFIGURATION

3 SCREEN CONFIGURATION AND BASIC

4 PROJECT MANAGEMENT

5 EDITING PROGRAMS

6 SETTING PARAMETERS

7 SETTING DEVICE MEMORY

8 SETTING DEVICE INITIAL VALUES

4.5 Managing Project Revisions

QCPU



This section explains the method for registering a backup of the project with added revision information, and restoring the registered backup data (contents of the past project).

4.5.1 Registering revision information (creating backup)

This section explains the method for creating a backup of the project at the point of registration, and registering it with the revision information.

Screen display

Select [Project] ⇒ [Project Revision] ⇒ [Revision Entry].

The image shows a 'Revision Registration' dialog box. It contains the following fields and controls:

- History for Entry**: A section header for the input fields.
- Revision No.**: A text box containing the value '1'.
- Date**: A text box with a placeholder format '----/---/--- --:--:--'.
- User**: A text box for entering the user name.
- Title**: A text box containing the value 'New project'.
- Comment**: A multi-line text area containing the value 'Project of production line A'.
- Buttons**: 'OK' and 'Cancel' buttons at the bottom.

Operating procedure

- Set the items on the screen.

Item	Description
Revision No.	Displays the revision number to be registered.
Date	Displays "----/--/-- --:--:--" (year/month/date hour:minute:second).
User	Displays the user name when using the project with security.
Title	Enter a title of the revision.
Comment	Enter comments for the revision.

Point

- **Revision number and the allowable number of revisions that can be registered**

A revision number for the registered revision is automatically assigned from 1 to 9999.

The maximum number of revisions that can be registered is 100. If the number of the registered revisions has exceeded 100, delete unnecessary revisions. The deleted revision numbers are unused.

If the revision number has exceeded 9999, delete all the revision data, or save the project with a different name without succeeding the revision information. (→ Section 4.1.3)

- **The allowable number of characters that can be entered for a title**

The maximum number of characters that can be entered for a title is 32.

- **The allowable number of characters that can be entered for comments**

The maximum number of characters that can be entered for comment is 256.

- **Registration of project revisions when overwriting and saving projects**

According to the option setting, the Revision Registration screen for the project revision is displayed when overwriting and saving the project.

To display the Revision Registration screen when overwriting and saving the project, select [Tools] ⇒ [Options] ⇒ "Project History", and then select "History is Registered when Save Project".

- **Registration of project revisions for projects with security**

For the projects with security, the revisions can be registered only when the user's access level is 'Administrators'.

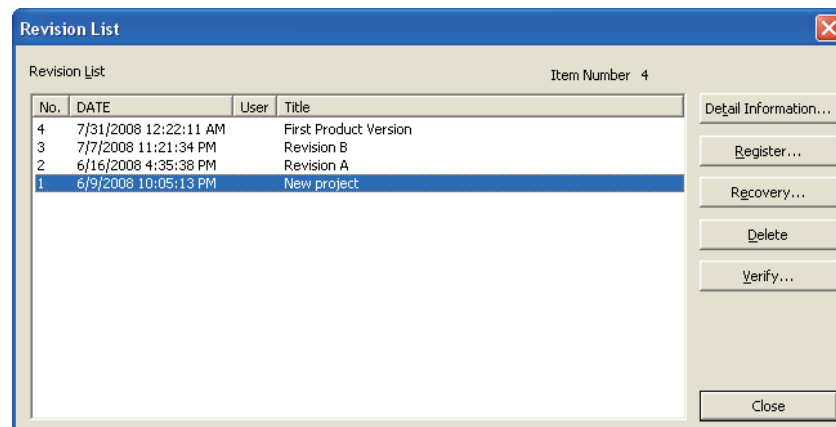
4.5.2 Displaying revision list

This section explains the method for displaying the registered revision information in the order of the revision number.

The revision list is used for registering, restoring, deleting, and verifying backups.

Screen display

Select [Project] ⇒ [Project Revision] ⇒ [Revision List].



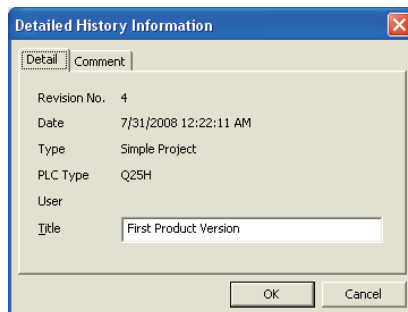
Display contents

Item	Description
No.	Displays the revision numbers.
DATE	Displays the dates of revision registration.
User	For the projects with security, displays the user names who have registered the revisions.
Title	Displays the titles of the revisions.

Screen button

- **Detail Information...**

Displays the detailed information of the revision which is selected in the list. "Title" and "Comment" can be edited.



- **Register...**

Registers the project being edited as a revision. (☞ Section 4.5.1)

- **Recovery...**

Restores the backup data. (☞ Section 4.5.3)

- **Delete**

Deletes the revision information. (☞ Section 4.5.4)

- **Verify...**

Verify the revision with other revisions or the projects being edited. (☞ Section 4.5.5)

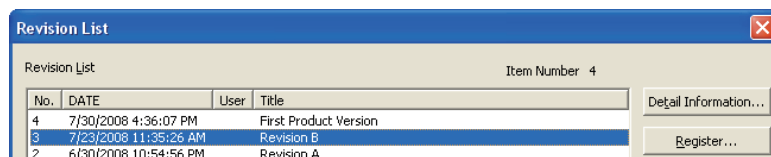
4.5.3 Restoring backup projects

This section explains the method for restoring the backup revision information.

After restoring the backup, the project is in the status at the time of registering the revision information.

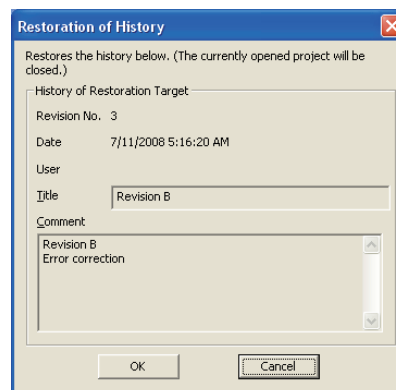
Operating procedure

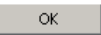
1. Select the revision to be restored on the **Revision List** screen (☞ Section 4.5.2).



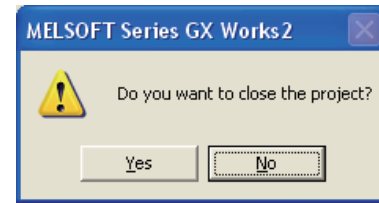
2. Click the **Recovery...** button.

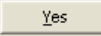
The revision information to be restored is displayed.
Confirm the revision information to be restored.



3. Click the  button.

The message on the right is displayed.



4. Click the  button.

The backup of the selected revision information is restored.

Point

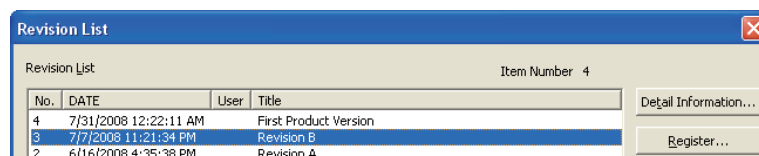
- **Access level to be able to use the restoring function when using the projects with security**
For the projects with security, the revisions can be restored only when the user's access level is 'Administrators'.
- **Revisions for the project with security**
If the project being edited is the project with security, the registered security in the revision is deactivated when the security is deactivated.
As the revision is restored without security, delete the revision data in advance.

4.5.4 Deleting revision information

This section explains the method for deleting the registered revision information.

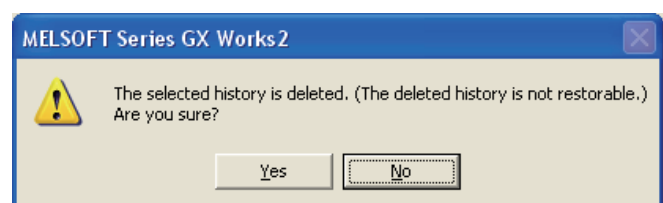
Operating procedure

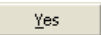
1. Select the revision information to be deleted on the **Revision List** screen ( Section 4.5.2).



2. Click the  button.

The message on the right is displayed.



3. Click the  button.

The selected revision information is deleted.

Point

- **Revision number**
The deleted revision numbers are unused.
- **Revisions being restored**
The revision of the project which is restored from the revision cannot be deleted. To delete the project, overwrite and save the project after restoring it.

4.5.5 Verifying revisions

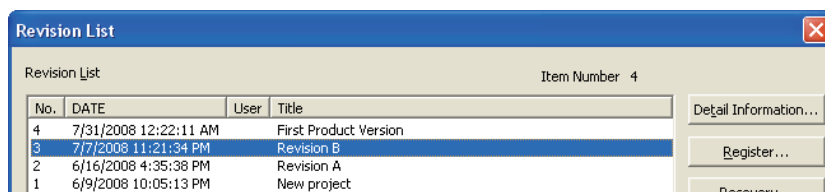
This section explains the method for verifying the revision information with other revision information or the project being edited.

Operating procedure

1. Select the revision to be verified on the Revision List screen (☞ Section 4.5.2).

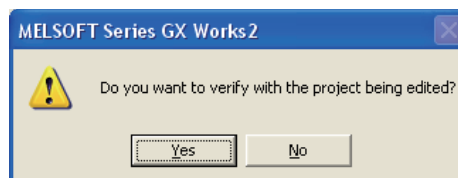
When only one revision is selected and the verification function is performed, the selected revision information is verified with the project being edited.

To verify two revisions, select two revisions with pressing the **[Shift]** key or **[Ctrl]** key.



2. Click the **Verify... button.**

The message on the right is displayed. This message is displayed when verifying the selected revision information with the project being edited.

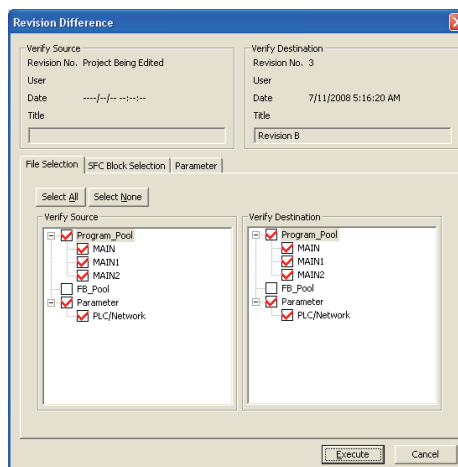


3. Click the **Yes button.**

The Revision Difference screen is displayed.

4. Select the data to be verified.

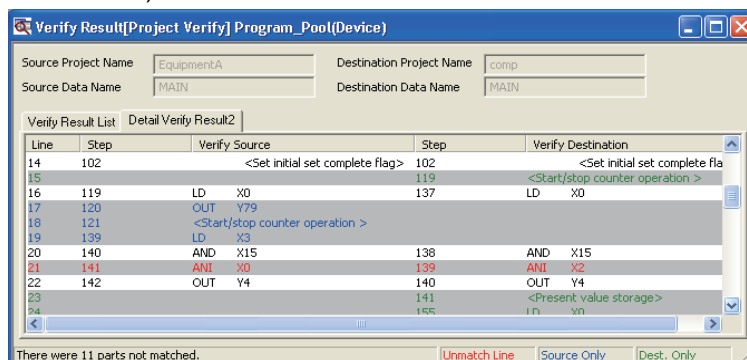
For details on setting items, refer to the project verification. (☞ Section 4.1.6)



5. Click the **Execute button.**

The verification result is displayed on the Verify Result screen. For details on the Verify Result screen, refer to the project verification.

(☞ Section 4.1.6)



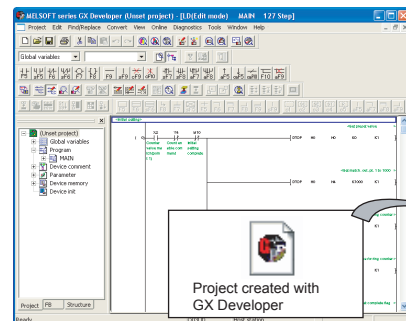
4.6 Utilizing Projects and Data in Other Formats



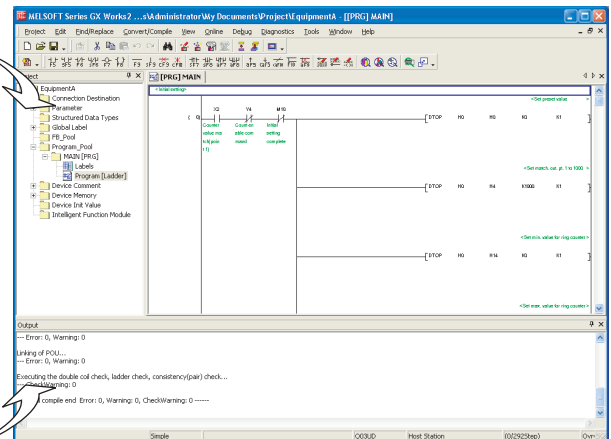
This section explains the method for utilizing projects created with GX Developer or GX IEC Developer, and files (ASCII files) created using the Export function of GX IEC Developer in GX Works2. Projects edited with GX Works2 can also be utilized in GX Developer.

■ Utilizing projects and data created with GX Developer or GX IEC Developer in GX Works2

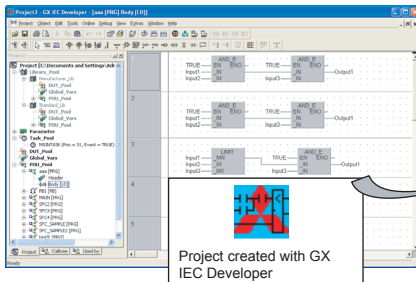
Projects created with GX Developer or GX IEC Developer can be utilized in GX Works2 by using the 'Open Other Project' function. (☞ Section 4.6.1)



Open Other Project function.



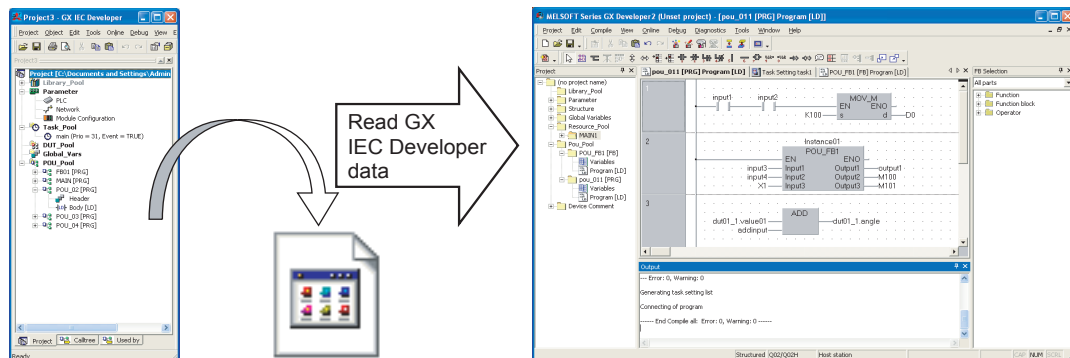
Opened as a GX Works2 project.



Open Other Project function.

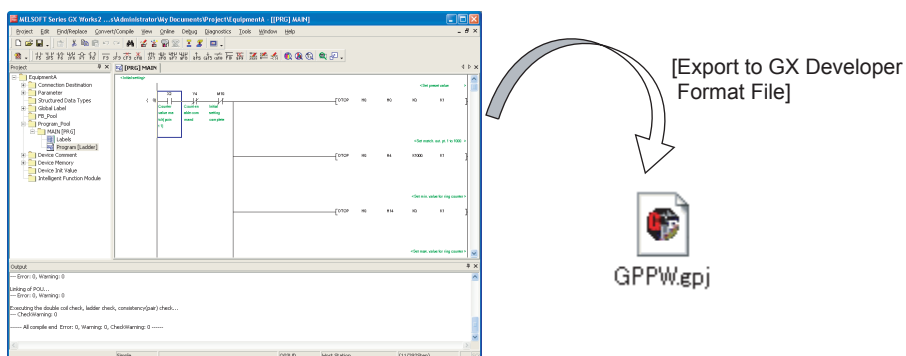
■ Utilizing files created using the Export function of GX IEC Developer

ASCII files created using the Export function of GX IEC Developer can be added as projects in GX Works2 by using the 'Read GX IEC Developer Data' function. (☞ Section 4.6.2)



■ Utilizing projects and data created with GX Works2 in GX Developer

Files created/edited with GX Works2 can be utilized in GX Developer by using the 'Export to GX Developer Format File' function. (☞ Section 4.6.4)



■ Storage of utilized data in GX Works2

Each project and data created with GX Developer or GX IEC Developer are stored in the areas shown in the table below with GX Works2.

GX Developer projects are opened as Simple projects and GX IEC Developer projects, as Structured projects.

GX Developer projects containing ST programs, however, are opened as Structured projects in GX Works2.

● Comparison of projects and data storage locations between GX Developer and GX Works2

GX Developer	GX Works2 (Simple project)	GX Works2 (Structured project)
Parameter	Parameter	Parameter
Structure	Structure	Structure
Global variables	Global labels	Global labels
Program	Program_Pool	POU_Pool/Program_File_Pool
FB	FB_Pool	POU_Pool
Device Comment	Device Comment	Device Comment
Device memory	Device memory	Device memory
Device initial value	Device initial value	Device initial value

● Comparison of projects and data storage locations between GX IEC Developer and GX Works2

GX IEC Developer	GX Works2 (Structured project)
User Library	Library_Pool
Parameter (Programmable controller parameter)	Parameter
DUT_Pool (Structure)	Structure
Global_Vars (Global variable)	Global labels
Task_Pool	Program_File_Pool
POU_Pool	POU_Pool

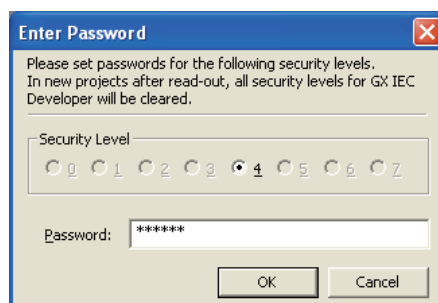
● Data compatibility according to labels between GX Developer and GX Works2

GX Developer	GX Works2
Without labels	Simple project (Do not use labels)
With labels (Without ST programs)	Simple project (Use labels)
With labels (With ST programs)	Structured project

■ Security level of GX IEC Developer

The security level in the GX IEC Developer project is cleared after reading the project.

When the GX IEC Developer project is read using GX Works2, the following Enter Password screen is displayed.

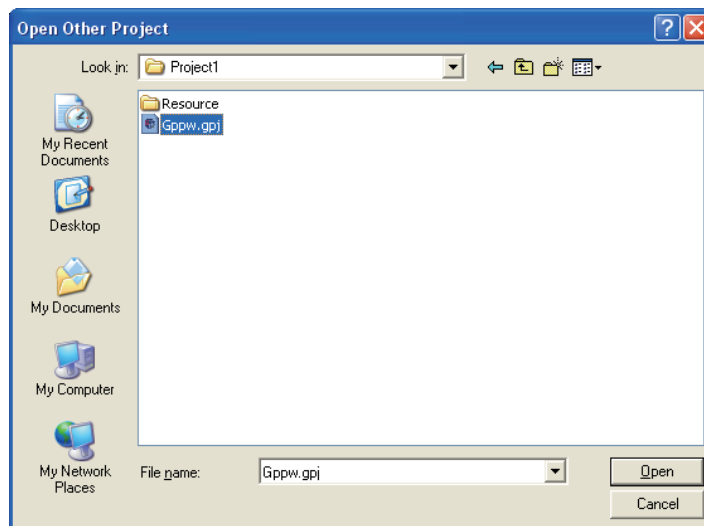


4.6.1 Opening projects in other formats

This section explains the method for opening a project created with GX Developer or GX IEC Developer in GX Works2.

Screen display

1. Select [Project] ⇒ [Open Other Data] ⇒ [Open Other Project].



Operating procedure

- Specify the project, and click the **Open** button.
Select '*.gpj' for a GX Developer project and '*.pro' for a GX IEC Developer project.
The selected project is opened.

Point

● Compatible applications

This function is compatible with projects created using the following applications.

CPU type	GX Developer	GX IEC Developer
High Performance model QCPU	Version 8.00A or later	Version 7.00 or later
Universal model QCPU (Excluding Q02UCPU and Built-in Ethernet port QCPU)	Version 8.45X or later	-
Universal model QCPU (Q02UCPU)	Version 8.48A or later	-
Built-in Ethernet port QCPU	Version 8.68W or later	-

● Status after opening projects in other formats

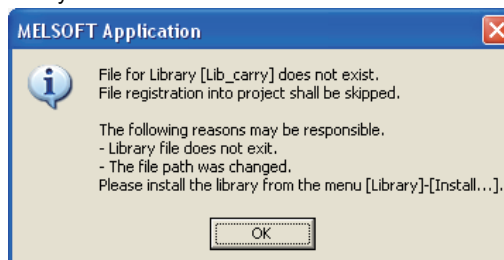
After opening a project in another format, the project is in the uncompiled status. Compile all programs in the project before executing online operations such as writing data and monitoring.

● Opening the project in other format that contains SFC programs

The block information, such as the block information devices, the block titles and the block statements, is set in the block data properties.

● Opening the GX IEC Developer project

When the GX IEC Developer project that contains user library is opened, the following message may be displayed and the user library may not be read. If the following message is displayed, select [Project] ⇒ [Library] ⇒ [Install] in GX Works2 to obtain the user library.

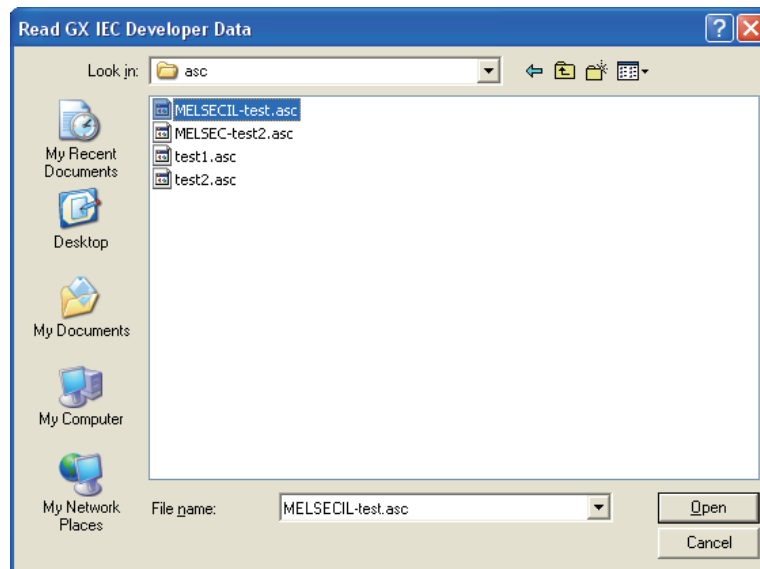


4.6.2 Reading GX IEC Developer data

This section explains the method for adding data (ASCII files) created using the Export function of GX IEC Developer to a GX Works2 project being edited.
Data can be added only to Structured projects.

Screen display

Select [Project] ⇒ [Open Other Data] ⇒ [Read GX IEC Developer Data].



Operating procedure

- Specify the file, and click the  button.
Select '*.asc' for the file.
The specified data is added to the project.

Point

- **Importing project data of different programmable controller type**
Project data having different programmable controller type can be imported to the open project. In this case, instructions and devices not supported in the open project are also imported. Compile the programs after importing the data to check and correct errors.
- **Importing data whose name already exists in the project**
A number is appended in serial order (starting from one) to the end of the data name to be imported, and then the data is added to the project.
- **Importing global labels of GX IEC Developer**
When the global labels of GX IEC Developer are imported, the "Device" column of the global label may be blank. If the "Device" column is blank, check the items in the <<Device>> tab of PLC parameter.

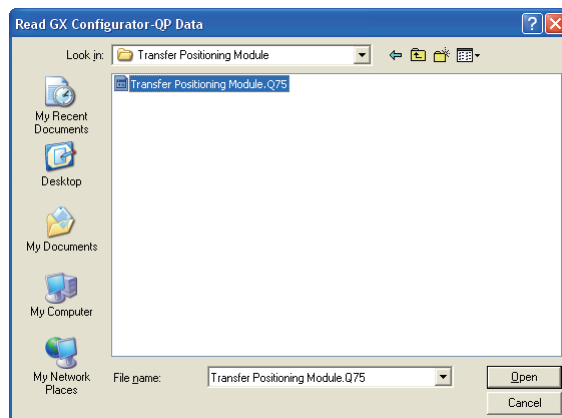
4.6.3 Reading project files created with GX Configurator-QP

This section explains the method for utilizing a project file created with GX Configurator-QP to add an intelligent function module.

Operating procedure

1. Select [Project] ⇒ [Open Other Data] ⇒ [Read GX Configurator-QP Data].

The Read GX Configurator-QP Data screen is displayed.

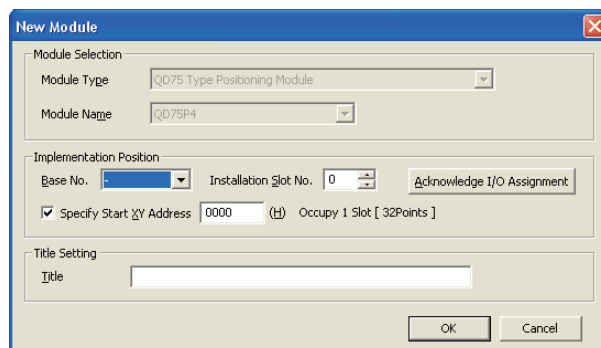


2. Select the project file to be utilized.

3. Select the **Open** button.

The New Module screen is displayed.

➡ Section 4.3.1

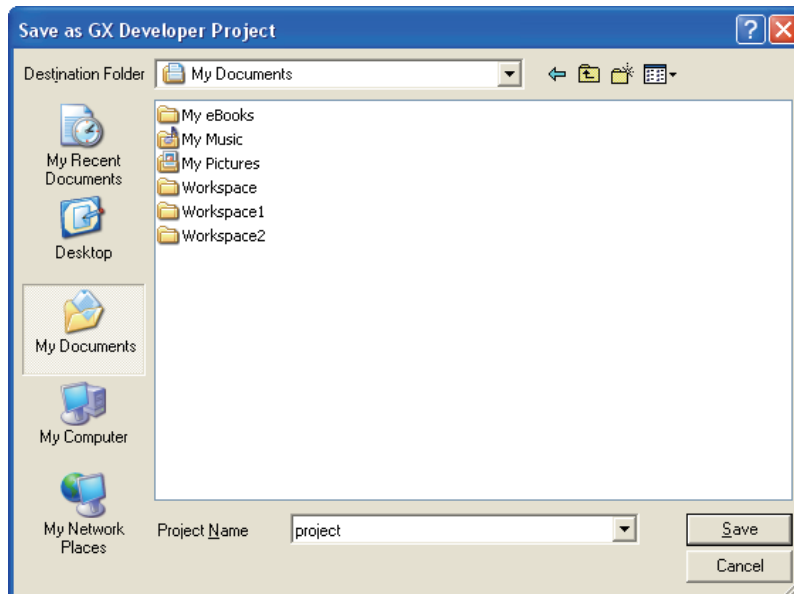


4.6.4 Saving projects in other formats

This section explains the method for saving a Simple project of GX Works2 in the GX Developer format.

Screen display

Select [Project] ⇒ [Export to GX Developer Format File].



Operating procedure

1. Select the save destination of the GX Developer format project.
2. Enter the project name, and click the  button.

Point

● Compatible applications

Projects saved using this function are available with the following applications.

CPU type	GX Developer
High Performance model QCPU	Version 8.00A or later
Universal model QCPU (Excluding Q02UCPU and Built-in Ethernet port QCPU)	Version 8.45X or later
Universal model QCPU (Q02UCPU)	Version 8.48A or later
Built-in Ethernet port QCPU	Version 8.68W or later

For opening projects using applications earlier than the specified versions, refer to 'SW D5□ -GPPW Compatibility' in the GX Developer Version 8 Operating Manual.

● Precautions for saving projects

For the restrictions other than the ones described below, refer to Appendix 9.

- Programs are saved in the uncompiled status.
- The data whose access level is set to other than 'Administrators' cannot be saved. Change the access level before saving the data. (☞ Section 4.7.4)
- The data with a block password cannot be saved. Unlock the block password before saving the data. (☞ Section 4.8.3)

4.7 Setting Security for Projects

QCPU



This section explains the method for setting security for projects to protect the projects themselves and the data in projects.

Setting security not only restricts an access to projects but also prevents the data, such as POU's, device comments, and parameters, that are created by the user from erroneous modification and/or disclosure to unauthorized users.

This function cannot restrict writing/reading of data to/from a programmable controller CPU. Use the online password function to protect the data in a programmable controller CPU. (Chapter 13)

■ Access levels and access restrictions

An access to data can be restricted by setting an access level to the individual user.

An access level is an operating authority given to a login user of the project.

There are five access levels as shown below. The data that can be edited by a user having lower access level can also be edited by a user who has higher access level.

	Access level	Operating authority
Higher ↑ ↓ Lower	Administrators	<Administrator level> All operations are possible.
	Developers(Level3)	<Developer level> Security setting, data access, and a part of operations are restricted.
	Developers(Level2)	
	Developers(Level1)	
	Users	<Operator level> Only access to project data is possible. Data cannot be read from the programmable controller CPU.

<Example>

The data with access restriction of Developers(Level 2) can be edited by a login user whose access level is Developers(Level 2) or higher (Administrators, Developers(Level 3) or Developers(Level 2)).

■ Access authority settable data

The following tables show the data for which access authority can be set.

● * Simple project

Items in Project window				Read	Write
Connection Destination				×	×
	Connection target data			×	×
PLC Parameter/Network Parameter/Remote Password				○	○
Structured Data Types				×	×
	Structure data			×	○
Global Label				×	×
	Global label data			×	○
FB_Pool				×	×
	FB data			×	×
		Label		×	○
		Program		○	○
Program_Pool				×	×
	Ladder program data			×	×
		Label		×	○
		Program		○	○
	SFC program data			×	×
		SFC block		×	×
			Label	×	○
			Program	○	○
Device Comment				×	×
	Comment data			○	○
Device Memory				×	×
	Device memory data			○	○
Device Init Value				×	×
	Device initial value data			×	×
Intelligent Function Module				×	×
	Intelligent function module data			○	○

○: Settable ×: Not settable

1
OVERVIEW2
SYSTEM
CONFIGURATION3
SCREEN
CONFIGURATION
AND BASIC4
PROJECT
MANAGEMENT5
EDITING
PROGRAMS6
SETTING
PARAMETERS7
SETTING DEVICE
MEMORY8
SETTING DEVICE
INITIAL VALUES

● Structured project

Items in Project window		Read	Write
Library_Pool ^{*1}		×	×
	Library data	×	×
Connection Destination		×	×
	Connection target data	×	×
PLC Parameter/Network Parameter/Remote Password		○	○
Structured Data Types		×	×
	Structure data	×	○
Global Label		×	×
	Global label data	×	○
Program_File_Pool		×	×
	Program file data	○	○
POU_Pool		×	×
	POU data	×	×
	Label	×	○
	Program	○	○
Device Comment		×	×
	Comment data	○	○
Device Memory		×	×
	Device memory data	○	○
Device Init Value		×	×
	Device initial value data	×	×
Intelligent Function Module		×	×
	Intelligent function module data	○	○

○: Settable ×: Not settable

*1 : Protection of library data is possible by setting a password to libraries.

( GX Works2 Operating Manual (Structured Project))

4.7.1 Setting/resetting security of projects

This section explains the method for setting security for an open project as well as the method for resetting the set security.

■ Setting security for projects

This function sets security for a project.

Once security is set for a project, user authentication is required when the project is opened once again. (☞ Section 4.8.3)

Screen display

Select [Project] ⇒ [Security Level] ⇒ [User Management].

Operating procedure

1. Set the items on the screen.

Item	Description
User Name	Enter a user name in 1 to 20 characters, using alphabets, numerals, and/or symbols corresponding to the ASCII codes (Appendix 4) of 20H to 26H and 28H to 7EH. (Alphabets are case-sensitive.)
Access Level	Displays 'Administrators'. (Fixed)
Password	Enter a password in 6 to 32 characters, using alphabets, numerals, and/or symbols corresponding to the ASCII codes (Appendix 4) of 20H to 7EH. (Alphabets are case-sensitive.)
Re-enter Password	Set the same password again for confirmation.

2. Click the button.

Security is set for the project.

Point

● Setting security

When security is set for a project, the project is in the status logged in by the set user (Administrators). The current login user can be checked in the status bar. (☞ Section 3.2.6)

● Loss of login password

If a user forgets the login password, logging in to the project is disabled. Remember the password securely. If the user whose access level is Developers(Level 3) or lower forgets the password, log in the project using the access level 'Administrators' and set the password again.

■ Resetting security of projects

This function resets the set security of a project by deleting all users, and returns the project to the status without security. (☞ Section 4.8.2)

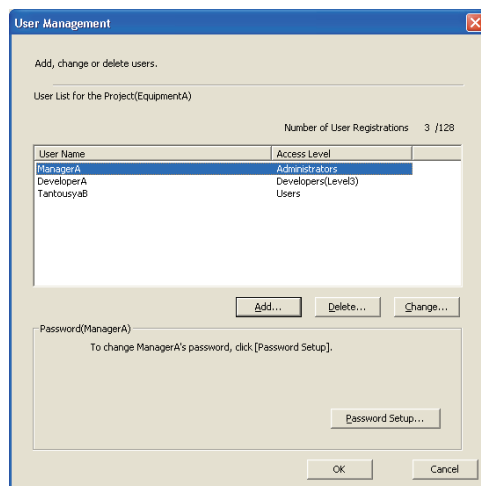
4.7.2 Managing (adding/deleting/changing) users

This section explains the method for managing the registered status of users for a project with security. This function also adds/deletes/changes users.

This function is available only when a project is logged in by the user whose access level is 'Administrators' or 'Developers'.

Screen display

Select [Project] ⇒ [Security Level] ⇒ [User Management].



Display contents

Item	Description
Number of User Registrations	Displays the number of registered users and the number of registerable users.
User Name	Displays the registered user names.
Access Level	Displays the access level of each registered user.

Screen button

● Add...

Adds a user. ( ' ■ Adding users')

● Delete...

Deletes a user selected in the list.

The current login user cannot be deleted. If registered users are only 'Administrators' and there are no other users to be deleted, deletion of the current login user is possible.

If 'Administrators' level users are deleted, security is reset.

● Change...

Changes the information of the user selected in the list. ( ' ■ Changing user information')

● Password Setup...

Changes the password of the user selected in the list. ( ' ■ Changing passwords')

The password of the current login user cannot be changed using this function. To perform this change, use the Change password function by selecting [Project] ⇒ [Security Level] ⇒ [Change Password].

■ Adding users

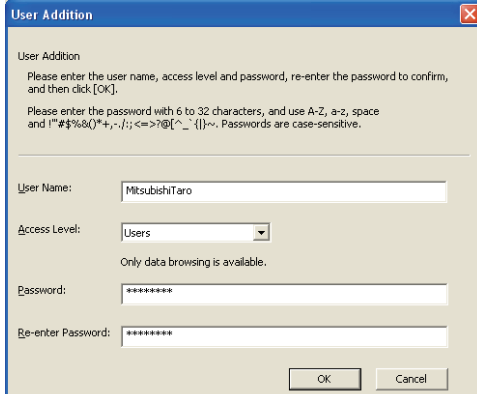
This function adds a user to a project with security.

A user whose access level is higher than the access level of login user cannot be added.

Operating procedure

1. Click the  button on the **User Management** screen.

The User Addition screen is displayed.



2. Set the items on the screen.

Item	Description
User Name	Enter a user name in 1 to 20 characters, using alphabets, numerals, and/or symbols corresponding to the ASCII codes (Appendix 4) of 20H to 26H and 28H to 7EH. (Alphabets are case-sensitive.)
Access Level	Select the access level.
Password	Enter a password in 6 to 32 characters, using alphabets, numerals, and/or symbols corresponding to the ASCII codes (Appendix 4) of 20H to 7EH. (Alphabets are case-sensitive.)
Re-enter Password	Set the same password again for confirmation.

3. Click the  button.

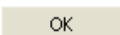
The user is added.

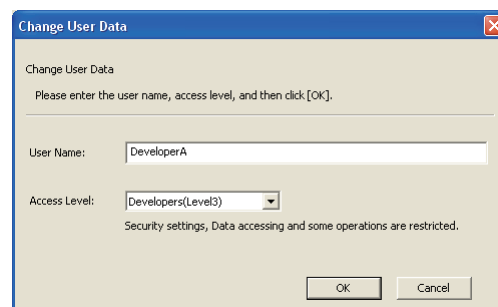
The added user is displayed in the User Management screen.

■ Changing user information

This function changes the user information (user name and access level) of registered users. The information of the login user and the user whose access level is higher than that of login user cannot be changed.

Operating procedure

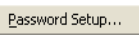
1. Click the  button on the **User Management** screen.
The Change User Data screen is displayed.
2. Set the items on the screen.
Setting items  Section 4.8.1
3. Click the  button.
The user information is changed.

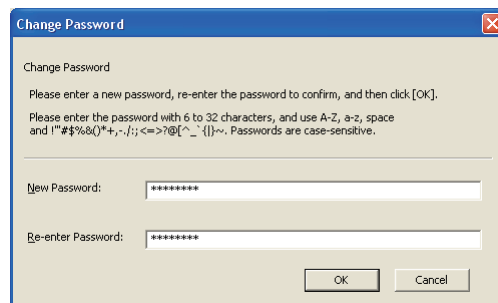


■ Changing passwords

This function changes the password of the user selected in the list on the User Management screen. The password of the login user and the user whose access level is higher than that of login user cannot be changed. To change the password of the login user, use the Change password function by selecting [Project] ⇒ [Security Level] ⇒ [Change Password].

Operating procedure

1. Click the  button on the **User Management** screen.
The Change Password screen is displayed.
2. Set the "New Password" and the "Re-enter Password".
3. Click the  button.
The password is changed.

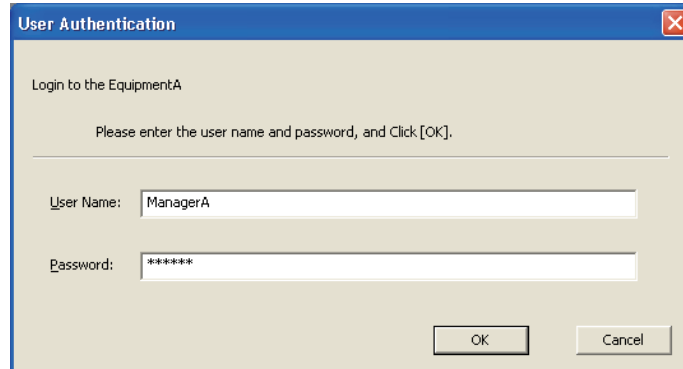


4.7.3 Logging in projects

This section explains the user authentication procedure required when opening a project with security.

Screen display

Screen display when a project with security is opened.



The image shows a 'User Authentication' dialog box with a blue title bar and a close button. The main area is light beige. It contains the text 'Login to the EquipmentA' and 'Please enter the user name and password, and Click [OK].'. Below this are two input fields: 'User Name:' with the text 'ManagerA' and 'Password:' with masked characters '*****'. At the bottom right are 'OK' and 'Cancel' buttons.

Operating procedure

1. Set the items on the screen.

Item	Description
User Name	Enter the user name registered to the project to be logged in.
Password	Enter the password.

2. Click the button.

Login authentication is performed with the entered user name and password. The project is opened when the entry is confirmed to be correct.

Point

● Checking login status

The current login user can be checked in the status bar. (→ Section 3.2.6)

4.7.4 Changing access authority of access level

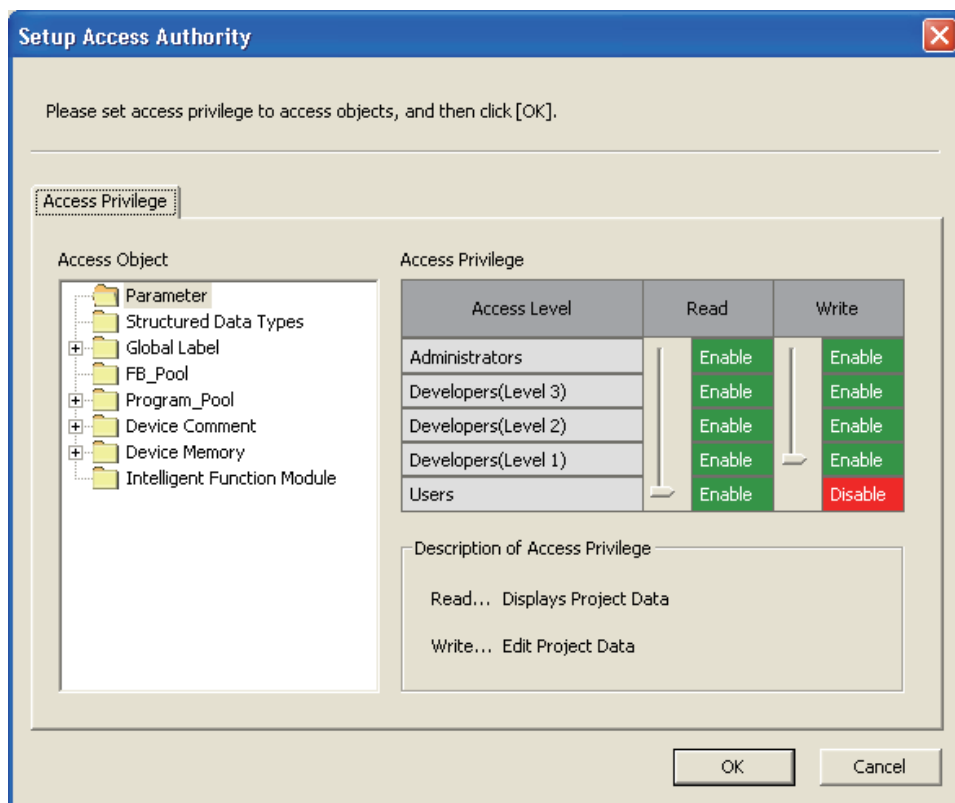
This section explains the method for setting an authorization of displaying/saving data for each access level.

Changing the access authority of higher access level is not possible.

If the access level of the current login user is 'Users', changing the access authority is not allowed.

Screen display

Select [Project] ⇒ [Security Level] ⇒ [Data Security Setting].



Operating procedure

1. Set the items on the screen.

Item	Description
Access Object	Select the data for which access authority is changed.
Access Privilege	Set 'enable/disable' of reading/writing data for each access level by moving the slider.

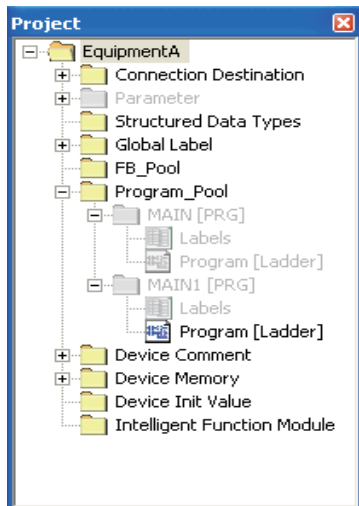
2. Click the button.

4.7.5 Precautions on using the security function

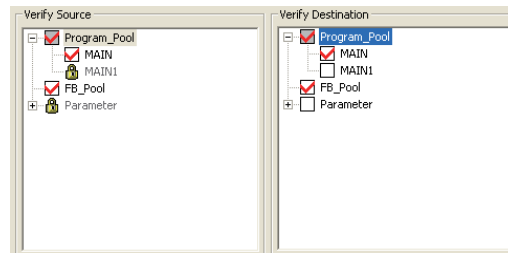
1) Read protected data

The read protected data are displayed in gray icons in the Project window. On the screens of project verification and programmable controller verification, a lock mark is appended to the icon. The read protected data cannot be opened.

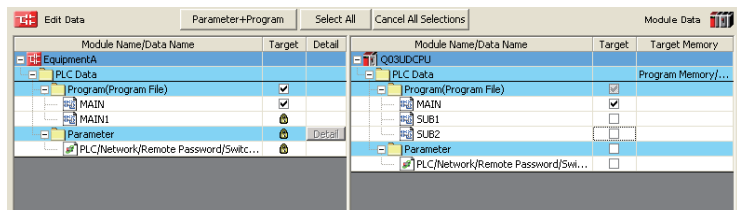
<Project window>



<Project verification>



<Programmable controller verification>



2) Write protected data

The write protected data can be opened as the read only data.

3) Properties of data

The properties of the read/write protected data can be displayed, but cannot be edited.

4) Device comment display in ladder editor and on the Sampling Trace screen

If the data of the device comment is set as read protected, the device comment is not displayed in ladder editor or on the Sampling Trace screen.

5) Reading symbolic information from programmable controller CPU

When symbolic information^{*1} is read from a programmable controller CPU, the security settings (settings on the Setup Access Authority screen) of the data^{*2}, which are not included in the symbolic information, are set to their default.

If the settings on the Setup Access Authority screen are changed, make settings again after reading data from the programmable controller CPU.

*1 : Symbolic information (Section 12.1)

*2 : The data not included in the symbolic information are as follows:

- PLC parameter/network parameter/remote password
- Global comment
- Local comment

4.8 Protecting POU's in Projects

QCPU



This section explains the method for setting a block password to a POU^{*1}.

Setting a block password to a POU^{*1} disables browsing of program contents. To browse program contents, the block password must be unlocked.

^{*1} : With Simple projects, block passwords can be set only to function blocks. However, block passwords cannot be set for Simple projects of “do not use labels” type.

Point

- **Effective range of block passwords**

A block password is the function that protects POU's, not actual programs.

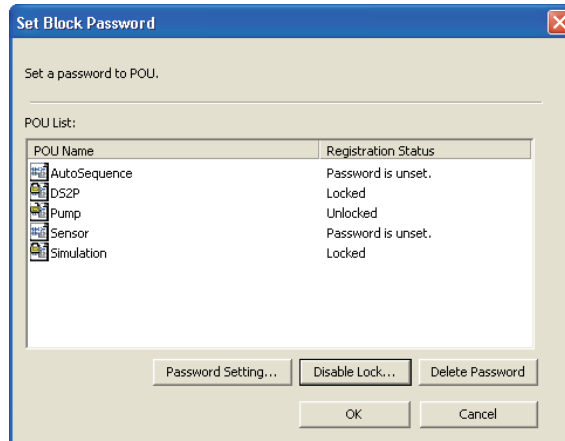
To protect actual programs, use the security function or online password function.

4.8.1 Managing (setting/unlocking/deleting) block passwords

This section explains the method for managing the block password setting status of a POU. In addition, this function sets/unlocks/deletes a block password.

Screen display

Select [Tools] ⇒ [Block Password].



Display contents

Item	Description
POU Name	Displays POU's.
Registration Status	Displays the status of block password for each POU.

Screen button

● Password Setup...

Sets a block password to a POU. (☞ Section 4.8.2)

● Disable Lock...

Unlocks the block password set to the POU. (☞ Section 4.8.3)

● Delete Password

Deletes the registered block password. The block password of the POU must be unlocked before deleting it.

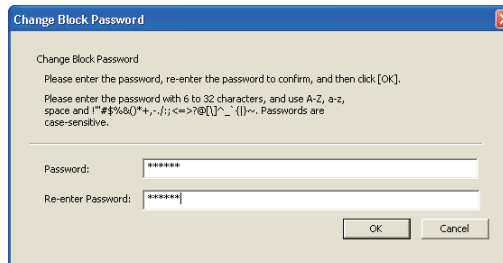
4.8.2 Setting/changing block passwords

This section explains the method for setting a block password to a POU.

Operating procedure

1. Click the **Password Setup...** button on the **Set Block Password** screen.

The **Change Block Password** screen is displayed.



2. Set the items on the screen.

Item	Description
Password	Enter a password in 6 to 32 characters, using alphabets, numerals, and/or symbols corresponding to the ASCII codes (☞ Appendix 3) of 20H to 7EH. (Alphabets are case-sensitive.)
Re-enter Password	Set the same password again for confirmation.

3. Click the **OK** button.

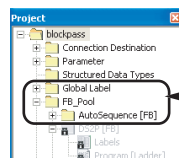
The block password is set to the selected POU.

Lock of the POU by the block password becomes effective when the project is opened once again.

Point

● Display in the Project window

A POU with a block password is displayed in the Project window as follows.



A lock mark is appended to the icon of POU to which a block password is set.

● Changing block passwords

To change a block password, simply set a new password for the POU to which a block password has already been set. However, the block password must be unlocked before changing it.

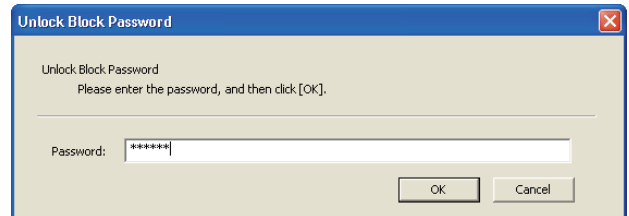
4.8.3 Unlocking block passwords

This section explains the method for unlocking the block password set to a POU. Browsing of POU's is enabled by unlocking block passwords.

Operating procedure

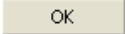
1. Click the  button on the **Set Block Password** screen.

The Unlock Block Password screen is displayed.



2. Set the items on the screen.

Item	Description
Password	Enter the block password to be unlocked.

3. Click the  button.

The block password of the selected POU is unlocked.

[illegible]



5 EDITING PROGRAMS

This chapter explains the functions of the program editors used to edit sequence programs.

5.1	Programming	5-2
5.2	Converting/Compiling Projects	5-2

1	OVERVIEW
2	SYSTEM CONFIGURATION
3	SCREEN CONFIGURATION AND BASIC
4	PROJECT MANAGEMENT
5	EDITING PROGRAMS
6	SETTING PARAMETERS
7	SETTING DEVICE MEMORY
8	SETTING DEVICE INITIAL VALUES

5.1 Programming

QCPU



For programming in each project, refer to the following manuals:

-  GX Works2 Version1 Operating Manual (Simple Project)
-  GX Works2 Version1 Operating Manual (Structured Project)

5.2 Converting/Compiling Projects

QCPU



This section explains the method for compiling an edited project to convert it into the code executable on the programmable controller CPU.

For ladder projects, perform ladder conversion to fix the edited ladders before compilation.

The following table shows the compilation types.

Compilation type	Description
Build	Compiles uncompiled data (programs, structured data, labels, and functions/function blocks).
Compile + Online Change	Writes the difference between the compiled programs and the programs stored in the programmable controller CPU to the programmable controller CPU after compilation.
Rebuild All	Compiles all data (programs, structured data, labels, and functions/function blocks).
Change SFC All	Converts all SFC diagrams. (SFC projects only)
Ladder Conversion	Fixes the edited ladder block. (ladder projects only)
Ladder Conversion (Online Change)	Writes the difference between the converted ladder and the program stored in the programmable controller CPU to the programmable controller CPU after conversion. (projects without labels only)

For details, refer to the following manuals:

-  GX Works2 Version1 Operating Manual (Simple Project)
-  GX Works2 Version1 Operating Manual (Structured Project)



6 SETTING PARAMETERS

This chapter explains the setting items, operations on the setting screens, and common notes on parameter settings.

For necessary information and details of settings, refer to the manuals of each module to be used.

6.1	Setting PLC Parameter	6-2
6.2	Setting Network Parameter	6-10
6.3	Setting Remote Password	6-16
6.4	Checking Parameters	6-18

6.1 Setting PLC Parameter

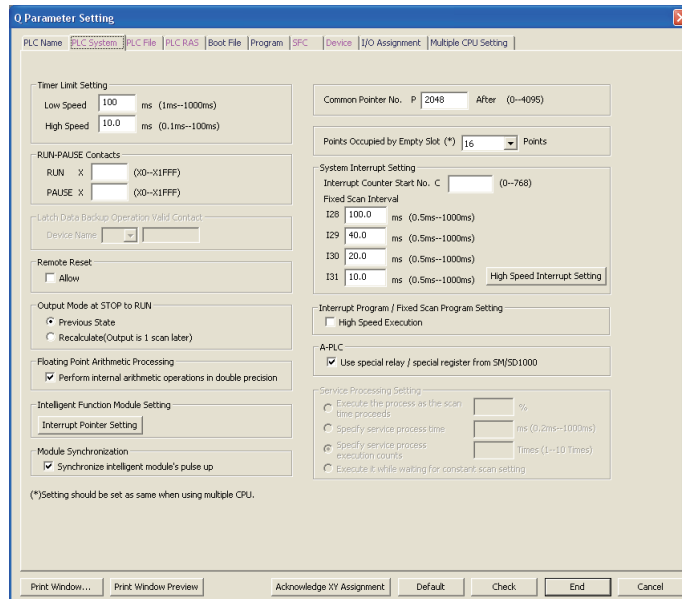
QCPU



This section explains the method for setting PLC parameter.

Screen display

Select Project window ⇒ "Parameter" ⇒ "PLC Parameter".



Display contents

Item	Description										
Tab	The setting items are categorized under tabs according to their purpose.										
	The parameter setting status is displayed by different font colors of the tab names.										
	<table><tr><th>Font color</th><th>Setting status</th></tr><tr><td>Red</td><td>Status that data is not set under the tab (Data must be set under the tab for operation.)</td></tr><tr><td>Blue</td><td>Status that data is set under the tab (A red tab name changes to blue after data is set.)</td></tr><tr><td>Magenta</td><td>Default values (The user has not made settings under the tab.)</td></tr><tr><td>Dark blue</td><td>Values other than default values (A magenta tab name changes to dark blue after data is set.)</td></tr></table>	Font color	Setting status	Red	Status that data is not set under the tab (Data must be set under the tab for operation.)	Blue	Status that data is set under the tab (A red tab name changes to blue after data is set.)	Magenta	Default values (The user has not made settings under the tab.)	Dark blue	Values other than default values (A magenta tab name changes to dark blue after data is set.)
	Font color	Setting status									
	Red	Status that data is not set under the tab (Data must be set under the tab for operation.)									
	Blue	Status that data is set under the tab (A red tab name changes to blue after data is set.)									
	Magenta	Default values (The user has not made settings under the tab.)									
Dark blue	Values other than default values (A magenta tab name changes to dark blue after data is set.)										
Details of the setting items  Section 6.1.1											

Screen button

- **Print Window...**
Executes printing. (☞ Section 18.3)
- **Print Window Preview**
Executes print preview. (☞ Section 18.2)
- **Acknowledge XY Assignment**
Checks the X/Y setting made in the <<I/O Assignment>> tab of PLC Parameter or in Network Parameter.
- **Default**
Resets all setting items on the open screen to their defaults.
- **Check**
Checks whether the parameter setting items set by the user on the open screen are correct.

6.1.1 PLC parameter item list

This section shows the list of PLC parameter setting items for each programmable controller type. For details of each item, refer to the following manuals.

( User's manuals and programming manuals of each CPU)

The following table shows the PLC parameter items that can be set according to the programmable controller type.

Fig 6.1.1-1 List of PLC parameter setting items according to the programmable controller type

Setting tab name	High Performance model QCPU / Universal model QCPU
PLC Name	☐
PLC System	☐
PLC File	☐
PLC RAS	☐
Boot File	☐
Program	☐
SFC	☐
Device	☐
I/O Assignment	☐
Multiple CPU Setting	☐
Built-in Ethernet Port Setting ^{*1}	☐

☐: Settable -: Not settable

*1 : Built-in Ethernet port QCPU only

■ PLC parameter setting items for Q series programmable controller

1) PLC Name

Item	Description	Remarks
Label	Set a label (name and application) of the programmable controller CPU.	—
Comment	Set a comment for the label of the programmable controller CPU.	—

2) PLC System

Item	Description	Remarks
Timer Limit Setting	Set the time limit of the low-speed/high-speed timer.	—
RUN-PAUSE Contacts	Set the contacts for controlling RUN/PAUSE of the programmable controller CPU. PAUSE contact only setting is not available. (RUN contact only or RUN contact + PAUSE contact setting is available.)	—
Latch Data Backup Operation Valid Contact	Set the contact device for executing a latch data backup operation.	Universal model QCPU only
Remote Reset	Set whether to allow a remote reset operation from GX Works2.	—
Output Mode at STOP to RUN	Set the status of output (Y) when the programmable controller is switched from STOP to RUN.	—
Floating Point Arithmetic Processing	Set whether to perform floating-point processing in double precision.	High Performance model QCPU only
Intelligent Function Module Setting	Set the interrupt pointer assignment of the module. Set the start I/O number and start SI number of the module.	—
Common Pointer No.	Set the start number of the common pointers used in the program.	—
Points Occupied by Empty Slot	Set the number of points occupied by empty slots for the main base unit/extension base unit.	—
System Interrupt Setting	Set the start number of the interrupt counters. Set the execution interval for the interrupt pointers.	—
	Set the fixed scan interval for high-speed interrupt pointers, high-speed I/O refresh, and high-speed buffer transfer.	High Performance model QCPU only
Interrupt Program/Fixed Scan Program Setting	Set whether to perform high-speed execution of an interrupt program.	—
Module Synchronization	Set whether to synchronize the start-up of the programmable controller CPU with that of the intelligent function module.	—
A-PLC	Set whether to use the MELSEC-A series special relays/special registers (SM1000/SD1000 to SM1299/SD1299).	High Performance model QCPU only
Service Processing Setting	Set the processing time and the number of times of service processing.	Universal model QCPU only

3) PLC File

Item	Description	Remarks
File Register	Set the file register file to be used in the program.	—
	Set whether to transfer data to the standard ROM when executing a latch data backup operation.	Universal model QCPU only
Comment File Used in a Command	Set the device comment file to be used in the program.	—
Initial Device Value	Set the device initial value file to be used in the programmable controller CPU.	—
File for Local Device	Set the local device file to be used in the program.	—
File used for SP.DEVST/S.DEVLD Instruction	Set the device data ROM write/read instruction file to be used in the program.	Universal model QCPU only

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6 SETTING PARAMETERS

4) PLC RAS

Item	Description	Remarks
WDT (Watchdog Timer) Setting	Set the WDT of the programmable controller CPU.	—
	Set the WDT for an initial execution type program.	—
	Set the WDT for a low-speed execution type program.	High Performance model QCPU only
Error Check	Set whether to detect specified errors.	—
Operating Mode When There is an Error	Set the programmable controller CPU operation mode when an error is detected.	—
Constant Scanning	Set the constant scan time.	—
Breakdown History	Set the storage destination for error histories of the programmable controller CPU.	High Performance model QCPU only
Low speed Program Execution Time	Set the execution time of a low-speed program in every scan.	High Performance model QCPU only

5) Boot File

Item	Description	Remarks
Boot Option	Set whether to clear the program memory when booting up.	—
	Set whether to write data in the memory card automatically to the standard ROM when booting up.	—
Boot File Setting	Set the type, data name, and transfer source device of the boot file.	—

6) Program

Item	Description	Remarks
Program	Set the file name and execution type (executing condition) for programs when several programs are written to the programmable controller CPU. Set the fixed scan interval (the execution interval of a fixed scan execution type program).	—
File Usability Setting button	Displays the <u>File Usability Setting</u> screen.	—
I/O Refresh Setting button	Displays the <u>I/O Refresh Setting</u> screen.	High Performance model QCPU only

7) SFC

Item	Description	Remarks
SFC Program Start Mode	Set the start-up mode of an SFC program.	—
Start Conditions	Set the start-up condition of an SFC program.	—
Output Mode When the Block is Stopped	Set the SFC program output mode at block stop.	—

8) Device

Item	Description	Remarks
Dev. Points	Set the number of points used for each device of the programmable controller CPU.	—
Latch (1) Start/End	Set the latch range (start device number/end device number) clearable with the RESET/L.CLR switch or a remote latch clear operation.	—
Latch (2) Start/End	Set the latch range (start device number/end device number) not clearable with the RESET/L.CLR switch or a remote latch clear operation.	—
Local Device Start/End	Set the range (start device number/end device number) of devices used as a local device.	—
File Register Extended Setting	Set the extended data register and extended link register.	Universal model QCPU only
Index Setting for ZR Device	Set the start number of Z to be 32-bit indexed, or use the index register ZZ for 32-bit indexing.	Universal model QCPU only

9) I/O Assignment

Item	Description	Remarks
I/O Assignment	- Set the type, model, number of occupied I/O points, and start I/O number of each module mounted on the base unit. - Set the switch settings of the programmable controller CPU. (Universal model QCPU only) - Set the switch settings of the intelligent function module.	—
Base Setting	Set the model and the number of slots of the base unit, the model of the power supply module, and the model of the extension cable.	—

10) Multiple CPU Setting

Item	Description	Remarks
No. of PLC	Set the number of programmable controller CPUs used in the multiple CPU system.	—
Operating Mode	Set the operation mode of the multiple CPU system when a stop error occurs in any of the programmable controller CPU No.2 to No.4. The multiple CPU system stops when a stop error occurs in the CPU No.1 module.	
Host Station	Set the CPU number for the host CPU.	Universal model QCPU only (Not settable for Q02UCPU)
Multiple CPU Synchronous Startup Setting	Select the CPU modules to be started up synchronously.	
Online Module Change	Set whether to allow Online module change in the multiple CPU system.	Not settable for Q02UCPU
I/O Sharing When Using Multiple CPUs	Set whether to retrieve the I/O status of the I/O module or intelligent function module controlled by other programmable controller CPUs.	—
Communication Area Setting (Refresh Setting)	Set the CPU shared memory to enable data sharing among multiple CPUs. (Usable devices: B, M, Y, D, W, R, and ZR)	—
Multiple CPU High Speed Communication Area Setting	Set the user setting area, auto refresh, assignment confirmation, and system area.	Universal model QCPU only

11) Built-in Ethernet Port Setting

Item	Description	Remarks
IP Address Setting	Set the IP address and the input format of the IP address.	Built-in Ethernet port QCPU only
Communication Data Code	Select the Binary code or ASCII code for communication.	
Open Setting button	Set the protocol, open system, and host station port number.	
FTP Setting button	Select whether to use the FTP function.	
Time Setting button	Set whether to use the SNTP function, and set the timing of setting the time.	

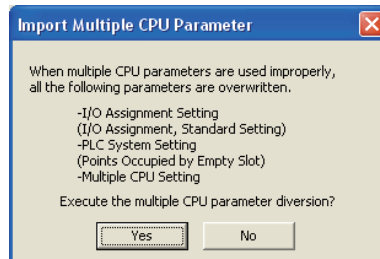
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Point

● Utilizing existing data to set parameters of multiple CPU

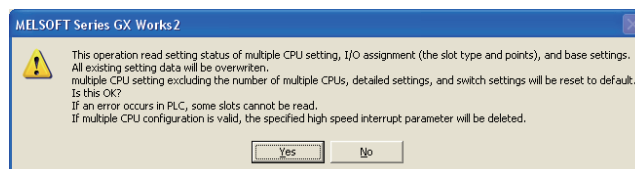
Parameters for multiple CPU can be set utilizing existing data by clicking the [Import Multiple CPU Parameter](#) button in the <<I/O Assignment>> tab.

Specify the project to be utilized, read the message, and then execute the function.



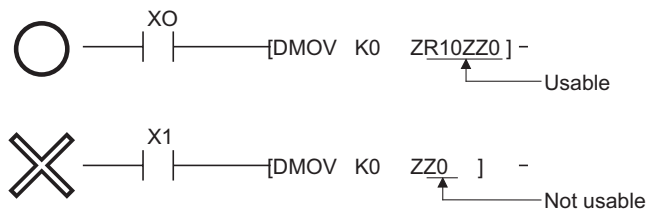
● Reading mounting status of programmable controller CPU

The mounting status of the programmable controller CPU can be read and overwritten to the current parameters by clicking the [Read PLC Data](#) button in the <<I/O Assignment>> tab. Read the message and execute the function.



● "Index Setting for ZR Device" in the <<Device>> tab.

When "Use ZZ" is set for the 32-bit indexing, the ZZ device can not be used or monitored independently in the program.



To confirm the current value of the ZZ device, specify Z and set the display format to 32-bit integer, on the [Device/Buffer Memory Batch Monitor](#) screen.



● Checking duplication of X/Y assignment among parameters

Duplication of X/Y assignment among parameters can be checked by clicking the **Acknowledge XY Assignment** button.

XY No.	Type	I/O Assignment	Slot	Module Type	Points	Model Name	Duplication
0000	PLC network(Slot 1)	I/O Assignment	0(*- 0)	Input	16Points		MNET(Slot 1)
0010	PLC network(Slot 1)	I/O Assignment	1(*- 1)	Intelligent	32Points		MNET(Slot 1)
0020	CC-Link (Slot 1)	I/O Assignment	1(*- 1)	Intelligent	32Points		CC-Link
0030	CC-Link (Slot 1)	I/O Assignment	2(*- 2)	Intelligent	32Points		CC-Link
0040	CC-Link (Slot 1)	I/O Assignment	2(*- 2)	Intelligent	32Points		CC-Link
0050	CC-Link (Slot 1)		3 Station -> X0050				
0060	CC-Link (Slot 1)		4 Station -> X0060				
0070	CC-Link (Slot 1)		4 Station -> X0070				
0080	CC-Link (Slot 1)		5 Station -> X0080				
0090	CC-Link (Slot 1)		5 Station -> X0090				
00A0	CC-Link (Slot 1)		6 Station -> X00A0				
00B0	CC-Link (Slot 1)		6 Station -> X00B0				
00C0	CC-Link (Slot 1)		7 Station -> X00C0				
00D0	CC-Link (Slot 1)		7 Station -> X00D0				

The part displayed in light blue is start XY and module assigned by I/O assignment because of the blank automatically.
In the I/O assignment setting, It is not possible to check correctly, when there is a slot of the unsetting on the way.

Close

- The following shows the display contents of the screen.

Item		Description						
XY No.		Displays the I/O number.						
Type	Network	Displays the contents set in Network parameter.						
	I/O Assignment	Displays the I/O assignment set in parameter.						
Slot		Displays the slot with I/O assignment setting, module type, number of occupied I/O points, and module model set in parameter.						
Module Type								
Points								
Model Name								
Duplication		Displays the module in which the first duplication is detected in a parameter check.						
		<table><tr><th>Display in duplication column</th><th>Contents</th></tr><tr><td>MNET (Slot 1) to MNET (Slot 4)</td><td>MELSECNET or CC-Link IE controller network (slot 1 to slot 4) network parameter</td></tr><tr><td>CC-Link</td><td>CC-Link remote I/O</td></tr></table>	Display in duplication column	Contents	MNET (Slot 1) to MNET (Slot 4)	MELSECNET or CC-Link IE controller network (slot 1 to slot 4) network parameter	CC-Link	CC-Link remote I/O
		Display in duplication column	Contents					
MNET (Slot 1) to MNET (Slot 4)	MELSECNET or CC-Link IE controller network (slot 1 to slot 4) network parameter							
CC-Link	CC-Link remote I/O							

- The following shows the priority when GX Works2 checks parameter settings.

Priority	Display
1	I/O assignment
2	MELSECNET or CC-Link IE controller network (slot 4) network refresh parameter
3	MELSECNET or CC-Link IE controller network (slot 3) network refresh parameter
4	MELSECNET or CC-Link IE controller network (slot 2) network refresh parameter
5	MELSECNET or CC-Link IE controller network (slot 1) network refresh parameter
6	CC-Link remote I/O

6.2 Setting Network Parameter

QCPU



This section explains the method for setting Network parameter.

■ Ethernet/CC-Link IE controller network/MELSECNET parameter setting

Screen display

Select Project window ⇒ "Parameter" ⇒ "Network Parameter" ⇒ "Ethernet/CC IE/MELSECNET".
The screen below is a screen for setting the number of MELSECNET/CC IE/Ethernet cards.

Screen button

● Interlink Transmission Parameters

Displays the Interlink Transmission Parameters screen.

● Acknowledge XY Assignment

Displays the details of the I/O assignment settings. (☞ Section 6.1)

● Routing Parameters

Displays the Routing Information screen.

● Assignment Image

Displays the Assignment Image screen of the refresh parameters.

● Clear

Deletes the set parameters.

● Check

Checks whether the set parameters are correct.

● Print Window...

Executes printing. (☞ Section 18.3)

● Print Window Preview

Executes print preview. (☞ Section 18.2)

■ CC-Link parameter setting

Screen display

Select Project window ⇒ "Parameter" ⇒ "Network Parameter" ⇒ "CC-Link".

Screen button

- **Print Window...**

Executes printing. (☞ Section 18.3)

- **Print Window Preview**

Executes print preview. (☞ Section 18.2)

- **Acknowledge XY Assignment**

Displays the details of the I/O assignment settings. (☞ Section 6.1)

- **Clear**

Deletes the set parameters.

- **Check**

Checks whether the set parameters are correct.

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6.2.1 Network parameter item list

This section shows the list of parameter setting items for each network.
For details of each item, refer to the following manuals.

( User's manuals and reference manuals of each module)

■ MELSECNET/10, MELSECNET/H, and CC-Link IE controller network setting

Item		Description
Network Type		Specify the network type (MELSECNET/10 mode, MELSECNET/H mode or CC-Link IE controller network) whose parameters are to be set.
Start I/O No.		Set the start I/O number.
Network No.		Set the network number.
Total Stations		Set the total number of (slave) stations.
Group No.		Set the group number.
Station No.		Set the station number of a module. (CC-Link IE controller network only)
Mode		Set the mode.
Network Range Assignment (Common parameters)	Specify I/O Master Station	Set the I/O master station.
	Specify Reserved Station	Specify the reserved station.
	Equal Assignment	Assign the number of link device points of all stations equally.
	Identical Point Assignment	Assign the same number of link device points based on the total number of set stations.
	Shared Group Setting*1	Set the shared group of the group cyclic function.
	Supplementary Setting	Set the transient setting, low-speed cyclic setting, and other settings.
Station Inherent Parameters		Set station inherent parameters. (Not available for CC-Link IE controller network)
Refresh Parameters		Set refresh parameters.
Interrupt Setting		Set the device code, detection method, interrupting condition, interrupt (SI) number, and other settings.
Specify Station No. by Parameter		Set whether to set a station number in a program or by a parameter. (CC-Link IE controller network only) The station number can be specified only when the normal station is selected in the Universal model QCPU.

*1 : Only when the control station of the CC-Link IE controller network is selected in the Universal model QCPU.

■ MELSECNET/H and Remote I/O setting

Item		Description
Network Type		Specify "MELSECNET/H (remote master)".
Start I/O No.		Set the start I/O number.
Network No.		Set the network number.
Total Stations		Set the total number of (slave) stations.
Mode		Set the mode.
Network Range Assignment (Common parameters)	Specify Reserved Station	Specify the reserved station.
	Equal Assignment	Assign the number of link device points of all stations equally.
	Supplementary Setting	Sets the constant scan time and the maximum number of return stations in one link scan.
Refresh Parameters		Set refresh parameters.
Interrupt Setting		Set the device code, detection method, interrupting condition, interrupt (SI) number, and other settings.

■ Ethernet setting

Item		Description
Network Type		Specify "Ethernet".
Start I/O No.		Set the start I/O number.
Network No.		Set the network number.
Total Stations		Set the total number of (slave) stations.
Group No.		Set the group number.
Station No.		Set the station number.
Mode		Set the mode.
Operation Setting		Set the common items for the module.
Initial Setting		- Set data communication timer values. - Set IP addresses for DNS servers.
Open Setting		Set parameters required for the open processing.
Router Relay Parameter		Set parameters for the router relay function of Ethernet.
Station No.↔IP Information		Make settings for communication with a programmable controller on another station equating Ethernet with a MELSECNET/H, MELSECNET/10 or CC-Link IE controller network system.
FTP Parameters		Set FTP parameters such as the login name, password, command input monitoring timer, and PLC monitoring timer.
E-mail Setting	General Setting	Set the password, e-mail address, and inquiry interval for receiving mails.
	Mail Server Name	Set the SMTP server, POP server, and IP addresses for both servers.
	Send Mail Setting	Set addresses of send mail.
	News Setting	Set the notifying condition.
Interrupt Setting		Set the device code, detection method, interrupting condition, interrupt (SI) number, and other settings.

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■ CC-Link setting

Item	Description
No. of Boards in Module	Set the number of CC-Link modules.
Start I/O No.	Set the start I/O number.
Operation Setting	Set the parameter name, data link error station, CPU stop setting, exclusive station count, expanded cyclic setting, and block guarantee of cyclic data per station.
Type	Set the station type such as a master/local/standby master station.
Master Station Data Link Type	The setting is fixed to "PLC Parameter Auto Start".
Mode	Set the mode.
Total Module Connected	Set the total number of remote stations, local stations, intelligent device stations, and/or standby master stations connected to the master station.
Remote Input [RX] refresh device	Set the devices to refresh the data of RX, RY, RWr, and RWw. (For remote network Ver.1 mode and remote network additional mode)
Remote Output [RY] refresh device	
Remote Register [RWr] refresh device	
Remote Register [RWw] refresh device	
Ver.2 Remote Input [RX] refresh device	Set the devices to refresh the data of RX, RY, RWr, and RWw. (For remote network Ver.2 mode and remote network additional mode)
Ver.2 Remote Output [RY] refresh device	
Ver.2 Remote Register [RWr] refresh device	
Ver.2 Remote Register [RWw] refresh device	
Special Relay (SB) refresh device	Set the devices to refresh the data of SB and SW.
Special Register (SW) refresh device	
Retry Count	Set the number of retries in case a communication error occurs.
Automatic Reconnection Station Count	Set the number of remote stations, local stations, intelligent device stations, and/or standby master stations can be returned to the system in one link scan.
Standby Master Station No.	Specify the station number of the standby master station.
PLC Down Select	Specify the data link status when an error occurs in the programmable controller CPU on the master station.
Scan Mode Setting	Specify whether to synchronize the link scan with the sequence scan.
Delay Information Setting	Set the link scan interval delay time.
Station Information Setting	Set the station type, number of occupied stations, and other settings.
Remote Device Station Initial Setting	Set the target station number and procedure registration (such as operating condition and executing condition).
Interrupt Setting	Set the device code, detection method, interrupting condition, interrupt (SI) number, and other settings.

6.2.2 Supplementary explanation for Network parameter setting

■ 'MELSOFT connection' in Ethernet Network parameter

'MELSOFT connection' is set when connecting up to 17 MELSOFT products (including GX Works2) using the TCP/IP communication system.

To display the setting screen, select Ethernet ⇒ "Open Settings" ⇒ "Protocol (TCP)" ⇒ "Open System" (MELSOFT connection).

Connection with non-MELSOFT products {

Connection with MELSOFT products (including GX Works2) {

	Protocol	Open System	Fixed Buffer	Fixed Buffer Communication Procedure	Pairing Open	Existence Confirmation	Host Station Port No.	Destination IP Address	Destination Port No.
1	TCP	Unpassive	Receive	Procedure Exist	Disable	No Confirm	0521		
2	TCP	Active	Send	Procedure Exist	Disable	No Confirm	0512	192. 0. 1.200	0821
3	TCP	Unpassive	Send	Procedure Exist	Disable	No Confirm	0623		
4	TCP	Unpassive	Send	Procedure Exist	Disable	No Confirm	0614		
5	UDP		Send	Procedure Exist	Disable	No Confirm	0735	192. 0. 1.201	1000
6									
7									
8									
9									
10									
11									
12									
13									
14	TCP	MELSOFT Connection							
15	TCP	MELSOFT Connection							
16	TCP	MELSOFT Connection							

End Cancel

- The screen above shows the example of the settings for the following connections:
 Connection 1 to 5: Connection with non-MELSOFT products
 Connection 14 to 16: Connection with MELSOFT products (including GX Works2)
 For 'MELSOFT connection' settings, refer to the user's manual of the Ethernet interface module.

Restrictions!

● Q series-compatible E71 modules for 'MELSOFT connection'

For 'MELSOFT connection', use the following Q series-compatible E71 modules:

- Function version B modules with a serial number, whose first 5 digits are '02122' or higher

6.3 Setting Remote Password

QCPU



This section explains the method for setting a password to prevent illegal access from remote users to the QCPU via a Q series-compatible E71C24 module or Built-in Ethernet port QCPU.

Screen display

Select Project window ⇒ "Parameter" ⇒ "Remote Password".

The "Remote Password Setting" dialog box contains the following elements:

- Password Setting:** A text field for the password and a note: "Characters that can be used in password: 4 characters, Numbers, A-Z a-z, Special characters."
- Password Active Module Setting:** A table with columns: Model Name, StartXY, and Condition.

Model Name	StartXY	Condition
QnUDE(H)CPU		Detail
QJ71C24/CMO		
QJ71E71		Detail
QJ71E71		
QJ71C24/CMO		
- Necessary Setting:** A status indicator showing "No Setting / Already Set".
- Buttons:** Clear, End, and Cancel.

Operating procedure

1. Set the items on the screen.

Item		Description
Password		Set the password.
Password Active Module Setting	Model Name	Set the routing module (the QJ71E71, QJ71C24/CMO or QnUDE(H)CPU).
	Start XY	Set the start I/O number.
	Condition	Set the details when selecting the QJ71E71. ● User connection No. valid setting Set whether to enable the remote password for the user connection No. 1 to No. 16. ● System connection valid setting Set whether to enable the remote password for the system connections.

2. Click the **Setting completion** button.

The Password Confirmation screen is displayed.

3. Enter the set password again.

The "Password Confirmation" dialog box contains the following elements:

- Text:** "Please input the password again for confirmation."
- Password Field:** A text field showing "****".
- Buttons:** OK and Cancel.

4. Click the button.

The remote password setting ends.

To set the password in the programmable controller CPU, write the parameter to the programmable controller CPU using the Write to PLC function.

( Section 12.1)

Point

- **Modules that allow remote password setting**
For details of the modules that allow the remote password setting and the remote password setting method, refer to the user's manual of the programmable controller CPU, Q series-compatible E71 or Q series-compatible C24 module to be used.
- **Characters for password**
Enter the password in 4 characters, using alphabets, numerals, and symbols corresponding to the ASCII codes ( Appendix 3) of 20H to 7EH.

6.4 Checking Parameters

QCPU

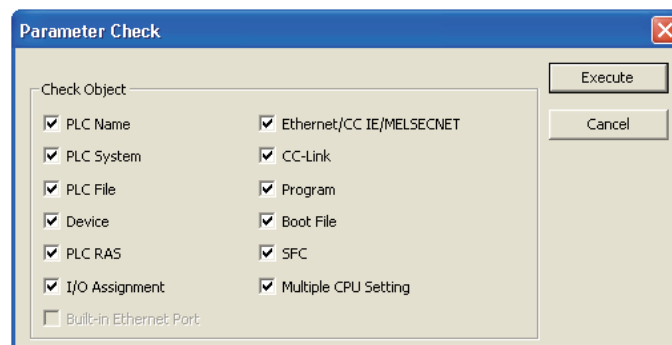


This section explains the method for checking errors in the PLC parameter and Network parameter which are set in the project.

The result of the parameter check is displayed in the Output window.

Screen display

Select [Tools] ⇒ [Parameter Check].



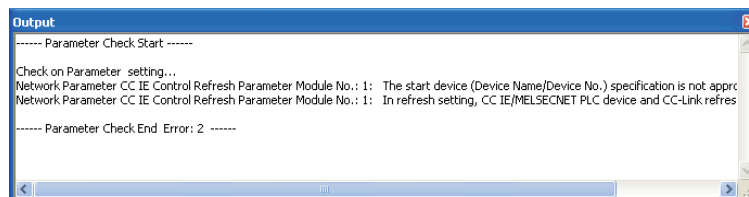
Operating procedure

1. Set the items on the screen.

Item	Description
Check Object	Check the items for the parameter check.

2. Click the button.

The parameter check is performed, and the result is displayed in the Output window.





7 SETTING DEVICE MEMORY

This chapter explains the settings of the device memory.

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7.1 Device Memory



This section explains the features of the device memory.

7.1.1 Features of device memory

Device memory is the function that reads/writes data from/to the device memory in a programmable controller CPU.

- Read

The function batch reads device memory data from a programmable controller CPU to GX Works2. The read data can be used to check the status of the device memory in a programmable controller CPU as well as for offline debugging.

- Write

The function batch writes device memory data from GX Works2 to a programmable controller CPU. The current values of the device memory in a programmable controller CPU can be batch changed.

7.1.2 List of devices selectable on the Insert Devices screen

Table 7.1.2-1 List of selectable devices

Category	Device type		Symbol	Display/edit
Internal user device	Input		X	△
	Output		Y	△
	Internal relay		M	○
	Latch relay		L	○
	Annunciator		F	○
	Edge relay		V	○
	Step relay		S	○
	Link relay		B	○
	Link special relay		SB	○
	Timer	Current value	T	○
		Contact	TS	-
		Coil	TC	-
	Counter	Current value	C	○
		Contact	CS	-
		Coil	CC	-
	Retentive timer	Current value	ST	○
		Contact	STS	-
		Coil	STC	-
	Data register		D	○
	Link register		W	○
	Link special register		SW	○
	Direct input		DX	-
	Direct output		DY	-
Internal system device	Special relay		SM	△
	Special register		SD	○
Link direct device	Link input		J□\X□	△
	Link output		J□\Y□	△
	Link register		J□\W□	○
	Link special register		J□\SW□	○
	Link relay		J□\B□	△
	Link special relay		J□\SB□	△
File register	File register		R	-
			ZR ^{*1}	○
Index register	Index register		Z, ZZ	△
Intelligent function module device	Intelligent function module device		U□\G□	○

○: Can be edited △: Display only -: Not supported

*1 : With Universal model QCPUs, ZR device cannot be used if '0K' is set for the "Device points" of R/ZR in the <<Device>> tab of PLC parameter.

QCPU
Q

Screen display

[illegible]

Device value
display area



● Inserting rows

Select [Edit] ⇒ [Insert Row] to insert a blank row at the cursor position.

	+0	+1	+2
D0	0		
W0	0		

[Edit] ⇒ [Delete]

	+0	+1	+2
D0	0		
W0	0		

● Cutting/copying/pasting character strings in units of rows

To paste a character string in units of rows, select the desired cell(s) and paste the character string. If a row is selected, pasting is not possible.

● Cutting/copying/pasting character strings in units of cells

To paste a character string in units of cells, if the selected cell(s) is in the row where a device is not entered, pasting is not possible.

● Deleting devices

If a deletion is executed after selecting a cell, the device value clears to '0'.

If a deletion is executed after selecting a row, the selected row (device) is deleted.

<Deletion in units of cells>

D70	0		20	
D80	0	0	0	0
D90	0		2.2215E-010	
D100	MA	IN	P	RG
D110	#00#00	#00#00	#00#00	#00#00
D120	0			

[Edit] ⇒ [Delete]

D70	0		20	
D80	0	0	0	0
D90	#00#00	#00#00	#00#00	#00#00
D100	#00#00	#00#00	#00#00	#00#00
D110	#00#00	#00#00	#00#00	#00#00
D120	0			

The device values are set to "0".

<Deletion in units of rows>

D70	0		20	
D80	0	0	0	0
D90	0		2.2215E-010	
D100	MA	IN	P	RG
D110	#00#00	#00#00	#00#00	#00#00
D120	0			

[Edit] ⇒ [Delete]

D70	0		20	
D80	0	0	0	0
D110	#00#00	#00#00	#00#00	#00#00
D120	0			

The selected rows are deleted.

7.2.1 Setting device values in units of points

This section explains the method for setting a device and device value in units of points.

Create a new device memory in advance. (☞ Section 4.2.1)

<Example> Setting value:

'Device: D0, Device value: 12'

Operating procedure

1. Select the cell to which a device value is set.

	+0	+1	+2

2. Enter 'D0' for a device.

	+0	+1	+2
D0			

3. Press the  key.

The entered device is set in the device number display area.

In this example, 'D0' is set in the device number display area and the current value is displayed in the device value display area.

	+0	+1	+2
D0	0		

4. Enter '12' for a device value.

'12' is set as the device value of device 'D0'.

	+0	+1	+2
D0	12		

7.2.2 Setting device values by setting device range

This section explains the method for setting device values by specifying a device range.

<Example> Setting values:

'Device: D, Range: 0 to 50, Display format: Decimal number'

Operating procedure

1. Select the cell to which a device value is set.

	+0	+1	+2

2. Select [Edit] ⇒ [Insert Device].

The Insert Device screen is displayed.

3. Set the items on the screen.

Item	Description
Device	Select the device name. For devices that can be edited, refer to Section 7.1.2.
Module Start	Displayed when U□\G□ or J□\□ is selected in the "Device" field.
Network No.	Enter the start XY address or network number.
Range	Select the range of devices to be set.
	All
	Select this to target all of the selected devices.
	Address
	Select this to target the devices in the specified range.
Display Mode	Select the display format of device values.
	BIN
	Select this to display device values in binary numbers.
	OCT
	Select this to display device values in octal numbers.
	DEC
	Select this to display device values in decimal numbers.
	HEX
	Select this to display device values in hexadecimal numbers.
	FLOAT
	Select this to display device values in real numbers.
	ASCII
	Select this to display device values in character strings.
Register	Select the display format of device values.
	16-bit
	Select this to display the display size of device values in words.
	32-bit
	Select this to display the display size of device values in double words. Specify the device range in multiples of two.
	64-bit*1
	Select this to display the display size of device values in double-precision real numbers. Specify the device range in multiples of four.

*1 : Universal model QCPU only

OK

[illegible]

The entered values are set.

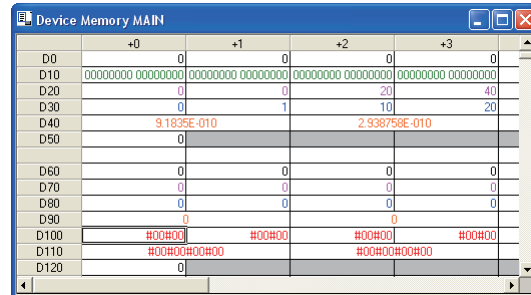
[illegible]

7.2.3 Setting character strings

This section explains the method for setting a character string to a device.

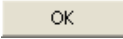
Operating procedure

1. Select the cell or row to which a character string is set.



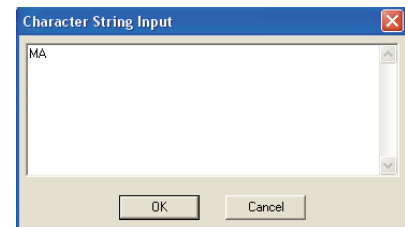
2. Select [Edit] ⇒ [Paste Text].

The Character String Input screen is displayed.

3. Enter a character string, and click the  button.

The entered character string is set to the device.

The set character string can be checked by switching the display format.

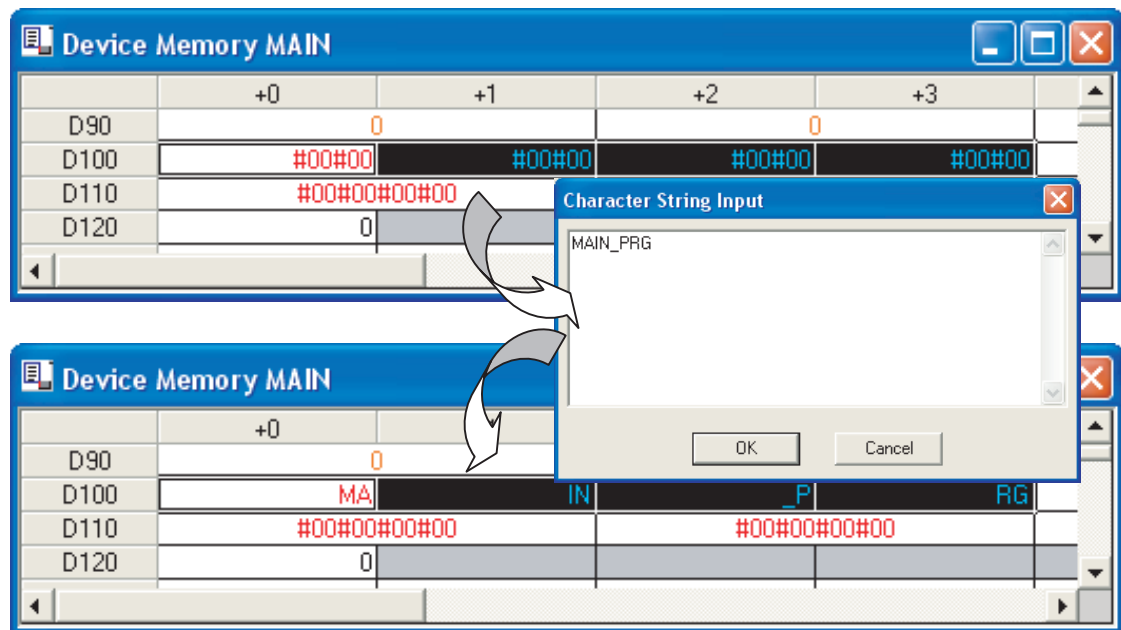


Point

● Entering character strings

The number of characters can be entered to a cell is two.

Select multiple cells for entering a character string of more than 2 characters. On the Character String Input screen, a character string with 'number of selected cells x 2' characters can be entered.



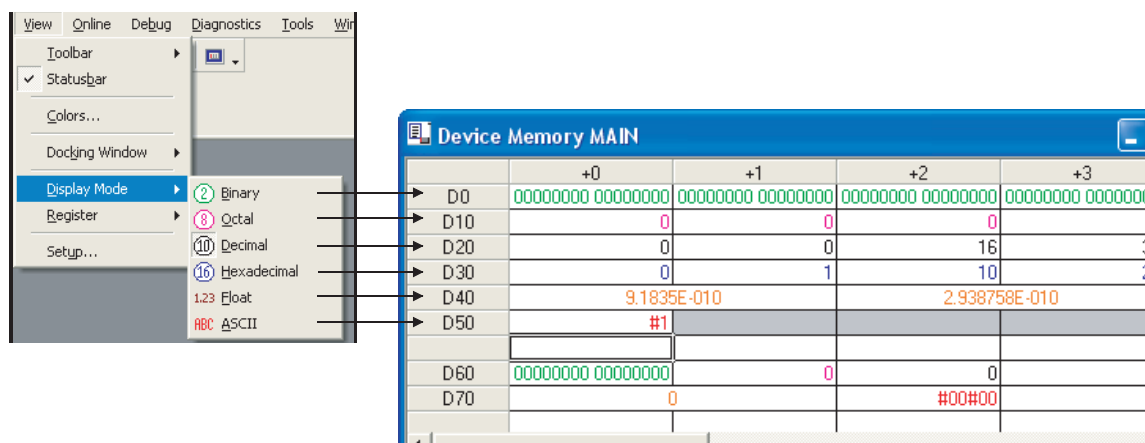
7.2.4 Changing display format

Switching display format

This function switches the device value display format for each cell on the Device Memory screen.

Operating procedure

- Select [View] ⇒ [Display Mode] ⇒ [Binary/Octal/Decimal/Hexadecimal/Float/ASCII].
Device values are displayed in the selected display format.

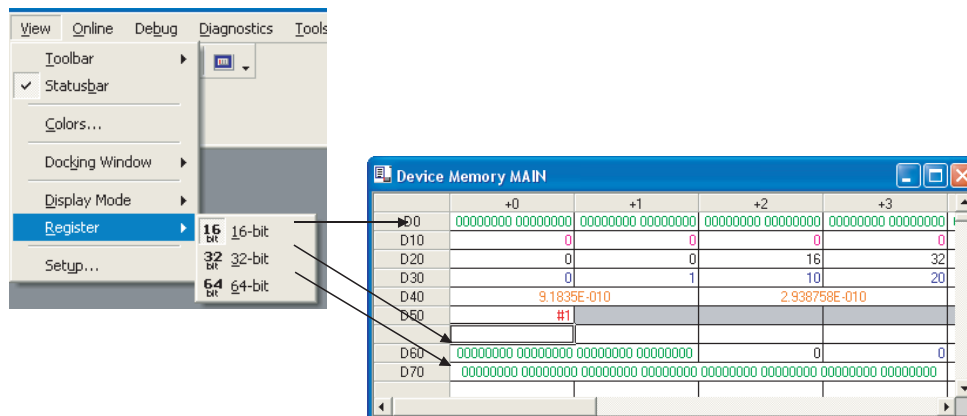


Switching display size in 16-bit/32-bit/64-bit

This function switches the device value display size in 16-bit/32-bit/64-bit for each cell on the Device Memory screen.

Operating procedure

- Select [View] ⇒ [Register] ⇒ [16-bit/32-bit/64-bit].
Device values are displayed in the selected display size (16 bits, 32 bits or 64 bits).

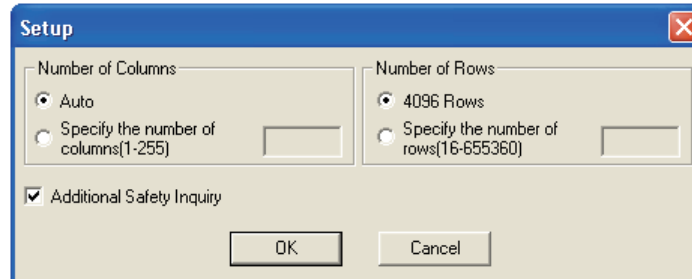


7.2.5 Changing the number of rows/columns in device memory editor

This function changes the number of rows/columns in the device memory editor.

Screen display

Select [View] ⇒ [Setup].



Operating procedure

1. Set the items on the screen.

Item	Description
Number of Columns	Set the number of columns in the editor.
Auto	Select this to set the number of columns to 16.
Specify the number of columns (1 to 255)	Select this to set the desired number of columns in the editor. Setting range: 1 to 255
Number of Rows	Set the number of rows in the editor.
4096 Rows	Select this to set the number of rows to 4096.
Specify the number of rows (16 to 655360)	Select this to set the desired number of rows in the editor. Setting range: 16 to 655360
Additional Safety Inquiry	Check this to display the confirmation message when device deletion is executed.

2. Click the button.

The set number of rows/columns are displayed.

Point

● Number of columns

When the "Number of Columns" is set to "Auto", the device values are displayed in 10 columns or 16 columns according to the specified devices.

7.3 Searching Devices and Device Values

This section explains the method for searching for a device set in the device memory.

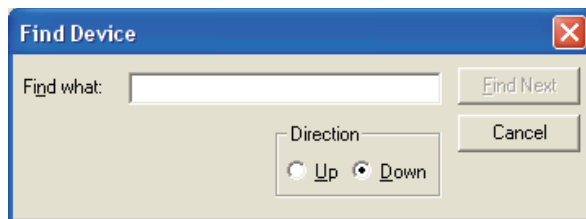
■ Searching for devices

This function searches for a device.

Screen display

Select [Find/Replace] ⇒ [Find Device].

<Device search>



Operating procedure

1. Set the items on the screen.

Item		Description
Find what		Enter the device to be searched for.
Direction	Up	Select this to perform searching in the upward direction from the cursor position.
	Down	Select this to perform searching in the downward direction from the cursor position.

2. Click the button.

The cursor moves to the found device.

7.4 Writing/Reading Device Memory Data

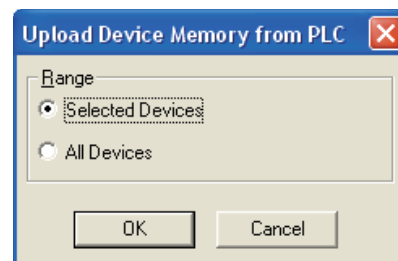
This section explains the method for writing/reading data of the device memory being edited to/from a programmable controller CPU or Excel file.

7.4.1 Writing/reading data to/from programmable controller CPUs

This function writes/reads data of the device memory to/from a programmable controller CPU. To write/read data of the device memory in units of files, refer to the online Write to PLC/Read from PLC function. (☞ Section 12.1)

Screen display

Select [Tools] ⇒ [Download Device Memory to PLC]/[Upload Device Memory from PLC].
<Writing device memory> <Reading device memory>



Operating procedure

1. Set the items on the screen.

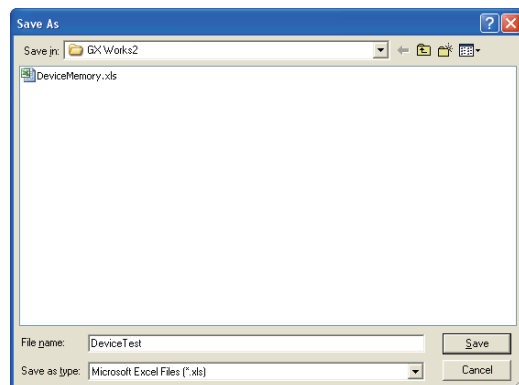
Item	Description
Range	Select the write/read range.
Selected Devices	Select this to write/read data in the specified range to/from a programmable controller CPU.
All Devices	Select this to write/read all data in the device memory being edited to/from a programmable controller CPU.

7.4.2 Writing/reading data to/from Excel files

This function writes/reads data of the device memory to/from an Excel file.

Screen display

Select [Tools] ⇒ [Export to Excel File]/[Import from Excel File].



Operating procedure

1. Enter a file name or select the file to be opened.

The Save As screen or Open screen is displayed.

2. Click the Save or Open button.

Data are saved to the specified destination, or the file is opened from the specified location.

Point

● Compatible Excel version

Microsoft Office Excel 97 or later version is compatible with the data write/read operations.

● Reading data

When reading data from an Excel file, the following is regarded as an error and processed as explained.

- Unsupported devices ⇒ Deleted
- Invalid value ⇒ Set to '0'.
- Invalid display mode ⇒ Displayed in decimal numbers.



8 SETTING DEVICE INITIAL VALUES

This chapter explains the method for setting, editing, and deleting device initial values.

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8.1 Device Initial Values

QCPU



This section explains the device initial values.

8.1.1 Feature of device initial values

The device initial values are device values used for the sequence program operation when the programmable controller is in RUN.

When the device initial values are set, the initial setting program is unnecessary.

- Not setting the device initial value

The initial setting program is necessary.

<Example>

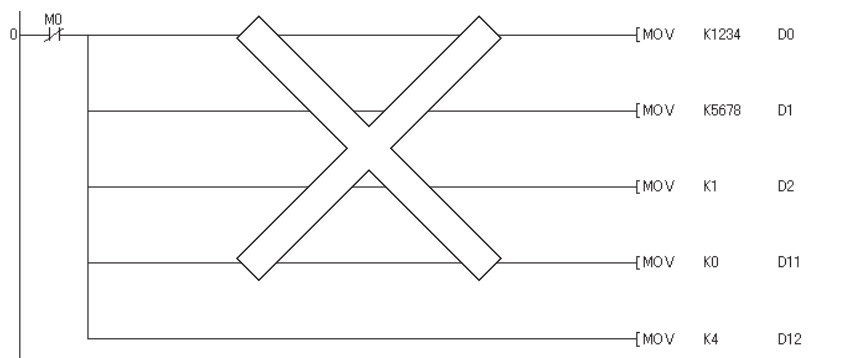


- Setting the device initial value

<Example>

	Points	Start	End	Comment
1	3	D0	D2	
2	2	D11	D12	
3				
4				
5				
6				

The initial setting program is unnecessary.



8.1.2 List of settable devices for device initial values

The following table shows the list of devices which can be used as device initial values.

Table 8.1.2-1 List of settable devices for device initial values

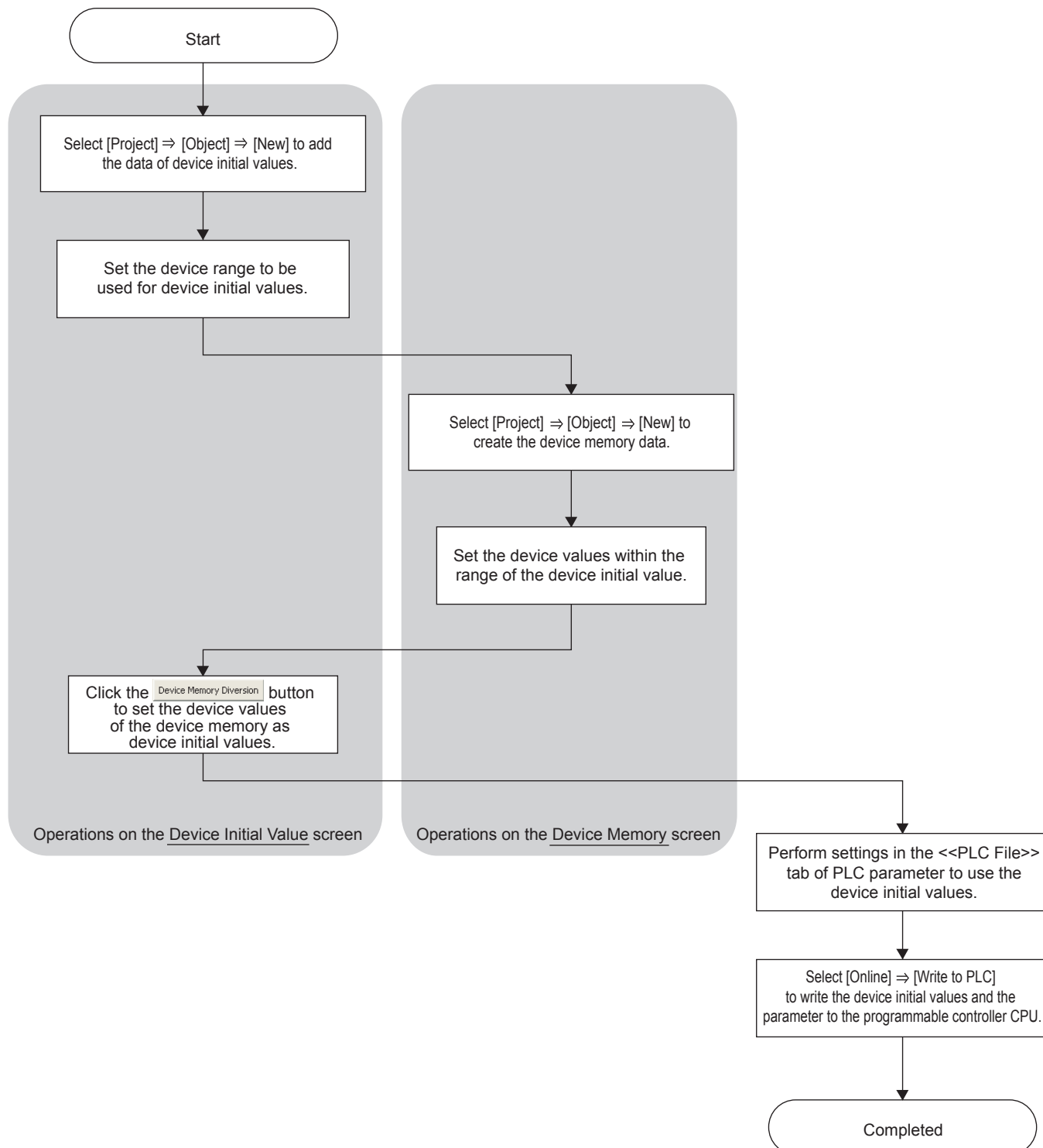
Category	Device name	Device
Internal user device	Timer	T
	Retentive timer	ST
	Counter	C
	Data register	D
	Link register	W
	Link special register	SW
Internal system device	Special register	SD
File register	File register	R ^{*1} ,ZR
Intelligent function module device	Intelligent function module device	U□\G□
Link direct device	Link register	J□\W□
	Link special register	J□\SW□

*1 : When the R device is specified to utilize the data of the device memory, the ZR device value is utilized for the R device.

1
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SETTING DEVICE
MEMORY8
SETTING DEVICE
INITIAL VALUES

8.1.3 Procedure for setting device initial values

The following flow chart shows the procedure for setting the device initial values.



8.2 Setting Device Initial Values

QCPU



This section explains the method for setting device values, which are set in the device memory, as device initial values.

Create a new data of device initial values in advance. (☞ Section 4.2.1)

Operating procedure

Select the Project window ⇒ "Device Init Value" ⇒ "(data name)".

Range setting

The device range and the device data that is set above will be write to PLC.
You must execute "Device Memory Diversion" operation when the device initial range setting is changed.

Setting Method: ☒ Start/End ☐ Points/Start

Device Memory for Diversion: MAIN

Device Memory Diversion

OK Cancel

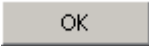
Operating procedure

1. Set the following items on the screen.

Item	Description
Range setting	Set the range for device initial values.
Points	Set the number of points of each device. Up to 8,000 points of devices can be set within a range.
Start	Specify the start device of the range to be set.
End	Specify the end device of the range to be set.
Comment	Enter a comment in the set device range. (Up to 32 characters)
Setting Method	Start/End
	Select this to set the range for device initial values by start or end device.
	Points/Start
	Select this to set the range for device initial values by device points or start device.

2. Select the data name to be utilized from in "Device Memory Diversion", and click the button.

The device value in the set range is set as a device initial value.

3. Click the  button.

Point

- **Using device initial values**

If the device values with set ranges are used as the initial values when activating the programmable controller CPU, specify the file names used for the initial values in the <<PLC File>> tab of PLC parameter.

- **Device range**

The device range that can be set for device initial values is the range set in the <<Device>> tab of PLC parameter.



9 SETTING DEVICE COMMENTS

This chapter explains the operation method for setting, editing, and deleting device comments.

9.1	Device Comments	9-2
9.2	Creating Device Comments	9-6
9.3	Deleting Device Comments	9-9
9.4	Utilizing Sample Comments	9-10

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9.1 Device Comments

QCPU



This section explains the general concept of device comments and the setting availability.

9.1.1 Global comments/local comments

This section explains details of two types of device comments: global comments and local comments.

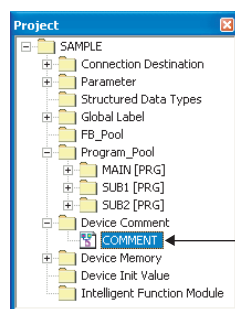
■ Global comments

A global comment is a device comment created automatically when a new project is created.

● Q series

Global comments are set to use common comment data among multiple programs.

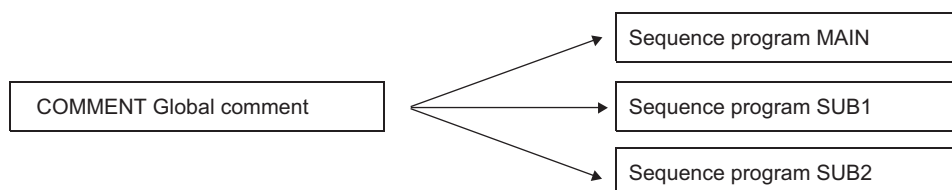
Global comments can be set even when there is only one program.



A global comment name is fixed to COMMENT. Global comments can be changed to local comments later.

<Image that is created with only global comments>

• Q series



Local comments

A local comment is a device comment created by the user.

No local comment exists when a new project is created.

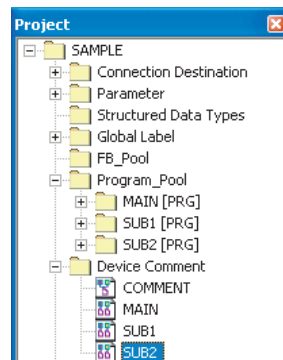
Create a local comment if necessary. (☞ Section 4.2.1)

● Q series

Local comments are used in association with each program.

Comments are set under the same name as sequence programs.

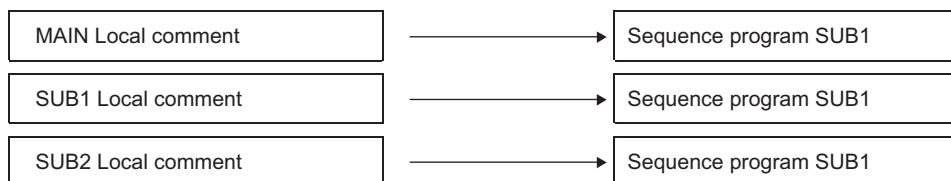
For Structured projects, comments are set under the same data name as the program file name.



Display example when local comments are set.

<Image that is created with only local comments>

• Q series



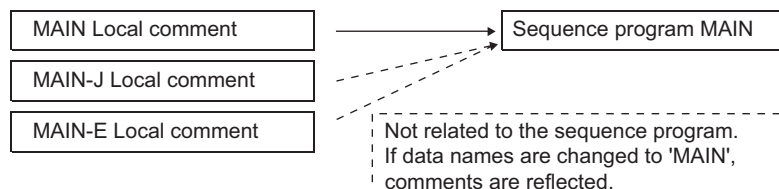
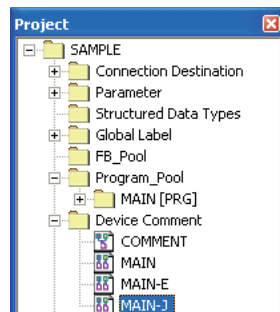
Point

● Setting local comments with data names different from the sequence program name

Multiple local comments can be created with data names different from the sequence program name. In this case, however, the comments are not related to the sequence program.

To make the comments relate to the sequence program, the comments should have the same data names as the program name.

This is useful when switching comments between Japanese and English in the same program.



● Global comments/local comments

Global comments/local comments correspond respectively to common comments/comments by program in GX Developer.

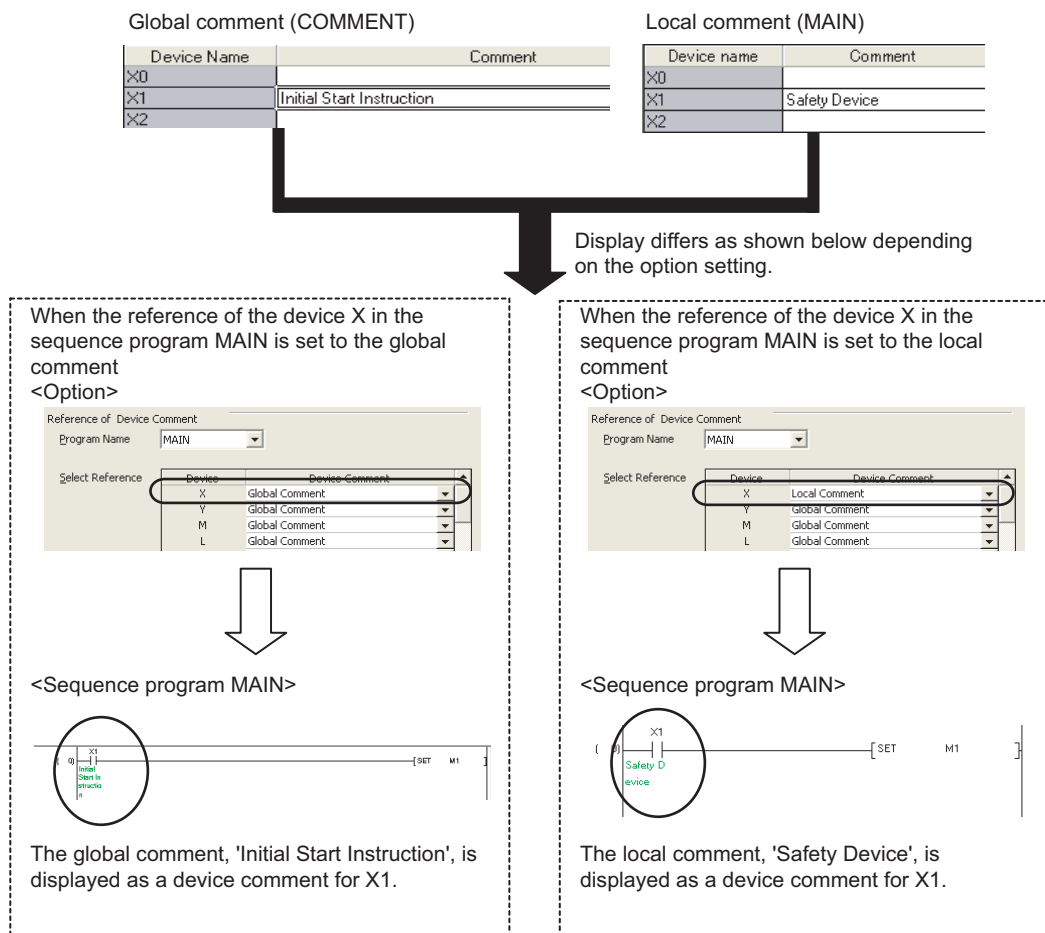
■ Comment display when both global and local comments are set

The following explains the method for specifying the comment to be displayed when both global and local comments are set.

Operation

- Set the device comment to be referenced by selecting [Tools]⇒[Options]⇒"Program Editor"⇒"Ladder/SFC"⇒"Comment".

<Example> When different device comments are set for the same device (X)



Point

● Device comment to be referenced is not set

If a comment does not exist in the device comment set for "Select Reference", the other device comment can be displayed by the option setting. Select [Tools]⇒[Options]⇒"Ladder/SFC"⇒"Comment", and check the "Refer to the other device comment when device comment is not set." item.

9.1.2 List of comment settable devices

The following table shows device types and comment setting availability.

Table 9.1.2-1 List of comment settable device

Category	Device name	Symbol	QCPU (Q mode)
Internal user device	Input	X	○
	Output	Y	○
	Internal relay	M	○
	Latch relay	L	○
	Annunciator	F	○
	Edge relay	V	○
	Step relay	S	×
	Link relay	B	○
	Link special relay	SB	○
	Timer	T	○
	Retentive timer	ST	○
	Counter	C	○
	Data register	D	○
	Link register	W	○
	Link special register	SW	○
	Direct input	DX	○
	Direct output	DY	○
Internal system device	Special relay	SM	○
	Special register	SD	○
File register	File register	R	○
		ZR	○
Index register	Index register	Z, ZZ	×
Intelligent function module device	Intelligent function module device	U□\G	○
Nesting	Nesting	N	×
Pointer	Pointer	P	○
	Interrupt pointer	I	○
Other	SFC block device	BL*1	○
	Step relay (Step relay with a block specification)	BL\S	○
	SFC transition device	BL\TR	○
	I/O number specifying device	U	○

○: Settable / ×: Not settable

*1 : For projects with labels, the BL device comments are not reflected to the block titles.

Point

- **Device comment creation supported range in the multiple CPU system configuration for the Q series**
Device comments can be created in the following ranges, corresponding to the buffer memory of the programmable controller CPU (3E00H to 3E30H) in a multiple CPU system.

System configuration	Supported range	Non-supported range
Non-Multiple CPU system	U0(\G0) to U1FF(\G65535)	—
Multiple CPU system	U0(\G0) to U1FF(\G65535)	U200(\G0) to U3DF(\G65535)
	U3E0(\G0) to U3FF(\G65535)	

9.2 Creating Device Comments

QCPU



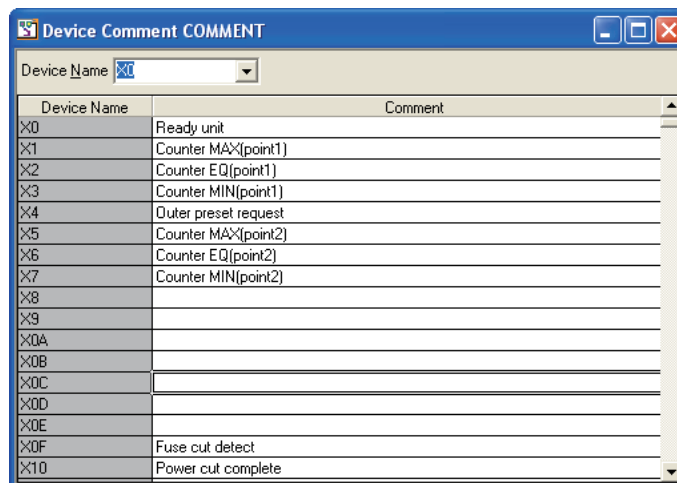
This section explains the method for creating device comments, which make it easy to understand contents of program processing.

9.2.1 Creating comments on the device comment editor

This function enables the creation of device comments for each device on the same screen. When creating local comments, create a new device comment in advance. (→ Section 4.2.1)

Screen display

Select Project window ⇒ "Device Comment" ⇒ "(data name)".



Operating procedure

- Set the items on the screen.

Item	Description
Device Name	Specify the device to be edited.
Comment	Enter a comment for each device.

Point

● Limit for the number of characters to be entered

Enter each comment within 32 characters.

The limit for the number of characters to be entered can be switched between 16 characters and 32 characters.

(→ Section 19.1)

9.2.2 Creating comments on the ladder editor

This function is useful for modifying or adding device comments.

■ Creating device comments in device comment editing mode

Example) Setting value: 'Contact: Open contact, Device: X50, Device comment: Indication of initial start'.

Operating procedure

1. Select [Edit] ⇒ [Documentation] ⇒ [Device Comment].

The mode changes to the device comment editing mode.

2. Move the cursor to the device comment entry position.

3. Press the key.

The Input Device Comment screen is displayed.

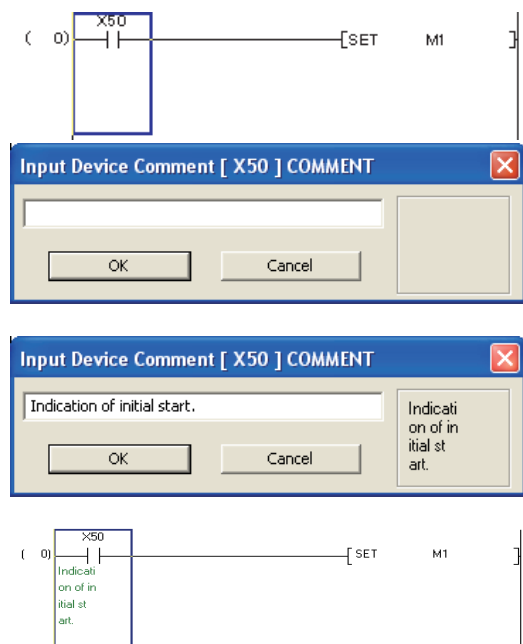
4. Enter a device comment.

The line wrapping of the device comment for display can be checked when the comment is entered.

5. Click the button.

The entered device comment is displayed as shown at the right.

(Device comment displaying method,  Section 19.2)



Point

- **Disabling the device comment editing mode**
Select the same menu option again and remove the check mark from the item displayed on the screen.
- **Instructions using multiple devices**
For instructions using multiple devices such as the FROM/TO instruction, the same number of device comments as the number of devices used in the instruction can be created.
- **Device comments created on the ladder editor**
Comments created on the ladder editor are set as device comments specified in "Reference of Device Comment" under [Tools] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder/SFC" ⇒ "Comment".
( Section 9.1.1)

■ Creating device comments in the ladder editing mode

Device comments can be added/modified on the created ladder of the ladder editing screen.
Example) Set the comment 'Indication of initial start.' for X1.

Operating procedure

1. Enter ';;X1=Indication of initial start.' on the ladder editor.

The entered comment is added as a device comment.



Device Name	Comment
X0	
X1	Indication of initial start.
X2	
X3	
X4	
X5	
X6	

Point

● Entering comments followed by ladder symbol entry

Using the method explained below, a comment can be entered followed by a ladder symbol entry in ladder editing mode.

Select [Tools] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder" ⇒ "Device".

Check a check box for "Enter device comment".

Operational Setting

- ☐ Check double coil
- ☒ Enter device comment

● Instructions using multiple devices

For instructions using multiple devices such as the FROM/TO instruction, device comments cannot be added/modified followed by a ladder symbol entry. To add/modify device comments followed by a ladder symbol entry, change the mode to the device comment editing mode.

● Comments created on the ladder editor

Comments created on the ladder editor are set as device comments specified in "Reference of Device Comment".

(☞ Section 9.1.1)

9.3 Deleting Device Comments



This section explains the method for deleting data of a device comment.

9.3.1 Deleting comment data of all devices

This function deletes the comment data set as a device comment of all the devices.

Operating procedure

- 1. **Select device comment editor** ⇒ **[Edit]** ⇒ **[Clear All]**
All comment data set as a device comment is deleted.

9.3.2 Deleting comment data of device being displayed

This function deletes the comment data set as a device comment of the displayed device.

Operating procedure

- 1. **Select device comment editor** ⇒ **[Edit]** ⇒ **[Select All]**.
All comment data of the displayed device are selected.
- 2. **Select [Edit]** ⇒ **[Delete]**.
The selected comment data are deleted.

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9.4 Utilizing Sample Comments

QCPU



This section explains the method for setting a sample comment of special relays/special registers and intelligent function modules automatically.

Open the device comment editor in advance.

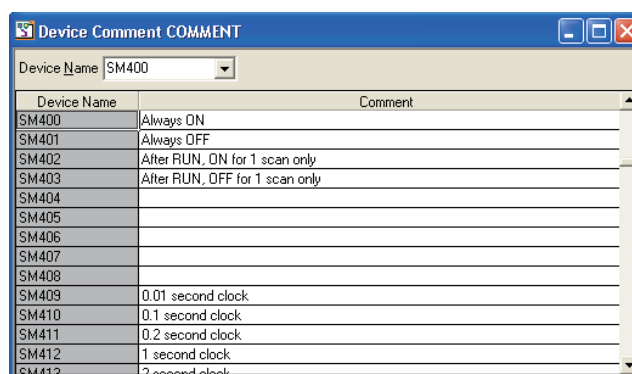
9.4.1 Utilizing sample comments of special relays/special registers

This section explains the method for utilizing sample comments of special relays/special registers.

Operating procedure

- Select [Edit] ⇒ [Import from Sample Comment] ⇒ [Special Relay/Register].

The sample comments of special relays/special registers are set in the device comment editor being edited.

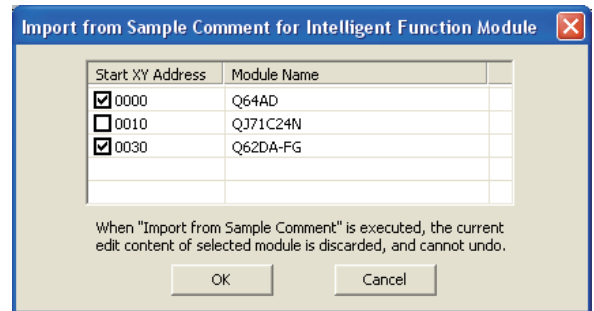


9.4.2 Utilizing sample comments of intelligent function modules

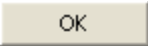
This section explains the method for utilizing sample comments of intelligent function module devices.

Operating procedure

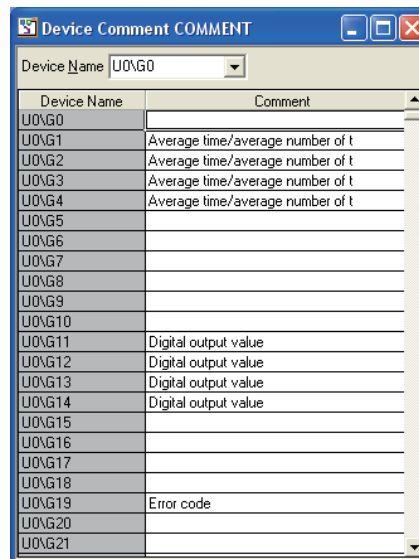
1. Select [Edit] ⇒ [Import from Sample Comment] ⇒ [Intelligent Function Module].



2. Select modules whose sample comments are utilized.

3. Click the  button.

The sample comments of intelligent function module devices are set in the device comment editor being edited.



Point **● Utilizing sample comments**

- Only the sample comments of the intelligent function modules that exist in the project can be utilized.
- The sample comments can also be utilized by right clicking any position on the device comment editor, and selecting [Import from Sample Comment] in the shortcut menu.
- For the data protected by security, the device comments cannot be utilized.
- Once a sample comment is utilized, it cannot be deleted or modified even if the start XY address of the intelligent function module is changed.

● Device comments for buffer memory

For the device comments for buffer memory, only sample comments in word or double words are applicable.

● Number of characters displayed in device comment editor

The sample comments are displayed with the number of characters set in "Device Comment Editor" under [Tools] ⇒ [Options].



10 SEARCH/REPLACE

This chapter explains the operation method for searching/replacing the character strings used in programs.

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10.1 Searching/Replacing Character Strings

QCPU



This section explains the method for searching for and replacing character strings.
Any character strings of data in the project can be searched or replaced.
If the Find All/Replace All function is executed, the details of the execution result is displayed.

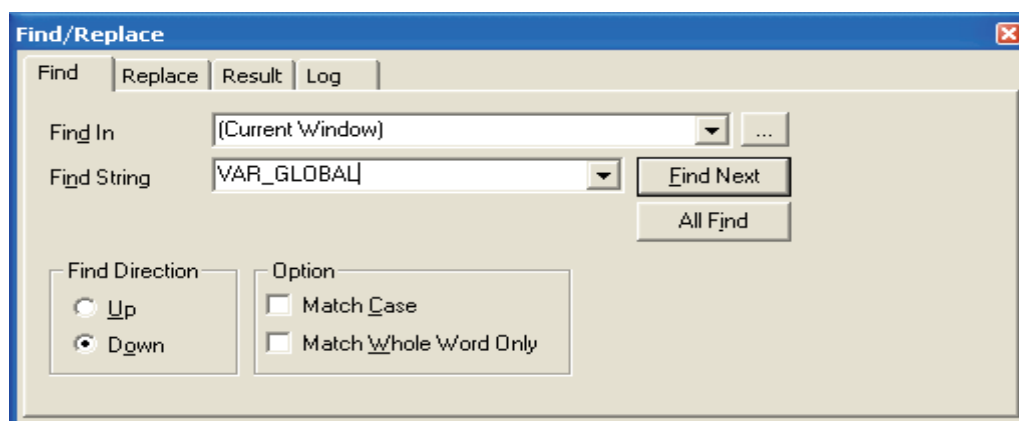
10.1.1 Searching/replacing character strings

This section explains the method for searching for and replacing character strings.

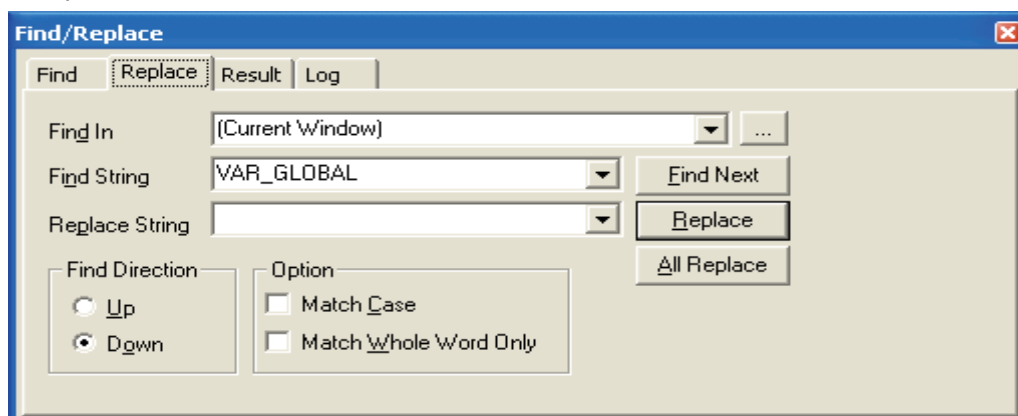
Screen display

[Find/Replace] ⇒ [Find]/[Replace].

<<Search>>



<<Replace>>



Operating procedure

1. Set the items on the screen.

Item		Description
Find In		Select a location to search for. Click  to select a location to search for. Click  to select a location from the list of previously searched locations. The location cannot be entered directly.
Find/Replace String		Enter a character string to be searched for or replaced. Click  to select a character string from the list of previously searched character strings.
Find Direction	Up	Select this to execute a search in the upward direction from the cursor position.
	Down	Select this to execute a search in the downward direction from the cursor position. (Default)
Option	Match Case	Select this to execute a case-sensitive search.
	Match Whole Word Only	Select this to execute a search by matching whole word only. For details of the whole word, refer to the Point in this section.

2. Click the button.

The cursor moves to the searched character string.

Screen button

●

Searches for the character string entered in "Find String".

●

Batch searches for the character string entered in "Find String".

The search result is also displayed. ( Section 10.1.2).

●

Replaces the character string entered in "Find String" with the character string entered in "Replace String".

●

Batch replaces the character string entered in "Find String" with the character string entered in "Replace String".

The replace result is also displayed. ( Section 10.1.2).

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Point● **Displaying the Find/Replace screen**

The Find/Replace screen can also be displayed by selecting [View] ⇒ [Docking Window] ⇒ [Find/Replace Window].

● **Replace function**

- The programs are in the uncompiled status after the Replace function is executed. Compile all the programs again.
- The Replace function cannot be executed during monitoring. Execute the function after monitoring is finished.
- The Replace function cannot be executed when a program is opened with the read-only mode. Execute the function after setting the data in editable mode by the setting such as resetting the security.
- When executing the Replace function in the structured ladder program, select [View] ⇒ [View Mode] ⇒ "Label".

● **Searching for NOP instructions and TRAN instructions**

The NOP instructions used in the ladder programs and the TRAN instructions used in the transition condition of SFC programs cannot be searched.

● **Blank in "Replace String"**

If the "Replace String" field is set to blank, the searched character strings are deleted when executing the Replace function.

For replacing statement/note, note that the lines of searched statement are deleted.

● **Searching/replacing by matching whole word only**

The whole word means a string separated by the break characters. The search/replace by matching whole word searches for only the character strings which are completely match with the character string entered in "Find String". Break characters are shown as below.

- Space, tab, line feed

Example) Searching for a device comment 'abc def' by the following character strings.

String to be searched for	Search result	
	Not selected	Selected
a	<u>a</u> bc def	Nothing is found.
abc	<u>abc</u> def	<u>abc</u> def
bc	<u>bc</u> def	Nothing is found.
abc def	<u>abc</u> def	<u>abc</u> <u>def</u>

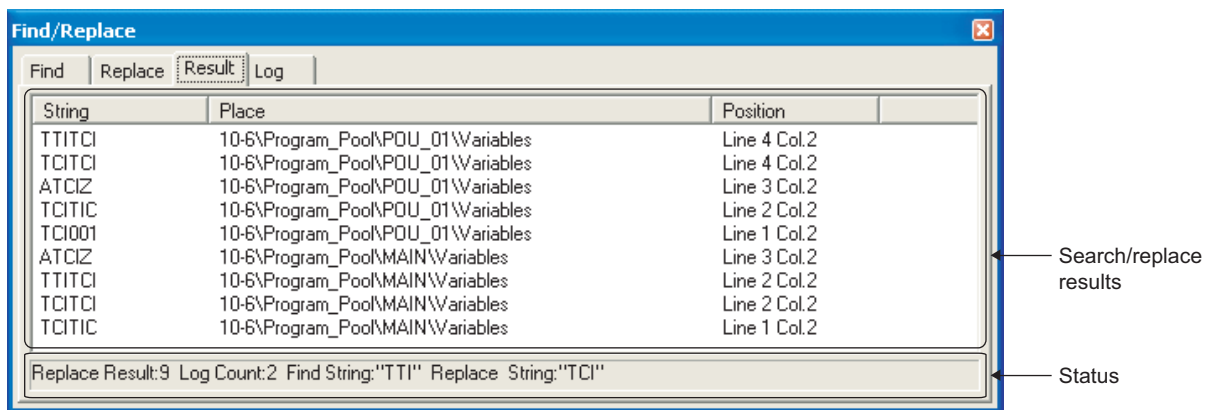
10.1.2 Displaying results and logs

After the Find All/Replace All function is executed, results and logs are displayed.

■ Displaying results

Screen display

Select [Find/Replace] ⇒ [Find]/[Replace] ⇒ <<Result>>.



Display contents

Item	Description																
Search/replace results	Display the character strings, locations, and positions which have been searched for or replaced.																
String	Displays the character strings which match with the one in "Find/Replace String".																
Place	Displays the locations where the Search/Replace function is executed.																
Position	Displays the positions where the Search/Replace function is executed. <table> <tr> <th>Type</th><th>Display content</th></tr> <tr> <td>Ladder editor (without labels)</td><td>Step number</td></tr> <tr> <td>Ladder editor (with labels)</td><td>Step number (with brackets)</td></tr> <tr> <td>ST editor</td><td>Line number</td></tr> <tr> <td>SFC editor</td><td>Step type and number</td></tr> <tr> <td>Structured ladder editor</td><td>Network number</td></tr> <tr> <td>Device comment</td><td>Device name, start position</td></tr> <tr> <td>Device memory editing screen, Label editor, Structured data device setting screen</td><td>Row, column</td></tr> </table>	Type	Display content	Ladder editor (without labels)	Step number	Ladder editor (with labels)	Step number (with brackets)	ST editor	Line number	SFC editor	Step type and number	Structured ladder editor	Network number	Device comment	Device name, start position	Device memory editing screen, Label editor, Structured data device setting screen	Row, column
Type	Display content																
Ladder editor (without labels)	Step number																
Ladder editor (with labels)	Step number (with brackets)																
ST editor	Line number																
SFC editor	Step type and number																
Structured ladder editor	Network number																
Device comment	Device name, start position																
Device memory editing screen, Label editor, Structured data device setting screen	Row, column																
Status	Displays the details of the search/replace results																
Find/Replace Result	Displays the number of character strings which have been searched for or replaced.																
Log Count	Displays the number of logs.																
Find String	Displays the character strings specified in "Find String".																
Replace String	Displays the character strings specified in "Replace String".																

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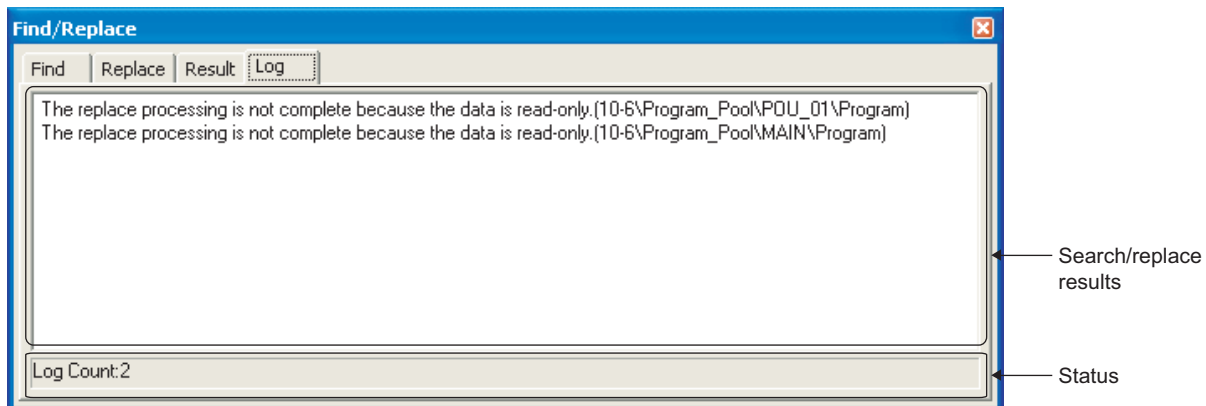
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■ Displaying logs

Screen display

Select [Find/Replace] ⇒ [Find]/[Replace] ⇒ <<Log>>.



Display contents

Item	Description
Search/replace results	Display the errors in search/replace results.
Status	Displays the number of logs in search/replace results.

Point

● Jump function

The jump function is used to jump from any line of search/replace results or logs to the corresponding character strings.

To execute a jump, right click on the selected line, and select [Jump] in the shortcut menu, or double click the selected line.

10.2 Cross Reference

QCPU



This section explains the method for creating and displaying the cross reference information, which shows a list of used location of devices/labels selected in the program editor/label list.

10.2.1 Creating/displaying cross reference information

This section explains the method for creating and displaying the cross reference information of the label/device selected in the program editor/label editor.

Screen display

Select [Find/Replace] ⇒ [Cross Reference].

<Extension display of Structured project>

Filtering condition columns

Device/Label	Class	Type	Constant	Device	Address	Browse	Position	Project	Program...	Task	Data Type	Data Name	Comment
Y31				Y31	%QX49	Write	1, (1...	Project02	MAIN	Task_01	Program	MAIN_02	
g_data2	VAR_GLOBAL	Struct1(0..3)					1	Project02			Global Label	Global1	Struct1
[0]		Struct1											
[1]		Struct1											
[2]		Struct1											
[3]		Struct1											
AAA		Bit		M8191	%M00.8191		1	Project02			Structure...	Struct1	data of member1
CCC		Double Word...		D12286	%MD0.12286		2	Project02			Structure...	Struct1	data of member3
data1	VAR	Bit		M8186	%M00.8186		1	Project02	MAIN	Task_01	Local Label	FUN_01	
IN_001	VAR_INPUT	Bit		M8187	%M00.8187		2	Project02	MAIN	Task_01	Local Label	FUN_01	
OUT_002	VAR	Word[Signed]		D12278	%MW0.12278		3	Project02	MAIN	Task_01	Local Label	FUN_01	
IN_003	VAR	Bit		M8185	%M00.8185		4	Project02	MAIN	Task_01	Local Label	FUN_01	
MorterOn	VAR	Bit		M8182	%M00.8182		1	Project02	MAIN	Task_01	Local Label	FUN_02	
IN_01	VAR_INPUT	Bit		M8184	%M00.8184		2	Project02	MAIN	Task_01	Local Label	FUN_02	

Cross Reference Information of All Device/Label 29

Display contents

Item	Description	
Device/Label	Displays the device/label name.	
Class ^{*1}	Displays the class of the device/label.	
Type ^{*1}	Displays the data type of the device/label.	
Constant ^{*1}	Displays the constant value set for the global label declaration or VAR_CONSTANT.	
Device ^{*1}	Displays the device of the device/label.	
Address ^{*1,*2}	Displays the address of the device/label.	
Browse	Displays Read/Write of the device/label.	
Position	Displays the position which identifies the location of the device/label.	
	Item	Display contents
	Label	Line number
	Ladder	Step number
	SFC	SFC step number
	Structured ladder	Network number and grid cursor position
	ST	Number of lines
Project ^{*1,*2}	Displays the project name or the library name in which the device/label is used.	
Program File Name ^{*1,*2}	Displays the program file name in which the device/label is used.	
Task ^{*1,*2}	Displays the task name of the program registration destination in which the device/label is used.	
Data Type	Displays the data type in which the device/label is used.	
Data Name	Displays the program or the data name registered in the program in which the device/label is used.	
Comment ^{*1}	Displays the comments of the device/label.	
Filtering condition columns	Enter the filtering condition. (☞ Section 10.2.2).	

*1 : For Structured projects only

*2 : For extension display only

Point

● Targets of cross reference information

Cross reference information can be created from the devices used in the followings.

- Programs
- Ladder, digit specification for word devices/multiple word devices in SFC program
- Auto refresh setting of intelligent function module parameter
- Multiple CPU refresh setting of PLC parameter
- Refresh parameter of Network parameter

● Creating cross reference information

Cross reference information can also be created by right clicking a device/label in the program editor, and selecting [Cross Reference] in the shortcut menu.

● Instructions that use multiple devices

When creating cross reference information by selecting the instruction, such as the FROM/TO instruction, that uses multiple devices (arguments), only the start device/label becomes the target of cross reference. Create the cross reference information for further devices/labels by setting the items in the <<Condition Settings>> tab of the Cross Reference window.

● Extension Display

The display can be switched to extension display by selecting [Tools] ⇒ [Options] ⇒ "Cross Reference", and unchecking "Disable Extension Column Display".

● Display

- After the creation of cross reference information has been completed correctly, the  icon shown in the lower left corner of the screen will change to the  icon which indicates the most recent information files.
- The data protected by security cannot be displayed.
- If the program or the setting of the option is changed, the cross reference information does not correspond with the program. In order to update the cross reference information, create it again.
- Items in the columns can be sorted in ascending or descending order by clicking the header of the column. However, the sort cannot be performed if the structure/array/FB is displayed in the tree. Select [Tools] ⇒ [Options] ⇒ "Cross Reference", and check "Disable Structure/Array/FB Tree Display".

● Jump function

The jump function is used to jump from the Cross Reference window to the location where the device/label is used.

- To execute a jump, select any row and then press the  key, or double click or right click the selected row and then select [Jump] in the shortcut menu. The editor is opened and the target device/label is selected.
- The jump function cannot be used for the intelligent function module parameter and the cross reference information in the parameter.

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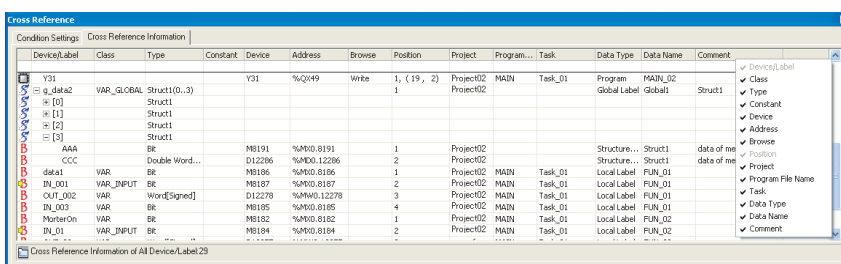
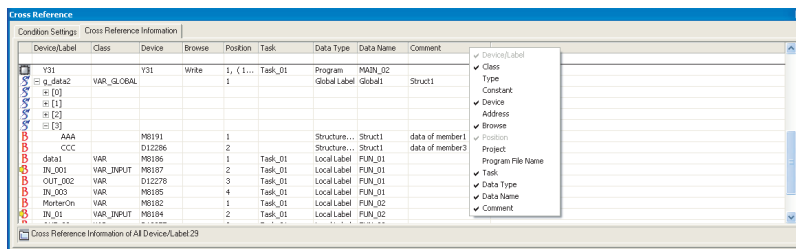
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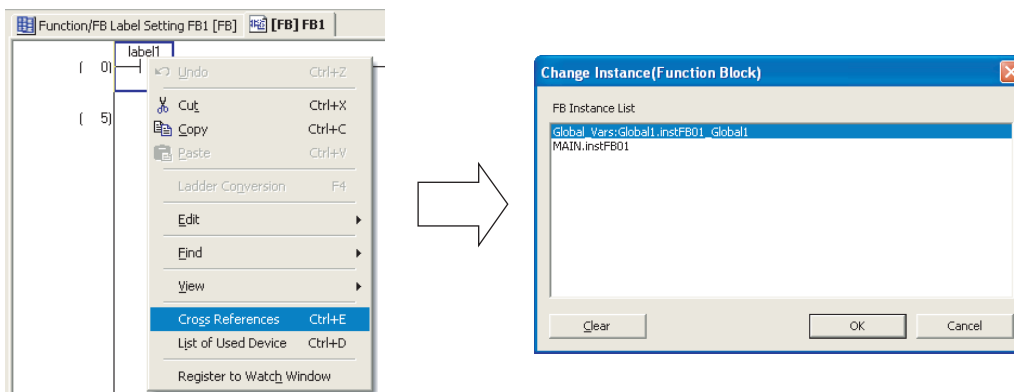
■ Displaying/hiding columns

Columns in the screen can be displayed or hidden by right clicking a column header of the cross reference information and selecting the items to be displayed or hidden from the shortcut menu.



■ Displaying devices/labels that use FB instance

When the cross reference information is created from the devices/labels used in the function block, select the FB instance to create the cross reference information.



10.2.2 Filtering display

Filtering display is performed on the created cross reference information.
The following shows an example of performing filtering display for device/label 'D*'.


Operating procedure

1. Enter 'D*' in the filtering condition column under "Device/Label".

Cross Reference							
Condition Settings		Cross Reference Information					
	Device/Label	Class	Type	Constant	Device	Address	Bi
	D*						
	data1	VAR	Bit		M8186	%MX0.8186	R
	Y39				Y39	%QX57	W
	X10				X10	%IX16	R
	X11				X11	%IX17	R
	MoterOn	VAR	Bit		M8182	%MX0.8182	W
	okey	VAR	Bit		M8181	%MX0.8181	R
	Y78				Y78	%QX120	W
	X0				X0	%IX0	R
	D0				D0	%MW0.0	W

2. Press the  key.

The data matching with the set filtering condition are displayed in the Cross Reference window.

Cross Reference							
Condition Settings		Cross Reference Information					
	Device/Label	Class	Data Type	Constant	Device	Address	
	D*						
	D0				D0	%MW0.0	
	D3				D3	%MW0.3	
	D9				D9	%MW0.9	
	D0				D0	%MW0.0	
	D0				D0	%MW0.0	

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Point● **Filtering condition**

Clicking  enables to select a keyword from the list of previously entered keywords.

● **Tree display of filtering condition**

Only data whose components match with the filtering conditions are displayed in the tree format when filtering display is executed for the structure data names or the instance names of the function block.

● **Deleting filtering condition**

Filtering display of the column can be canceled by deleting keywords entered in each filtering condition column.

● **Keywords for filtering condition**

The wildcards specified as filtering conditions can be set as below.

Example) When the filtering condition is set for the device/label column.

Wildcard	Search target	Example	Search Result
*	Specifies any character string.	*30*	ready301, K4X30, K1Y30, K4Y30
?	Specifies any one character.	K4?30	K4X30, K4Y30
[]	Specifies any one of those characters.	[XY]8	X8, Y8
[!]	Specifies any one character except for the characters in the bracket.	K4X[!3]0	K4X40, K4Y50
[-]	Specifies character strings within the range in the bracket.	D[0-2]	D0, D1, D2
#	Specifies any one-digit number.	Local200#	Local2001, Local2003

10.3 Displaying device usage list

QCPU



This section explains the method for displaying the usage of the specified devices.

Screen display

Select [Find/Replace] ⇒ [List of Used Device].

Device	- -	- () -	Comment
X0	*		Module Ready
X1	*		
X2		*	
X3	*		
X4			
X5			

Operating procedure

1. Set the items on the screen.

Item	Description
Find In	Select a location to search for. Click to select a location to search for. Click to select a location from the list of previously searched locations. The location cannot be entered directly.
Device	Enter a device to be searched for. Click to select a device from the list of previously searched devices.

2. Click the button.

A mark "*" is displayed in the rows of the devices used.

A global comment of the device entered in "Find String" is displayed in the "Comment" column.

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[illegible]



11 SETTING PROGRAMMABLE CONTROLLER CPU CONNECTION TARGET

This chapter explains the method for setting a connection target for accessing a programmable controller CPU from GX Works2.

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11.2	Accessing Programmable Controller CPU Directly Coupled . . .	11-6
11.3	Accessing Programmable Controller CPU Via Networks	11-9
11.4	Accessing Programmable Controller CPU in Multiple CPU System . . .	11-14
11.5	Accessing Programmable Controller CPU via Ethernet Board . . .	11-16
11.6	Accessing Programmable Controller CPU via CC-Link G4 or G4-S3 Module	11-18
11.7	Setting for Access via Serial Communication Module. . .	11-19
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11.9	Precautions on Communication with Programmable Controller CPU	11-25

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11.1 Setting Connection Targets

QCPU

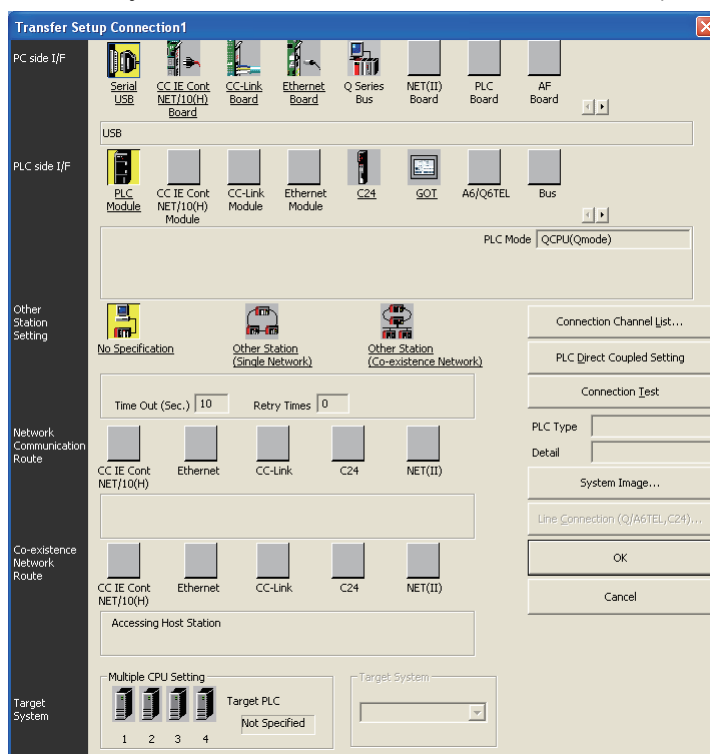


This section explains the method for setting communication routes, including the interfaces both on the personal computer and programmable controller CPU and the routing networks, for accessing a programmable controller CPU.

Multiple connection targets can be set with GX Works2. To set multiple connection targets, create data for each connection target on the New Data screen. (☞ Section 4.2.1)

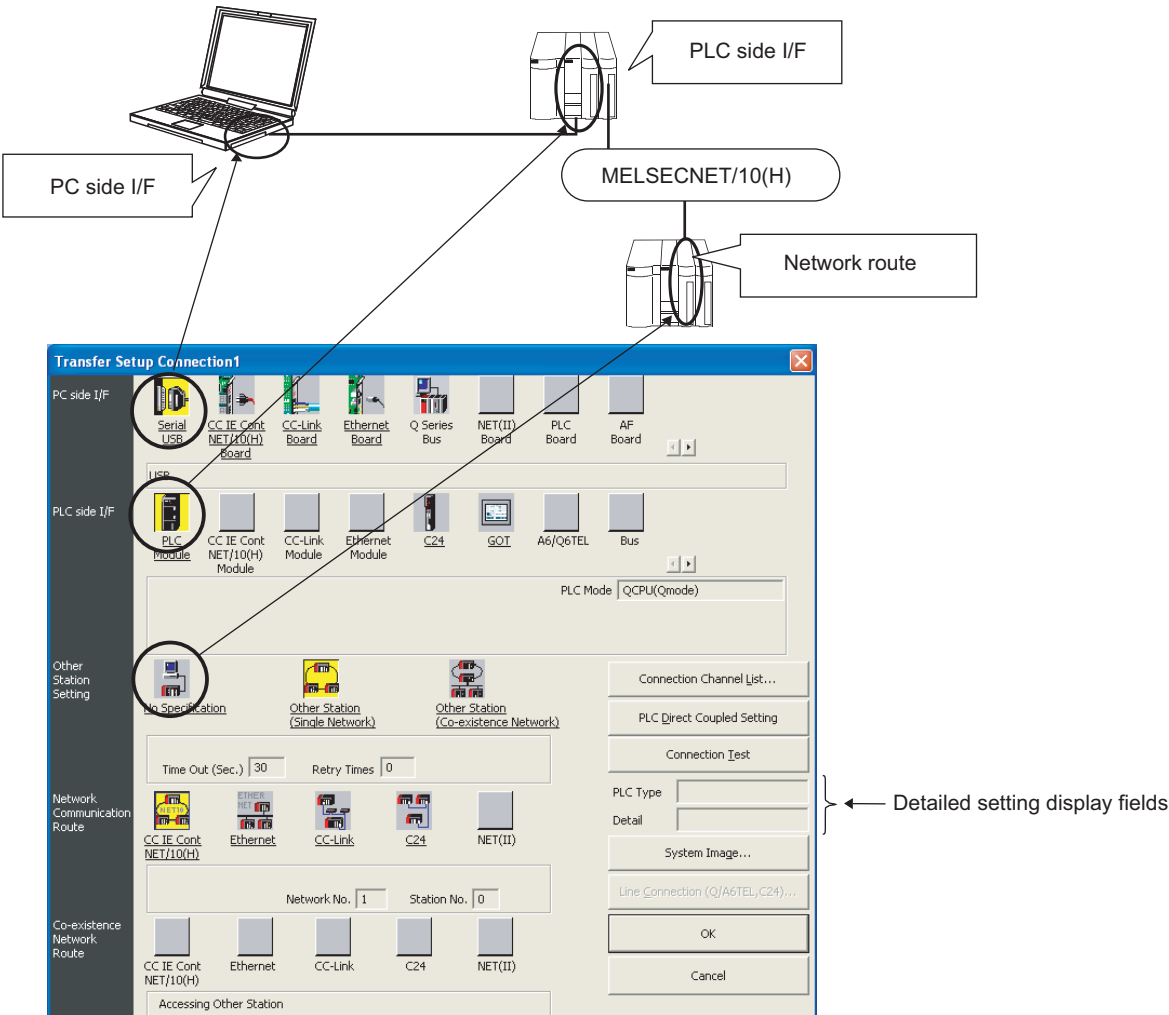
Screen display

Select Project window ⇒ "Connection Destination" ⇒ "(Connection target data name)".



11.1.1 Transfer setup screen

This section explains the Transfer Setup screen that displays interfaces as shown below and the setting details of each interface.



The settable items are underlined on the screen. Double-click these items to set the details. The items whose icons are displayed in yellow are items that have been already set.

- PC side I/F
Set the interface of the personal computer.
- PLC side I/F
Set the interface of the programmable controller CPU connected to the personal computer.
- Other station

Item	Description
No Specification	Specify this to access the programmable controller CPU directly connected to a personal computer.
Other Station [Single Network]	Specify this to access the programmable controller CPU on another station via only one kind of network (including a multi-tier system) such as CC-Link only, MELSECNET/10(H) only, CC-Link IE controller network only, Q series-compatible C24 module only or Ethernet only. Since Ethernet is regarded as equivalent to CC-Link IE controller network and MELSECNET/10(H), specify "Single Network" for a mixed system in which Ethernet, CC-Link IE controller network, and MELSECNET/10(H) are configured.
Other Station [Co-existence Network]	Specify this to access the programmable controller CPU on another station via two kinds of network. This means the system that is configured with two different networks, such that from MELSECNET/10(H) to CC-Link module or from Q series-compatible C24 module to MELSECNET/10(H).

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- Network route/Co-existence network route

Select the network type, network number, station number, and start I/O number of the network that is routed for accessing the programmable controller CPU on another station. The setting items depend on the selected network type.

Screen button

- Connection Channel List...

The Connection Channel List screen is displayed.

Connection targets can be set by checking network routes on the Connection Channel List screen. Since the route selected in the Connection Channel List screen is set automatically on the Transfer Setup screen, the setting is easy even for a complex system.

Operation

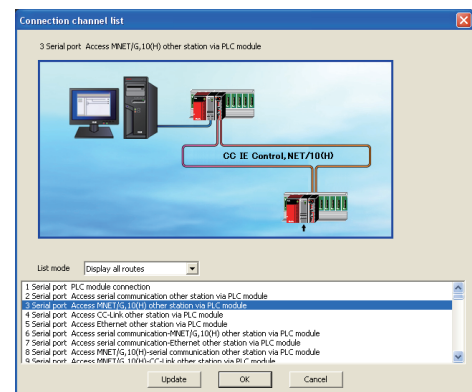
1. Select a route on the Connection Channel List screen.

2. Click the / button.

The selected route is displayed on the Transfer Setup screen. Set the network number, station number, and other settings depending on the access target.

- "List mode"

List mode	Description
Display All Routes	Displays all routes supported in GX Works2.
Display Selected Routes	Displays only accessible routes for "Other Station Setting" and "Network Communication Route" setting. Specify the interfaces for "PC side I/F" and "PLC side I/F" on the <u>Transfer Setup</u> screen and select "Display Selected Routes" to display the routes.



- PLC Direct Coupled Setting

Changes the connection target setting for the setting that connects a personal computer directly to the programmable controller CPU to be accessed.

This function is useful to change the station specification from another station to host station.

- Connection Test

Tests if the target programmable controller CPU set on the Transfer Setup screen can be accessed normally.

If accessed normally, the model of the target programmable controller CPU module is displayed in the "PLC Type" field, one of the detailed setting display fields. In addition, for the multiple CPU system, the connection target CPU number is displayed in the "Detail" field.

- System image(S)...

Shows the set connection channel in an illustration.

11.1.2 Specifying connection target for regular use

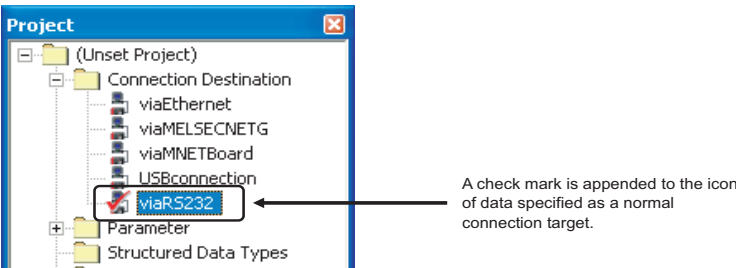
This section explains the method for specifying the connection target for regular use when multiple connection targets are set.

Operating procedure

1. Select the connection target data to be specified as the connection target for regular use in the Project window.
2. Select [Project] ⇒ [Object] ⇒ [Set as Default Connection].

The selected connection target data are set as the connection target for regular use.

A check mark, ✓, is appended to the icon of the connection target data set as the connection target for regular use.

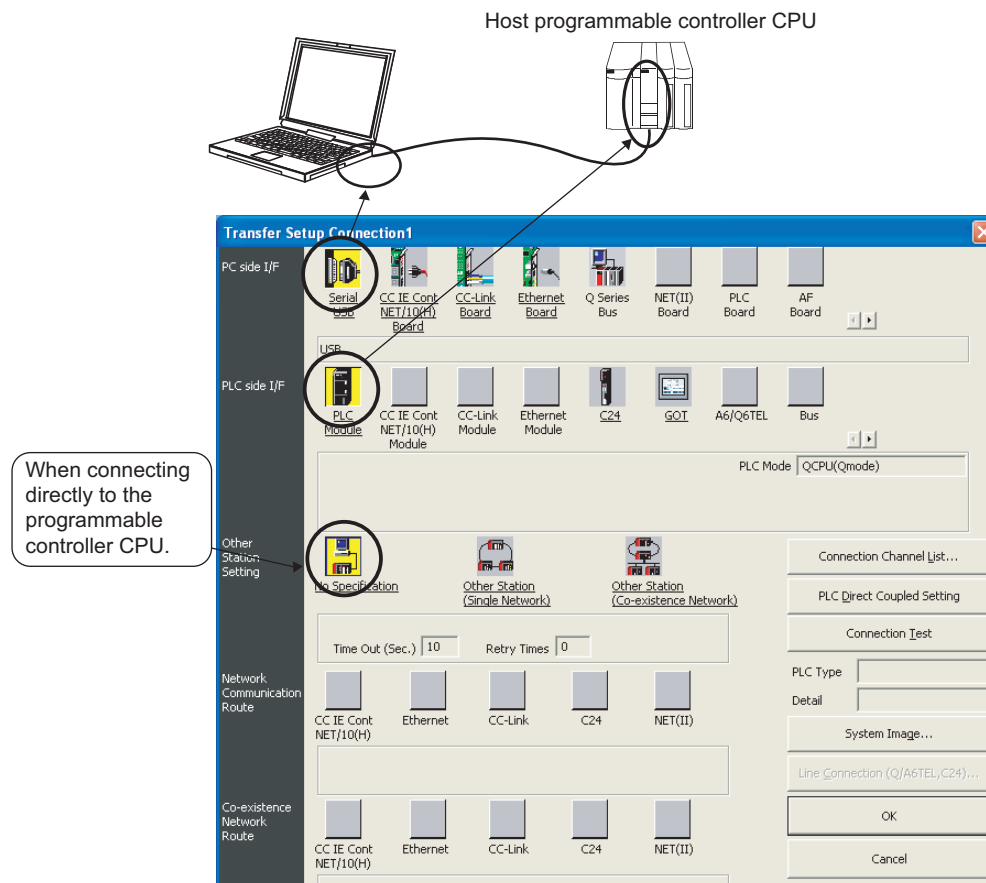


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11.2 Accessing Programmable Controller CPU Directly Coupled



This section explains the setting method for accessing the programmable controller CPU directly connected to a personal computer.



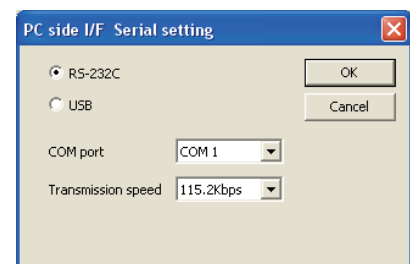
11.2.1 Connecting to QCPU (Q mode)

The following explains the setting for accessing the Q series programmable controller CPU on the host station.

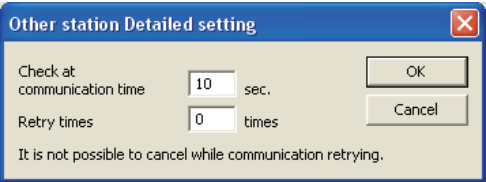
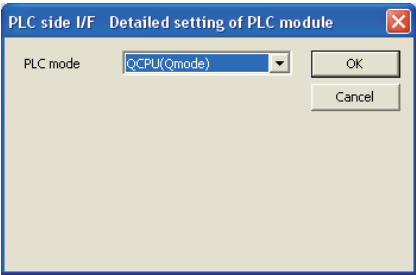
Operation

1. Set "PC side I/F".

→ Section 11.1.1



- 2.Set "PLC side I/F".
Select the series of the programmable controller CPU to be connected.
- 3.Set "No Specification" for "Other Station Setting".
Set "Check at communication time" and "Retry times" as needed.



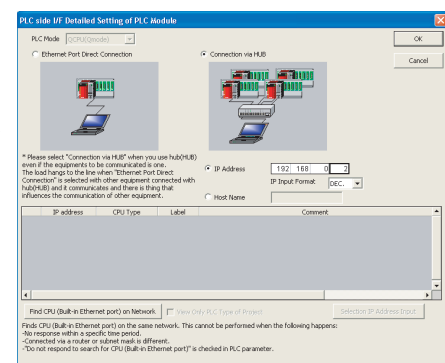
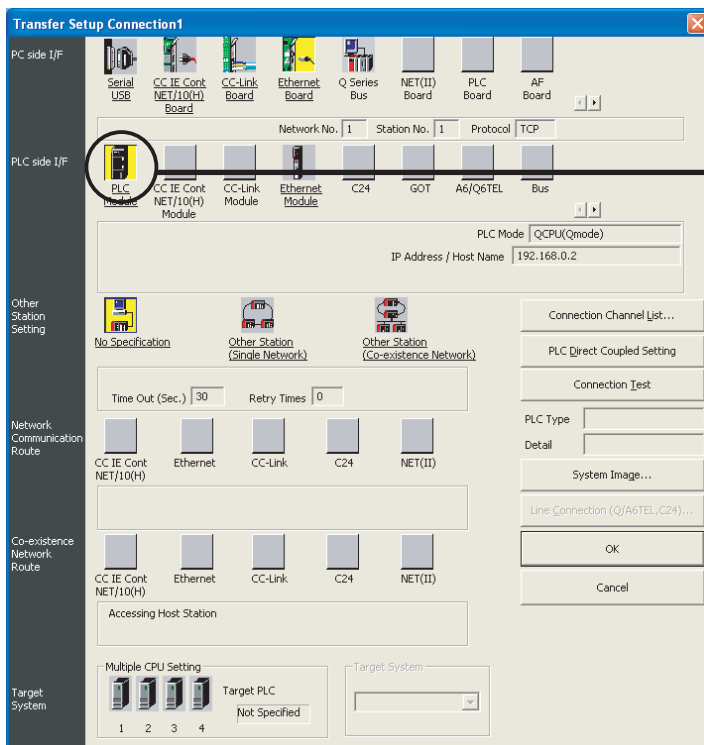
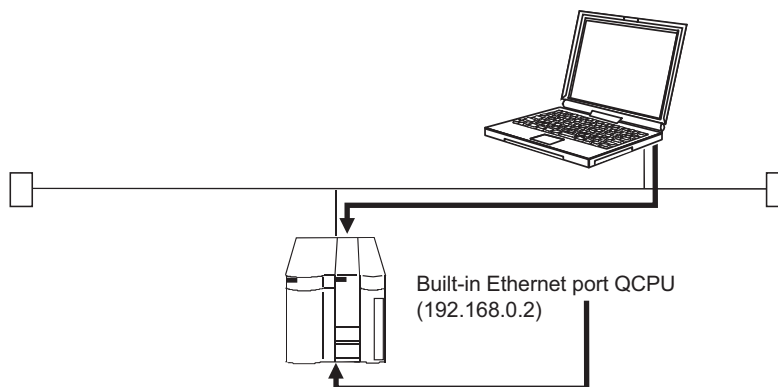
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11.2.2 Accessing Built-in Ethernet port QCPUs

This section explains the method for accessing the Built-in Ethernet port QCPU from GX Works2.

Operation

- Set the connection target.

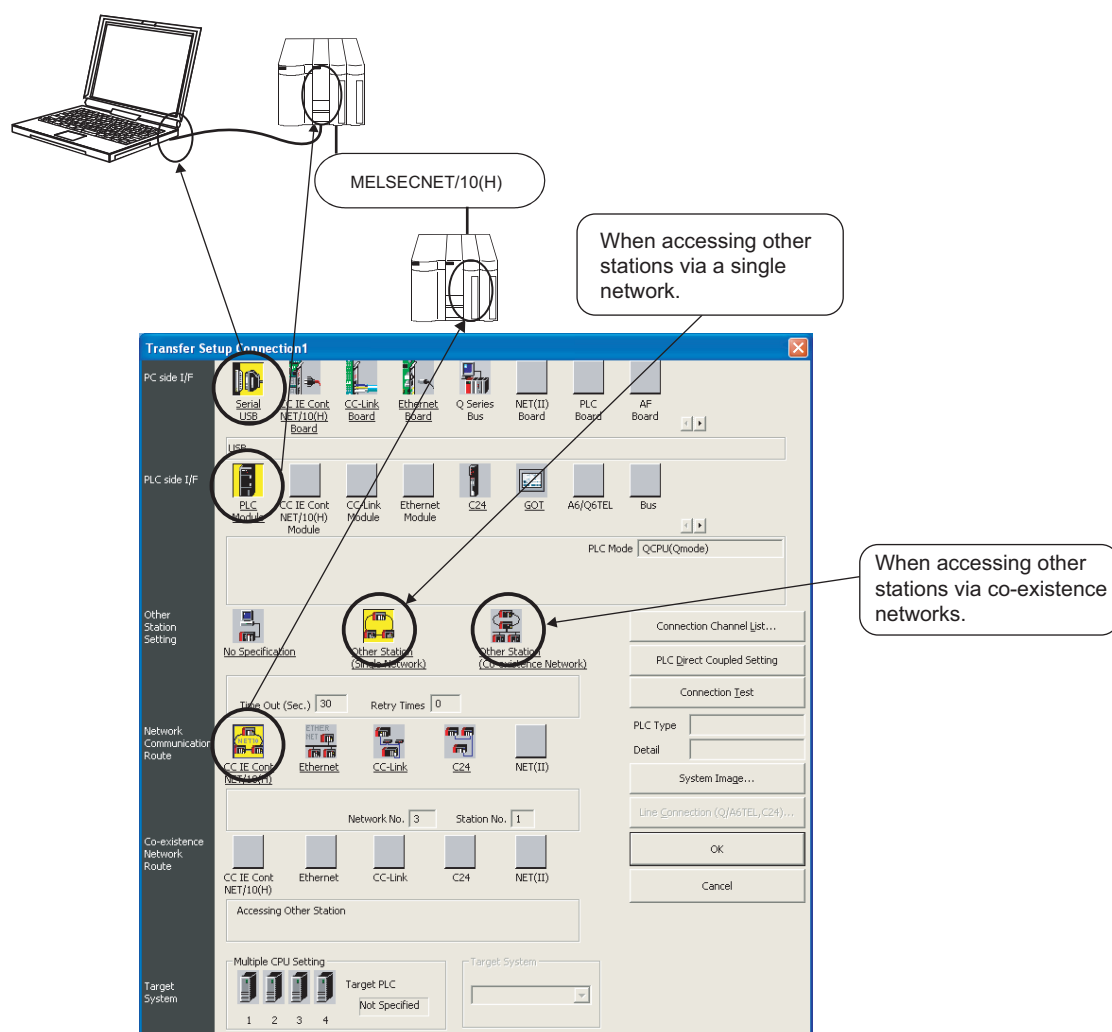


Item	Description
PLC side I/F	Select the access method. When the Find CPU (Built-in Ethernet port) on Network button is clicked, a Built-in Ethernet port QCPU on the network is searched for and displayed. The IP address of the searched CPU can be utilized from the Selection IP Address Input button.

11.3 Accessing Programmable Controller CPU Via Networks



This section explains the setting method for accessing the programmable controller CPU on another station from a personal computer via networks.



Operation

1. Set "PC side I/F".

☞ Section 11.1.1

2. Set "PLC side I/F".

☞ Section 11.1.1

3. Set "Other Station Setting"

☞ Section 11.1.1

4. Set "Network Communication Route" / "Co-existence Network Route".

Select the network type, network number, station number, and start I/O number of the network that is routed for accessing the programmable controller CPU on another station. The setting items depend on the selected network type.

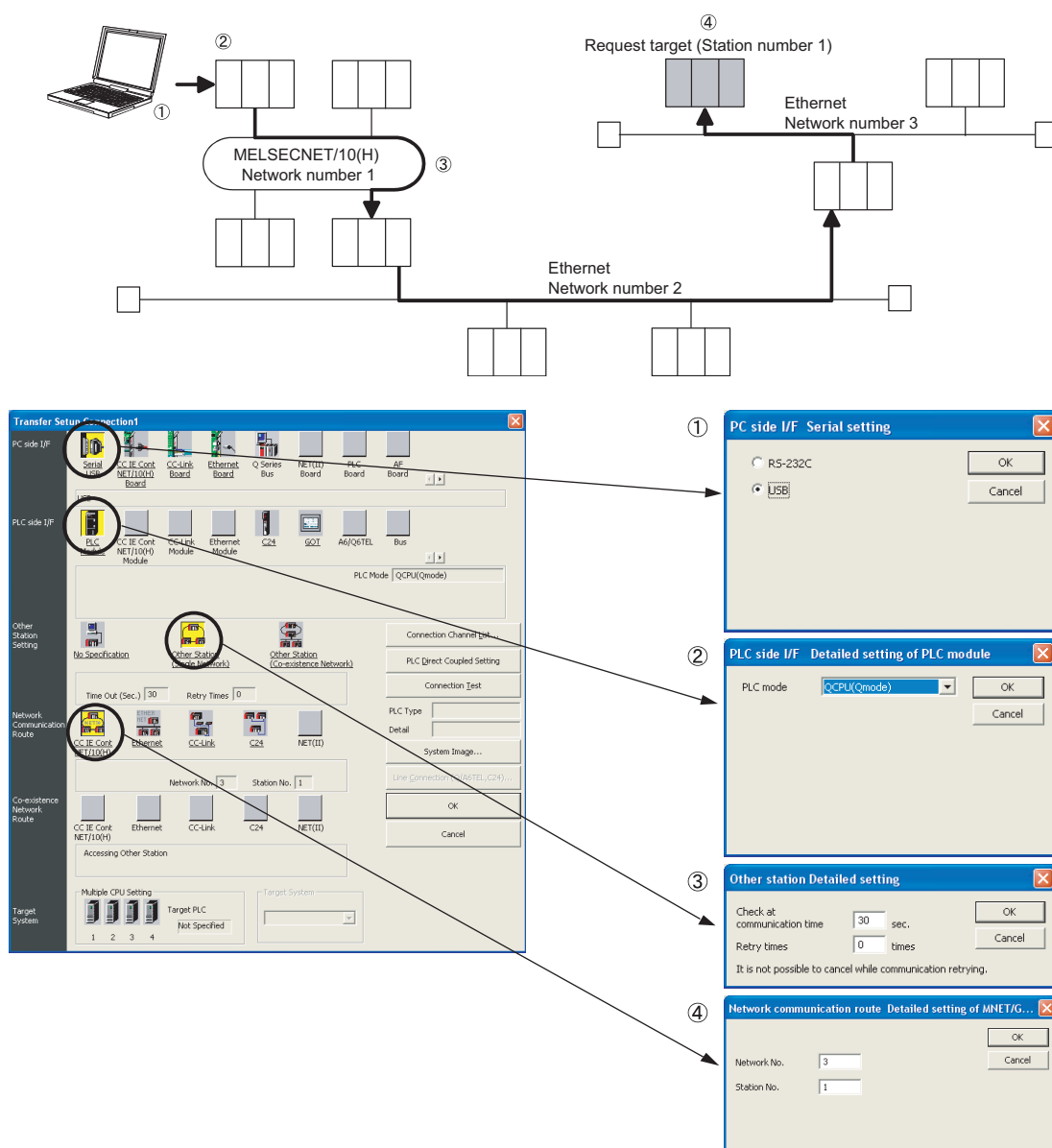
■ Setting example of "Other Station (Single Network)"

The following is the setting example for accessing the programmable controller CPU via single network.

- Screen settings for the mixed system in which MELSECNET/10(H), CC-Link IE controller network, and Ethernet are configured (single network)

For the mixed system in which MELSECNET/10(H), CC-Link IE controller network, and Ethernet are configured, specify "Single Network" when accessing the programmable controller CPU on another station. (Since Ethernet is regarded as equivalent to CC-Link IE controller network and MELSECNET/10(H), specify "Single Network".)

The following shows the connection target detail setting screen example for the mixed system configuration (Q series only).



Point

- **Accessing programmable controller CPUs on another station**
Accessing a programmable controller CPU on another station is possible within the network system specifications by setting routing parameters of MELSECNET/10(H) (including CC-Link IE controller network and Ethernet). For details of routing parameters, refer to the manual of each network module.
- **Mixed system consisting of MELSECNET/10(H), CC-Link IE controller network, and Ethernet**
Ethernet parameter "Station No. ⇔ IP Information" must be set. For details, refer to the following manual.
☞ Q Corresponding Ethernet Interface Module User's Manual (Application)

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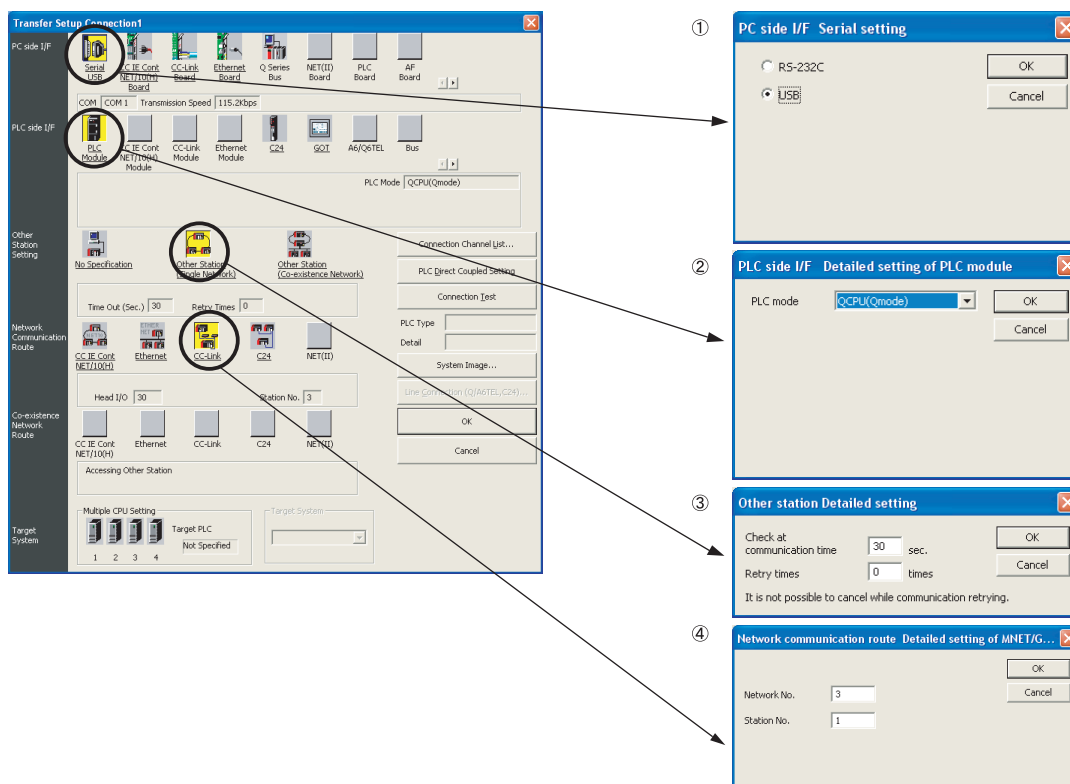
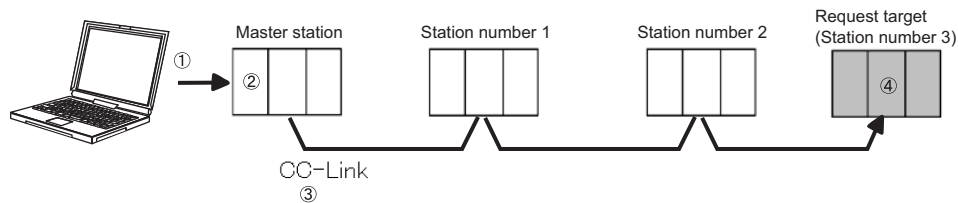
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● Screen settings for the CC-Link system (single network)

The following shows the connection target detail setting screen example for the CC-Link system configuration (Q series only).



Point

● Accessible station numbers when accessing the programmable controller CPU on another station via CC-Link

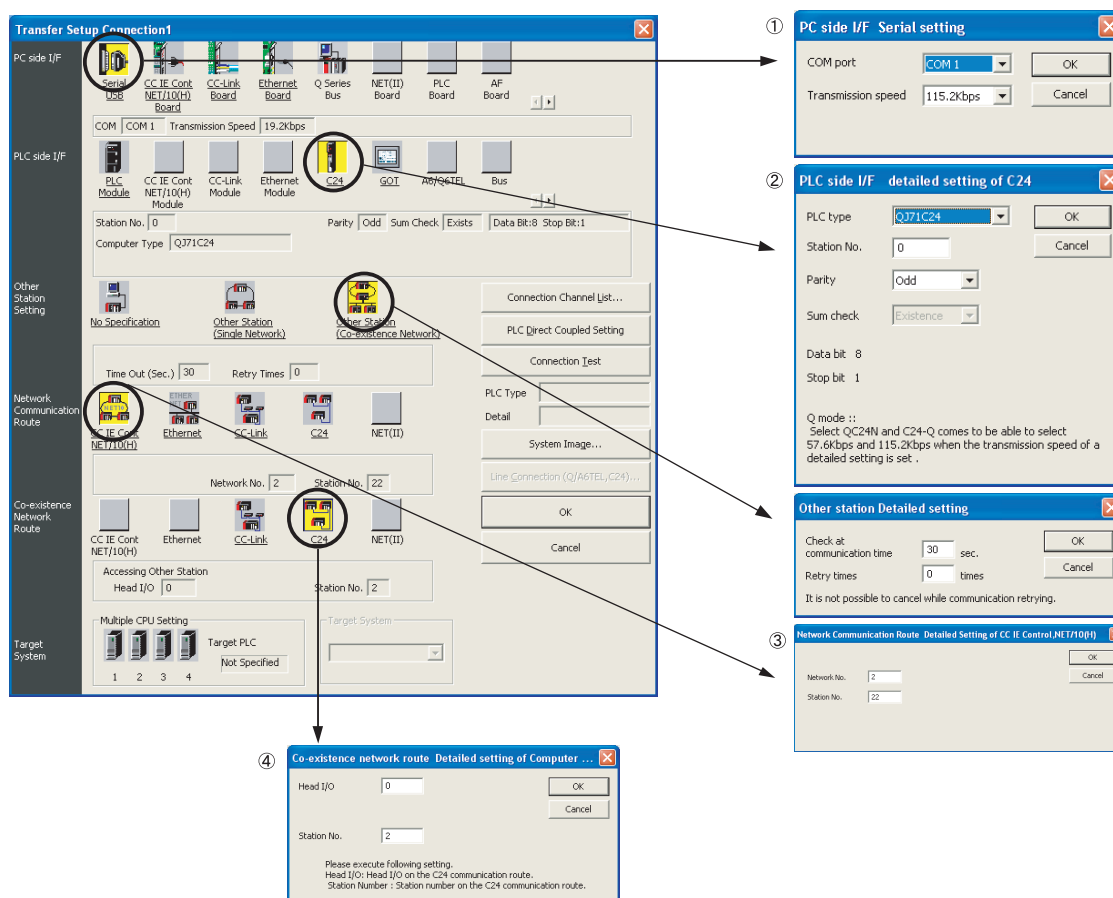
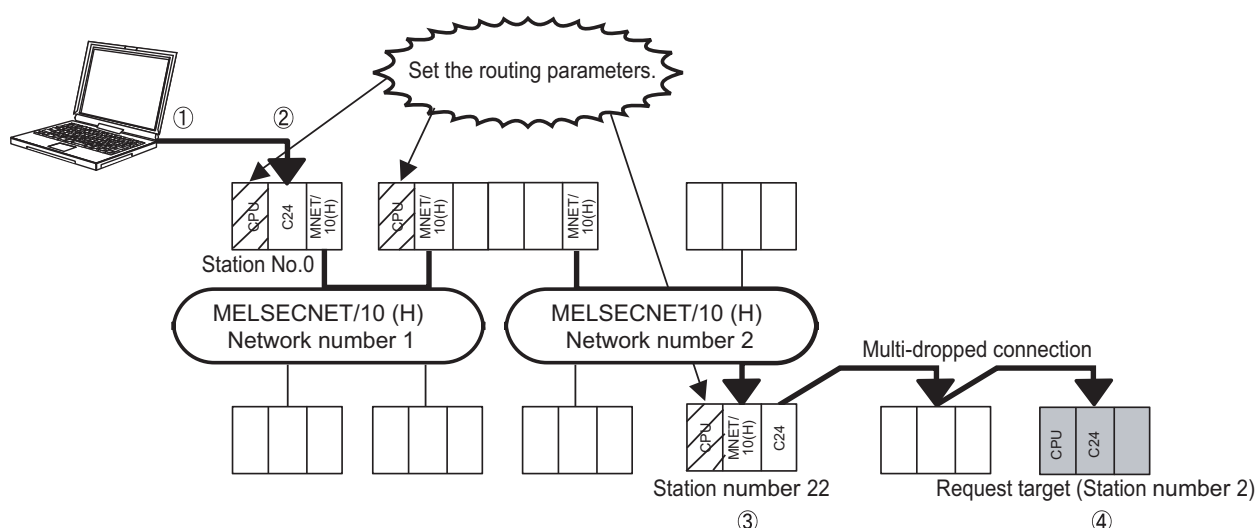
When the programmable controller CPU is connected directly or via a serial communication module, accessible station numbers when accessing the programmable controller CPU on another station via CC-Link are 0 (master) to 63.

■ Setting example of "Other Station (Co-existence Network)"

The following is the setting example for accessing the programmable controller CPU via co-existence network.

- Screen settings for the mixed system in which MELSECNET/10(H) and Q series-compatible C24 module are configured (co-existence network)

The following shows the connection target detail setting screen example for the mixed system configuration (Q series only).



11.4 Accessing Programmable Controller CPU in Multiple CPU System



*1: Except the QOOJCPU

This section explains the setting method for accessing the programmable controller CPU (host CPU) directly connected to the personal computer or other programmable controller CPUs (other CPUs) in the multiple CPU system. The setting method for accessing the multiple CPU system on another station via a network is also explained.

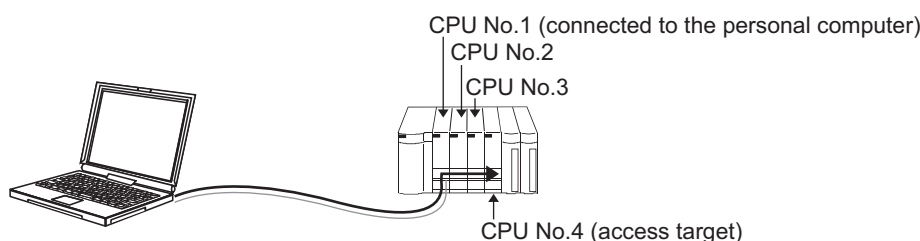
■ Accessing host CPU

The setting for accessing the host CPU is the same as that for accessing the programmable controller CPU on the host station. (→ Section 11.2)

■ Accessing other CPUs

In the multiple CPU system, specify the CPU number of the access target at "Multiple CPU Setting" when accessing a programmable controller CPU that is not directly connected to the personal computer.

The following shows the setting example when accessing the CPU No.4 by connecting the personal computer to the CPU No.1.



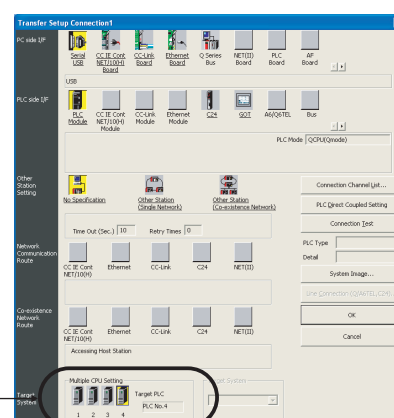
Operation

1. Set "PC side I/F" to "Co-existence Network Route".

→ Section 11.1.1

2. Set the access target CPU number at "Multiple CPU Setting" in "Target System".

Specify the CPU number



■ Accessing the programmable controller CPU via network in multiple CPU system

The following explains the setting method for accessing the programmable controller CPU in a multiple CPU system on another station via a network.

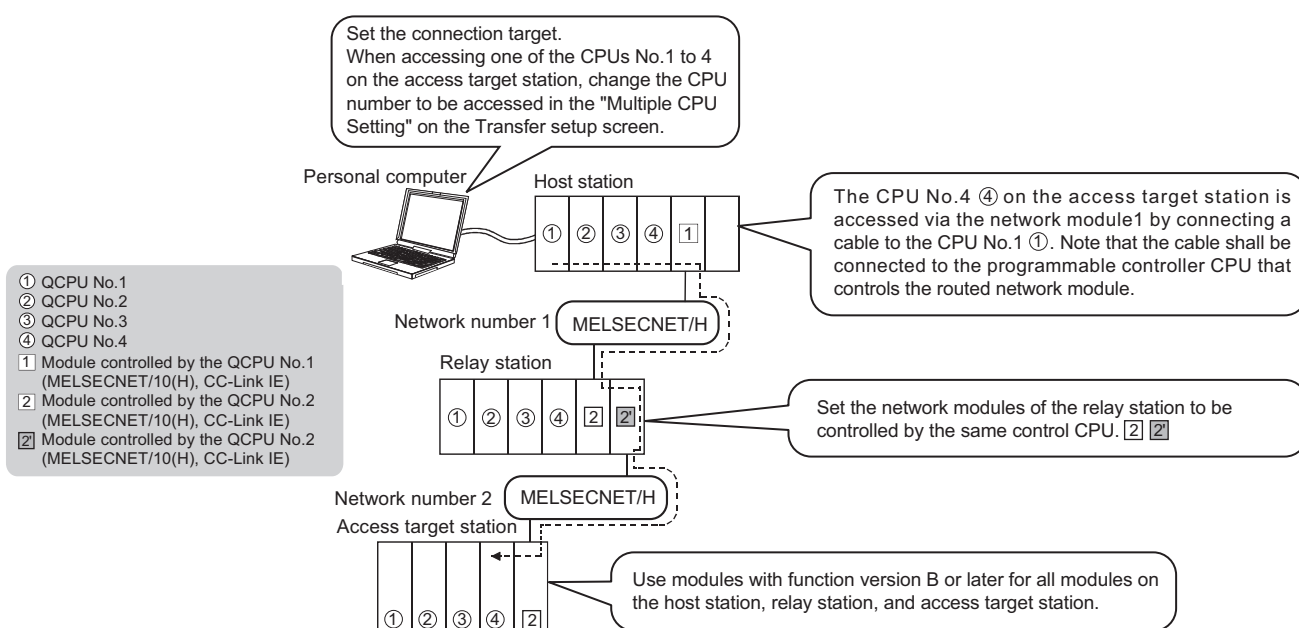
● Relay station

Set the parameters so that the network module mounted on the relay station is controlled by the same programmable controller CPU. (In the figure below, CPU No.2 is the control CPU.)

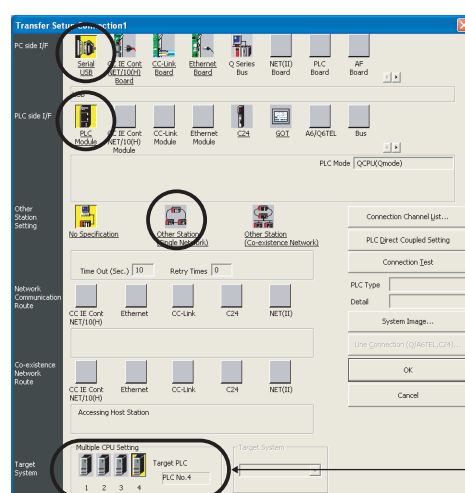
● Access target station

Set the CPU number in the "Multiple CPU Setting" on the Transfer Setup screen if the access target station has the multiple CPU system.

The following shows the setting example when accessing the CPU No.4 in the multiple CPU system on the access target station via a network.



Section 11.1.1



Specify the CPU number.

Point

● Access range by network module function versions

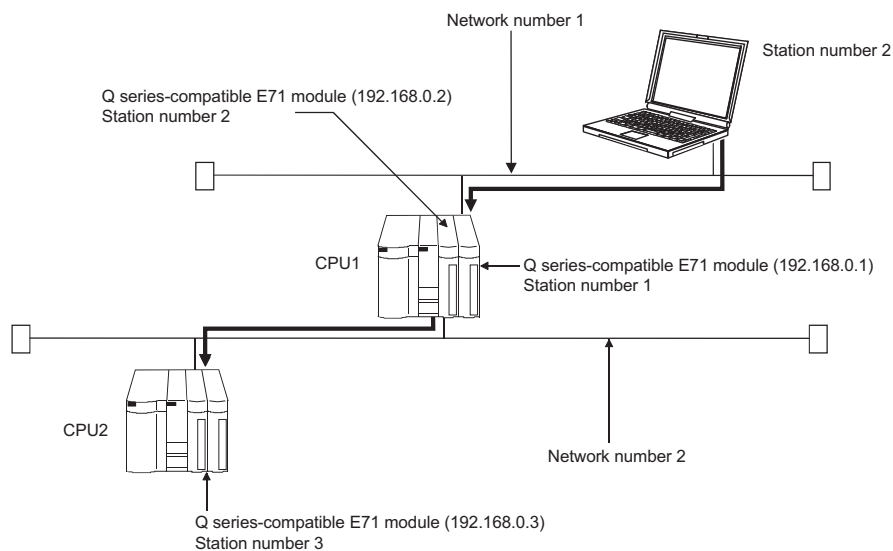
To access programmable controller CPUs which are not controlling the network module of the access target station, use the network module with function version B or later.

11.5 Accessing Programmable Controller CPU via Ethernet Board



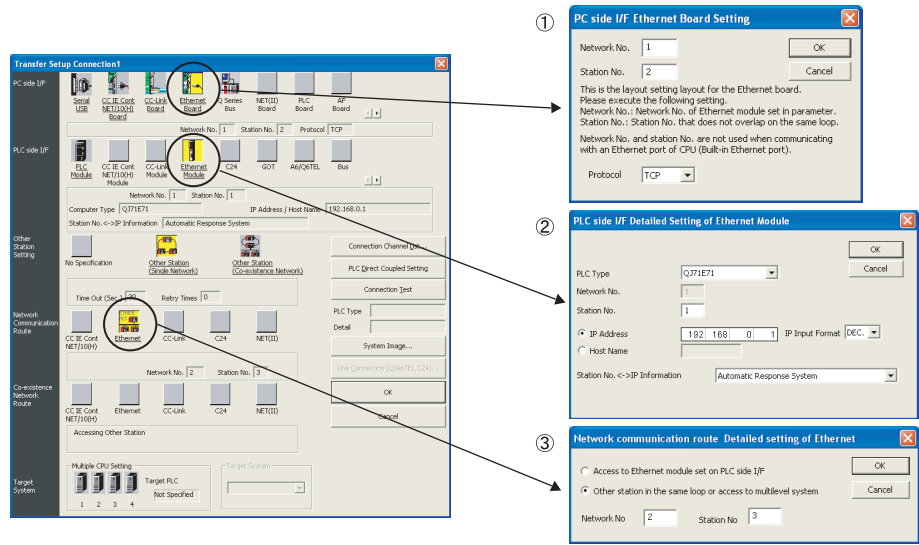
This section explains the setting method for accessing the programmable controller CPU via an Ethernet board of a personal computer.

The following shows the setting example when accessing the programmable controller CPU from GX Works2 via Q series-compatible E71 module.



Operation

- Set the connection target.



Item	Description
PC side I/F	Set the network number, station number, and protocol.
PLC side I/F	Set the model, station number, IP address and other items for the module to be connected to the personal computer. For "Station No. ⇔ IP Information", set the method corresponding to the setting for "Station No. ⇔ IP Information" of Ethernet parameter.
Network Communication Route	Set the network number and station number of the access target station.

Point

- **Communication when connecting multiple GX Works2**
Use TCP/IP or UDP/IP. (☞ Section 6.2.2)
- **Multiple network systems**
For multiple network systems, routing parameters must be set.
☞ Q Corresponding Ethernet Interface Module User's Manual (Application)

9	SETTING DEVICE COMMENTS
10	SEARCH/REPLACE
11	SETTING PROGRAMMABLE CONTROLLER CPU CONNECTION TARGET
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11.6 Accessing Programmable Controller CPU via CC-Link G4 or G4-S3 Module

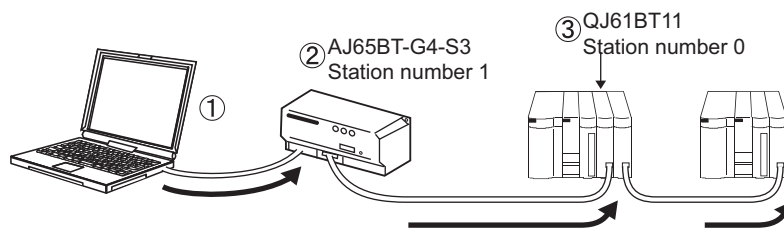
QCPU



This section explains the setting method for accessing the programmable controller CPU via a CC-Link G4 module or G4-S3 module.

The following shows the setting example when accessing the programmable controller CPU via G4-S3 module.

Data link must be correctly established by setting the switch settings and parameters for the G4-S3 module and the CC-Link master module.

**Operation**

- Set the connection target.

The screenshot shows the 'Transfer Setup Connection1' dialog box. Three callouts point to specific settings:

- PC side I/F Serial setting:** This dialog box shows the 'COM' port set to 'COM 1' and the 'Transmission speed' set to '115.2Kbps'.
- PLC side I/F detailed setting of G4 module:** This dialog box shows the 'PLC type(Mode)' set to 'AJ65BT-G4-S3(Q mode)'.
- Network communication route Detailed setting of CC-Link:** This dialog box shows the 'Station No.' set to '0'.

Item	Description
PC side I/F	Set the COM port and transmission speed.
PLC side I/F	Set the model of the G4-S3 module to be connected.
Other Station Setting	Set "Other Station (Single Network)".
Network Communication Route	Set the station number of the access target station.

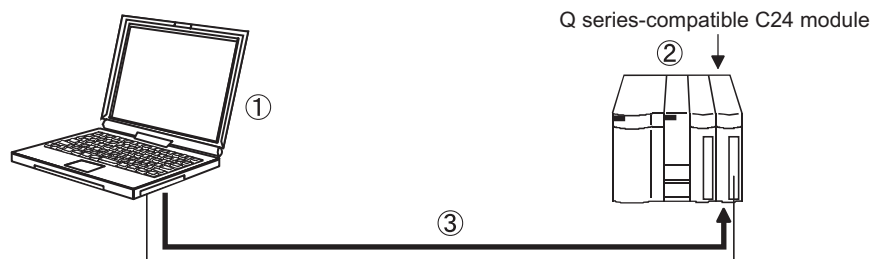
11.7 Setting for Access via Serial Communication Module



This section explains the setting for accessing the programmable controller CPU on host station or on another station via a Q series-compatible C24 module.

11.7.1 Connection on a 1:1 basis

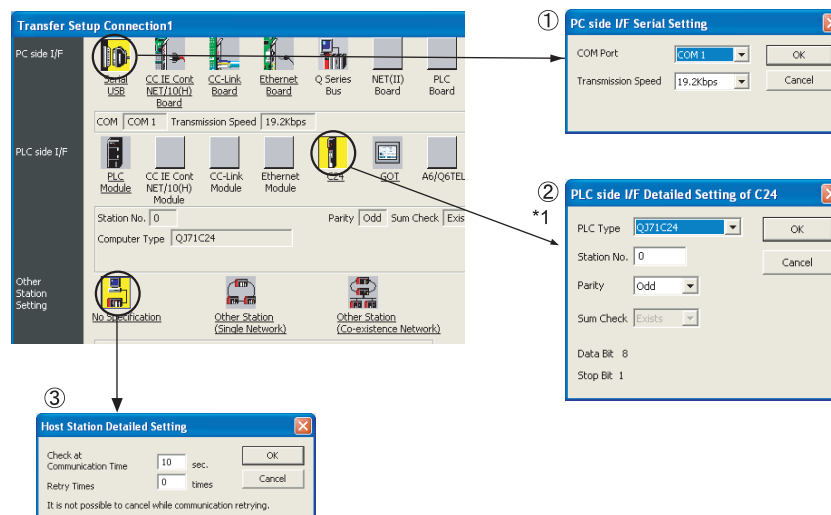
The following shows the setting example when accessing a programmable controller CPU by connecting a personal computer and a Q series-compatible C24 module.



Operation

- Set the connection target.

The following shows the setting example on a screen when accessing a programmable controller CPU from GX Works2 via a Q series-compatible C24 module.



Item	Description
PC side I/F	Set the COM port and transmission speed.
PLC side I/F *1	Set the model and station number of a Q series-compatible C24 module to be connected.
Other Station Setting	Set "No Specification".

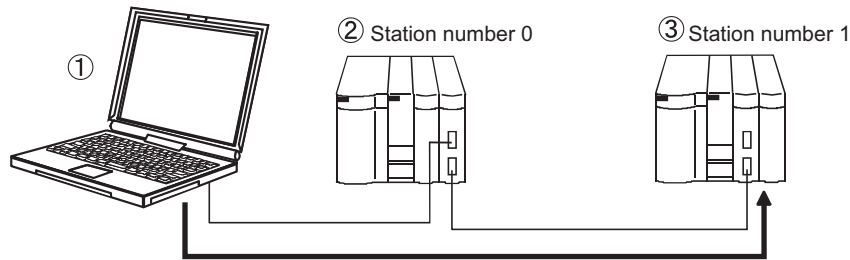
*1 : If a station number other than '0' is set for a Q series-compatible C24 module, set the station number at the same number.
Set the station number using Switch 5 (station number setting) of PLC parameter Switch setting.

11.7.2 Connection on a 1:n basis

This section explains the methods for accessing the programmable controller CPU in another station from GX Works2 in a system composed of multiple programmable controller CPU stations.

■ Access via a serial communication module

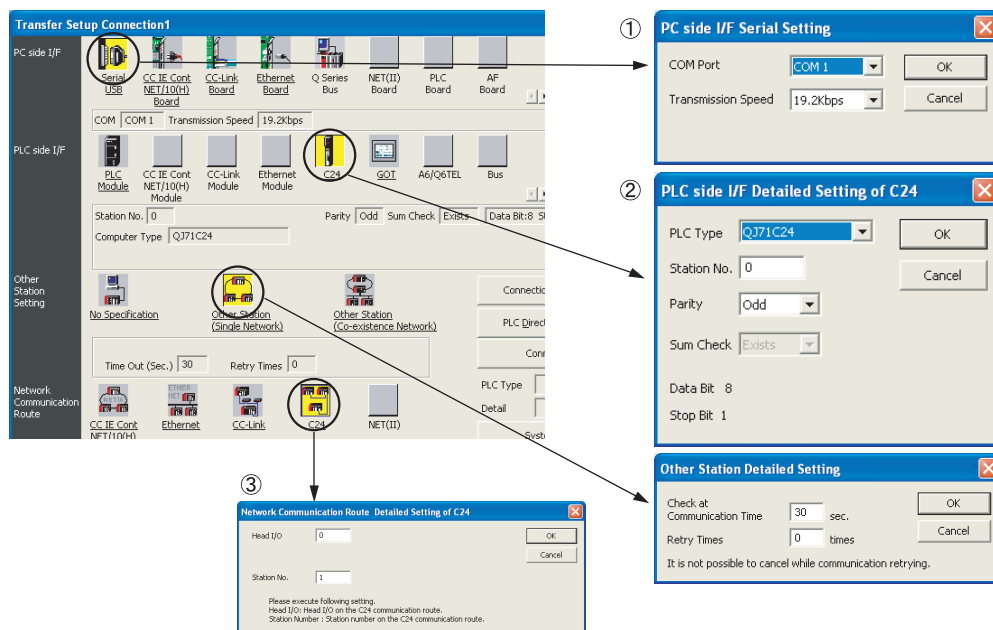
The following shows the setting example when accessing the programmable controller CPU in another station via a Q series-compatible C24 module.



Operation

- Set the connection target.

The following shows the setting example of a screen for accessing a Q series-compatible C24 module from GX Works2.

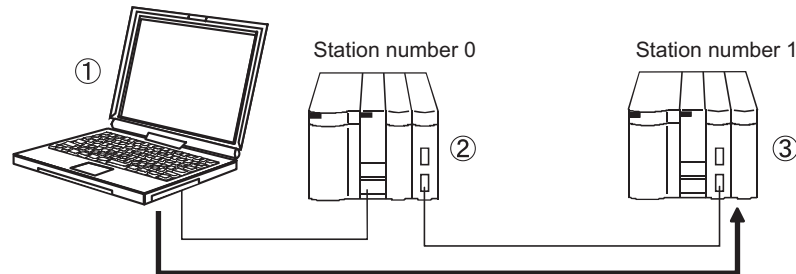


Item	Description
PC side I/F	Set the COM port and transmission speed.
PLC side I/F	Set the model and station number of a Q series-compatible C24 module to be connected.
Other Station Setting	Set "Other Station (Single Network)".
Network Communication Route	Specify the start I/O number of the Q series-compatible C24 module connected to GX Works2 and the station number of access target.

■ Direct coupled of a programmable controller CPU

The following shows the setting example when accessing the programmable controller CPU in another station via a Q series-compatible C24 module by directly connecting the personal computer to the programmable controller CPU.

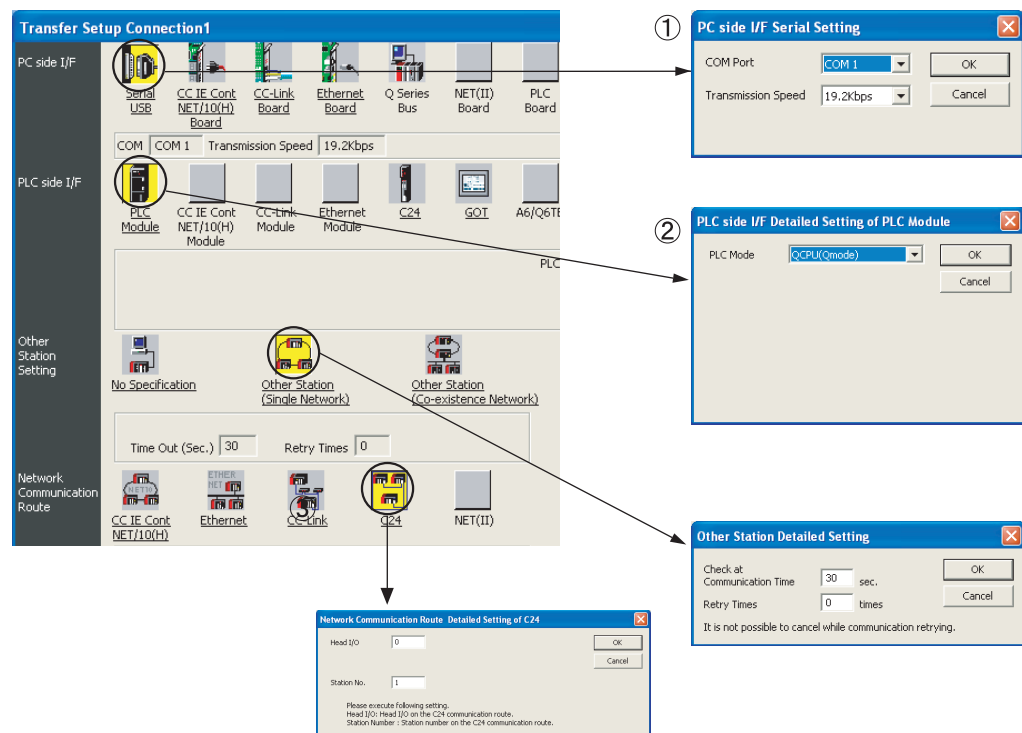
For connection cable, refer to Appendix 3.



Operation

- Set the connection target.

The following shows the setting example of a screen for accessing a programmable controller CPU from GX Works2 via a Q series-compatible C24 module.



Item	Description
PC side I/F	Set the COM port and transmission speed.
PLC side I/F	Set the model and station number of a Q series-compatible C24 module to be connected.
Other Station Setting	Set "Other Station (Single Network)".
Network Communication Route	Specify the start I/O number of the Q series-compatible C24 module connected to GX Works2 and the station number of access target.

11.8 Setting for Access via GOT (GOT Transparent Function)



This section explains the method for accessing the programmable controller CPU from GX Works2 via GOT using the GOT transparent function.

Point

● Precautions on executing online operations from GX Works2

Do not execute online operations from GT Designer2 to GOT (such as downloading project data) when online operations are being executed from GX Works2 to the programmable controller CPU using the GOT transparent function.

● When GOT does not monitor normally

The GOT transparent function cannot be used in the following cases.

- When GOT does not monitor normally due to programmable controller CPU errors or communication errors between the programmable controller CPU and GOT
- During the period of time between turning ON or resetting the programmable controller CPU or GOT and the start of GOT monitoring

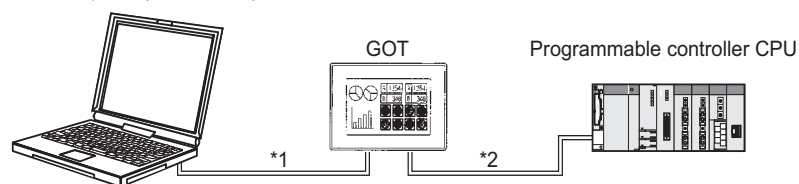
Check the following items if GOT does not monitor normally.

Item	Description
Does the programmable controller CPU operates normally?	Refer to the user's manual of the programmable controller CPU used.
Is the programmable controller CPU connected to GOT normally?	Refer to the user's manual of the GOT to be used. • GOT1000 Series Connection Manual • GOT-A900 Series User's Manual (Connection System Manual) • GOT-F900 SERIES GRAPHIC OPERATION TERMINAL HARDWARE Manual [Connection]

11.8.1 Accessing programmable controller CPU via GOT

This section explains the method for accessing the programmable controller CPU via GOT.

Personal computer (GX Works2)



*1: The following table shows the connection between the personal computer and GOT.

Connection	GOT		
	GOT1000 series	GOT-A900 series	GOT-F900 series
RS-232 connection	○	○	○
USB connection	○	—	—

○: Connectable

*2: For cables connecting GOT with the programmable controller CPU, GOT settings, and precautions, refer to the manual of the GOT connected.

- GOT1000 Series Connection Manual
- GOT-A900 Series User's Manual (Connection System Manual)
- GOT-F900 SERIES GRAPHIC OPERATION TERMINAL HARDWARE Manual [Connection]

■ Connecting to the QCPU (Q mode)

The following shows the settings for accessing the QCPU (Q mode).

Operation

1. Set "PC side I/F".

 Section 11.1.1

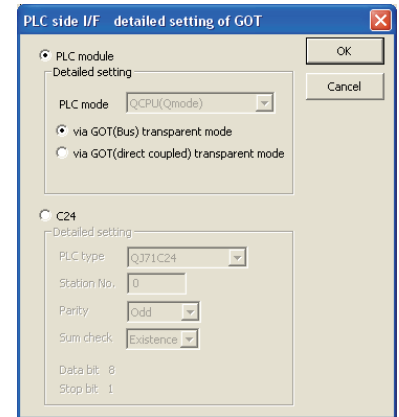
2. Set "PLC side I/F" to "GOT".

Select "PLC module" in "Detailed setting".

When bus-connecting the programmable controller CPU and GOT, select "via GOT (Bus) transparent mode". When connecting them directly, select "via GOT (direct coupled) transparent mode".

3. Set "Other Station Setting" depending on a route to the connection target.

 Section 11.1.1



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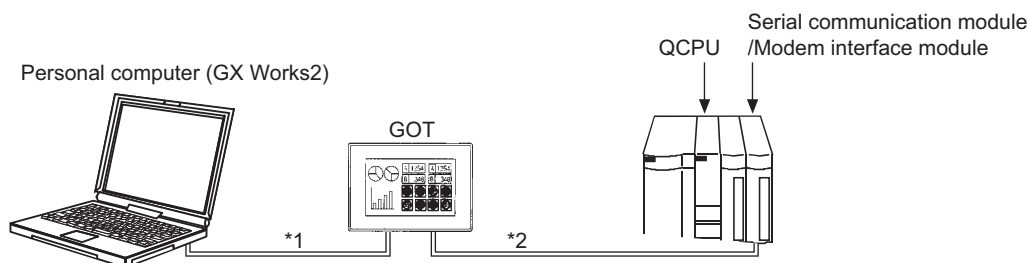
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11.8.2 Accessing programmable controller CPU via serial communication module/modem interface module

This section explains the GX Works2 setting method for accessing the programmable controller CPU via a GOT and a serial communication module/modem interface module.



*1 : The following table shows the connection between the personal computer and GOT.

Connection	GOT		
	GOT1000 series	GOT-A900 series	GOT-F900 series
RS-232 connection	○	—	—
USB connection	○	—	—

○: Connectable

*2 : For details of cables connecting GOT with the serial communication module/modem interface module, GOT settings, and precautions, refer to the manual of the GOT connected.
 · GOT1000 series Connection Manual

■ Connecting to the QCPU (Q mode)

The following shows the settings for accessing the QCPU (Q mode).

Operation

1. Set "PC side I/F".

☞ Section 11.1.1

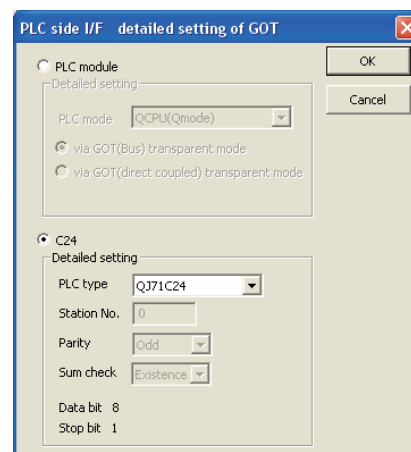
2. Set "PLC side I/F" to "GOT".

Select "C24" in "Detailed setting".

Select either "QJ71C24" or "QJ71CMO" in "PLC type".

3. Set "Other Station Setting" depending on a route to the connection target.

☞ Section 11.1.1



11.9 Precautions on Communication with Programmable Controller CPU



This section explains precautions on communication with the programmable controller CPU. Refer to POINT and Restrictions described in each section as well as the descriptions in this section.

■ Precautions on communication via multiple network systems

When accessing the QCPU (Q mode) via multiple network systems, connected station^{*1} and relay stations^{*2} must all be the QCPUs (Q mode).

*1: Station directly connected from GX Works2

*2: Stations to be routed on network system

■ Precautions on communication with the programmable controller CPU using a USB cable

- 1) Connecting and disconnecting a USB cable, resetting the programmable controller CPU, and turning the power ON/OFF

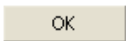
A communication error may occur and operation may not be recovered if connecting and disconnecting a USB cable, resetting the programmable controller CPU or turning the power ON/OFF is performed frequently during communication with the programmable controller CPU. Be sure to set GX Works2 to offline^{*1} as much as possible during these operations.

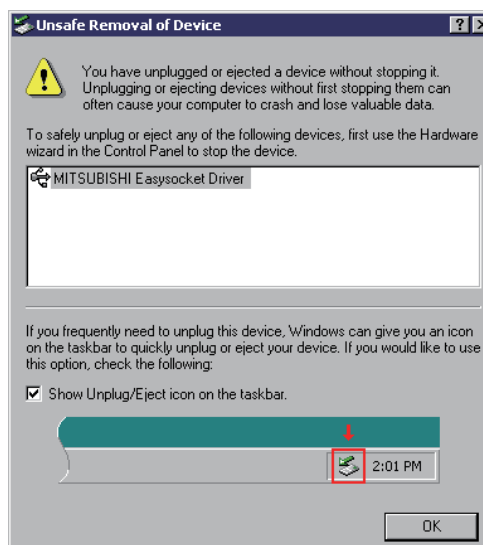
When operation is not recovered from an error, remove a USB cable. Then, connect it again after five or more seconds. (Even after this operation, an error may occur at initial communication. However, communication will be successful after that.)

*1: The offline indicates the status other than indicated below.

Write to PLC, Read from PLC, Monitor, and PLC diagnostics

The following screen appears on the personal computer using Windows® 2000 Professional Operating System.

If the screen appears, click the  button and remove a USB cable from the personal computer.



- 2) Combination of personal computers and USB cables

A communication error may occur depending on the combination of personal computers and USB cables.

If an error occurs, take appropriate actions according to the message displayed on the screen.

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■ Other precautions

1) High-speed communication using an RS-232 cable

Communication may fail depending on the performance of the personal computer when high-speed communication is attempted by changing the transmission speed at the serial port of the personal computer (personal computer side interface). Communication speed may also slow down due to communication retries. Decrease the transmission speed if high-speed communication is not performed normally.

2) Resume function, suspend setting, power saving function, and standby mode of the personal computer

A communication error may occur during communication with the programmable controller CPU when the resume function, suspend function, power saving function or standby mode set to the personal computer. Disable these settings for communication with the programmable controller CPU.



12 WRITING/READING DATA

This chapter explains operations to write or read data to/from the programmable controller CPU or a memory card.

12.1	Writing or Reading Data to/from Programmable Controller CPU.....	12-2
12.2	Verifying Data at Programmable Controller CPU against Data at Personal Computer.....	12-15
12.3	Deleting Programmable Controller CPU Data.....	12-18
12.4	Copying Program Memory Data to ROM.....	12-20
12.5	Writing/Reading/Deleting PLC User Data.....	12-21
12.6	Transferring Data to Program Memory in a Batch.....	12-23
12.7	Latch Data Backup.....	12-24
12.8	Online Program Change.....	12-26
12.9	Writing/Reading Data to/from Memory Cards.....	12-36

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12.1 Writing or Reading Data to/from Programmable Controller CPU



This function writes project data to the programmable controller CPU or a memory card, or reads data in the programmable controller CPU or a memory card to the project.

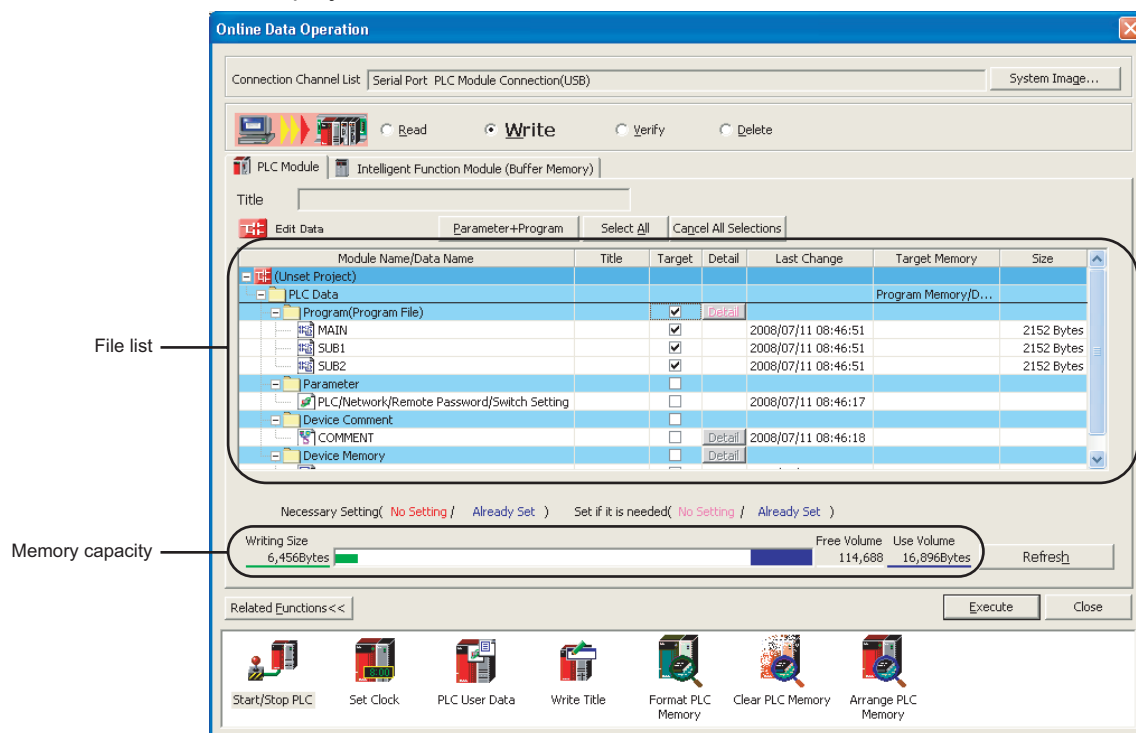
Data for intelligent function module also can be written/read. (☞ Section 12.1.5)

Screen display

Select [Online] ⇒ [Write to PLC] ()/[Read from PLC]().

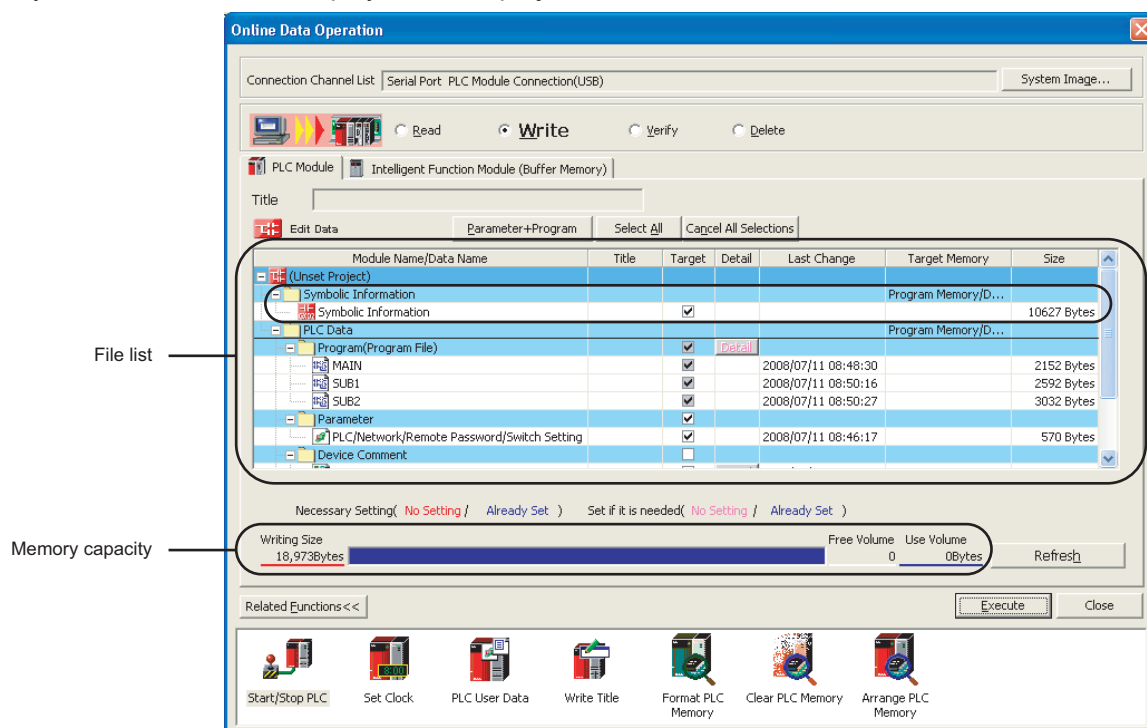
The following explains the settings for writing data to a programmable controller CPU. Settings for reading data from a programmable controller CPU can be made in the same manner.

<Write to PLC screen for the projects without labels.>



<Write to PLC screen for the projects with labels>

The symbolic information is displayed for the projects with labels.



Operating procedure

1. Set the items on the screen.

Item		Description
Connection Channel List		Displays the information on the set connection target.
Title		Displays the title of the target memory by clicking the Refresh button.
File list	Target	Select the data to be written/read.
	Target Memory	Select the memory from the list (▼) by clicking the cell under "Target Memory". For details of the memory card application, refer to the following manual. ☞ QCPU User's Manual (Hardware Design, Maintenance and Inspection)
Memory capacity		—
Writing Size		Displays the total size of written data checked in "Target".
Free Volume		Displays the free space volume of the target memory.
Use Volume		Displays the used space volume of the target memory.

When a program (program file), device comment or device memory is selected, the range can be set by clicking the [Detail](#) / [Detail](#) button.

When reading data from the programmable controller CPU, and the device memory is selected, the detailed settings are required.

For details, refer to the following sections.

☞ 12.1.1 Setting write/read range of program (program file)

☞ 12.1.2 Setting write/read range of device data

☞ 12.1.3 Setting comment write/read ranges

2. Click the button.

When the Write to PLC function is executed, the specified data are written to the target memory.

When the Read from PLC function is executed, the specified data are read from the target memory.

Screen button

-

Displays the illustration of the connection channel list.

-

Selects the parameters and all the programs displayed in the list.

-

Selects all data displayed in the list.

-

Cancels the selection status of all data selected in the list.

- /

Switches display/hide of the Related functions button.

For details of the related functions, refer to the following sections.

- Remote Operation  Section 16.1 Remote Operation of Programmable Controller CPU
- Set Clock  Section 16.5 Setting Clock in Programmable Controller CPU
- PLC User Data  Section 12.5 Writing/Reading/Deleting PLC User Data
- Write Title : Sets a title to the target memory.
- Format PLC Memory  Section 16.2 Formatting Programmable Controller CPU
- Clear PLC Memory  Section 16.3 Clearing Programmable Controller CPU
- Arrange PLC Memory  Section 16.4 Arranging Programmable Controller CPU

- (Read from PLC, Delete PLC Data only)

Displays the project name of the symbolic information in the Title/Project Name column.

It is not displayed for projects without labels.

-

Updates data list, writing size, free space volume, and used space volume on the Online Data Operation screen.

When multiple personal computers are connected to the programmable controller CPU, update the target memory before reading data from the programmable controller CPU.

■ Unlocking a remote password

The confirmation message for unlocking the remote password is displayed when the programmable controller CPU for which the remote password is set is accessed via Q series-compatible C24 module or Q series-compatible E71 module. Unlock the password by following the message.

(Setting a remote password  Section 6.3)

When the number of permissible unmatched remote password entries or the cumulative number of permissible unmatched password entries has been set and the number of unmatched entries exceeds the set number, the programmable controller CPU will be in the following status. For corrective action, refer to the Q Corresponding Serial Communication Module User's Manual (Application).

Table 12.1-1 Status when the unmatched remote password entries exceed the set number

Item	Status
When the number of permissible entries is exceeded	The line is disconnected automatically.
When the cumulative number of permissible entries is exceeded	Turn ON the ERR. LED on the module.

Point

● Target memory

The following table shows the relations between the target memory on the Online Data Operation screen and the drive of the programmable controller CPU.

Drive No.	Target memory on the <u>Online Data Operation</u> screen	PLC parameter
0	Program memory/Device memory	Program memory (Drive 0)
1	Memory card (SRAM)	Memory card (RAM) (Drive 1)
2	Memory card (Flash) (Q2MEM-2MBF)	Memory card (ROM) (Drive 2)
	Memory card (Flash) (Q2MEM-4MBF)	
	Memory card (ATA)	
3	Standard RAM	Standard RAM (Drive 3)
4	Standard ROM	Standard ROM (Drive 4)

● Saving the selection status of the files for the Write to PLC/Read from PLC function

The selection status of the files for the Write to PLC/Read from PLC function can be saved.

To save the file selection status, select [Tools] ⇒ [Options] ⇒ "PLC Read/Write" and set "Operation Setting". However, the file selection status is cancelled by any of the following operations.

- Changing the setting of Transfer setup
- Changing the target memory
- Changing the PLC type
- Ending the project

Operational Setting

☒ Keep last file selection for PLC upload/download dialog

<Option setting>

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■ Symbolic information

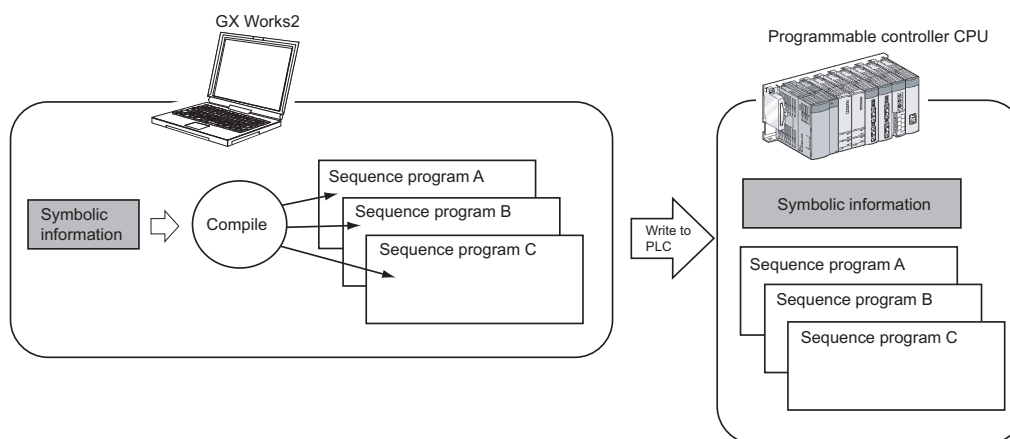
Symbolic information is data that store the program configuration such as structures and labels. To restore these data included in the symbolic information when reading a program from the programmable controller CPU, write/read the symbolic information to/from the programmable controller CPU.

Data such as structures and labels included in the symbolic information cannot be restored if only sequence programs are read. (In case of a Structured project, the programming language is treated as the ladder language.)

The following table shows the program data included in the symbolic information.

Table 12.1-2 Data included in symbolic information

Project type	Data included in symbolic information
Simple project	Structures
	Local labels
	Programs
	Function blocks
Structured project	User libraries
	Structures
	Global labels
	Program_File_Pool
	Tasks
	POU_Pool
	Local labels
	Programs
	Function blocks
	Functions



Point

● Compile status when the symbolic information is read

- When the symbolic information and parameters are read simultaneously, and the data in the symbolic information match with parameters and programs (program files) in the programmable controller CPU, the read data are in compiled status.
- When only the symbolic information is read, the read data are in uncompiled status.
- When the symbolic information of GX Developer or GX IEC Developer is read, the read data are in uncompiled status. Compile the program again after executing the Read from PLC function.

● Precautions for reading symbolic information

For the precautions for reading label programs (symbolic information) of the existing application using GX Works2, or reading label programs (symbolic information) of GX Works2 using the existing application, refer to the following section.

(☞ Appendix 6.2 Data compatibility)

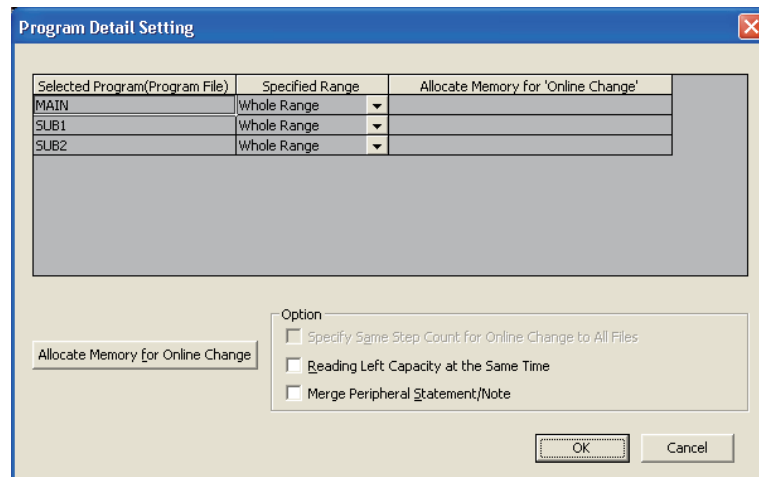
12.1.1 Setting write/read range of program (program file)



This section explains a method for setting the range of a program (program file) to be written/read when the program (program file) is selected on the Online Data Operation screen.

Screen display

Select the program (program file) and click the **Detail** button.



Operating procedure

- Set the items on the screen.

Item		Description
Selected Program (Program File)		Displays the program name selected in the 'File list'.
Specified Range		Select write/read range of each program.
Allocate Memory for 'Online Change' (Write to PLC only)		Enter the number of steps secured for Online program change.
Option	Specify Same Step Count for Online Change to All Files (Write to PLC only)	Select this to specify the same number of secured steps for Online program change to all files.
	Reading Left Capacity at the Same Time (Read from PLC only)	Select this to read the remaining secured steps for Online program change of the files written in the programmable controller CPU.
	Merge Peripheral Statement/Note (Read from PLC only)	Select this to use an Peripheral statement/note. If a program is read without selecting this item, the Peripheral statement/note is lost.
GX Works2 Version1 Operating Manual (Simple Project)		

Screen button

- Read file type** (Read from PLC only)
Displays the remaining steps for Online program change.

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12.1.2 Setting write/read range of device data

QCPU



This section explains a method for setting the type and range of device memory and the range of file register to be written/read when any or both of them are selected on the [Online Data Operation](#) screen.

Table 12.1.2-1 Devices that can be written/read

Device	Writing	Reading
M, L, B, F, SB, V, S, T ^{*1} , ST ^{*1} , C ^{*1} , D, W, SW, FX, FY, FD, Z, and ZR	○	○
X, Y, SM, SD, and U□\G□ (Buffer memory)	×	○

○: Can be written/read ×: Cannot be written/read

*1 :Three types of data (contact, coil, and current value) can be written/read.

Screen display

Select the device data and click the [Detail](#) / [Detail](#) button.

Device Data Detail Setting

Device Data Name: MAIN

Device Selection

☒ Internal Device Memory Default

Input Column

☐ Points+Start ☒ Start+End

	Device Name	Sym.	Radix	Device Point	Start	End
☐	Input	X	16	8192	0	1FFF
☐	Output	Y	16	8192	0	1FFF
☒	Internal relay	M	10	8192	0	8191
☒	Latch relay	L	10	8192	0	8191
☒	Link relay	B	16	8192	0	1FFF
☒	Annunciator	F	10	2048	0	2047
☒	Special link relay	SB	16	2048	0	7FF
☒	Edge relay	V	10	2048	0	2047

☐ Link Memory

☐ Buffer Memory Start Address (lowest digit not needed)

No. U/G

OK Cancel

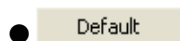
Operating procedure

- Set the items on the screen.

Item		Description
Device Data Name (Read from PLC only)		Enter the data name for data created when the device memory data are read.
Device Selection	Internal Device Memory	Select this to write/read device data.
	Input Column	Set the method for specifying the device range to be written/read.
	Points + Start	Select this to specify the range with the number of device points and the start device number.
	Start + End	Select this to specify the range with the start and end device numbers.
Device Name		Set the device to be written/read and the device range. All the device types and device ranges are selected as the default.
Link Memory (Read from PLC only)		Set this to read the link memory of the data link module or the network module to the link direct device (J□\W□). ^{*2} Setting range: Slots 1 to 4
Buffer Memory Start Address (Lowest digit not needed) (Read from PLC only)		Set this to read the intelligent function module buffer memory. ^{*2} Setting range: 0 to 1FF
File register		Set write/read range of the file register. This setting is also made when multiple file registers are selected. If multiple file registers are selected, each file register value is written/read in the same range.

^{*2} : For specifying devices, refer to the QCPU (Q Mode)/QnACPU Programming Manual (Common Instructions).

Screen button



Changes the device range to the default.

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12.1.3 Setting comment write/read ranges

QCPU

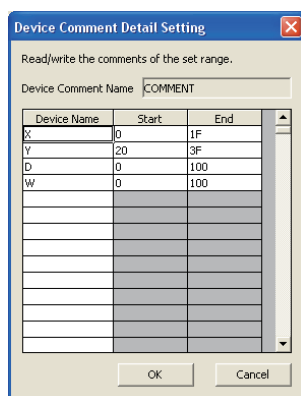


This section explains a method for setting the device and range of global comment/local comment to be written or read when the global comment/local comment is selected on the [Online Data Operation](#) screen.

Set this to restrict the writing range for comments, for example when the free space of the programmable controller CPU is limited.

Screen display

Select the global comment/local comment and click the [Detail](#) button.



Operating procedure

- Set the items on the screen.

Item	Description
Device Comment Name	Displays the selected device comment name.
Device Name	Set the device name whose write/read range is to be specified.
Start	Set the start device number.
End	Set the end device number.

12.1.4 Writing/reading intelligent function module data



This section explains a method for writing the set intelligent function module data to a programmable controller CPU or intelligent function module buffer memory.

■ Writing/reading the data to/from programmable controller CPU as parameter file

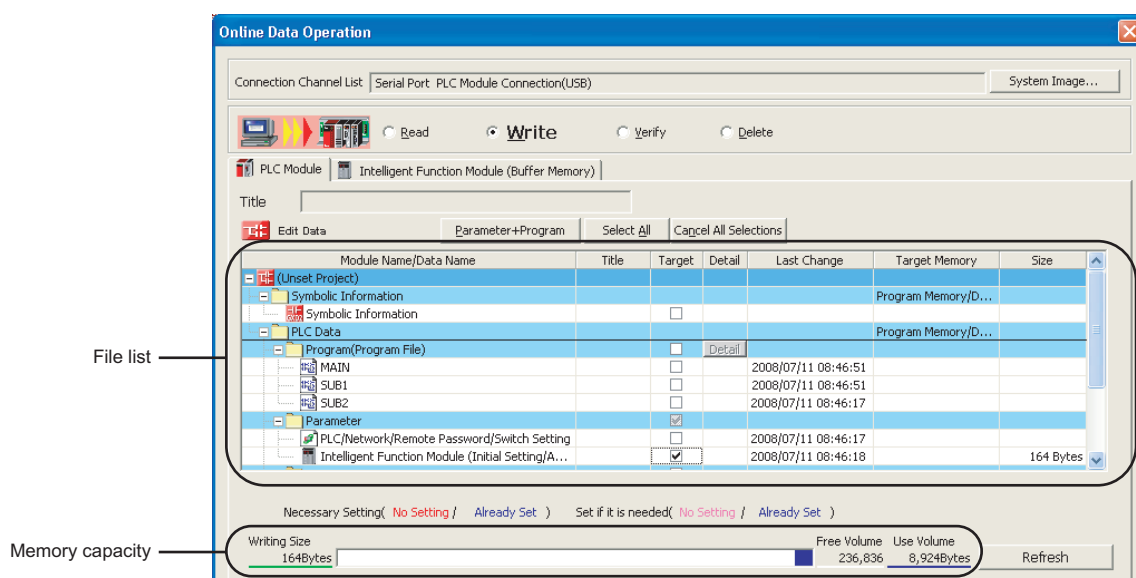
The following explains a method for writing the set intelligent function module data to a programmable controller CPU as the parameter file. The method for reading the data from the programmable controller CPU to a project is also explained.

Screen display

Select [Online] ⇒ [Write to PLC] ()/[Read from PLC] () ⇒ <<PLC Module>>

The settings for writing/reading data to/from a programmable controller CPU are explained together as they are similar operations.

<Write to PLC screen>



Operating procedure

1. Set the items on the screen.

Item	Description
Connection Channel List	Display the information on the set connection target.
Title	Displays the title of the target memory by clicking the button.
File list	—
Target	Select the data to be written/read.
Target Memory	Select the memory from the list () by clicking the cell under the "Target Memory". For details of the memory card application, refer to the following manual. QCPU User's Manual (Hardware Design, Maintenance and Inspection)
Memory capacity	—
Writing Size	Displays the total size of written data checked in "Target".
Free Volume	Displays the free space volume of the target memory.
Use Volume	Displays the used space volume of the target memory.

2. Click the button.

In the Write to PLC operation, the intelligent function module data are written to the target memory as parameter file. In the read from PLC operation, the specified data are read from the parameter file of the intelligent function module in the programmable controller CPU.

■ Writing data to intelligent function module buffer memory

The following explains a method for writing the set intelligent function module data to the buffer memory of the intelligent function module via a programmable controller CPU. The method for reading the intelligent function module data to a project is also explained.

Use the operation for changing the data temporarily during debugging.

If the intelligent function module parameter has no initial settings, this function can directly write data to the intelligent function module buffer memory.

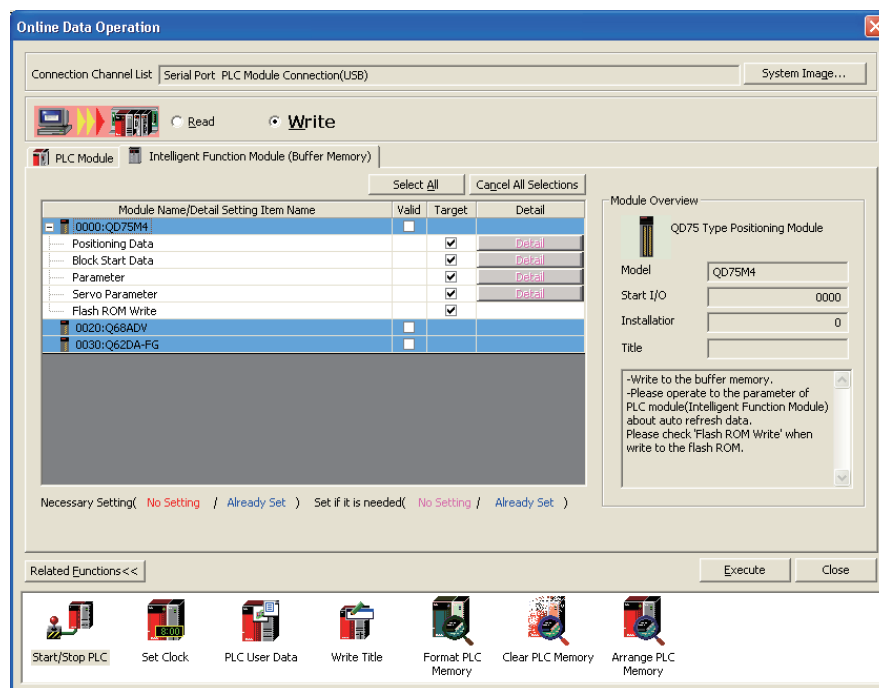
Screen display

Select [Online] ⇒ [Write to PLC] () / [Read from PLC] () ⇒ <<Intelligent Function Module (Buffer Memory)>>

The following explains the settings for writing data to a programmable controller CPU.

Settings for reading data from a programmable controller CPU can be made in the same manner.

<Write to PLC screen>



The items in [Detail](#) depend on the module.

Operating procedure

1. Select the modules for writing/reading data in "Module Name/Detail Setting Item Name" and set the items for each module in [Detail](#).
2. Click the  button.

In the Write to PLC operation, the set data are written to the intelligent function module buffer memory, and in the Read from PLC operation, the data are read from the intelligent function module buffer memory.

Screen button

For the buttons on the screen, refer to Section 12.1.



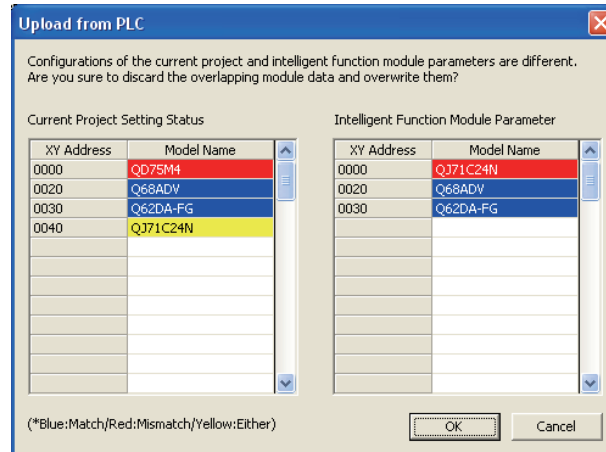
● Writing data to programmable controller CPU

When writing the intelligent function module data, match the configuration of the intelligent function module on the project with the configuration in the intelligent function module parameter file stored in the programmable controller CPU.

Data cannot be written to the programmable controller CPU unless the start XY address and the module name for the write target match.

● Reading data from programmable controller CPU

If the configuration of the intelligent function module on the project does not match with the mounted status, the intelligent function module on the project is overwritten with the actual module configuration. Read the data from the programmable controller CPU after checking the screen contents.



Configuration and mounted status of the intelligent function module on the project are indicated by the background color of the cell as shown in the table below.

Background color	Description
Blue	Matched module
Red	Mismatch module
Yellow	Module existing only in either side

● Writing data when the QD75 ready signal (X0) is ON (positioning data only)

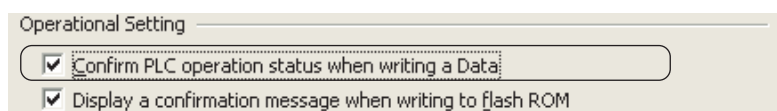
Data cannot be written when the QD75 ready signal (X0) of the target intelligent function module is ON.

When the QD75 ready signal (X0) is OFF, the writing status depends on the option setting as shown below.*1

		"Confirm PC operation status when writing a data"	
		Checked	Not checked
Programmable controller CPU operating status	STOP	○	○
	Other than STOP	×	○

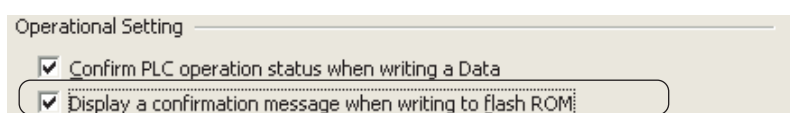
○: Can be written ×: Cannot be written

*1 : Select [Tools] ⇒ [Options] ⇒ "Intelligent Function Module" ⇒ "QD75 Type Positioning".



● Displaying the confirmation message when writing data to a flash ROM (positioning data only)

The confirmation message can be displayed when data are written to a flash ROM by the following setting. Select [Tools] ⇒ [Options] ⇒ "Intelligent Function Module" ⇒ "QD75 Type Positioning" and check "Display a confirmation message when writing to a flash ROM (except QD70□)".



12.1.5 Precautions on writing/reading data to/from programmable controller CPU

This section explains precautions on writing/reading data to/from the programmable controller CPU.

- 1) Writing or reading programs with an In Peripheral statement/note to or from the programmable controller CPU

The information of the lines with In Peripheral statement/note is written to the programmable controller CPU, but the contents of the statement/note are not written to the programmable controller CPU.

If a program with the same name as that of the program set with an In Peripheral statement/note is read from the programmable controller CPU, the former overwrites the latter (the one in GX Works2), so the In Peripheral statements/notes of the latter is discarded. To keep the In Peripheral statement/note in GX Works2 when reading data from the programmable controller CPU, merge the In Peripheral statement/note.

(Merging statements/notes  GX Works2 Version1 Operating Manual (Simple Project))

- 2) Writing symbolic information to the programmable controller CPU

Be sure to execute Write to PLC when old symbolic information exists in the programmable controller CPU, or when the execution program is changed online.

To write execution programs only, uncheck "Symbolic Information" before Write to PLC.

- 3) Not reading the symbolic information from the programmable controller CPU

If the symbolic information is not read from the programmable controller CPU, or a program whose symbolic information has not been written to the programmable controller CPU is read from the programmable controller CPU, the read program is displayed in a ladder. However, as there are cases where the program cannot be displayed correctly in a ladder, be sure to check the program after the symbolic information has been read from the programmable controller CPU.

The background color of the ladder block in which the program cannot be displayed correctly in a ladder is displayed in yellow.

The program can be edited by deleting the ladder block or adding new ladder block before or after it, even when the background color is displayed in yellow.

Be sure to write/read the symbolic information to/from the programmable controller CPU in order to restore the program to its original state.

- 4) Writing data after the device range in PLC parameter is changed

When the device range of PLC parameter has been changed, write the parameter to the programmable controller CPU. Programs cannot be written to the programmable controller CPU unless the parameter is written to the programmable controller CPU.

- 5) Reading the symbolic information, which is written to the programmable controller CPU using the Japanese version of GX Works2, using the English version of GX Works2

The symbolic information created and written to the programmable controller CPU using the Japanese version of GX Works2, cannot be read from the programmable controller CPU using the English version of GX Works2.

In this case, save the project created in the Japanese version of GX Works2 again using the English version of GX Works2, and write the symbolic information to the programmable controller CPU.

By following the operation above, the symbolic information can be read from the programmable controller CPU using the English version of GX Works2.

12.2 Verifying Data at Programmable Controller CPU against Data at Personal Computer



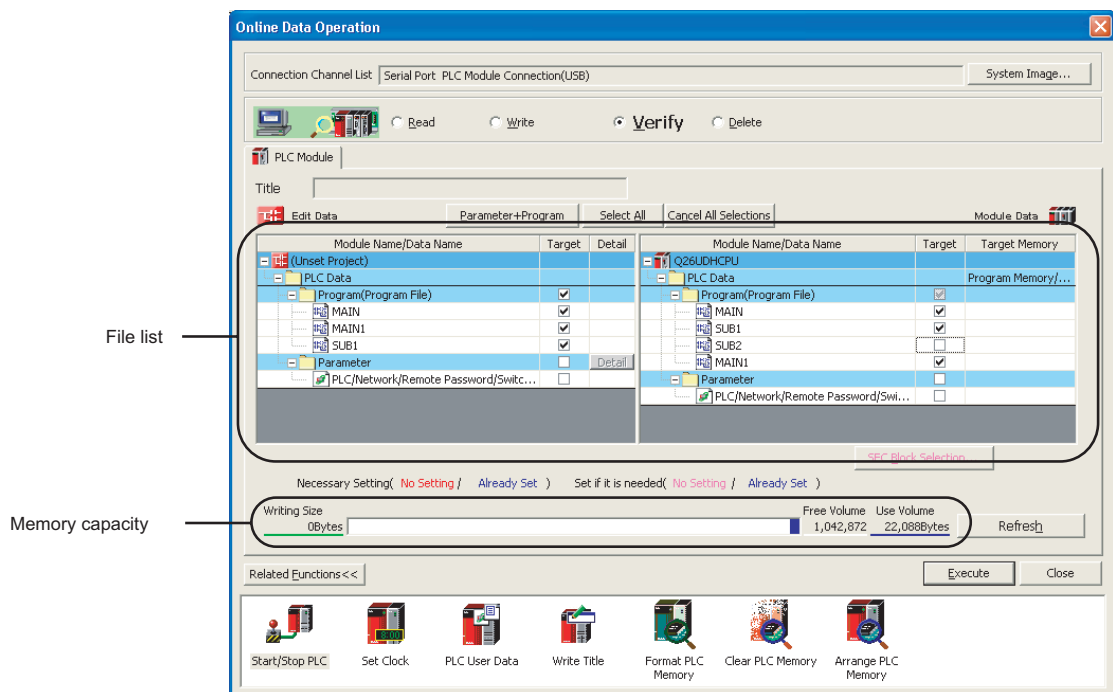
This section explains the method for verifying the open project against the data in the programmable controller CPU.

The verification function is used to compare the contents of two projects or to locate program changes made in the programs.

To verify data between two projects, use the Verify with PLC function. (☞ Section 4.1.6)

Screen display

Select [Online]⇒[Verify with PLC].



Operating procedure

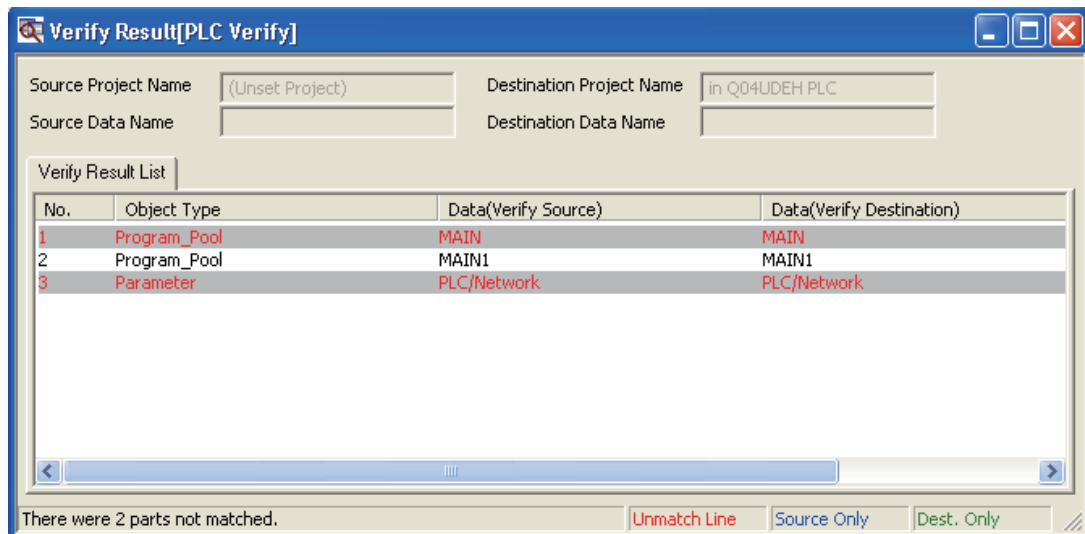
1. Set the items on the screen.

Item	Description
Connection Channel List	Displays the information on the set connection target.
Title	Displays the title of the target memory by clicking the button.
File list	—
Target	Select the memory of the verification target.
Target Memory	Select the memory from the list (▼) by clicking the cell under the "Target Memory". For details of the memory card application, refer to the following manual. ☞ QCPU User's Manual (Hardware Design, Maintenance and Inspection)
Memory capacity	—
Writing Size	Displays the total size of written data checked in "Target".
Free Volume	Displays the free space volume of the target memory.
Use Volume	Displays the used space volume of the target memory.

2. Click the **Execute** button.

The verification results are displayed on the Verify Result screen.

- When ladder programs and parameters are verified, the detail of mismatched points is displayed by double-clicking the corresponding line.

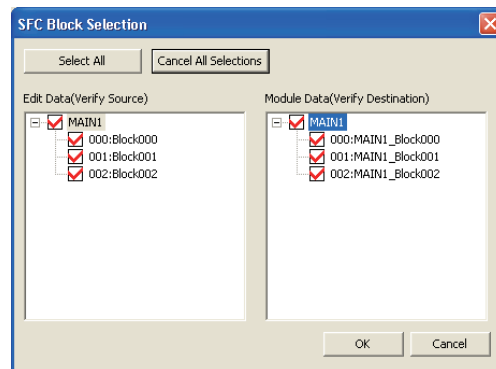


Screen button

For buttons on the screen, refer to Section 12.1.

● SFC Block Selection...

Select the SFC block to be verified.

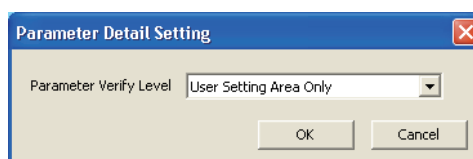


■ Parameter verification

The following explains the verification levels that can be selected for verifying parameters.

Screen display

Select the parameter and click the **Detail** button.



The following table shows the setting items for parameter verification.

Item	Description
User Setting Area Only	Verifies only the parameter area set by the user.
All Areas	Verifies all area including the parameter area set by the system.

● Mismatched point in system area

If a mismatched point is detected in the system area with "All Areas" setting, either of the following messages is displayed.

Take corrective action depending on the message.

Message	Corrective action
The header information of the parameter block is inconsistent.	A mismatch exists in area other than the user setting area.*1 Rewrite the parameters having been written to the programmable controller CPU.
This parameter block can't analyze.	Versions of GX Works2, GX Developer or GX IEC Developer used to create the project differ between the programmable controller CPU and GX Works2. The programmable controller CPU operation is not affected. To match the verified data in "All Areas", install the latest version of GX Works2, read the parameters from the programmable controller CPU and rewrite them again to the programmable controller CPU.

*1 : Data in areas other than the user setting area may be erroneous data due to such as noise.

■ Checking details of verification result

The following explains the method for checking the details of mismatched data on the Verify Result screen.

For checking the verification result, refer to the following section.

(☞ Section 4.1.6 ■ Checking verification result details)

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PROGRAMMABLE
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MONITORING

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DEBUGGING
PROGRAMS

16

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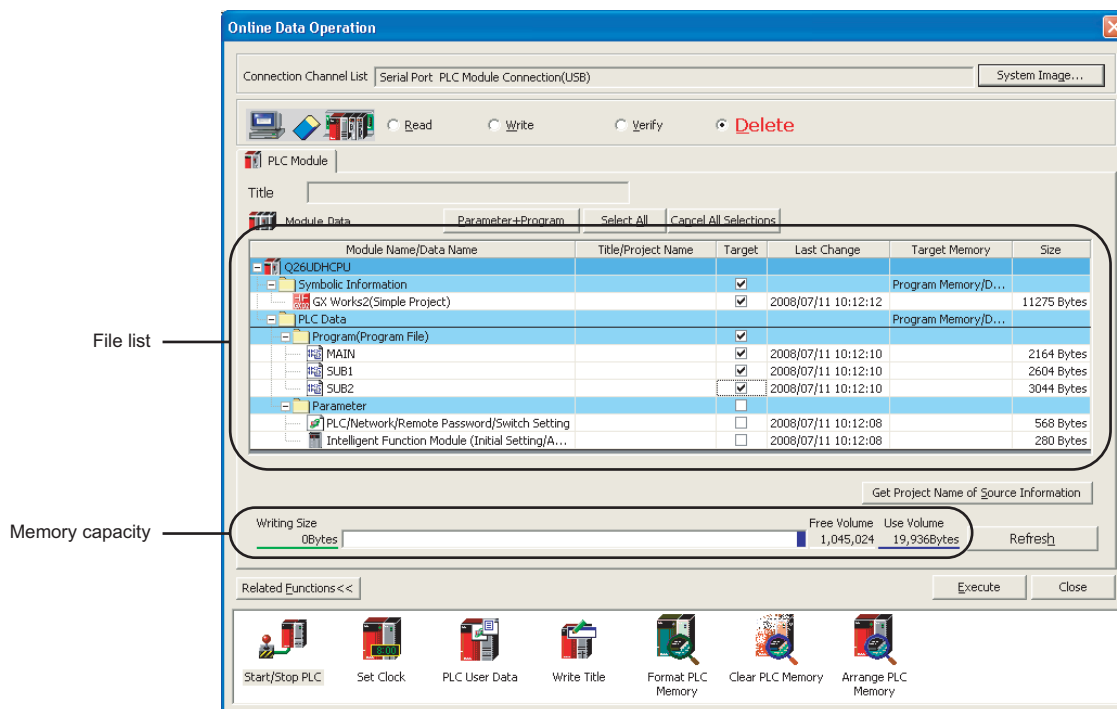
12.3 Deleting Programmable Controller CPU Data



This section explains the method for deleting the data in the programmable controller CPU such as programs and parameters.

Screen display

Select [Online] ⇒ [Delete PLC Data].



Operating procedure

1. Set the items on the screen.

Item	Description
Connection Channel List	Displays the information on the set connection target.
Title	Displays the title of the target memory by clicking the button.
File list	—
Target	Select the data to be deleted.
Target Memory	Select the memory from the list () by clicking the cell under the "Target Memory". For details of the memory card application, refer to the following manual. QCPU User's Manual (Hardware Design, Maintenance and Inspection)
Memory capacity	—
Writing Size	Displays the total size of written data checked in "Target".
Free Volume	Displays the free space volume of the target memory.
Use Volume	Displays the used space volume of the target memory.

2. Click the button.

The specified data are deleted.

Screen button

For buttons on the screen, refer to Section 12.1.

Point

- **Deleting symbolic information**
If the symbolic information is deleted, information such as labels cannot be restored.
- **Deleting programs (program files) only**
The contents of the symbolic information are not updated, even if a program (program file) is deleted. When the symbolic information is read, the deleted program is restored.

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PROGRAMMABLE
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12.4 Copying Program Memory Data to ROM

QCPU

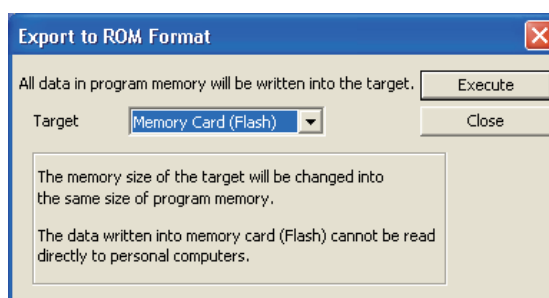


This section explains the method for copying the program memory data in the programmable controller CPU to a standard ROM in the programmable controller CPU or a Flash card in a batch.

This function is used to boot up using a standard ROM or a Flash card or store the program memory data in a standard ROM or a Flash card.

Screen display

Select [Online] ⇒ [Export to ROM Format].



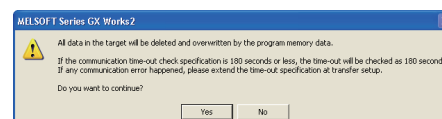
Operating procedure

1. Set the items on the screen.

Item	Description
Target	Select the memory in which the program memory data are to be written.

2. Click the button.

The message is displayed.



3. Click the button.

The program memory data are exported in ROM format and the data are written to the memory set in "Target".

Point

- **Precautions on writing**
All the write target data are deleted.
- **Reading data written in ROM format**
Use the Read from PLC function to read the data written in ROM format.
- **Exporting device memory in ROM format**
The device memory cannot be written using the Export to ROM format function.

12.5 Writing/Reading/Deleting PLC User Data



This section explains the method for writing/reading/deleting PLC user data (CSV format file/binary format file) to/from an ATA card or a standard ROM.

PLC user data written to an ATA card or a standard ROM can be used in sequence programs. For details on handling the PLC user data in sequence programs, refer to the following manual.

QCPU (Q Mode)/QnACPU Programming Manual (Common Instructions)

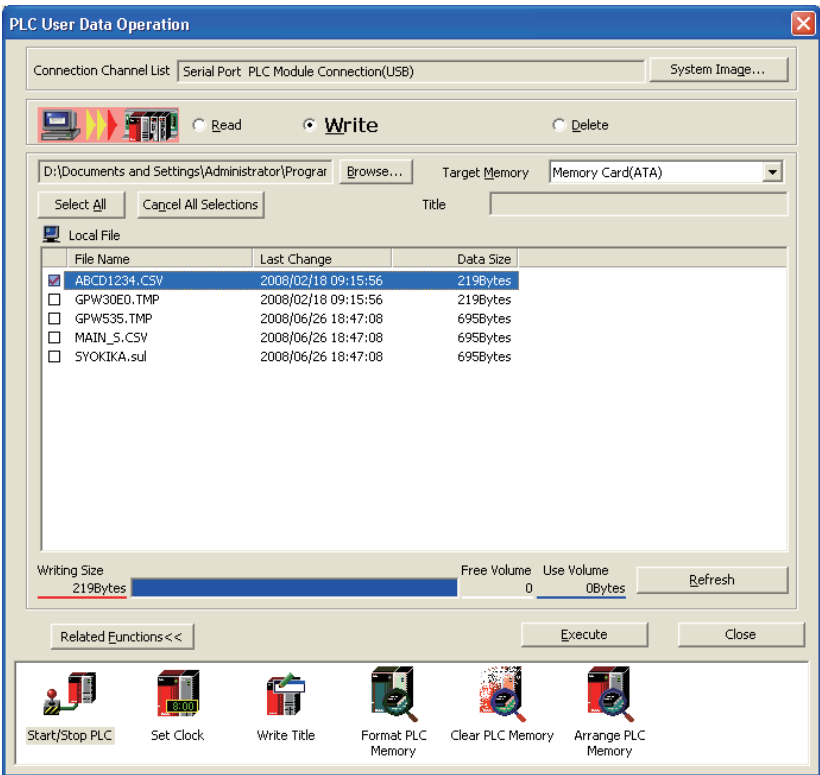
Point

- **Formatting ATA cards**
Format the ATA card to be used on the programmable controller CPU by selecting [Online] ⇒ [PLC Memory Operation] ⇒ [Format PLC Memory] in GX Works2.
If a card is formatted using the function such as Windows® format functions, it may not be used on the programmable controller CPU.
- **Project file attributes**
Even when attributes (read only, hidden file) are set for files in the application such as Windows® Explorer, they become invalid.

Screen display

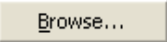
Select [Online] ⇒ [PLC User Data] ⇒ [PLC User Data Write]/[PLC User Data Read]/[PLC User Data Delete].

The following explains the settings for writing PLC user data. The settings for reading/deleting PLC user data can be made in the same manner.
<Write PLC User Data>



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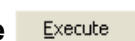
Operating procedure

1. Use the  button to set the storage source for the PLC user data to be written.

When reading PLC user data, set the save destination for the PLC user data to be read.

2. Set the items on the screen.

Item	Description
Connection Channel List	Displays the information of the set connection target.
Target Memory	Select the memory to which the PLC user data are to be written. Standard ROM can only be selected for the Universal model QCPU.
Title	Displays the title of the target memory by clicking the  button.
Local File (Write PLC User Data only)	Select the PLC user data to be written.
PLC Side File (Read/Delete PLC User Data only)	Select the PLC user data to be read. Select the PLC user data to be deleted.

3. Click the  button.

When the Write PLC User Data function is executed, the selected PLC user data are written.

When the Read PLC User Data function is executed, the selected PLC user data are read.

When the Delete PLC User Data function is executed, the selected PLC user data are deleted.

Screen button

For the explanation of the buttons on the screen, refer to Section 12.1.

12.6 Transferring Data to Program Memory in a Batch



*1: Universal model QCPU only

This section explains the method for transferring the contents of program cache memory to program memory in a batch, using the Universal model QCPU.

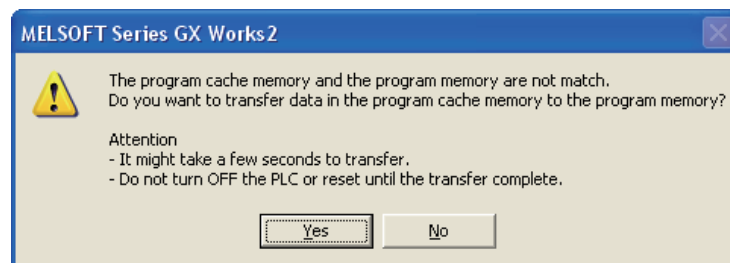
Use this function to transfer data at desired timing, for example, when option setting is made so that a program is not transferred to the program memory at Online program change.

Operating procedure

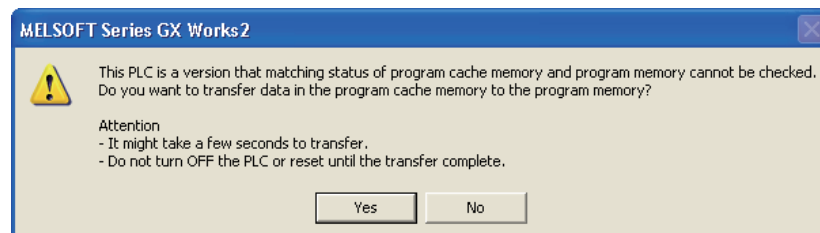
- Select [Online] ⇒ [Program Memory Batch Download].

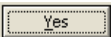
Depending on the version of the programmable controller CPU used, one of the following screens is displayed.

<The first five digits of the serial number are '10012' or higher>



<The first five digits of the serial number are '10011' or lower>



- Click the  button.

The contents in the program cache memory is transferred to program memory in a batch.

Point

● Precautions on program memory batch transfer

The following functions cannot be executed during program memory batch transfer. Execute these functions only after completing program memory batch transfer.

- Online program change (ladder, structured ladder, ST, FB)
- Write to PLC function (when program memory is the target memory)
- Program memory batch transfer (this function)
- Set as default connection
- Change PLC Type function

● When the program cache memory and the program memory match

The batch transfer of the program memory data is not executed.

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12.7 Latch Data Backup



*1: Available only with Universal model QCPU

This section explains the method for backing up device memory/file register/error history data to the standard ROM.

The backup contents stored using this function is automatically restored to program memory or other area when the programmable controller CPU is turned from OFF to ON or when it is reset.

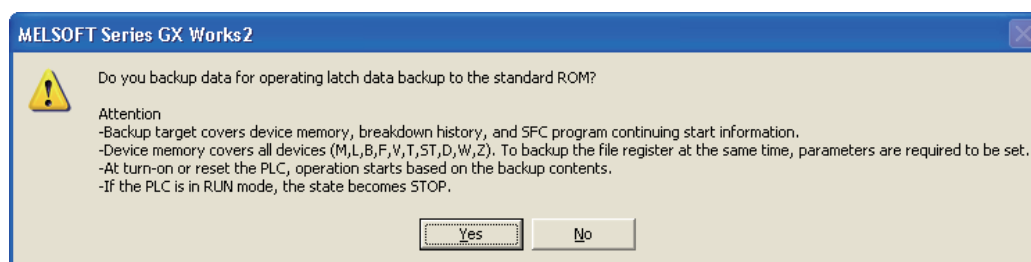
The function backs up device data, error history data, and other data without using battery when stopping the system for a long time.

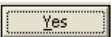
12.7.1 Backing up latch data

This section explains the method for backing up device memory/file register/error history data.

Operating procedure

1. Select [Online] ⇒ [Latch Data Backup] ⇒ [Backup].



2. Click the  button.

Device memory/file register/error history data are backed up.

Point

● Devices

The latch data backup function is available for the following devices.

M, L, B, F, V, T, ST, C, D, W, Z, ZR, R

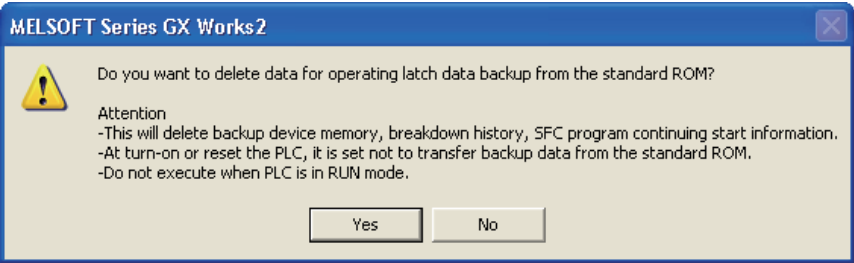
To back up ZR and R, perform PLC file setting in PLC parameter.

12.7.2 Deleting backup data

This section explains the method for deleting the backup data in programmable controller CPU.

Operating procedure

1. Select [Online] ⇒ [Latch Data Backup] ⇒ [Delete Backup Data].



2. Click the button.

Backup data are deleted.

Point

- **Precautions on deleting backup data**
 Backup data cannot be deleted when the programmable controller CPU is in RUN status.
 To delete the backup data, set the programmable controller CPU to STOP status.

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12.8 Online Program Change

This section explains the operations for changing programs or data while the programmable controller CPU is in RUN (Online program change).

The Online program change operations include Online program change performed during conversion/ compilation and performed from the Write to PLC screen in units of files.

Be sure to fully understand the descriptions below and in Sections 12.8.3 and 12.8.4 for operating with care.

DANGER

- When data change, program change, or status control is performed from a personal computer to a running programmable controller, create an interlock circuit outside the programmable controller to ensure that the whole system always operates safely.
Furthermore, for the online operations performed from a personal computer to a programmable controller CPU, the corrective actions against a communication error due to such as a cable connection fault should be predetermined as a system.

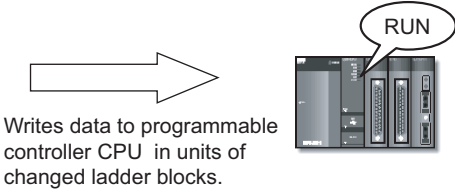
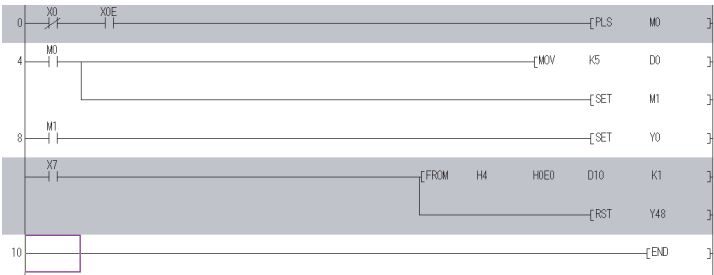
CAUTION

- The online operations performed from a personal computer to a running programmable controller CPU (Program change when a programmable controller CPU is RUN, operating status change such as RUN-STOP switching, and remote control operation) have to be executed after the manual has been carefully read and the safety has been ensured.
When changing a program while a programmable controller CPU is RUN, it may cause a program corruption in some operating conditions. Fully understand the precautions described in this section.

12.8.1 Performing Online program change during conversion/compile



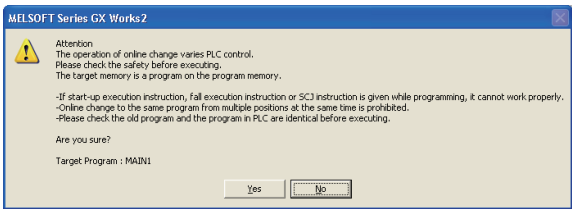
This section explains a method for performing online program change during conversion/compile after program change.
Before changing a program, check that the program matches the one in the programmable controller CPU using the Verify with PLC function. Online program change cannot be performed if the programs do not match.



■ Projects without labels

Operating procedure

- 1. Verify a program against a program in programmable controller CPU to ensure that they match.
- 2. Change or modify the program.
- 3. Select [Convert/Compile] ⇒ [Ladder Conversion (Online Change)] to perform Online program change.
The message is displayed.
Fully understand the message before performing Online program change.
- 4. Click the button.



■ Projects with labels

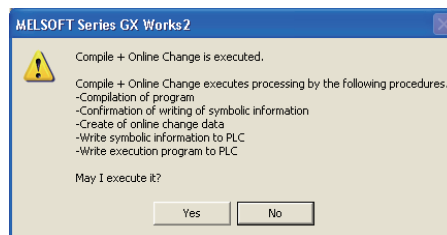
Operating procedure

- 1. Verify a program against a program in programmable controller CPU to ensure that they match.
- 2. Change or modify the program.
If the program is a ladder program, convert the ladder after program change. (☞ Section 5.2)

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3. Select [Convert/Compile] ⇒ [Compile + Online Change] for Online program change.

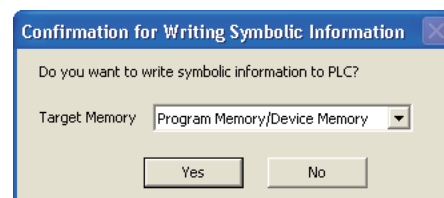
The message is displayed.



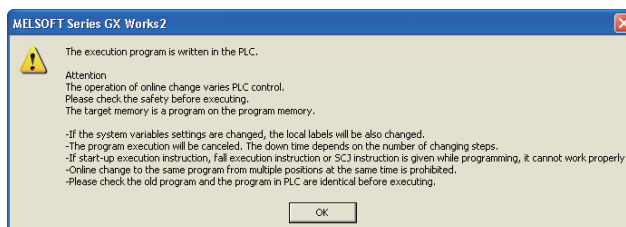
4. Click the **Yes** button.

The Confirmation for Writing Symbolic Information screen is displayed after the completion of compilation.

5. Select "Target memory" and click the **Yes** button when writing the symbolic information.



After the completion of writing the symbolic information, the message as shown on the right is displayed.



6. Be sure to read and fully understand the caution items in the message, and then click the **OK** button.

Writing range for Online program change

The following explains the writing range of Online program change depends on the editing mode.

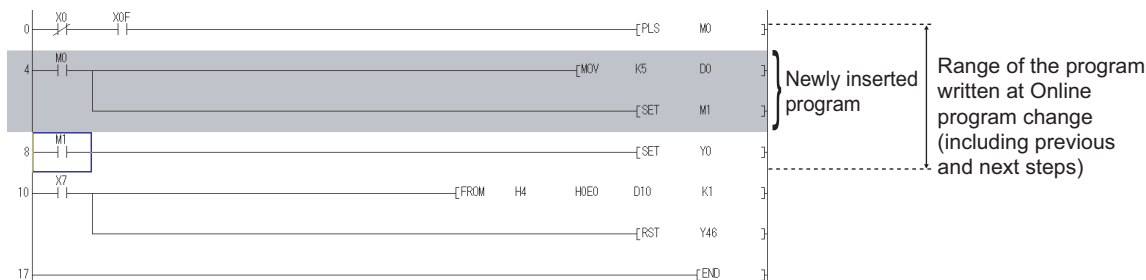
● Inserting a new ladder block in the project with labels

When a new ladder block is inserted, the inserted program is written together with two steps (one before and the other after the program) to the programmable controller CPU.

Therefore, the Online program change may not be completed at a time depending on the number of program steps added and the two steps before and after the program. In this case, reduce the number of steps written at a time and perform Online program change in several times.

In projects without labels, Online program change is performed only for the newly inserted programs.

<Example>



● Editing separate ladder blocks

If the destination of Online program change is the QCPU (Q mode) whose memory has "Online change area of multiple blocks", multiple blocks can be written in units of blocks.

With the High Performance model QCPU, "Online change area of multiple blocks" can be created using the memory format function. (➡ Section 16.2)

Point

- **When performing Online program change to a programmable controller CPU for the first time or an error occurs during Online program change**
Make sure that the program before writing matches the program in the programmable controller CPU with the Verify with PLC function.
- **When the program part to be written does not match**
If the program part to be written does not match with the program in the programmable controller CPU, Online program change cannot be performed.
Perform Online program change in units of files. (☞ Section 12.8.2)
- **When Online program change of multiple blocks cannot be performed**
The message is displayed in the following cases when Online program change is performed. Select whether to use the Online program change function to change a program.
 - There are no "Online change area of multiple blocks".
 - The number of blocks exceeds the limit of Online program change of multiple blocks.
 - The programmable controller CPU does not support the Online program change of multiple blocks.
- **When performing Online program change to a programmable controller CPU in which the symbolic information has been written**
When performing Online program change to a programmable controller CPU in which the symbolic information has been written, be sure to write the execution program together with the symbolic information.

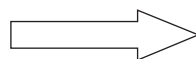
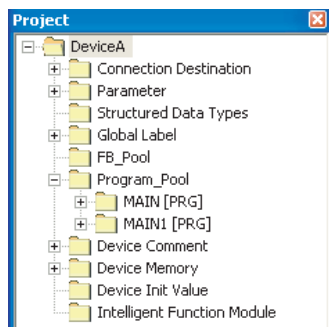
9	SETTING DEVICE COMMENTS
10	SEARCH/REPLACE
11	SETTING PROGRAMMABLE CONTROLLER CPU CONNECTION TARGET
12	WRITING/READING DATA
13	PROTECTING PROGRAMMABLE CONTROLLER CPU DATA
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12.8.2 Performing Online program change in units of files

QCPU



This section explains a method for writing programs or data in units of files while the programmable controller CPU is in RUN.



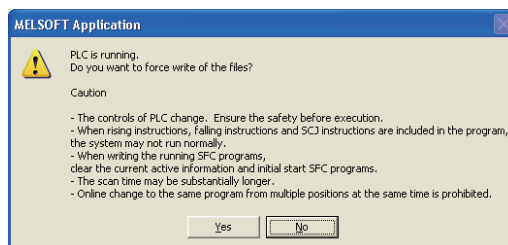
Writes data to programmable controller CPU in units of files.



Operating procedure

- Select [Online] ⇒ [Write to PLC] for Online program change.
The message is displayed.
Fully understand the message before performing Online program change.

(Writing to programmable controller CPU Section 12.1)



Point

● Data that can be written in units of files with Online program change

Data such as sequence programs and device comments can be written with Online program change. The data that can be written with Online program change depends on the write target memory. For details, refer to the following manual.

- QCPU User's Manual (Function Explanation, Program Fundamentals)

● Memory shortage of the programmable controller CPU

Increase the free space of the programmable controller CPU with the Memory arrangement function. (Section 16.4)

If the capacity is still insufficient after the operation, switch the programmable controller CPU to STOP and delete unnecessary programs in it. Then, write the programs using the Write to PLC function. (Section 12.3)

● When performing Online program change to a programmable controller CPU in which the symbolic information has been written

When performing Online program change to a programmable controller CPU in which symbolic information has been written, be sure to write the execution program together with the symbolic information.

● When performing Online program change to a Universal model QCPU

For Universal model QCPUs, programs that do not exist in the programmable controller CPU cannot be written while the programmable controller CPU is in RUN. In addition, Online program change for the SFC program in unit of file cannot be performed.

12.8.3 Precautions on Online program change of rise, fall or SCJ instruction



This section explains precautions on Online program change of programs containing the rise, fall or SCJ instruction.

■ QCPU (Q Mode)

● Fall instruction

The fall instruction may be executed even if the executing condition (ON→OFF) in the online-changed ladder is not met.

For the types and functions of the fall instructions, refer to the Programming Manual for each CPU.
<Fall instruction examples> PLF, LDF, ANDF, ORF, MEF, FCALLP, and EFCALLP

Table 12.8.3-1

ON/OFF status of a contact (conduction state at Online program change)	Fall instruction
OFF→OFF	Executed ^{*1}
OFF→ON	Not executed
ON→OFF	Executed ^{*1}
ON→ON	Not executed

*1 : For details on disabling the fall instruction execution, refer to the following section.
(Section 12.8.3)

● Rise instruction

The rise instruction may not be executed even if the executing condition (OFF→ON) in the online-changed ladder is met.

The rise instruction is executed when the executing condition turns OFF→ON again.

For the types and functions of the rise instructions, refer to the Programming Manual for each CPU.

<Rise instruction examples> PLS, LDP, ANDP, ORP, and MEP

Table 12.8.3-2

ON/OFF status of a contact (conduction state at Online program change)	Rise instruction
OFF→OFF	Not executed
OFF→ON	Not executed
ON→OFF	Not executed
ON→ON	Not executed

● SCJ instruction

When the executing condition for the SCJ instruction is ON after writing, the instruction jumps to the specified pointer without waiting for one scan.

■ Disabling the fall instruction in Online program change for the QCPU (Q mode)

The following explains methods for avoiding the fall instruction execution when the executing condition (ON→OFF) of the fall instruction for the online-changed program is not met.

● Using the option setting

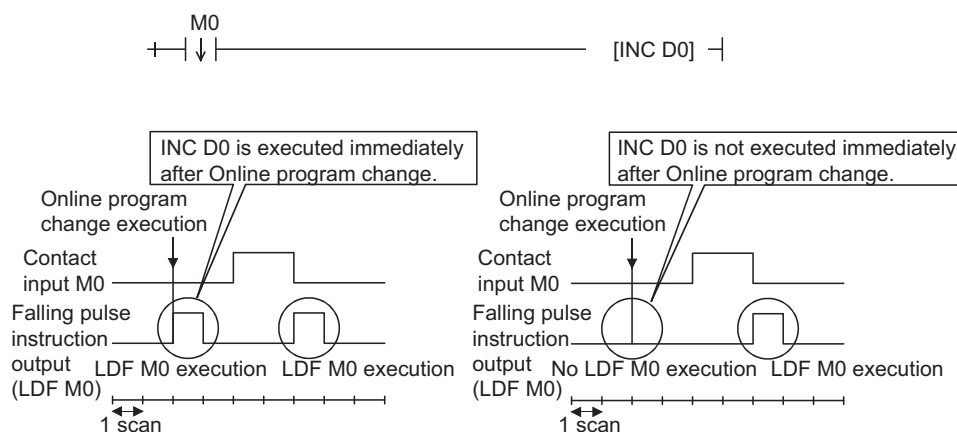
The fall instruction execution can be disabled by selecting [Tools] ⇒ [Options] ⇒ "Online Change" and setting the "Execute fall instruction". However, the fall instruction is not executed even if the executing condition (ON→OFF) is met in the online-changed ladder. The fall instruction is executed when the execution condition turns ON→OFF again.

For information on the QCPU versions that support this function, refer to the QCPU User's Manual (Function Explanation, Program Fundamentals).

<Example>

The following example shows the difference in the executing status depending on the option setting.

<Program example>



"Execute fall instruction" is selected in the [Options]. "Execute fall instruction" is not selected in the [Options].

Point

● Universal model QCPU

In option setting for the Universal model QCPU, the item is not selected at default.

● Replacing the instruction with the EGF instruction

The fall instruction execution can be disabled with the EGF instruction, which converts the operation result into a pulse.

For details, refer to version 'I' or later of the following manual.

- QCPU (Q mode)/QnACPU Programming Manual (Common Instructions)

<Manual version>

Check the REVISIONS of the manual.

Print date	*Manual number	Revision
Jun., 2004	SH (NA)-080039ENG-I	

Manual version

12.8.4 Precautions on Online program change of SFC programs



This section explains the precautions on Online program change of SFC programs.

- Online program change for operation outputs/transition conditions
For projects without labels, Online program change cannot be performed after changing programs of multiple operation outputs/transition conditions.
After correcting the program, perform Online program change for each unit of operation output or transition condition.
For projects with labels, Online program change can be performed after changing programs of multiple operation outputs/transition conditions.
- Online program change for SFC diagrams
When a SFC diagram is edited, perform Online program change by selecting [Online] ⇒ [Write to PLC] (☞ Section 12.8.2).

9	SETTING DEVICE COMMENTS
10	SEARCH/REPLACE
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13	PROTECTING PROGRAMMABLE CONTROLLER CPU DATA
14	MONITORING
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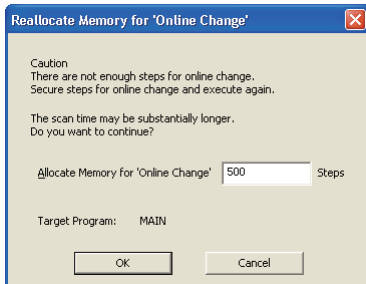
12.8.5 Precautions on each programmable controller series

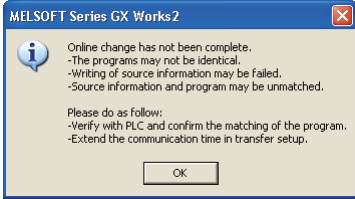
QCPU



This section explains precautions on Online program change for each programmable controller series.

■ Q series

Item	Description
Online program change to another station	Online program change to another station is possible through MELSECNET/10(H), CC-Link IE controller network or Ethernet. Pay attention when performing remote control operations through a network.
During boot operation	
Online program change to program memory (Universal model QCPU)	Write the changed program to the target memory of transfer source.
Deleting a corresponding device from a program	When an instruction is deleted during the OUT instruction execution, or when the device number has been changed and the corresponding device cannot be found in the program, the output status is retained. Perform Online program change after ensuring that sequence programs containing unnecessary coil outputs are OFF.
Online program change while a low-speed execution type program is executed	While a low-speed execution type program is executed, Online program change starts after the program execution. The program execution is suspended during Online program change. However, if "PRG TIME OVER(5010)" keeps occurring while a low-speed execution type program is executed, Online program change cannot be performed. In this case, set the programmable controller CPU to STOP, and increase the constant scan time and low-speed program execution time in PLC parameter, then reattempt Online program change.
Allocating memory for Online program change	- When the number of secured steps exceeds the currently set number during Online program change, the following message is displayed. In this case, set a new number of secured steps. - If '0' is set for the number of secured steps, the area for the exceeding amount from the secured steps is reserved and a sequence program is written. - The number of secured steps newly set on this screen is not displayed on the <u>Program Detail Setting</u> screen of the Write to PLC function. 

Item	Description
Error during Online program change	The following message may be displayed during Online program change. Take corrective action by following the message.  If the above error message is displayed, the program in GX Works2 changes back to the uncompiled status. However, the program in the programmable controller CPU may have been changed. In this case, compile the GX Works2 program and verify it against the program in the programmable controller CPU to confirm that these programs match. If the programs do not match, write the program to the programmable controller CPU using the Write to PLC function to match them.
Online program change of a program for which a password is set	When Online program change is performed to a sequence program for which a password is set, the <u>Disable Password</u> screen is displayed. Unlock the password to perform Online program change. Online program change is not possible if a password cannot be unlocked.
Online program change to the Universal model QCPU	• The Universal model QCPU has option setting of "Transfer cache memory to program memory" that allows selection whether to transfer the contents of program cache memory to program memory after Online program change. • (For option setting, see Section 19.2.) • For Universal model QCPUs, the contents of the modification are not reflected to the boot source even when CPU is in the boot operation. Be sure to reflect the contents of the modification to the boot source by executing the Write to PLC function. • (see Section 12.1) • While program memory is transferred in the Universal model QCPU after Online program change, the following functions cannot be executed. • Online program change (ladder, SFC, structured ladder, ST, FB) • Write to PLC (when the target memory is program memory) • Program memory batch transfer • Transfer setup • Change PLC Type

9

SETTING DEVICE
COMMENTS

10

SEARCH/REPLACE

11

SETTING PROGRAMMABLE
CONTROLLER CPU
CONNECTION TARGET

12

WRITING/READING
DATA

13

PROTECTING
PROGRAMMABLE
CONTROLLER CPU DATA

14

MONITORING

15

DEBUGGING
PROGRAMS

16

OPERATING
PROGRAMMABLE
CONTROLLER CPU

12.9 Writing/Reading Data to/from Memory Cards



This section explains the functions for writing/reading data to/from memory cards, using the PC card slot of personal computer.

If a memory card cannot be mounted on the programmable controller CPU, the data can be written/read directly to/from the memory card on a personal computer by using this function.

Functions	Memory card	Windows®2000	Windows®XP	Reference
IC memory card data write/read	SRAM card*1	×	×	Section12.9.1
	ATA card	○	○	
	Flash card	×	×	

○: Possible ×: Not possible

*1 : When using a SRAM card, set the driver to CONFIG.NT.

(For details, refer to HELP of Windows®)

When using an ATA card, Windows® recognizes it automatically.

If the ATA card cannot be recognized, select [Control Panel] ⇒ [System] to set the personal computer.

If the driver for SRAM card is set to CONFIG.NT, cancel the setting.

For writing/reading data when the memory card is mounted on the programmable controller CPU.

☞ Section 12.1

Point

● Formatting memory cards

Format the memory card to be used on the programmable controller CPU by selecting [Online] ⇒ [PLC Memory Operation] ⇒ [Format PLC Memory] in GX Works2.

If a memory card is formatted using the function such as Windows® format function it may not be used on the programmable controller CPU.

● PLC user data

The PLC user data in the memory card installed to the PC card slot of personal computer cannot write/read to/from GX Works2 directly.

Write/read the data using the application such as Windows® Explorer.

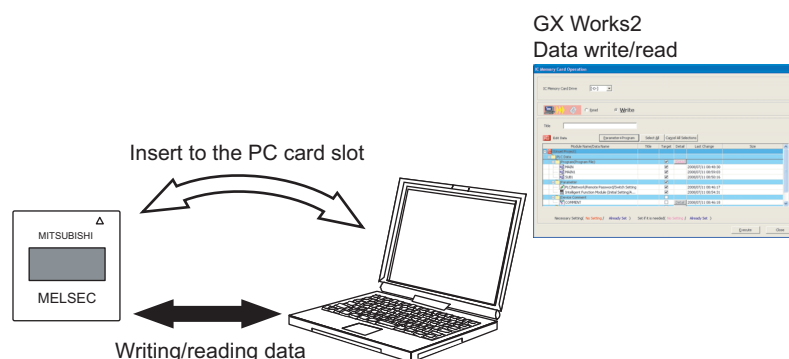
For writing/reading the PLC user data in the memory card mounted on the programmable controller CPU, refer to Section 12.5.

● Reading intelligent function module data

Create intelligent function module data to be read to the project in advance. If the intelligent function module data that do not match with the data in the memory card, they are read as data of unsupported module.

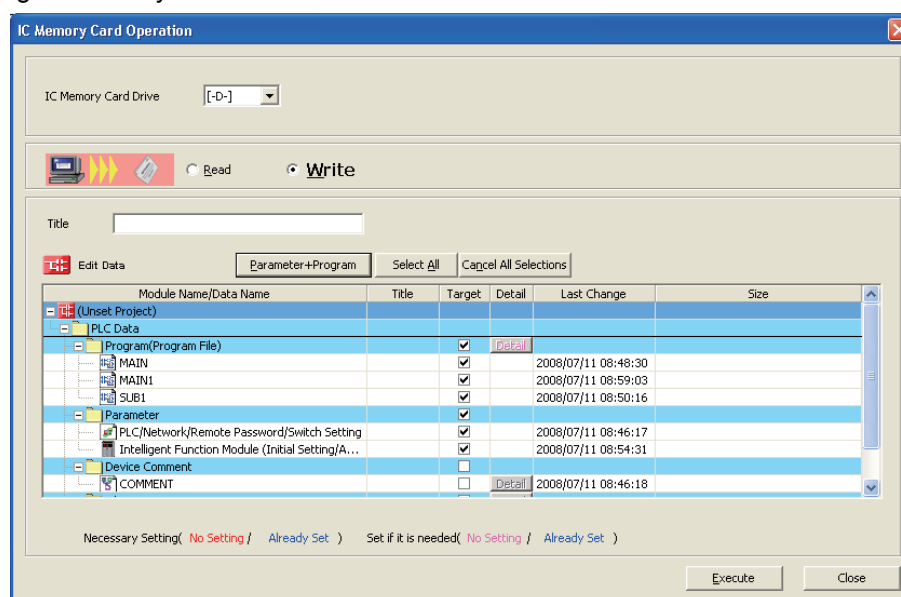
12.9.1 Writing/Reading Data to/from ATA/SRAM Cards

This section explains the method for writing/reading data in a memory card (ATA card or SRAM card) installed to the PC card slot of personal computer, directly to/from GX Works2.



Screen display

Select [Tools] ⇒ [IC Card] ⇒ [Write IC Card]/[Read IC Card].
<Screen for writing IC memory card>



Operating procedure

1. Set the following items on the screen.

Item	Description
IC Memory Card Drive	Select the drive of the personal computer where the memory card is installed.
Title	Enter title of the target memory when writing data to the IC memory card. Displays the title of the target memory when reading data from the IC memory card.
Edit Data (Write IC Memory Card only)	Select data to be written from the data list. Displays the data list of the open project. → Section 12.1
IC Memory Data (Read IC Memory Card only)	Select data to be read from the data list. Displays the data list of the project in the memory card. → Section 12.1

2. Click the button.

For the Write IC Memory Card function, the specified data are written to the memory card.

For the Read IC Memory Card function, the specified data are read from the memory card.



13 PROTECTING PROGRAMMABLE CONTROLLER CPU DATA

This chapter explains the function for setting a password to protect the programmable controller CPU data against such as falsification and leak.

13.1	Registering/Changing Password	13-2
13.2	Cancelling Password	13-4
13.3	Unlocking Password Temporarily	13-5

9	SETTING DEVICE COMMENTS
10	SEARCH/REPLACE
11	SETTING PROGRAMMABLE CONTROLLER CPU CONNECTION TARGET
12	WRITING/READING DATA
13	PROTECTING PROGRAMMABLE CONTROLLER CPU DATA
14	MONITORING
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16	OPERATING PROGRAMMABLE CONTROLLER CPU

13.1 Registering/Changing Password

QCPU



This section explains the method for registering a password to protect data in a Q series programmable controller CPU.

To register a password, connect GX Works2 to a programmable controller CPU in advance.

Project data cannot be protected using this function. Use the project security function to protect the project data. (☞ Section 4.7)

Point

- **Password management**

Keep passwords in a secure place.

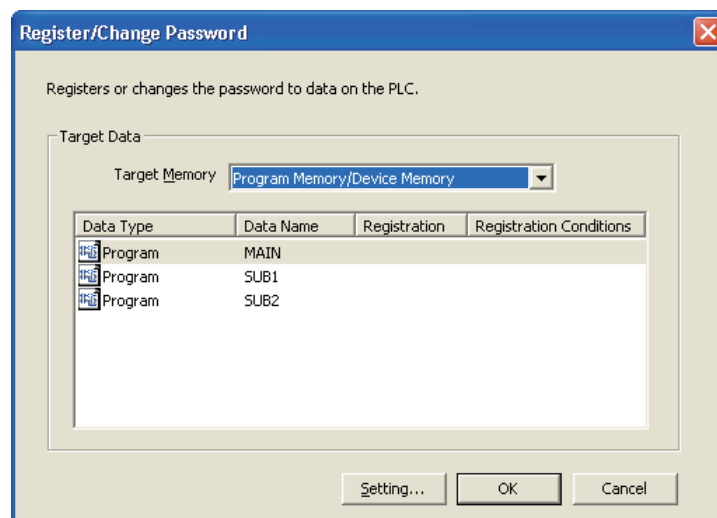
If a registered password is lost, initialize the programmable controller CPU using the PLC memory format function (☞ Section 16.2) and write the project to the programmable controller CPU.

- **Data for which a password can be registered**

A password can be set for programs and device comments. However, a password cannot be set for the symbolic information. (Symbolic information ☞ Section 12.1)

Screen display

Select [Online] ⇒ [PLC keyword] ⇒ [New].

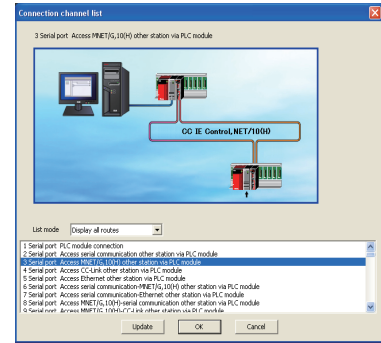


Operating procedure

1. Set the target memory.
2. Select the target data for registering/changing a password in the data list.

3. Click the **Setting...** button.

The Input Password screen is displayed.



4. Set the items on the Input Password screen.

Item	Description
New Password	Enter a new password or a password after change.
Re-enter Password	Enter a new password again for confirmation.
Registration Condition	Select a condition for password check.
Write Protection	Select this to check a password when data are written to the programmable controller CPU.
Read/Write Protection	Select this to check a password when data are read in addition to the "Write Protection".

5. Click the **OK** button on the Input Password screen.

The screen returns to the Register/Change Password screen.

Symbol  is appended to the data for which a password is registered.

Data Type	Data Name	Registration	Registration Conditions
 Program	MAIN	 Register	Read/Write Protection
 Program	SUB1		
 Program	SUB2		

6. Click the **OK** button on the Register/Change Password screen.

The password is registered or changed for the data in the programmable controller CPU.

Point

● **Changing a password**

If a password has been already set for the selected data, the Disable Password screen is displayed. Enter the old password to unlock the password.

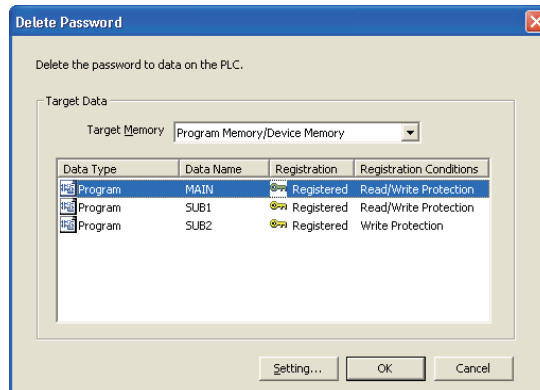
13.2 Cancelling Password



This section explains the method for cancelling the password set to the data in the programmable controller CPU.

Screen display

Select [Online] ⇒ [PLC keyword] ⇒ [Delete].



Operating procedure

1. Select data whose password is to be cancelled in the data list.

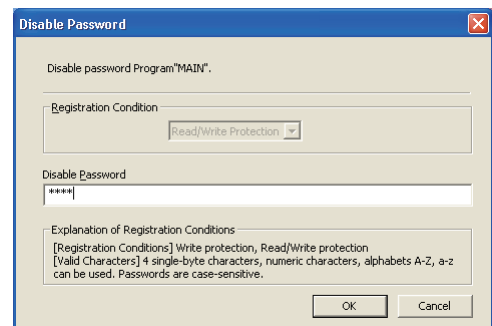
2. Click the **Setting...** button.

The Disable Password screen is displayed.
This screen is not displayed when the password has already been cancelled.

3. Enter the password set to the data.

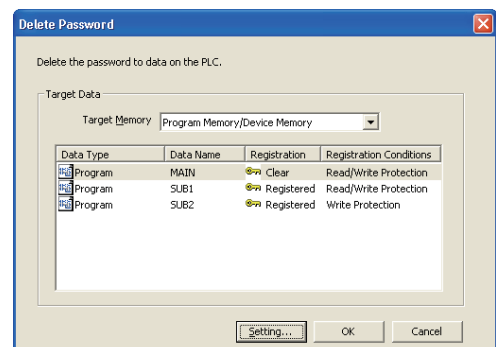
4. Click the **OK** button on the Disable Password screen.

The screen returns to the Delete Password screen.



5. Click the **OK** button on the Delete Password screen.

The password set to the data in the programmable controller CPU is cancelled.



13.3 Unlocking Password Temporarily



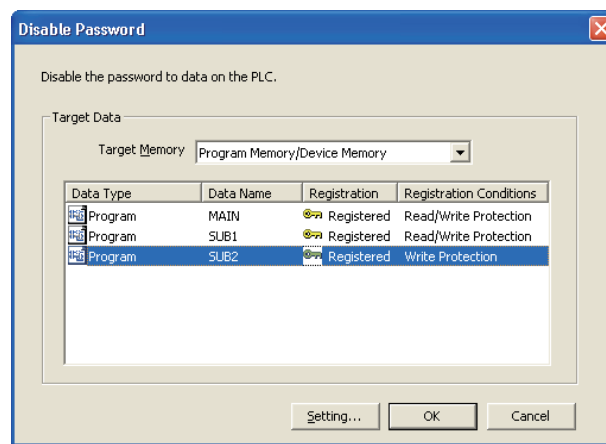
This section explains the method for temporarily unlocking a password, set to the data in the programmable controller CPU, by authenticating it.

When the password is unlocked, the corresponding data in the programmable controller CPU can be accessed freely until the project is closed.

This function does not cancel the password set for the data in the programmable controller CPU.

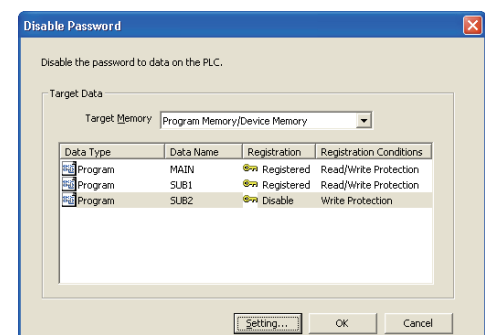
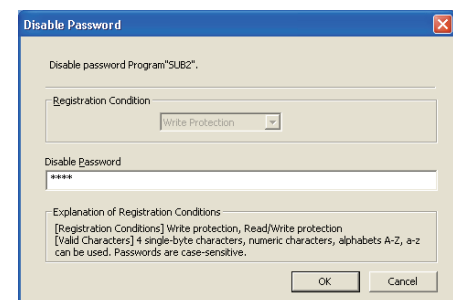
Screen display

Select [Online] ⇒ [PLC keyword] ⇒ [Disable].



Operating procedure

1. Select data whose password is to be temporarily unlocked in the data list.
2. Click the **Setting...** button.
The Disable Password screen (for entering a password) is displayed.
3. Enter the password set to the data.
4. Click the **OK** button on the Disable Password screen (for entering a password).
The screen returns to the Disable Password screen.
5. Click the **OK** button on the Disable Password screen.
The password set to the data in the programmable controller CPU is temporarily unlocked.



Screen button

For buttons on the screen, refer to Section 11.1.

[illegible]



14 MONITORING

This chapter explains the method for monitoring the execution status of the programmable controller CPU connected to the personal computer.

14.1	Monitoring Programs	14-2
14.2	Registering and Monitoring Devices	14-5
14.3	Monitoring Devices/Buffer Memory in a Batch.	14-10
14.4	Starting/Stopping Monitor of All Windows	14-14

9	SETTING DEVICE COMMENTS
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16	OPERATING PROGRAMMABLE CONTROLLER CPU

14.1 Monitoring Programs

QCPU



This section explains the method for monitoring the execution status of the programmable controller CPU. The monitored items depend on the programming language used. For details, refer to the following manuals.

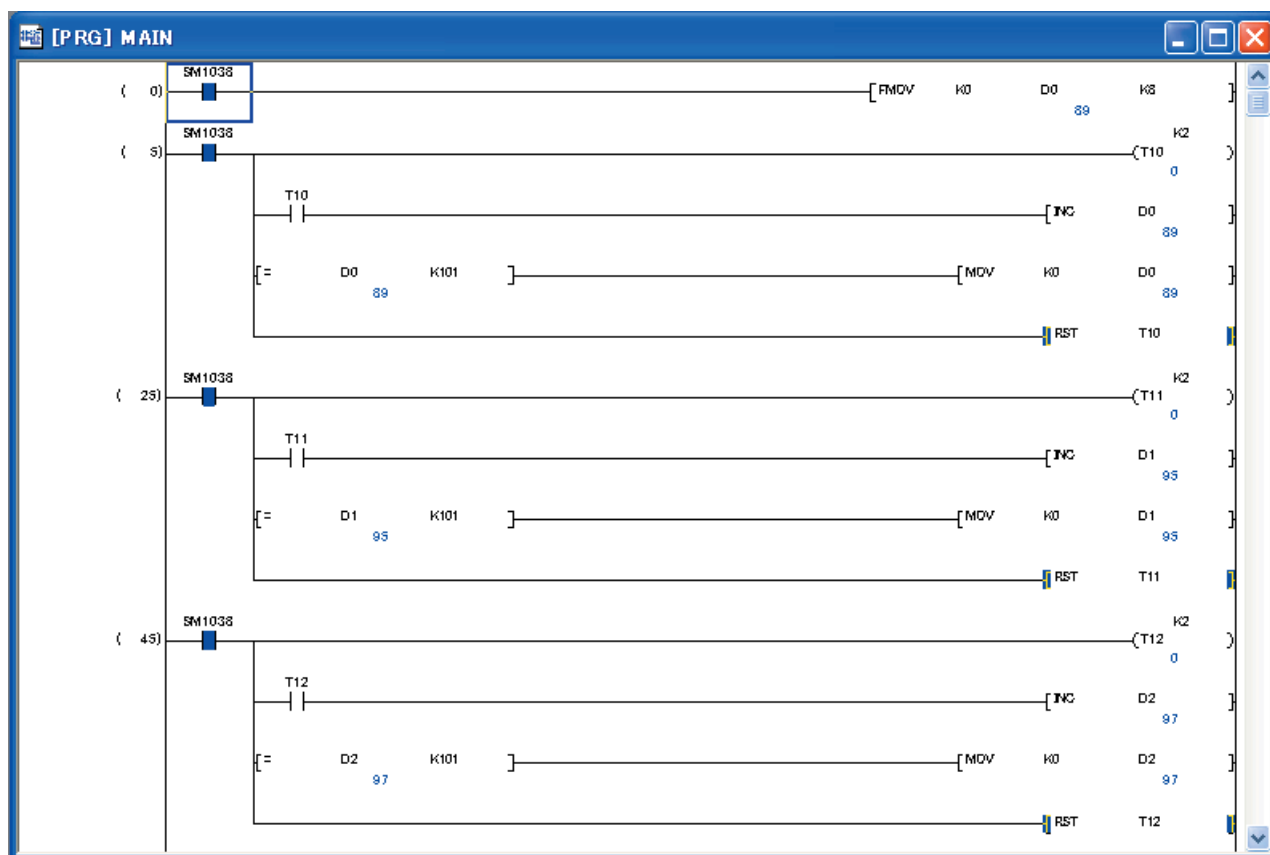
- ☞ GX Works2 Version1 Operating Manual (Simple Project)
- ☞ GX Works2 Version1 Operating Manual (Structured Project)

14.1.1 Monitoring Programs

This section explains the method for monitoring programs.

Screen display

Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring].



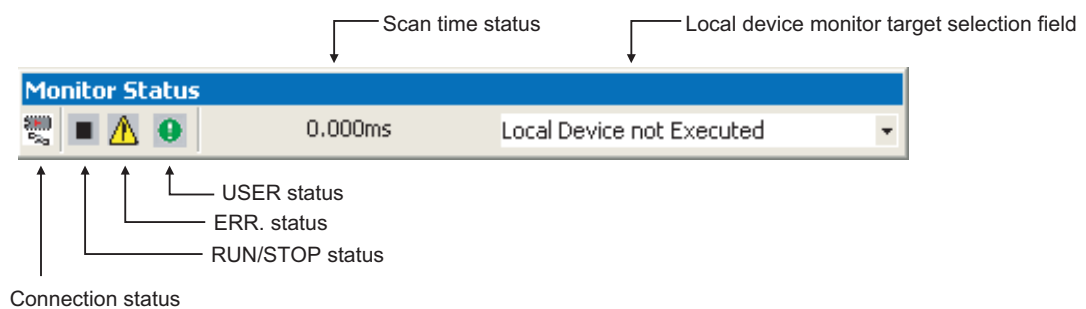
14.1.2 Monitor status

This section explains the Monitor status that is displayed during monitoring in the work window. The Monitor status is hidden when monitoring all items is stopped.

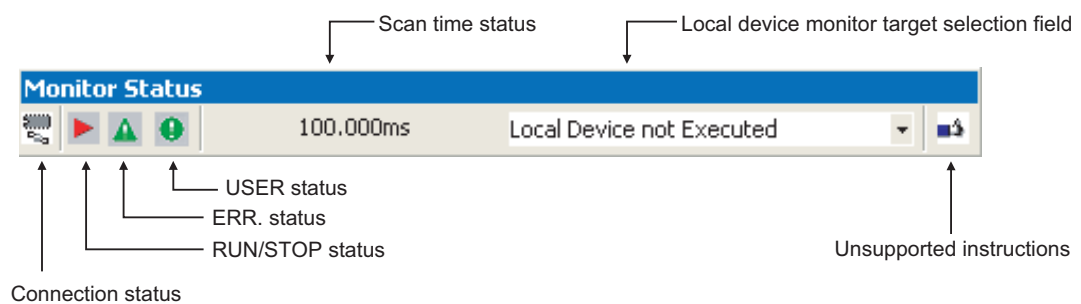
Screen display

At the start of monitoring

- When connected to a programmable controller CPU



- During simulation



Display contents

Item	Description
Connection status	Displays the connection status between a programmable controller CPU and personal computer in which the simulation function is started.
	 When connected to a programmable controller CPU During simulation
RUN/STOP status	Displays the programmable controller CPU status operated by the key switch on the programmable controller CPU or the remote operation from GX Works2.
	 RUN
	 STOP
ERR. status	Displays the error status of the programmable controller CPU. The PLC Diagnostics screen is displayed when the icon is clicked. PLC diagnostics screen (Section 17.1)
	 ERR. is OFF.
	 ERR. is ON.
	 ERR. is flashing.

Item		Description
USER status		Displays the error status of the programmable controller CPU. The PLC diagnostics screen is displayed when the icon is clicked. PLC diagnostics screen ( Section 17.1)
		USER is OFF.
		USER is ON.
		USER is flashing.
Scan time status		Displays the maximum scan time of the monitor target programmable controller CPU. For the QCPU (Q mode), the display is given in units of 0.1ms.
Local device monitor target selection field		Select the name of the program for which local device monitor is performed. If "Auto setting" is selected, the local devices in the program on the active screen are automatically monitored.
Unsupported instructions		Displays whether an unsupported instruction exists or not when the simulation function is executed. The <u>Unsupport Instruction/Device</u> screen is displayed when the icon is clicked. Checking unsupported instruction/device ( Section 15.3.2)
		Unsupported instruction exists.
		Unsupported instruction does not exist.

14.2 Registering and Monitoring Devices

QCPU



This section explains the method for monitoring devices.

14.2.1 Registering and monitoring devices

This section explains the method for registering multiple devices/labels in one screen and monitoring them simultaneously.

Screen display

Select [View] ⇒ [Docking Window] ⇒ [Watch1] to [Watch4].

Device/Label	Current Value	Data Type	Class	Device	Address	Comment
X0	--	Bit		X0	%IX0	ModuleReady
POU_01/counter	--	Double Word[Sig...	VAR	D12286	%MD0.12286	
D0	--	Word[Signed]		D0	%MW0.0	
M0	--	Bit		M0	%MX0.0	QD62Ready

Watch 1 Watch 2 Watch 3 Watch 4

Display contents

Item	Description
Device/Label	Displays the device/label name.
Current Value	Displays the current value of the device/label. Switches the display format (decimal/hexadecimal) of the current value. (Section 14.2.4)
Data Type	Displays the data type of the device/label.
Class	Displays the class of the label. Nothing is displayed for the devices.
Device	Displays the device, or device assigned to the label. For the labels with the class of VAR_CONSTANT or VAR_GLOBAL_CONSTANT, the initial value set with the label editor is displayed.
Address	Displays the address of the device/label. (Structured projects only)
Comment	Displays the comments of the device/label.

1. Select a row to be edited, and then click its "Device/Label" column.

The cell becomes the editing status.

Watch 1						
Device/Label	Current Value	Data Type	Class	Device	Address	Comment
X0	--	Bit		X0	%IX0	ModuleReady
POU_01/counter	--	Double Word[Sig...	VAR	D12286	%MD0.12286	
D0	--	Word[Signed]		D0	%MW0.0	
M0	--	Bit		M0	%MX0.0	QD62Ready

2. Enter a device/label to be registered.

Watch 1						
Device/Label	Current Value	Data Type	Class	Device	Address	Comment
X0	--	Bit		X0	%IX0	ModuleReady
POU_01/counter	--	Double Word[Sig...	VAR	D12286	%MD0.12286	
D0	--	Word[Signed]		D0	%MW0.0	
M0	--	Bit		M0	%MX0.0	QD62Ready
Y4						

3. Press the key.

The entered device/label is registered.

When the device/label is registered, its relevant information such as data type and class is registered automatically.

Watch 1						
Device/Label	Current Value	Data Type	Class	Device	Address	Comment
X0	--	Bit		X0	%IX0	ModuleReady
POU_01/counter	--	Double Word[Sig...	VAR	D12286	%MD0.12286	
D0	--	Word[Signed]		D0	%MW0.0	
M0	--	Bit		M0	%MX0.0	QD62Ready
Y4	--	Bit		Y4	%QX4	CountEnable

4. Select [Online] ⇒ [Monitor] ⇒ [Start Watch].

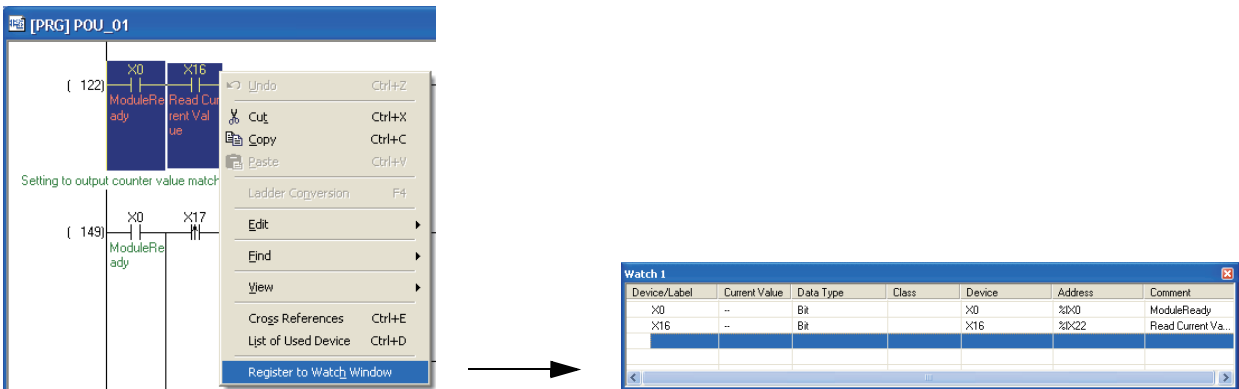
The current value of the registered device/label is displayed.

14.2.2 Registering devices/labels using shortcut menu from program editor/label editor

This section explains the method for registering the devices/labels using the shortcut menu from the program editor/label editor. Multiple devices/labels can be registered in a batch by selecting a range.

Operation

1. Select devices/labels to be registered to the Watch window.
2. Right-click and select [Register to Watch Window] in the shortcut menu.
The devices/labels are registered to the Watch1.



Point

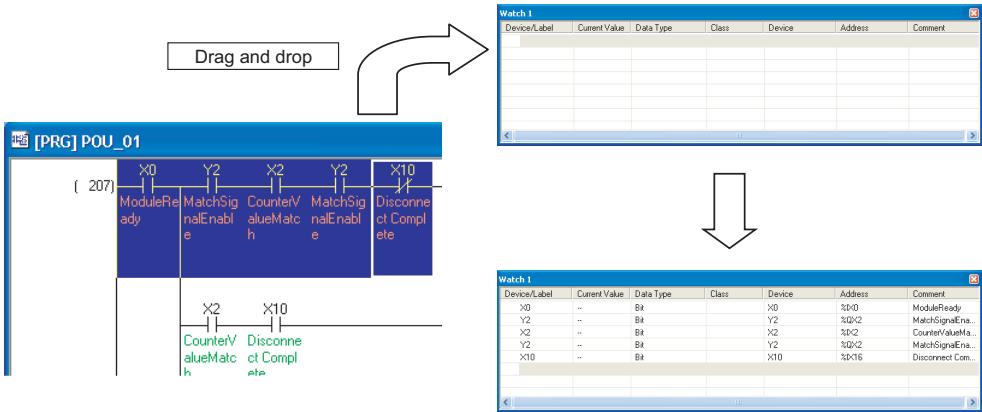
- **Registering devices/labels from the label editor**
When registering devices/labels to the Watch window from the label editor, select and right-click a target row.

14.2.3 Registering devices/labels using drag-and-drop operation from program editor/label editor

This section explains the method for registering devices/labels using the drag-and-drop operation from the program editor/label editor. Multiple devices/labels can be registered in a batch by selecting a range.

Operation

- Select devices/labels to be registered to the Watch window, and drag and drop them on to the Watch window.



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- **Dragging and dropping of devices/labels to the Watch window**

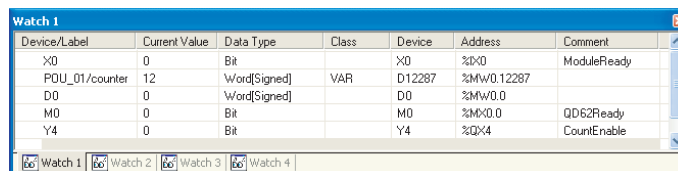
Dragging and dropping of devices/labels to the Watch window can only be performed from the program editor or the label editor.

14.2.4 Changing display format (decimal/hexadecimal) of current values

This section explains the method for changing the display format (decimal/hexadecimal) of the current values.

Operating procedure

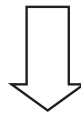
- Right-click on the Watch window, and select [Decimal]/[Hexadecimal] in the shortcut menu.



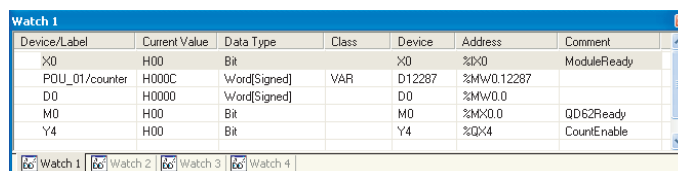
The screenshot shows the 'Watch 1' window with a table of variables and their current values in decimal format. The variables are X0, POU_01/counter, D0, M0, and Y4. Their current values are 0, 12, 0, 0, and 0 respectively. The data types are Bit, Word(Signed), Word(Signed), Bit, and Bit. The classes are VAR, VAR, VAR, VAR, and VAR. The devices are X0, D12287, D0, M0, and Y4. The addresses are %X0, %MW0.12287, %MW0.0, %MX0.0, and %QX4. The comments are ModuleReady, QD62Ready, and CountEnable.

Device/Label	Current Value	Data Type	Class	Device	Address	Comment
X0	0	Bit		X0	%X0	ModuleReady
POU_01/counter	12	Word(Signed)	VAR	D12287	%MW0.12287	
D0	0	Word(Signed)		D0	%MW0.0	
M0	0	Bit		M0	%MX0.0	QD62Ready
Y4	0	Bit		Y4	%QX4	CountEnable

Switch to the hexadecimal display



Switch to the decimal display



The screenshot shows the 'Watch 1' window with a table of variables and their current values in hexadecimal format. The variables are X0, POU_01/counter, D0, M0, and Y4. Their current values are H00, H000C, H0000, H00, and H00 respectively. The data types are Bit, Word(Signed), Word(Signed), Bit, and Bit. The classes are VAR, VAR, VAR, VAR, and VAR. The devices are X0, D12287, D0, M0, and Y4. The addresses are %X0, %MW0.12287, %MW0.0, %MX0.0, and %QX4. The comments are ModuleReady, QD62Ready, and CountEnable.

Device/Label	Current Value	Data Type	Class	Device	Address	Comment
X0	H00	Bit		X0	%X0	ModuleReady
POU_01/counter	H000C	Word(Signed)	VAR	D12287	%MW0.12287	
D0	H0000	Word(Signed)		D0	%MW0.0	
M0	H00	Bit		M0	%MX0.0	QD62Ready
Y4	H00	Bit		Y4	%QX4	CountEnable



● Changing current values

The current value can be changed by entering a value directly in the "Current Value" column during monitoring. For bit devices, select a row and press the **[Shift]** and **[Enter]** keys or press the **[Shift]** key and double click the row to change the current value.

Device/Label	Current Value	Data Type	Class	Device	Address	Comment
X0	1	Bit		X0	%IX0	
D0	100	Word[Signed]		D0	%MW0.0	
X3	0	Bit		X3	%IX3	
X4	0	Bit		X4	%IX4	
X5	0	Bit		X5	%IX5	

● Displaying Watch window

If a registered device/label is a structure/function block/array label, the detail of the device/label is displayed in tree format.

Device/Label	Current Value	Data Type	Class	Device	Address	Comment
g_data1		STRUCT01	VAR_GLOB...			
AAA	--	Word[Signed]		D12287	%MW0.12287	Member 1 data
EEE	--	Word[Signed]		D12286	%MW0.12286	Member 2data
CCC	--	Word[Signed]		D12285	%MW0.12285	Member 3data
DDD	--	Word[Signed]		D12284	%MW0.12284	Member 4 data
g_data2		STRUCT2	VAR_GLOB...			
FFF	--	Bit		M8191	%MX0.8191	
GGG		Double Wor...				
[0]	--	Double Wor...		D12276	%MD0.12276	
[1]	--	Double Wor...		D12278	%MD0.12278	
[2]	--	Double Wor...		D12280	%MD0.12280	
[3]	--	Double Wor...		D12282	%MD0.12282	

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14.3 Monitoring Devices/Buffer Memory in a Batch



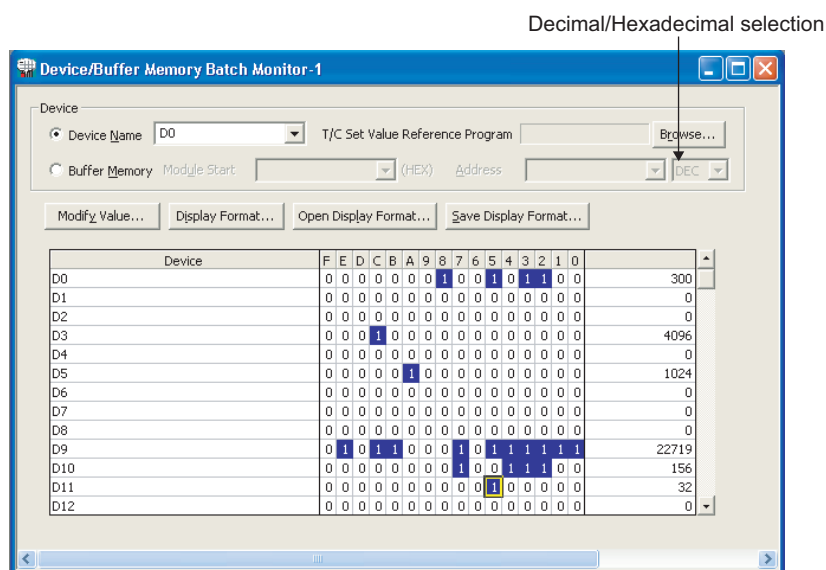
This section explains the method for monitoring devices/buffer memory in a batch.

For device batch monitoring, specify the target devices.

For buffer memory batch monitoring, specify the address of the intelligent function module.

Screen display

Select [Online] ⇒ [Monitor] ⇒ [Device/Buffer Memory Batch Monitor].



Operating procedure

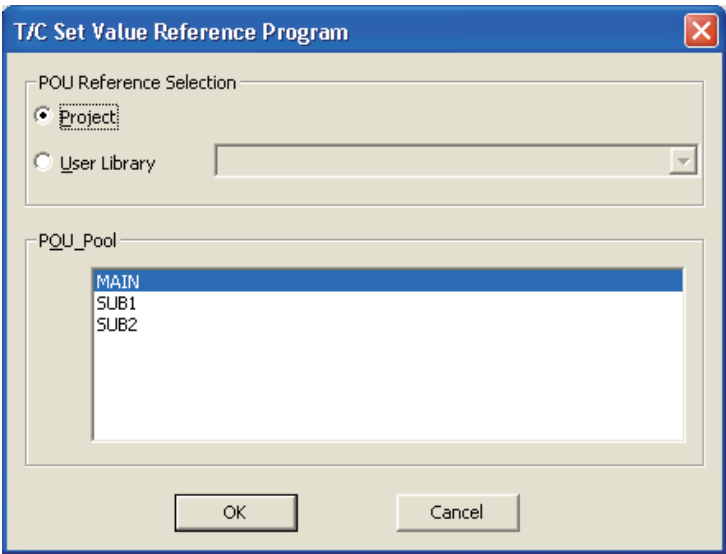
1. Set the items on the screen.

Item	Description
Device	Selected to monitor devices in a batch.
Device Name	Select this to enter the name of a device to be monitored in a batch.
T/C Set Value Reference Program	Specify the program whose setting value is to be displayed when monitoring timer (T) or counter (C) in a batch.
Buffer Memory	Selected to monitor buffer memory in a batch.
Module Start	Enter the start I/O number of the intelligent function module in hexadecimal number. - Multiple CPU system configuration - Specify the programmable controller CPU to be monitored. - CPU No. 1: 3E00, CPU No. 2: 3E10, CPU No. 3: 3E20, CPU No. 4: 3E30
Address	Enter the address of buffer memory to be monitored in decimal or hexadecimal.
Decimal/Hexadecimal selection	Select the address input format (decimal or hexadecimal).

Screen button

● Browse...

Displays the T/C Set Value Reference Program screen.



Operation

- Set the items on the screen.

Item	Description
Program Reference Selection/POU Reference Selection	Set the reference of POU. In Simple project, selection is fixed at "Project".
Project	Selected to reference a program in the project.
User Library	Selected to reference a POU in the user library by clicking ▾ .
Program/POU_Pool	Select the POU to be referenced. Projects selected by "POU Reference Selection" or POU in "User Library" is displayed. Items to be displayed are as follows: Simple project: Program file Structured project: POU

● Modify Value...

Displays the Modify Value screen. (☞ Section 15.1)

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● Display Format...

The **Display Format** screen is displayed.

Set the monitor display format.

The screen displays the set contents as an example. Setting is possible while confirming the display.

Display Format

Monitor Format: ☐ Bit, ☒ Bit and Word, ☐ Bit, ☐ Word

Display: ☒ 16bit Integer, ☐ 32bit Integer, ☐ Real Number(32Bit), ☐ Real Number(64Bit), ☐ ASCII

Value: ☒ DEC, ☐ HEX

Bit Order: ☐ 0--F, ☒ F--0

Switch No. of Points: Points of word device that display in 1 line. Bit Device: ☐ 10 Points, ☒ 16 Points. Word Device: ☒ 8 Points, ☐ 10 Points

Display Examples:

Device	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0	
X0	0	1	0	0	0	1	0	0	0	1	1	0	1	1	1		16951
X10	0	1	1	1	0	0	0	0	0	1	0	0	0	0	1		28737
X20	0	1	0	0	0	1	0	0	1	0	0	1	1	1	0		16974
X30	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0		28736

Device	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0	
D0	0	1	0	0	0	1	0	0	0	1	1	0	1	1	1		16951
D1	0	1	1	1	0	0	0	0	0	1	0	0	0	0	1		28737
D2	0	1	0	0	0	1	0	0	1	0	0	1	1	1	0		16974
D3	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0		28736

OK Cancel

Operation

- Set the items on the screen.

Item	Description
Monitor Format	Select the monitor format.
Bit	Select this to monitor bits in unit of one point.
Bit and Word	Select this to monitor both bits and words in unit of one point.
Bit	Select this to monitor bits in unit of multiple points.
Word	Select this to monitor words in unit of multiple points.
Display	Select the data type of the value stored in word device/buffer memory when "Bit and Word" or "Word" is selected for "Monitor Format".
16bit Integer	Select this to monitor in 16-bit integer.
32bit Integer	Select this to monitor in 32-bit double word (signed) integer.
Real Number (32Bit)	Select this to monitor in 32-bit (single precision real number).
Real Number (64Bit)	Select this to monitor in 64-bit (double precision real number).
ASCII	Select this to monitor in character string.
Value	Select either decimal or hexadecimal display format for 16-bit or 32-bit integer.
DEC	Select this to monitor in decimal number.
HEX	Select this to monitor in hexadecimal number.
Bit Order	Select the alignment sequence of bits to be monitored when "Bit and Word" or "Word" is selected for "Bit".
0-F	Select this to monitor bit information from the left to the right on the screen. This method is appropriate for monitoring bit devices.
F-0	Select this to monitor bit information from the right to the left on the screen. This method is appropriate for monitoring word devices or buffer memory.
Switch No. of Points	Select the number of points to be monitored per line.
16 Points (8 Points)	Select this to monitor 8 points of word device or 16 points of bit device per line.
10 Points (10 Points)	Select this to monitor 10 points per line.

● Open Display Format...

Utilizes the saved display formats.

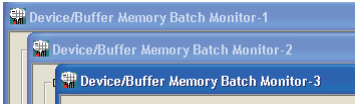
● Save Display Format...

Saves the current display format in the file.

Point

● Opening multiple **Device/Buffer Memory Batch Monitor** screens

The maximum number of **Device/Buffer Memory Batch Monitor** screens that can be opened is 64. A screen number is appended at the end of the screen title.



● Monitoring time with multiple **Device/Buffer Memory Batch Monitor** screens opened

When **Device/Buffer Memory Batch Monitor** screens are opened, lead time to start monitoring and monitoring intervals may become longer.

● Accessing multiple **CPU shared memory**

Multiple CPU shared memory of multiple CPU system can be monitored only by Device/Buffer Memory Batch Monitor function.

Restrictions

● Devices that execute index setting to multiple **CPU shared memory**

When index setting is executed to multiple CPU shared memory, the memory cannot be monitored. (U3E0Z0\G0, etc.)

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14.4 Starting/Stopping Monitor of All Windows

QCPU



This section explains the method for starting/stopping monitoring of all open program windows and batch monitoring of devices/buffer memory.

Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring (All Windows)]/[Stop Monitoring (All Windows)].



15 DEBUGGING PROGRAMS

This chapter explains the method for debugging sequence programs.

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15.1 Changing Current values

QCPU



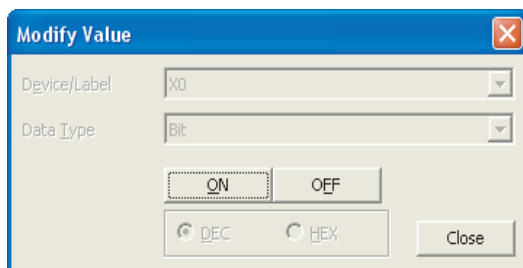
This section explains the method for changing current device values of the programmable controller CPU.

The following explains the methods for forcibly turning ON/OFF the bit device in the programmable controller CPU from the monitoring screen and also changing the current value of the word device and buffer memory. Select the device/buffer memory/label whose current value is to be changed on the monitoring screen in advance.

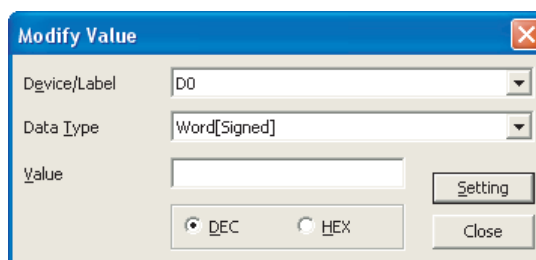
Screen display

Select [Online] ⇒ [Modify Value].

For bit device



For word device/buffer memory



Operating procedure

1. Set the items on the screen.

Item		Description	
Bit device	Device/Label	Displays the device or label selected on the monitoring screen.	
	Data Type	Displays 'bit'.	
Word device/Buffer memory	Device/Label	Displays the device or label selected on the monitoring screen. • Buffer memory Displays the start I/O number of the module in hexadecimal and the start address of the module in decimal.	
	Data Type	Displays the data type of the device or label.	
	Value	Enter a new value. Enter the new value according to the data type as shown below:	
		Type	Entry
		Word (signed), double word (signed), word (unsigned)/16-bit string, double word (unsigned)/32-bit string	Enter the value in decimal or hexadecimal format. • Append "H" in front of a hexadecimal value.
		Single-precision real	Enter the value in floating-point or exponent format. Example) • Floating-point format: -1.23456 • Exponent format: -1.23456E + 01
		Double-precision real	Enter the value in floating-point format.
		String	Enter the value as a character string. ("" is unnecessary.)
Time		Enter the value in the time format. • T#0s (Settable only for Structured projects)	

2. Click the / or button.

The current value of the programmable controller CPU is changed.

Point

- **Selecting devices/labels used in instructions that handle multiple devices**
When an instruction that uses multiple devices (such as FROM/TO instruction) is selected, all devices/labels used in the instruction are displayed in the "Device/Label" combo box.
Select a device from the combo box and then execute the Modify Value function.
- **Forcibly turning contacts ON/OFF on the ladder monitor**
A contact on the ladder monitor can be forcibly switched ON/OFF by double-clicking the contact ( key) while pressing the  key.

Restrictions

- **Devices that current value can not be changed**
The current value of index set or indirectly specified devices cannot be changed.

Device name	Example
Index setting	D0Z0
Indirect specification	@D0

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15.2 Sampling Trace

QCPU



This section explains the operation of the sampling trace function.

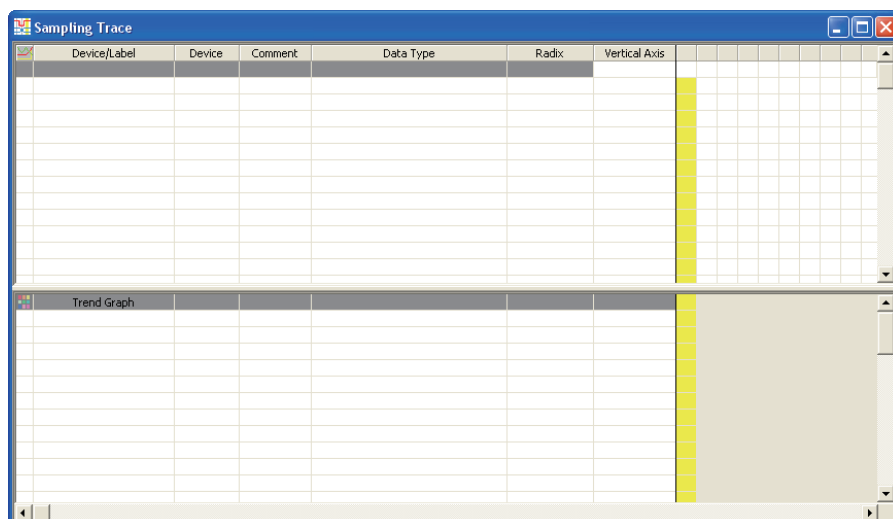
The sampling trace function acquires the data at the preset timing to find how device values change during program operation and traces the changes by displaying them in time series.

For details of the sampling trace function, refer to the manual of each CPU module.

15.2.1 Opening sampling trace screen

Operating procedure

- Select [Debug] ⇒ [Sampling Trace] ⇒ [Open Sampling Trace].



15.2.2 Setting executing condition of sampling trace

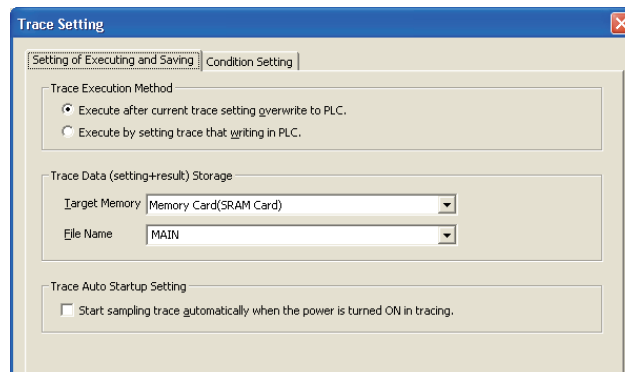
This section explains the settings required for executing sampling trace and the execution method.

■ Setting sampling trace execution method and data storage destination

This function sets the sampling trace execution method and the storage destination of the trace data.

Screen display

Select [Debug] ⇒ [Sampling Trace] ⇒ [Trace Settings] (🔍) ⇒ <<Setting of Executing and Saving>>.



Operating procedure

- Set the items on the screen.

Item	Description
Trace Execution Method	Set the trace execution method.
Execute after current trace setting overwrite to PLC	Select this to execute sampling trace after overwriting the current trace setting to the programmable controller CPU.
Execute by setting trace that writing in PLC	Select this to execute sampling trace using the trace setting stored in the programmable controller CPU.
Trace Data (setting+result) Storage	Set the memory and the file name where the trace data set on the <<Condition Setting>> tab and the trace result after execution are stored.
Trace Auto Startup Setting	Place a check mark in the box to perform the sampling trace automatically when the programmable controller CPU is in RUN. (Universal model QCPU only*1)

*1 : For the versions of Universal model QCPU that correspond to this product, refer to the QCPU User's Manual (Function Explanation, Program Fundamentals).

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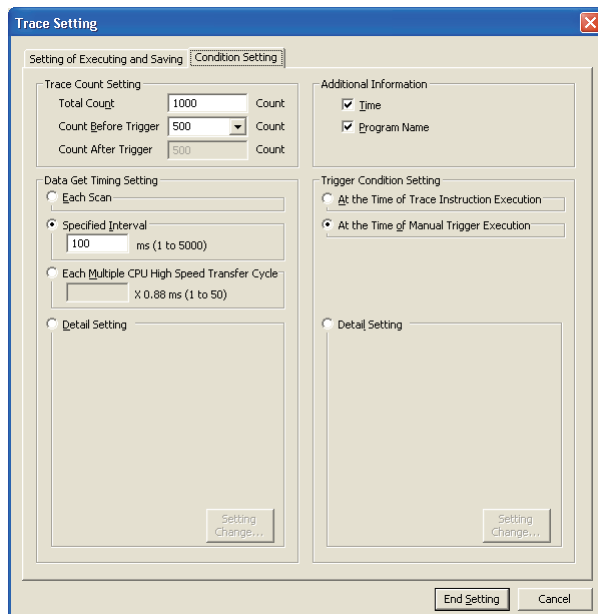
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■ Setting sampling trace conditions

This function sets the sampling trace conditions such as the number of traces and the trigger condition.

Screen display

Select [Debug] ⇒ [Sampling Trace] ⇒ [Trace Settings] (🔍) ⇒ <<Condition Setting>>.



Operating procedure

- Set the items on the screen.

Item	Description
Trace Count Setting	Set the number of data acquisitions (samplings) before and after the trigger. Select a value using the combo box or enter a value directly. Setting range: Count Before Trigger ≤ Total Count ≤ 8192
Additional Information	Set the information to be added to the trace result.
Data Get Timing Setting	Set the trace data acquisition timing.
Each Scan	Select this to acquire the data every scan.
Specified Interval	Select this to acquire the data in the set intervals. Setting range: 1 to 5,000 (can be set in units of 1ms)
Each Multiple CPU High Speed Transfer Cycle	Select this to acquire the data in the Each multiple CPU high speed transfer cycle. (Universal model QCPU only) Setting range: 1 to 50
Detail Setting	Select this to set the data acquisition timing depending on the device condition. Use the  button to set the conditional expression.
Trigger Condition Settings	Set the trigger (condition) that is taken as the start point (0 point) of sampling trace execution.
At the Time of Trace Instruction Execution	Select this to generate a trigger when the TRACE instruction in the program is executed. For the TRACE instruction, refer to the following. (🔍 QCPU (Q mode)/QnACPU Programming Manual (Common Instructions))
At the Time of Manual Trigger Execution	Select this to generate a trigger manually with GX Works2. Select [Debug] ⇒ [Sampling Trace] ⇒ [Execute Manual Trigger] to generate a trigger.
Detail Setting	Select this to set a trigger timing depending on the device condition. A trigger is generated when the conditional expression is satisfied. Use the  button to set the conditional expression.

Screen button



Displays the Detail Setting screen.

Setting of the conditional expression can be changed in the "Data Get Timing screen" or "Trigger Condition screen".

(Data Get Timing)

The dialog box titled "Detail Setting - Data Get Timing" contains the following fields: a checked "Device" checkbox, a "Device/Label" text box, a "Device" dropdown menu, an "Address" text box, a "Comment" text box, a "Condition" dropdown menu, a "Radix" dropdown menu, and a "Values" text box. At the bottom are "End Setting" and "Cancel" buttons.

(Trigger Condition)

The dialog box titled "Detail Setting - Trigger Condition" contains the same fields as the "Data Get Timing" dialog: a checked "Device" checkbox, a "Device/Label" text box, a "Device" dropdown menu, an "Address" text box, a "Comment" text box, a "Condition" dropdown menu, a "Radix" dropdown menu, and a "Values" text box. At the bottom are "End Setting" and "Cancel" buttons.

Operation

- Set the items on the screen.

Item	Description						
Device /Label	Enter a device, address or label. Section 15.2.6						
Device	Displays the device corresponds to "Device /Label".						
Address* ¹	Displays the address corresponds to "Device /Label".						
Comment	Displays the device comment of "Device /label".						
Condition	Select the timing condition. <table border="1"> <thead> <tr> <th>Device</th><th>Description</th></tr> </thead> <tbody> <tr> <td>Bit device</td><td> Select "↑" for the rising of "Device /Label". Select "↓" for the falling of "Device /Label". </td></tr> <tr> <td>Word device</td><td>Select the condition in which "Device /Label" and the conditional value match "=", "Change"² or "Write"²</td></tr> </tbody> </table>	Device	Description	Bit device	Select "↑" for the rising of "Device /Label". Select "↓" for the falling of "Device /Label".	Word device	Select the condition in which "Device /Label" and the conditional value match "=", "Change" ² or "Write" ²
Device	Description						
Bit device	Select "↑" for the rising of "Device /Label". Select "↓" for the falling of "Device /Label".						
Word device	Select the condition in which "Device /Label" and the conditional value match "=", "Change" ² or "Write" ²						
Radix	Select the radix of the condition value. (Word device only)						
Values	Set the condition value. (Word device only)						

*1 : Structured projects only.

*2 : Universal model QCPU only

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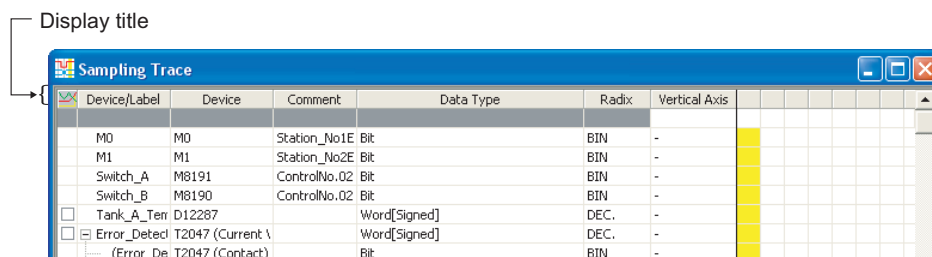
15.2.3 Registering devices/labels

This section explains the method for registering the devices/labels onto the Sampling Trace screen.

Operating procedure

- Register the devices/labels to which the sampling trace is performed.

Devices/labels can be registered by entering them directly or copying them from the program editor or label editor using the drag-and-drop operation.



Item	Description
Display title	-
Device/Label	Set the device, address, label, structure, array, and function block to which the sampling trace is performed. 50 bit devices and 50 word devices can be registered.
Device*1	Displays the device corresponds to "Device /Label".
Address*1,*2	Displays the address corresponds to "Device /Label".
Comment*1	Displays the device comment for the address or device/label which are entered in "Device /Label".
Data Type*1	Displays the data type of "Device /Label". The data type of the word device can be changed after registration.
Radix*1	If the device entered in "Device /Label" is the bit device, the radix is fixed as "Binary". If the device entered in "Device /Label" is the word device, the radix can be selected from "Binary", "Decimal", "Hexadecimal" or "ASCII". If the device entered in "Device /Label" is the single-precision/double-precision real number, the radix is fixed as "FLOAT".

*1 : Select [View] ⇒ [Switching display items] to display it.

*2 : Structured projects only

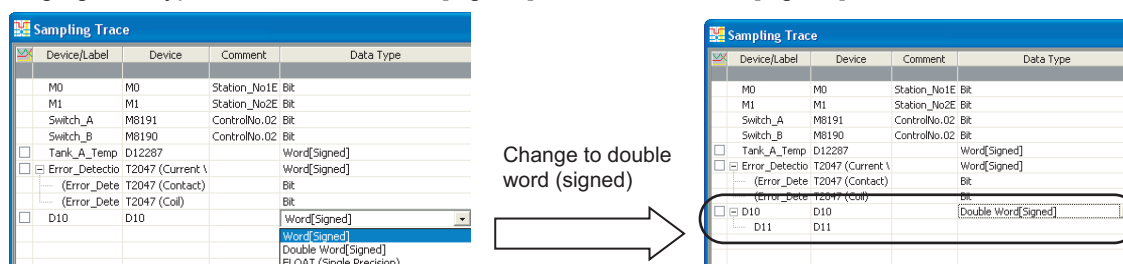
Changing data types of word devices

This section explains the method for changing the data type of the word device after registration.

When the data type of a device/label that uses the multiple devices is changed, the necessary devices are displayed in the tree format.

Example)

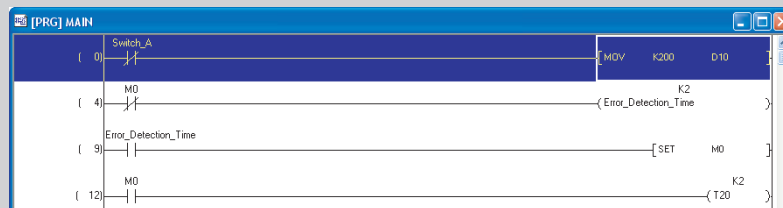
Changing data type of D10 from "Word [signed]" to "Double Word [signed]"



■ Registering devices/labels from program editor/label editor using drag-and-drop operation

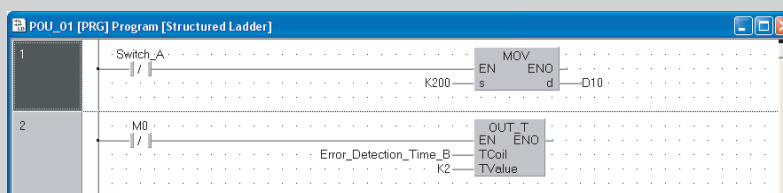
This section explains the method for registering a device/label from the program editor/label editor using the drag-and-drop operation. Multiple devices/labels can be registered in a batch by selecting a range.

<Ladder editor>



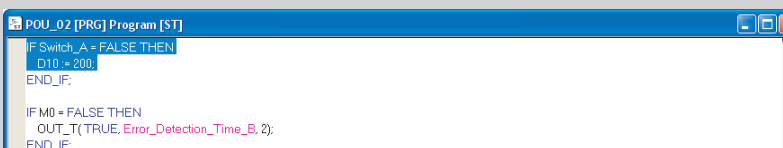
Select the device, instruction and ladder block.

<Structured ladder editor>



Select the device and ladder block.

<ST editor>



Select the device and line.

<Label editor>

Global Label Setting Global1						
	Class	Label Name	Data Type	Constant	Device	
1	VAR_GLOBAL	Switch_A	Bit		ControlNo.0210Mod	
2	VAR_GLOBAL	Switch_B	Bit		ControlNo.0211Mod	
3	VAR_GLOBAL	Tank_A_Temperature	Word(Signed)			
4	VAR_GLOBAL	Tank_B_History	Word(Signed)(0..9)			
5	VAR_GLOBAL	Tank_B_Temperature	Double Word(Signed)			
6	VAR_GLOBAL	Module_A_Base_Point	Bit			

Select the device by a unit of row.

Drag & drop



When the dragged cursor is placed on the sampling trace tab, the window is activated.



The device is registered at the cursor position.

Sampling Trace						
Device/Label	Device	Comment	Data Type	Radix	Vertical Axis	
M0	M0	Station_No1E	Bit	BIN	-	
M1	M1	Station_No2E	Bit	BIN	-	
Switch_A	M8191	ControlNo.02	Bit	BIN	-	

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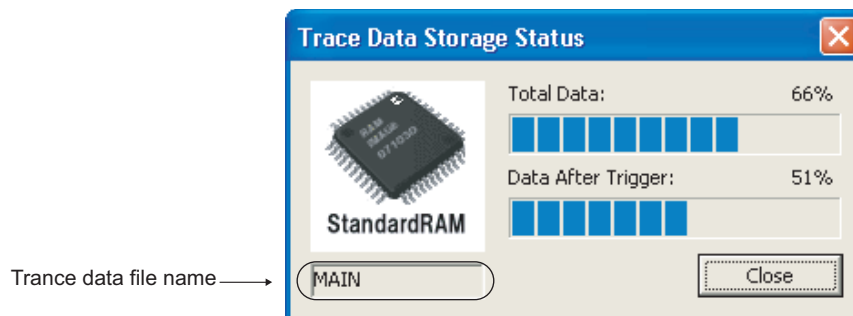
15.2.4 Executing sampling trace

Operating procedure

- Select [Debug] ⇒ [Sampling Trace] ⇒ [Start Trace] ().

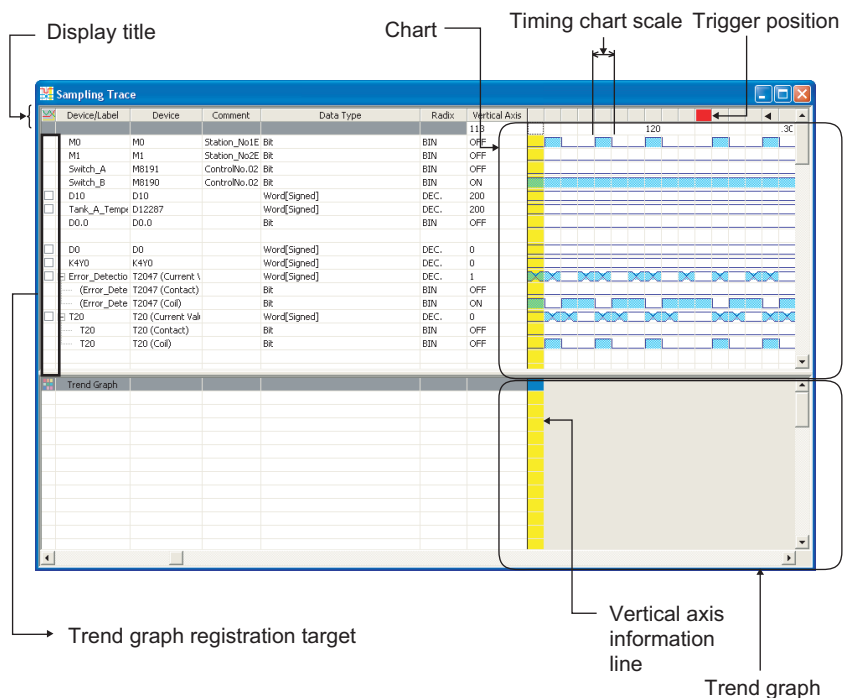
Sampling trace starts.

The Trace Data Storage Status screen is displayed when the sampling trace is started.



Item	Description
Total Data	Displays the current status of data acquisition (sampling) after the start of sampling trace in percentage in reference to the number of times set for "Trace Settings". Even after this status reaches 100%, sampling trace is continuously executed and the data are overwritten from the oldest data.
Data After Trigger	Displays the current status of data acquisition (sampling) after the generation of trigger in percentage in reference to the number of times set for "Trace Settings". When this status reaches 100%, sampling trace stops.
Trace data file name	Displays the trace data file name that is registered for the sampling trace in the programmable controller CPU.

After the stop or completion of sampling trace, the trace result is displayed on the Sampling Trace screen.



Display contents

Item	Description
Display title	-
Vertical Axis	Displays the device value of the selected cell position, on the 'vertical axis information line'.
Chart	Displays the acquired data in chart.
Timing chart scale	One block corresponds to one data acquisition. The number of scale indicates the number of data acquisitions. To change the display width, select [View] ⇒ [Timing Chart Scale] ⇒ [Narrow Scale] () / [Wide Scale] (), or move a scroll wheel on a mouse while pressing the Shift key.
Trigger position	A red mark is displayed at the position corresponding to the trigger generated timing on the timing chart scale when a trigger is generated.
Vertical axis information line	This line is displayed at the position where a cell is selected on the chart in yellow. The device value on the vertical axis information line is displayed in cells under "Vertical Axis". When the vertical axis information line is double clicked, the data at the right side of the line are displayed on the sampling trace (detailed data) screen. ( ■ Switching screen to the sampling trace (detailed data) screen)
Trend graph registration target	Registers the checked word device onto the trend graph.
Trend graph	Displays the changes of the word device values on the trend graph. ( ■ Displaying trace results on trend graphs)

Point

- **Starting sampling trace from sequence program**
Select [Debug] ⇒ [Sampling Trace] ⇒ [Register Trace].
To start sampling trace, execute the Trace start command (SM801) in a program.
- **Displaying only the trace result stored in the programmable controller CPU without executing sampling trace**
Select [Debug] ⇒ [Sampling Trace] ⇒ [Upload from PLC]. ( Section 15.2.5)
- **Word devices whose data types can be changed after sampling trace results are displayed**
The type of a word device can be changed to the double word type or the real type, only when the consecutive devices are registered as the necessary number of trace data.
Example)
If the sampling trace is performed to D0, D1, D2 and D3, the data type of D0 can be changed to the double word type.
If the data type of D2 is changed to the data type that uses multiple devices, such as the double word or single-precision real number, the data type of D0 can not be changed as it has no consecutive 4-words devices.
- **Performing sampling trace from other peripherals during performing sampling trace**
For Universal model QCPU, the sampling trace currently being performed can be stopped by other peripherals and perform another sampling trace. When the sampling trace is performed by other peripherals, select [Debug] ⇒ [Sampling Trace] ⇒ [Forced Execution Registration Valid] to activate the forced registration.
- **Trace ready status (SM800) after sampling trace is completed**
In GX Developer, the trace ready status (SM800=1) is held until the trace results are read, even if the sampling trace is completed. In GX Works2, the trace results are automatically read and displayed when the sampling trace is completed, and then the trace ready status (SM800=0) is deactivated.

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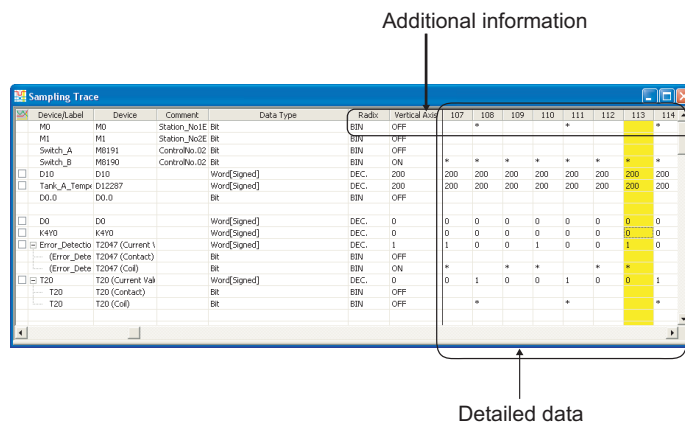
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■ Switching screen to the sampling trace (detailed data) screen

This function displays the device/label value change in numeric values.

Screen display

- Click the tool button  (Chart/Switching Detail).
The sampling trace (detailed data) screen is displayed.
- Click the tool button  (Chart/Switching Detail) again to switch to the chart.



Display contents

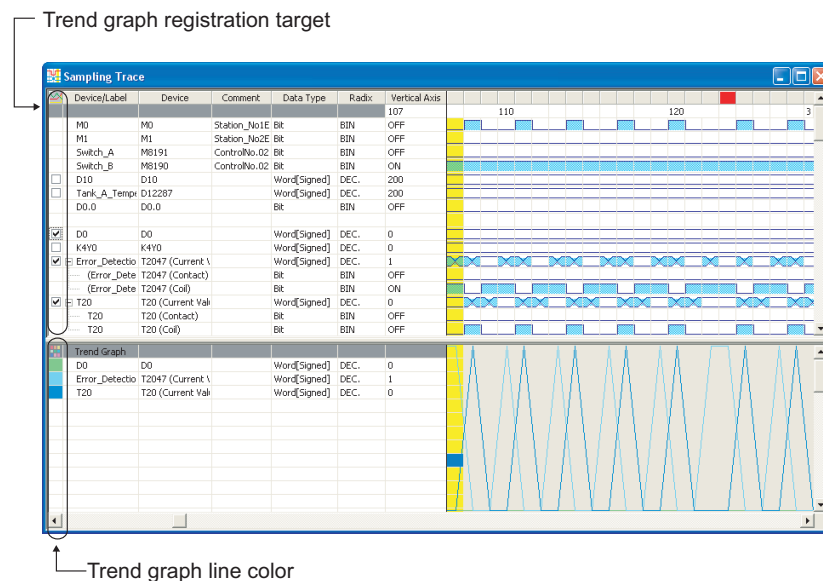
Item	Description
Additional information	Displays the additional information set for "Additional Information" in the <<Condition Setting>> tab on the <u>Trace Setting</u> screen.
Detailed data	Confirm the device values. In the case of a bit device, '*' is displayed for ON, nothing is displayed (blank) for OFF. In the case of a word device, numeric values are displayed. The registered "Device /Label" are linked with the <u>Sampling Trace</u> screen (chart).

■ Displaying trace results on trend graphs

This section explains the method for displaying the changes of the word device values on the trend graph.

Operating procedure

- Check the check box for the 'trend graph registration target' on the Sampling Trace screen.
The checked word device is registered on the trend graph.
Uncheck the check box to cancel the registration on the trend graph.



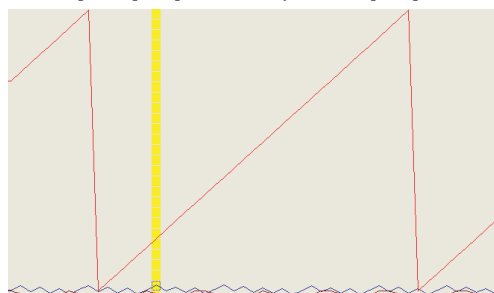
Display contents

Item	Description
Trend graph line color	Changes the background color of cell under 'trend graph line color' to the line color of the trend graph. Double click the cell, and the <u>Color</u> screen is displayed to allow changing of the trend graph line color.

Point

● Wide/narrow scales of trend graphs

Place the cursor at the base point to widen/narrow, and select [View] ⇒ [Trend Graph Scale] ⇒ [Narrow Scale] (🔍) / [Wide Scale] (🔍) or move a scroll wheel on a mouse while pressing the **Ctrl** key. The widened/narrowed graph with the specified base point as the center is displayed.
Select [View] ⇒ [Trend Graph Scale] ⇒ [Initial Display] to recover the display to the initial state.



Wide scale
Narrow scale

● Moving trend graphs

Double click the trend graph to move the graph up or down with the double-clicked point as the center.

15.2.5 Saving trace data

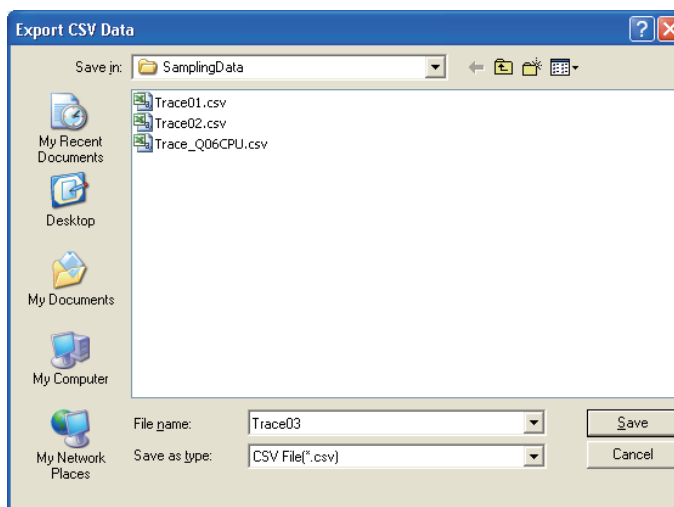
This section explains the method for saving the trace data of sampling trace (sampling trace target devices/labels, trace settings, and trace results) to a personal computer or a programmable controller CPU.

■ Saving trace data to personal computer

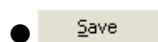
This function saves the trace data in a personal computer in the CSV file format.

Screen display

Select [Debug] ⇒ [Sampling Trace] ⇒ [Export CSV Data].



Screen button



Saves trace settings and trace results in the CSV file format. If no trace results exist, only trace settings are saved.

Point

- **Trace numbers when saving trace data in CSV file**

For the trace numbers of the sampling trace when the trace data are output to the CSV file, the number at the time of the trigger execution is set to 0, and the numbers are displayed with the negative values for the numbers before the trigger execution and positive values for the numbers after the trigger execution.

Example)

If M0, which was obtained at the fifth time after the trigger execution, is ON, M0 with the trace number '4' is displayed as 'ON' in the CSV file.

			Device/Label	[M0]	[M1]	[Switch_A]	[Switch_B]	[D10]	[Tank_A.Te
			Device	M0	M1	M8191	M8190	D10	D12287
			Comment	[Station_No1Er	[Station_No2E	[ControlNo.0	[ControlNo		
			Data Type	Bit	Bit	Bit	Bit	Word[Signe	Word[Signe
	Trace No.	Time(sec.)	Program Name	Radix	BIN	BIN	BIN	DEC.	DEC.
Before trigger execution	-4						*	200	200
	-3			*			*	200	200
	-2						*	200	200
	-1						*	200	200
	0						*	200	200
After trigger execution	1			*			*	200	200
	2						*	200	200
	3						*	200	200
	4			*			*	200	200
	5						*	200	200
	6						*	200	200

To display the CSV file with Excel as same as the display of the sampling trace result, copy the devices and the range of the result, check "Transpose" in "Paste Special", and then paste them on to Excel.

■ Writing/reading trace data to/from programmable controller CPU

This function writes/reads the trace data to/from a programmable controller CPU.

Operating procedure

- Select [Debug] ⇒ [Sampling Trace] ⇒ [Upload from PLC]/[Download to PLC].

The Download to PLC function writes the trace data to the target memory set in the <<Setting of Executing and Saving>> tab on the Trace Setting screen.

Point

- **Reading trace data to programmable controller CPU**

The word data, which was read by the Upload from PLC function, is read as the word (signed) regardless of the data type settings at the time of writing the data.

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15.2.6 Applicable devices/labels for sampling trace

■ List of applicable devices for sampling trace

Table 15.2.6-1 List of applicable devices

Category	Device type		Device	Sampling trace screen	Data acquisition timing	Trigger condition
Internal user device	Input		X	○*1	○*1	○
	Output		Y	○*1	○*1	○
	Internal relay		M	○*1	○*1	○
	Latch relay		L	○*1	○*1	○
	Annunciator		F	○*1	○*1	○
	Edge relay		V	○*1	○*1	○
	Step relay		S	x	x	x
	Link relay		B	○*1	○*1	○
	Link special relay		SB	○*1	○*1	○
	Timer	Current value	T	○	○	○
		Contact	TS	○*2	○*2	○*2
		Coil	TC	○*2	x	x
	Counter	Current value	C	○	○	○
		Contact	CS	○*2	○*2	○*2
		Coil	CC	○*2	x	x
	Retentive timer	Current value	ST	○	○	○
		Contact	STS	○*2	○*2	○*2
		Coil	STC	○*2	x	x
	Data register		D	○*1	○*1	○*1
	Link register		W	○*1	○*1	○*1
	Link special register		SW	○*1	○*1	○*1
Internal system device	Function input		FX	○	○	○
	Function output		FY	○	○	○
	Special relay		SM	○*1	○*1	○
	Function register		FD	○*1	○*1	○*1
	Special register		SD	○*1	○*1	○*1
Link direct device	Link input		J□\X□	○*1	○*1	x
	Link output		J□\Y□	○*1	○*1	x
	Link register		J□\W□	○*1	○*1	x
	Link special register		J□\SW□	○*1	○*1	x
	Link relay		J□\B□	○*1	○*1	x
	Link special relay		J□\SB□	○*1	○*1	x
File register	File register		R	○*1	○*1	○*1
			ZR	○*1	○*1	○*1
Index register	Index register		Z	○	○	x
			ZZ	x	x	x
Intelligent function module device	Intelligent function module device		U□\G□	○*1	○*1	x
	Cyclic transmission area device		U3E□\G□	○*1	○*1	x
Nesting	Nesting		N	x	x	x

Category	Device type		Device	Sampling trace screen	Data acquisition timing	Trigger condition
Pointer	Pointer		P	×	×	×
	Interrupt pointer		I	×	×	×
Others	SFC block device		BL	×	×	×
	SFC transition device		TR	×	×	×
	Network number specifying device		J	×	×	×
	I/O number specifying device		U	×	×	×
	Macro instruction argument device		VD	×	×	×
Constant	Decimal constant		K	×	×	×
	Hexadecimal Constant		H	×	×	×
	Real constant	Single-precision floating-point data	E	×	×	×
		Double-precision floating-point data	E	×	×	×
	String constant		""	×	×	×

*1 : Following settings are possible.

- Digit specification for bit devices
- Bit specification for word devices
- Index setting (not available under the trigger condition)

*2 : Structured projects only

■ Applicable label types for sampling trace

Table 15.2.6-2 Applicable label types for sampling trace

Label type	Description	Example
Global label* ¹	Registers and displays as 'label name'.	Label1
Local label* ¹	Registers and displays as 'program/label name'.	POU_01/ Label1
Structure* ¹	Registers and displays as 'label name.member name'. Registers all members when the whole structured labels are registered.	G_data.AAA
Function block* ¹	Registers and displays as 'instance name.label name in function block'. Registers all labels in the function block when the whole instances (function blocks) are registered.	FB_01.IN01
Array* ¹	Registers and displays as 'label name [one-dimensional element number] [two-dimensional element number] [three-dimensional element number]'. Registers all elements/all members when the whole array type labels are registered.	Array[0]
Structured array* ¹	Registers and displays as 'label [one-dimensional element number] [two-dimensional element number] [three-dimensional element number]. member name'. Registers and displays arrays when the structure contains member labels of arrays. Registers all elements/all members when the whole structured array type labels are registered.	Array[0].AAA
Nested function block* ¹	Registers and displays as 'instance name.label name in function block.label in nested function block'. Registers and displays structures when the nest function block contains structured labels. Registers all labels in the instance when the whole instances (nested function blocks) are registered.	FB_01.Label1. Label01

*1 : The following data types can be specified.

Bit, word (signed), word (unsigned)/16-bit string, double word (signed), double word (unsigned)/32-bit string, single-precision real, double-precision real, timer, counter, retentive timer

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15.2.7 Precautions when performing sampling trace

This section explains the precautions when performing the sampling trace.

- When files for both local device and trace data exist in standard RAM

Perform the following operation to change the local device when the files for both the local device and trace data exist in the standard RAM.

If the following operation is not performed, the files for the trace data may be deleted.

Operation

1. Select [Debug] ⇒ [Sampling Trace] ⇒ [Upload from PLC].
Read the file for trace data from the standard RAM.
2. Change the settings for the local device, and write the changes to the programmable controller CPU.
3. Select [Debug] ⇒ [Sampling Trace] ⇒ [Download to PLC].
Write the file for the trace data, which was read in the procedure 1, to the standard RAM.

15.2.8 Compatibility with sampling trace data in GX Developer

The sampling trace data which are saved by "Trace settings file operation" using GX Developer cannot be read in GX Works2.

The sampling trace data which are set in GX Works2 can not be saved as the format that can be read in GX Developer.

Perform the following operation when utilizing the sampling trace data.

- Utilizing GX Developer sampling trace data in GX works2

Operation

1. Write the sampling trace data, which are set in GX Developer, to the programmable controller CPU.
Perform the "Write to PLC" function of "Trace settings PLC operation" in GX Developer.
2. Read the sampling trace data from the programmable controller CPU in GX Works2.
Select [Debug] ⇒ [Sampling Trace] ⇒ [Upload from PLC] in GX Works2.

- Utilizing GX Works2 sampling trace data in GX Developer

Operation

1. Write the sampling trace data, which are set in GX Works2, to the programmable controller CPU.
Select [Debug] ⇒ [Sampling Trace] ⇒ [Download to PLC] in GX Works2.
2. Read the sampling trace data from the programmable controller CPU in GX Developer.
Perform the "Read from PLC" function of "Trace settings PLC operation" in GX Developer.

15.3 Debugging Programs Offline



This section explains the method for debugging a sequence program offline without connecting to the programmable controller CPU by using the simulation function. This function is useful to test programs before operating them actually on the programmable controller CPU. For precautions and restrictions on the simulation function, refer to Appendix 2.

■ Safety and handling precautions of the simulation function

The following explains precautions on safety and handling of the simulation function.

- 1) The simulation function simulates the actual programmable controller CPU to debug a sequence program. However, this function does not guarantee the operation of the debugged sequence program.
- 2) The simulation function uses the memory for simulation to input and output data to/from the I/O module and intelligent function module. Some instructions/functions and device memory are not supported. Therefore, the operation results obtained with the virtual programmable controller may differ from those obtained using the actual programmable controller CPU.

Point

After debugging programs using the simulation function, those programs must be debugged online before operating them actually on the programmable controller CPU.

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15.3.1 Starting simulation

The following explains the method for starting simulation.

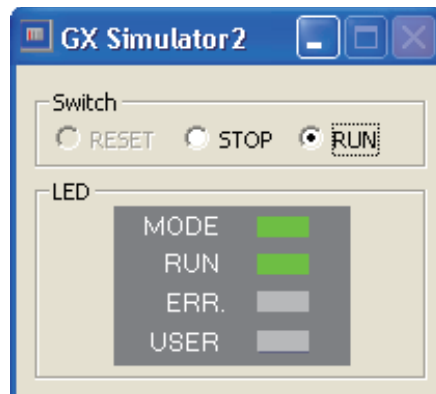
Operating procedure

- Select [Debug] ⇒ [Start/Stop Simulation].

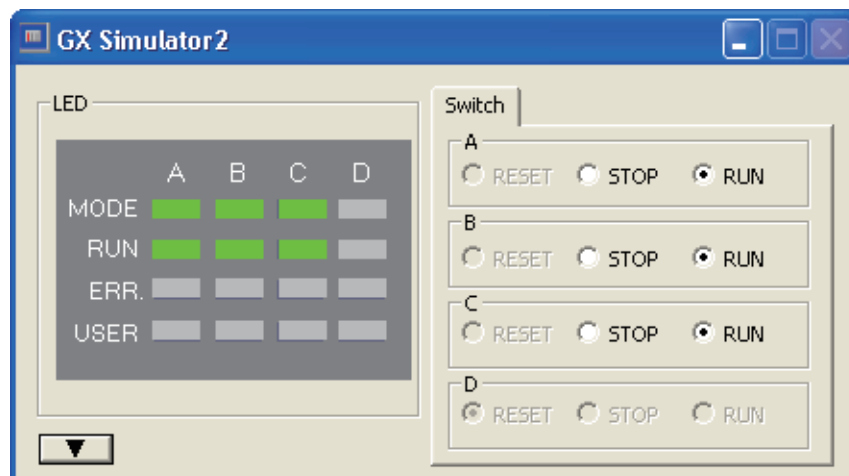
The GX Simulator2 screen is displayed, and the simulation starts.

To end the simulation function, select [Debug] ⇒ [Start/Stop Simulation] again.

<Simulation using one GX Works2>



<Simulation using multiple GX Works2>



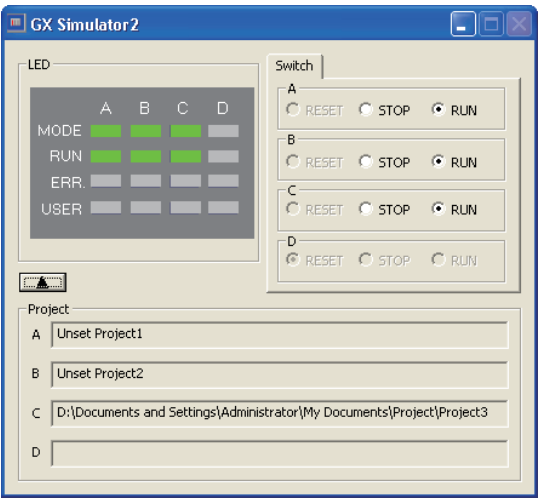
Display contents

Item	Description
Switch	Displays the operating status of the virtual programmable controller.
RESET	Select to switch the operating status of the virtual programmable controller.
STOP	
RUN	
LED	Displays the operating status of the virtual programmable controller. For the operating status error, the icon on the upper left corner of the screen is displayed in red.

Screen button

-   buttons

Switches between display/hide of all project names during the simulation.



Point

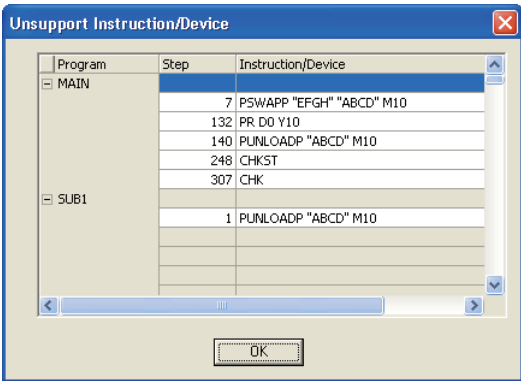
- **Simulations of multiple projects**
The maximum of 4 projects can be simulated simultaneously.
- **Precautions when changing project names**
If a project name is changed during the simulation, the project name on the GX Simulator2 screen is not changed. To display the changed project name on the GX Simulator2 screen, exit the simulation, and then start the simulation again.

15.3.2 Checking unsupported instructions/devices

The following explains the method for displaying a list of the instructions and devices used in the program and not supported for the simulation function.

Screen display

Select [Debug] ⇒ [Show Restricted Instructions].



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[illegible]



16 OPERATING PROGRAMMABLE CONTROLLER CPU

This chapter explains the methods for changing the execution status and setting the clock of the programmable controller CPU from GX Works2.

16.1	Remote Operation of Programmable Controller CPU	16-2
16.2	Formatting Programmable Controller CPU Memory	16-4
16.3	Clearing Programmable Controller Memory	16-6
16.4	Arranging Programmable Controller Memory	16-7
16.5	Setting Clock in Programmable Controller CPU	16-8

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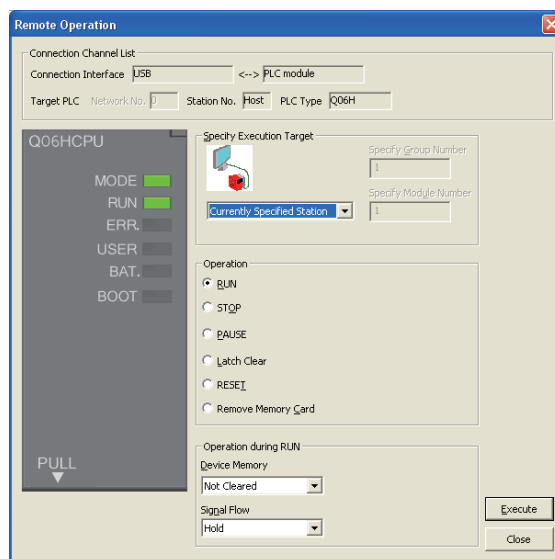
16.1 Remote Operation of Programmable Controller CPU



This section explains the method for switching the RUN/STOP status of the programmable controller CPU and allowing the memory card removal from GX Works2.

Screen display

Select [Online] ⇒ [Start/Stop PLC].



Operating procedure

1. Set the items on the screen.

Item	Description
Connection Channel List	Displays the information of the set connection target.
Specify Execution Target	Set the target station of remote operation.
Currently Specified Station	Select this to perform remote operation only to the station specified as connection target.
All Stations	Select this to perform remote operation to all stations in the network including the station currently set as the connection target station. Set a target module (No. 1 to No. 4) on the network module mounted to "Currently Specified Station" to "Specify Module Number".
Specified Group	Select this to perform remote operation to the station currently set as the connection target station and each station of the specified group on the specified network. Set a target module (No. 1 to No. 4) on the network module mounted to "Currently Specified Station" to "Specify Module Number" and set a group number.
Operation	Select the operation details.
RUN	Select this to switch the operating status of the programmable controller CPU.
STOP	
PAUSE	
Latch Clear	
RESET	
Remove Memory Card	Select this to remove the memory card while the programmable controller CPU is ON.
Operation during RUN	Set the status of the device memory and signal flow when the programmable controller CPU is switched to RUN.
Device Memory	Select whether to clear the device memory.
Signal Flow	Select whether to retain the signal flow.

2. Click the button.

The operating status of the programmable controller CPU is changed.

Point

● Remote operation and RUN/STOP switch of the QCPU

When operation to the programmable controller CPU differs among controls by the remote operation, RUN/STOP switch, and remote RUN/PAUSE contact, the programmable controller CPU operates according to the priority shown below:

Operation to the programmable controller CPU	Priority
STOP	1
PAUSE	2
RUN	3

The following table shows the operating status after RUN/STOP switching on the programmable controller CPU or remote RUN/PAUSE contact operation.

		Programmable controller CPU switch		Remote RUN/STOP contact is ON. (The programmable controller CPU is in STOP.)
		RUN	STOP	
Remote operation	RUN	RUN	STOP	STOP
	STOP	STOP	STOP	STOP
	PAUSE	PAUSE	STOP	STOP
	RESET*1	Inoperable*2	RESET	RESET
	Latch clear	Inoperable*2	Latch clear	Latch clear

*1 : The remote reset must be set enabled in the <<PLC System>> tab of PLC parameter.

*2 : The operation is possible when the programmable controller CPU is switched to STOP by remote operation.

● Precautions on removing a memory card

Turn OFF SM605 to allow the memory card removal.

If the memory card is removed when not allowed, the programmable controller CPU enters error status.

9

SETTING DEVICE
COMMENTS

10

SEARCH/REPLACE

11

SETTING PROGRAMMABLE
CONTROLLER CPU
CONNECTION TARGET

12

WRITING/READING
DATA

13

PROTECTING
PROGRAMMABLE
CONTROLLER CPU DATA

14

MONITORING

15

DEBUGGING
PROGRAMS

16

OPERATING
PROGRAMMABLE
CONTROLLER CPU

16.2 Formatting Programmable Controller CPU Memory



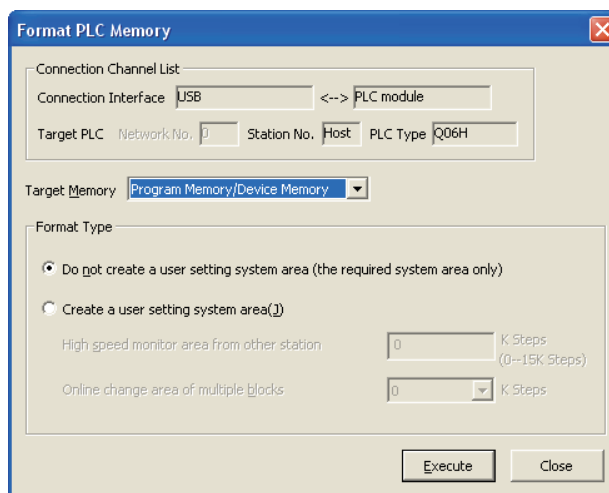
This section explains the method for formatting the programmable controller CPU memory or the memory card.

The function is used when using the programmable controller CPU and the memory card for the first time or clearing all data stored in them.

However, the Flash card cannot be formatted using this function. (Flash cards do not require formatting.)

Screen display

Select [Online] ⇒ [PLC Memory Operation] ⇒ [Format PLC Memory].



Operating procedure

1. Set the items on the screen.

Item	Description
Connection Channel List	Displays the information of the set connection target.
Target Memory	Set the memory to be formatted.
Format Type	Select the format type.
Do not create a user setting system area (the necessary system area only)	Select this to create the necessary system area only.
Create a user setting system area	Select this to create the necessary system area, the area for high-speed monitoring from another station, and the area for enabling Online program change of multiple blocks.

2. Click the button.

The target memory is formatted.

Format types

The system area is an area created in the programmable controller CPU memory. The system area consists of the 'Necessary system area' automatically created upon formatting the programmable controller CPU memory and 'User setting system area' created by the user.

In the necessary system area, data such as local devices are stored.

The user setting system areas are set for the following purposes:

- Area for enabling high-speed monitoring from another station

The area is set to accelerate monitoring from peripheral such as GX Works2 connected to serial communication module or other communication module or others.

Change the capacity to be set depending on the number of device points (capacity) to be monitored through a serial communication module or others and the volume of other user data to be stored in the program memory.

- Area for enabling Online program change of multiple blocks

This area is set to enable Online program change of multiple locations (multiple blocks) simultaneously.

The following table shows the restrictions on Online program change of multiple blocks according to the capacity.

This setting is not required for Universal model QCPU since 4K steps are reserved automatically except for the program memory.

Table 16.2-1

Description	Secured system area capacity for Online program change of multiple blocks		
	0k steps	2k steps	4k steps
The number of blocks for simultaneous writing	Online program change of multiple blocks is not possible.	Max. 32 blocks	Max. 64 blocks
The number of steps per block for writing		Max. 512 steps	Max. 1024 steps
The number of used pointers (P, I) per block for writing		Max. 50	Max. 100

Point

- **Device memory**

The device memory values cannot be cleared with the Memory format function.

To clear the device memory values, execute [Online] ⇒ [PLC Memory Operation] ⇒ [Format PLC Memory].

(☞ Section 16.3)

- **Formatting a memory card**

For an SRAM card or an ATA card to be used in the programmable controller CPU, use the GX Works2 format function ([Online] ⇒ [PLC Memory Operation] ⇒ [Format PLC Memory]).

If it is formatted using other functions such as the Windows®, the cards may not be usable when mounted to programmable controller CPUs.

- **Memory in which user setting system areas can be created**

The areas can be created only in the program memory.

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SETTING DEVICE
COMMENTS

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SETTING PROGRAMMABLE
CONTROLLER CPU
CONNECTION TARGET

12

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DATA

13

PROTECTING
PROGRAMMABLE
CONTROLLER CPU DATA

14

MONITORING

15

DEBUGGING
PROGRAMS

16

OPERATING
PROGRAMMABLE
CONTROLLER CPU

16.3 Clearing Programmable Controller Memory



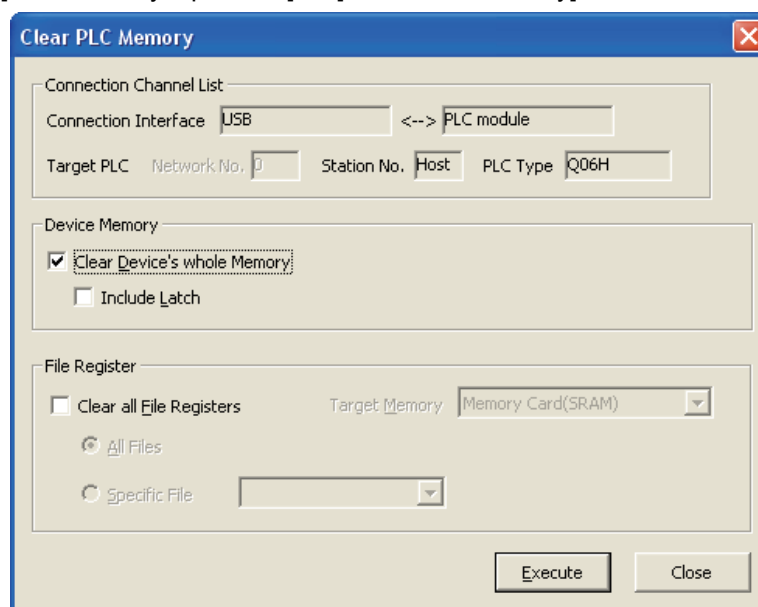
This section explains the method for initializing device memory data in the programmable controller CPU and file registers stored in the memory card and setting them to '0'.

■ Q series

The following explains the method for initializing device memory data in the programmable controller CPU and file registers stored in the memory card and setting them to '0'. However, the memory clear function is not available for standard ROM/Flash cards.

Screen display

Select [Online] ⇒ [PLC Memory Operation] ⇒ [Clear PLC Memory].



Operating procedure

1. Set the items on the screen.

Item	Description
Connection Channel List	Displays the information of the set connection target.
Clear Device's whole Memory	Select this to clear the device memory data.
Include Latch	Select this to clear device data in the latch range also. The device data for which latch clear is disabled is also cleared.
Clear all File Registers	Select this to clear the file register data.
Target Memory	Select the memory in which file registers are stored.
All Files	Select this to clear all file registers in the target memory.
Specific File	Select this to clear the selected file register memory. Select a file name of the file register.

2. Click the button.

The target memory data is cleared.

16.4 Arranging Programmable Controller Memory

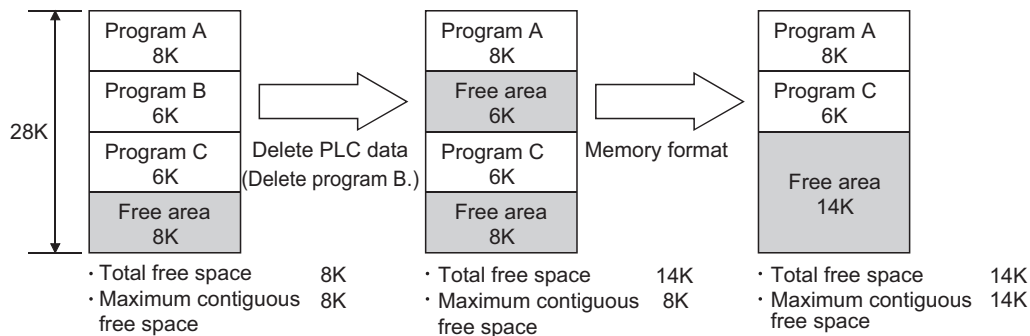


This section explains the method for securing contiguous free memory areas by arranging the data stored in program memory/standard RAM of the programmable controller CPU or memory card.

Use this function after operations such as Delete PLC Data.

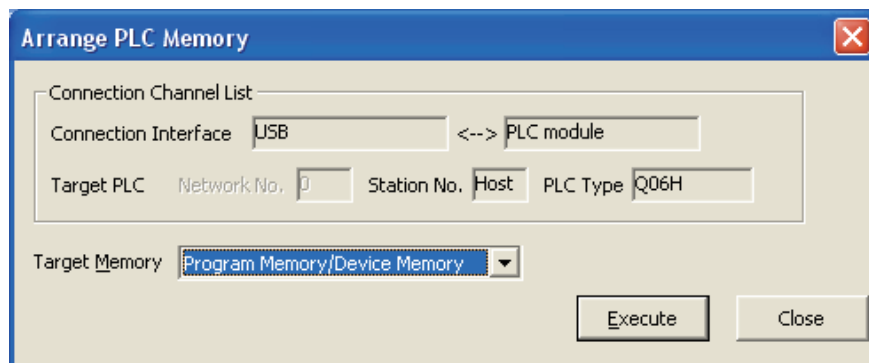
However, the Memory arrangement function is not available for standard ROM/Flash cards.

The following figure shows how consecutive free areas are created with the Memory arrangement function after Delete PLC Data.



Screen display

Select [Online] ⇒ [PLC Memory Operation] ⇒ [Arrange PLC Memory].



Operating procedure

1. Set the items on the screen.

Item	Description
Connection Channel List	Displays the information of the set connection target.
Target Memory	Set the memory to be arranged.

2. Click the button.

The target memory is arranged.

16.5 Setting Clock in Programmable Controller CPU

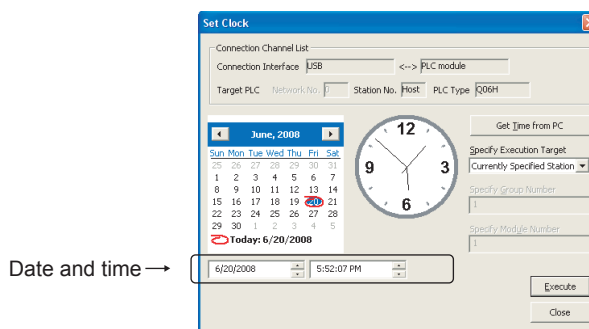
QCPU



This section explains the method for setting the clock in a programmable controller CPU.

Screen display

Select [Online] ⇒ [Set Clock].



Operating procedure

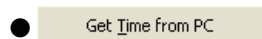
1. Set the items on the screen.

Item	Description
Date and time	Set the date and time.
Specify Execution Target	Set the target station whose clock is to be set.
Currently Specified Station	Select this to set the clock only to the station specified as connection target.
All Stations	Select this to set the clock of the currently specified station and all stations in the network. Set a target module (No. 1 to No. 4) on the network module mounted to "Currently Specified Station" to "Specify Module Number".
Specified Group	Select this to set the clock of the currently specified station and each station of the specific group on the network. Set a target module (No. 1 to No. 4) on the network module mounted to "Currently Specified Station" to "Specify Module Number" and set a group number.

2. Click the **Execute** button.

The programmable controller CPU clock is set.

Screen button



Sets the time display of personal computer as the 'date and time'.

Point

● Clock setting for the Q series

A clock for the Q series can be set regardless of the ON/OFF status of the clock setting device 'SM1028'. Note that the ON/OFF status of 'SM1028' does not change upon clock setting.

Restrictions

● Precautions on clock setting

Note that a time difference occurs by transfer time.



17 **DIAGNOSING PROGRAMMABLE CONTROLLER STATUS**

This chapter explains the methods for displaying system status and error codes of the programmable controller CPU.

17.1	Diagnosing Programmable Controller CPU	17-2
17.2	Diagnosing MELSECNET	17-6
17.3	Diagnosing CC-Link IE Controller Network	17-16
17.4	Diagnosing CC-Link and CC-Link/LT.....	17-25
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17	DIAGNOSING PROGRAMMABLE CONTROLLER STATUS
18	PRINTING
19	SETTING OPTIONS
A	APPENDIX
I	INDEX

17.1 Diagnosing Programmable Controller CPU

QCPU



This section explains the methods for displaying system status and error codes of the programmable controller CPU.

17.1.1 Diagnosing QCPU (Q mode)

This section explains the method for displaying the programmable controller CPU status.

Screen display

Select [Diagnostics] ⇒ [PLC Diagnostics].

The screenshot shows the 'PLC Diagnostics' window. On the left, there is a 'Monitor Status' section with a 'Monitoring' icon. Below it, a vertical bar displays the CPU status: 'MODE' (green), 'RUN' (red), 'STOP' (yellow), 'USER' (blue), 'BAT' (yellow), and 'BODY' (blue). A label 'CPU operating status' points to this bar. Below the status bar, a label 'Figure of programmable controller CPU' points to a small image of the CPU module. The main area of the window displays 'Error Information' for 'PLC No. 1'. It includes a table for 'Current Error' and a table for 'Error History'. A 'Status Icon Legend' on the right indicates: Major Error (red circle), Moderate Error (yellow triangle), User-Specified (blue triangle), and Minor Error (green triangle). Buttons for 'Error Jump', 'Error Clear', 'Error Help', 'Error History', 'Clear History', and 'Status Icon Legend' are present. At the bottom, there are buttons for 'Stop Monitor', 'Create CSV File', and 'Close'.

Model Name	Operation	Switch
1 Q06UDHCPU	STOP	RUN
2 Q06UDHCPU	STOP	RUN
3 Uninstalled/Blank		
4 Uninstalled/Blank		

PLC	Status	No.	Current Error(Abbreviation)	Current Error(Detail)	Year/Month/Day	Time
1	▲	7011	MULTI EXE. ERROR	MULTI EXE. ERROR	2000- 4-18	7:29:12
2	▲	7011	MULTI EXE. ERROR	MULTI EXE. ERROR	2000- 4-18	7:29:11
3						
4						

Status	No.	Error Message(Abbreviation)	Error Message(Detail)	Year/Month/Day	Time
▲	3100	LINK PARA. ERROR	LINK PARA. ERROR	2000- 4-18	7:28:27
▲	7030	CPU LAY ERROR	CPU LAY ERROR	2000- 4-18	7:28:57
▲	7011	MULTI EXE. ERROR	MULTI EXE. ERROR	2000- 4-18	7:29:12

Status Icon Legend:

- Major Error (red circle)
- Moderate Error (yellow triangle)
- User-Specified (blue triangle)
- Minor Error (green triangle)

Display contents

Item	Description
Monitor Status	Displays the current monitor status.
Connection Target Module	Displays the connection route which has been set.
CPU operating status	● Single CPU system Displays the operating status and switch status of the programmable controller CPU. ● Multiple CPU system Displays the operating status and the switch status of CPU No. 1 to No. 4. • "Uninstallable/Blank" is displayed for a slot with no module mounted.
Figure of programmable controller CPU	Performs online operations of the programmable controller CPU. (For details, ■ Online operations.)
Error Information	Select this to display the current error information of the programmable controller CPU.
PLC Status Information	Select this to display the status information of the programmable controller CPU.
Error History	Displays the latest error history by clicking the button.
Status Icon Legend	Displays the status icons on the screen. (■ Error icons)

Screen button

-

Displays the illustration of the connection route which has been set.

- /

Jumps the screen display to the sequence program step number corresponding to the selected error item/error history item.

However, jump is not applicable in the following cases.

- The error is not in a program.
- The error step information does not exist.
- The information of the program number and SFC step number of SFC block or the transition number does not exist.
- The label program is not compiled.

-

Clears the current error information.

- /

Displays the explanation screen corresponding to the error number of the selected error item/error history item.

-

Displays the latest error history.

-

Saves the currently displayed error history in a file in the CSV file format.

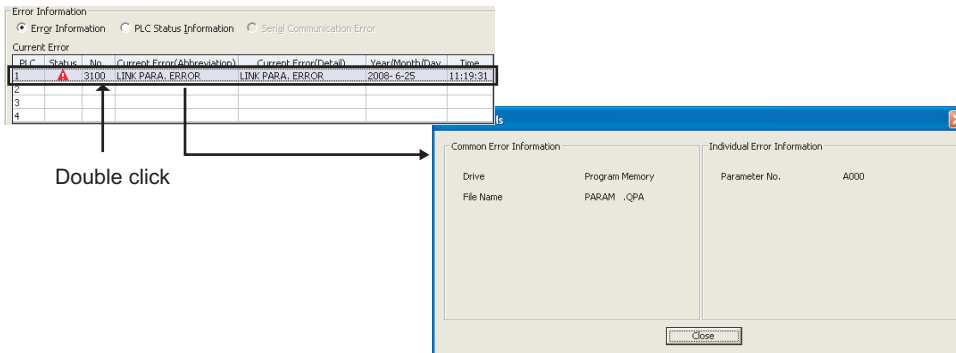
Point

● Displaying the Error Details screen

The following Error Details screen is displayed by double clicking the Present Error column or the error item in the Error History display column.

SD5 to 15 (Common Error Information) and SD16 to 26 (Individual Error Information) of the programmable controller CPU are displayed on the Error Details screen.

For details, refer to the manual of the programmable controller CPU module.



■ Error icons

The following table shows the details of the error information icons of the programmable controller CPU.

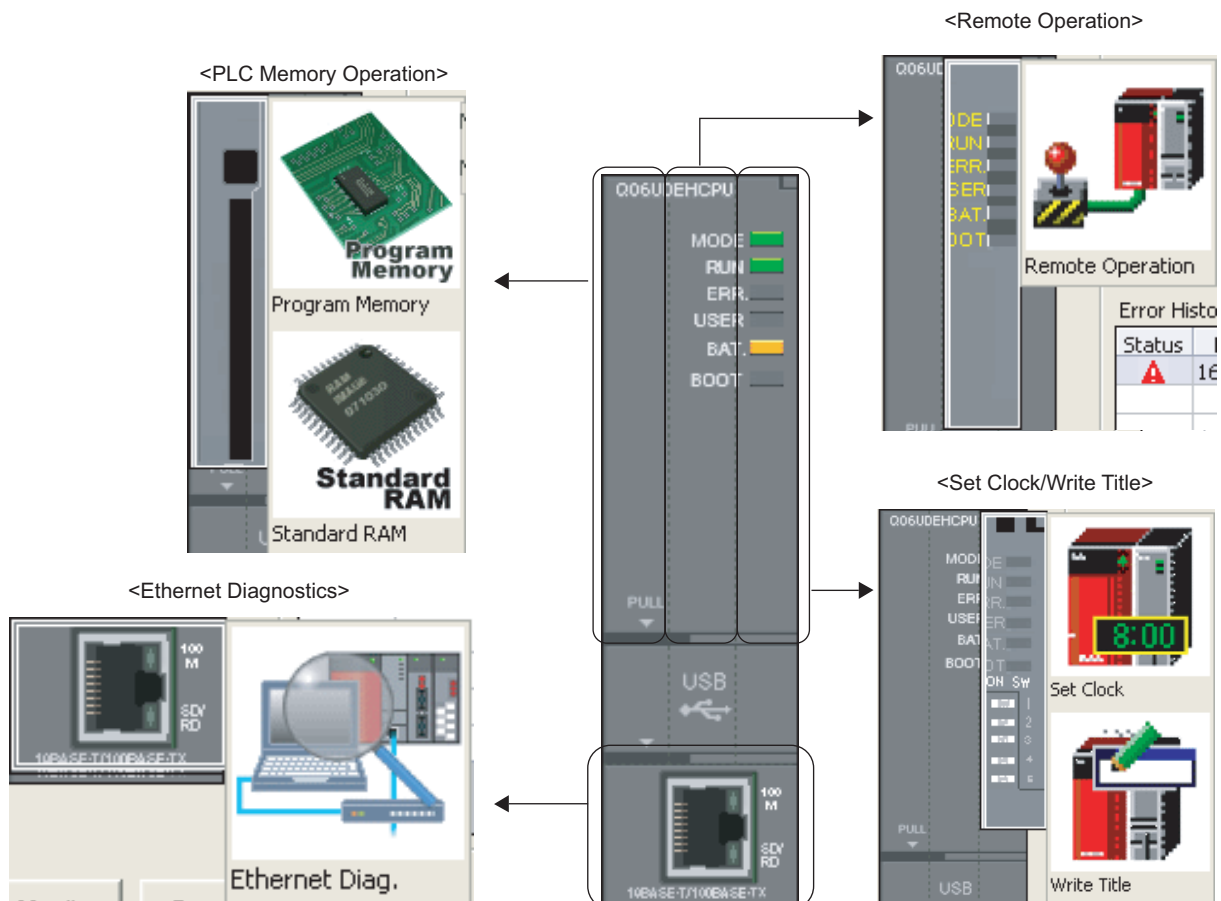
Icon	Programmable controller CPU status
	Serious error
	Moderate error
	User specified error
	Minor error

Online operations

The PLC Memory Operation function and the Remote Operation function can be executed from the figure of programmable controller CPU.

When the cursor is moved onto the figure of programmable controller CPU, the function menu is expanded. Click the figure of programmable controller CPU to display the items to be set.

Screen display



Display contents

Item	Description
PLC Memory Operation	Displays the screens to execute the function such as Format PLC Memory function (☞ Section 16.2), Clear PLC Memory function (☞ Section 16.3), Arrange PLC Memory function (☞ Section 16.4).
Remote Operation	Displays the <u>Remote Operation</u> screen. (☞ Section 16.1)
Set Clock/Write Title	Displays the <u>Set Clock</u> screen (☞ Section 16.5) and the <u>Write Title</u> screen (☞ Section 12.1).
Ethernet Diagnostics	For Built-in Ethernet port QCPU, when the cursor is moved onto the connectors in the figure of programmable controller CPU, the <u>Ethernet Diagnostics</u> screen is displayed. (☞ Section 17.5)

17.2 Diagnosing MELSECNET

QCPU

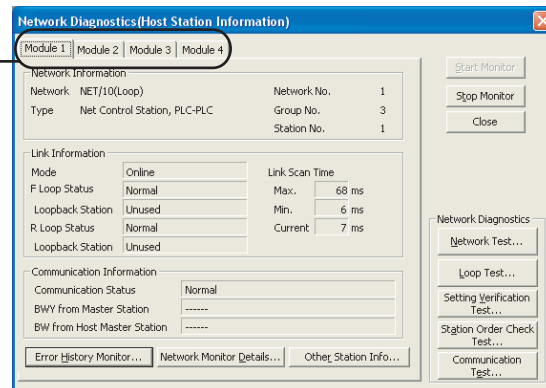


This section explains a method for checking the MELSECNET/10(H) status connected to the selected module.

Screen display

Select [Diagnostics] ⇒ [MELSECNET Diagnostics].

Link module
selection tab



Display contents

Item	Description
Link module selection tab	Switches the MELSECNET diagnostics result display screen for each link modules from 1 to 4. The information whether a link module is mounted or not is acquired from the mounted status.
Network Information	Displays the network information of the selected module.
Link Information	Displays the network status.
Communication Information	Displays the communication status of the target network.

Screen button

- (Section 17.2.1)
- (Section 17.2.2)
- (Section 17.2.3)
- (Section 17.2.4)
- (Section 17.2.5)
- (Section 17.2.6)
- (Section 17.2.7)
- (Section 17.2.8)

Point

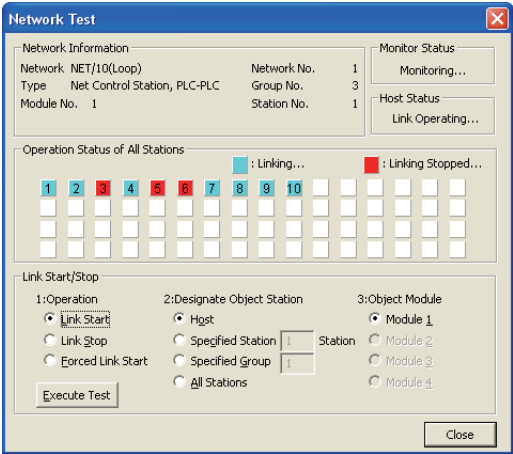
- **Network to be diagnosed**
To change a network to be diagnosed, change the target station on the Transfer Setup screen.
- **Another station is set as connection target.**
Test functions such as network test cannot be executed.

17.2.1 Network test

This section explains a method for starting/stopping a link to the host station, specified station, and all stations in MELSECNET/10(H).

Screen display

Select [Diagnostics] ⇒ [MELSECNET Diagnostics] ⇒ Network Test...



Display contents

Item	Description
Network Information	Displays the network information on the host station of the selected module.
Monitor Status	Displays the current monitor status.
Host Status	Displays the operating status of the host station for the selected module.
Operation Status of All Stations	Displays the link status of all stations on the tested network.

Operating procedure

1. Set the items on the screen.

Item	Description
Link Start/Stop	Set the test contents to be executed.
Operation	Link Start - Select this to start the station that was stopped by the host station. - The station that was stopped by another station cannot be started.
	Link Stop Select this to stop a station from the host/another station.
	Forced Link Start - Select this to start a station regardless of whether it was stopped by the host station or another station. However, forced start in units of stations is not possible while all stations are stopped. - Whether the function can be executed from a personal computer or not can be checked by monitoring SB and SW, and whether a station was started/stopped by host station or not can be checked by monitoring SW0000 to SW0004 and SB0000 to SB0003. - This function cannot be executed when the MELSECNET/10(H) board is used. - This function cannot be executed via the A series-compatible E71/QE71 module.
Designate Object Station	Specifies the network test target station.
Object Module	Select the module for which network test is executed.

2. Click the Execute Test button.

The network test is executed according to the set contents.

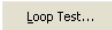
Point

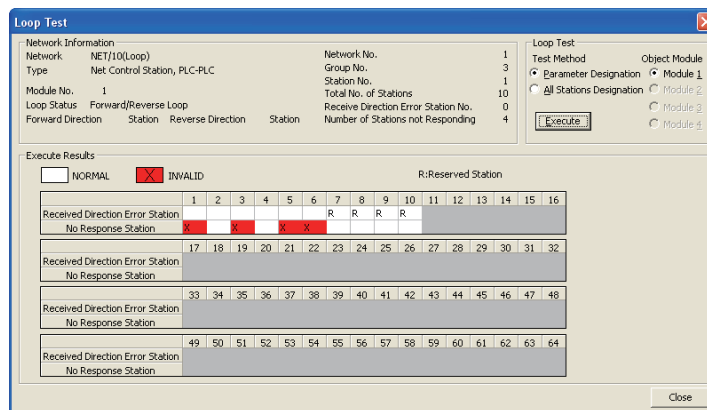
- Another station is set in connection target setting.
If the connection target is set to another station, the network test function cannot be executed.

17.2.2 Loop test

This section explains a method for checking the loop status of MELSECNET/10(H).

Screen display

Select [Diagnostics] ⇒ [MELSECNET Diagnostics] ⇒ .



Display contents

Item	Description
Network Information	Displays the network information on the host station of the selected module.
Execute Results	Displays the number of stations and the result (normal/invalid, reserved station: R) of loop test.

Operating procedure

1. Set the items on the screen.

Item	Description
Loop Test	Set the test contents to be executed.
Test Method	Parameter Designation Select this to test the station specified by parameter (excluding reserved stations). All stations are tested, if a parameter is not set.
	All Stations Designation Select this to test all stations.
Object Module	Select the module for which loop test is executed.

2. Click the button.

The loop test is executed according to the set contents.

Point

● Another station is set in connection target setting.

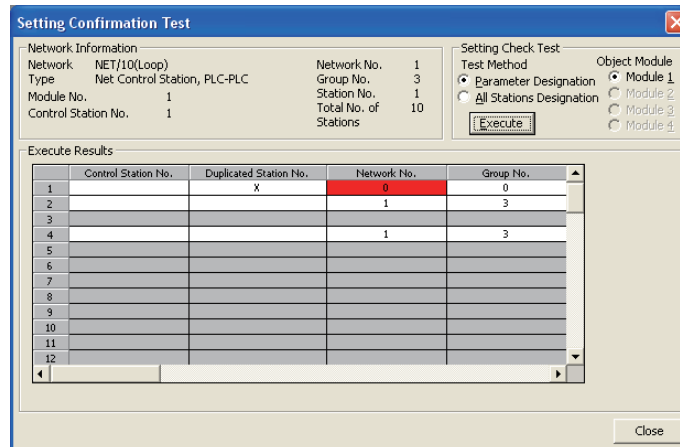
If the connection target is set to another station, the loop test function cannot be executed.

17.2.3 Setting verification test

This section explains a method for checking the status of the station number, network number, and group number set for each station.

Screen display

Select [Diagnostics] ⇒ [MELSECNET Diagnostics] ⇒ .



Display contents

Item	Description
Network Information	Displays the network information on the host station of the selected module.
Execute Results	Displays the test result.
Station No.	Displays the station number of the stations for which the setting verification test was executed. Up to 64 stations are displayed.
Control Station No.	Displays "○" symbol at the target station if control station is set at two or more places.
Duplicated Station No.	Displays "○" symbol at the target station if the same station number is set at two or more places.
Network No.	Displays the network number of the stations for which the setting verification test was executed. If the network number differs from that of the host station, it is identified by red.
Group No.	Displays the group number of the stations for which the setting verification test was executed. For the remote I/O network, the station in error is blank.
Reserved Station	Displays "○" symbol for the station reserved by parameter setting. (When "Parameter Designation" is set in the test execution method.)
Error Station	Displays "○" symbol for the station when it is reserved by parameter setting or if a module is faulty in all station specification.
Network Type Error Station	Displays "○" symbol for the station where the parameter setting and the actual connection type disagree.
Duplex R Sub M Station Duplication	Displays "○" symbol for the station where multiple sub-master stations exist on the same network.
Parallel R Sub M Station Duplication	Displays "○" symbol for the station where multiple sub-master stations exist on the same network.

Operating procedure

1. Set the items on the screen.

Item		Description
Setting Check Test		Set the test contents to be executed.
Test Method	Parameter Designation	Select this to test the station specified by parameter (excluding reserved stations). All stations are tested, if a parameter is not set.
	All Stations Designation	Select this to test all stations.
Object Module		Select the module for which setting verification test is executed.

2. Click the button.

The setting verification test is executed according to the set contents.

Point

- **Precautions on executing the test**

The test cannot be executed to multiple stations simultaneously.

If executed, cyclic transmission stops.

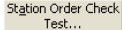
- **Another station is set in connection target setting.**

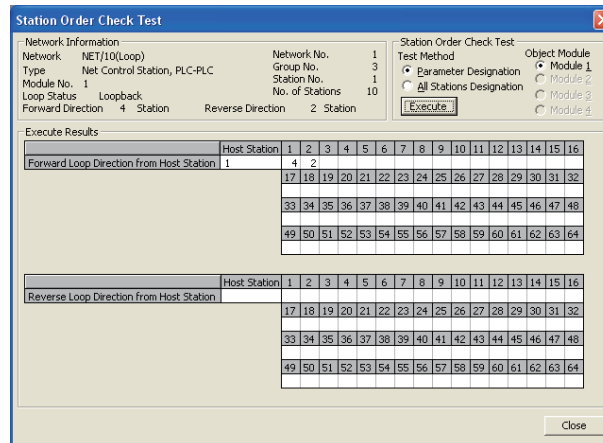
If the connection target is set to another station, the setting verification test cannot be executed.

17.2.4 Station order check test

This section explains a method for checking the station order in the forward/reverse loop on MELSECNET/10(H).

Screen display

Select [Diagnostics] ⇒ [MELSECNET Diagnostics] ⇒ .



Display contents

Item	Description
Network Information	Displays the network information on the host station of the selected module. The loop status indicates the forward/reverse loop, forward loop, reverse loop or loopback status. "No. of Stations" indicates the number of stations that have been checked, including the reserved station.
Execute Results	Displays the station number in "Forward Loop Direction from Host Station" and "Reverse Loop Destination from Host Station". In the loopback status, the test is executed only in "Forward Loop Direction from Host Station". The number for the reserved station is not displayed.

Operating procedure

1. Set the items on the screen.

Item	Description
Station Order Check Test	Set the test contents to be executed.
Test Method	Parameter Designation Select this to test the station specified by parameter (excluding reserved stations). All stations are tested, if a parameter is not set.
	All Stations Designation Select this to test all stations.
Object Module	Select the module for which station order check test is executed.

2. Click the button.

The station order check test is executed according to the set contents.

Point

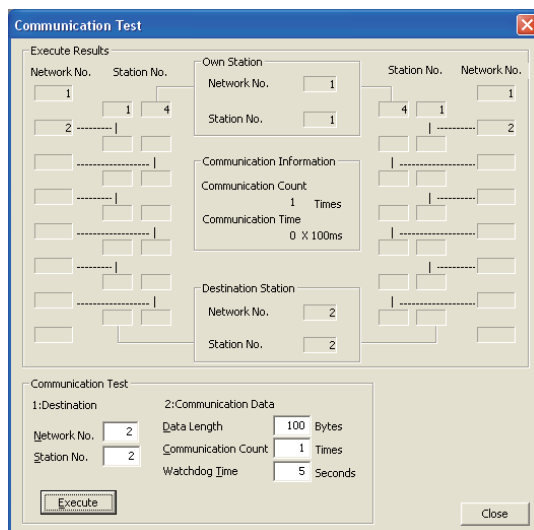
- **Precautions on executing the test**
The test cannot be executed to multiple stations simultaneously.
If executed, cyclic transmission stops.
- **Another station is set in connection target setting.**
If the connection target is set to another station, the station order check test cannot be executed.

17.2.5 Communication test

This section explains a method for testing communications between networks on MELSECNET/10(H).

Screen display

Select [Diagnostics] ⇒ [MELSECNET Diagnostics] ⇒ .



Display contents

Item	Description
Execute Results	Displays the result of communication test executed between networks.

Operating procedure

1. Set the items on the screen.

Item	Description
Communication Test	Set the test contents to be executed.
Destination	Set the network number and station number.
Communication Data	Set the data length (1 to 900 bytes), number of communications (1 to 100 times), and monitoring time (1 to 100 seconds) to execute the test.

2. Click the button.

The communication test is executed according to the set contents.

Point

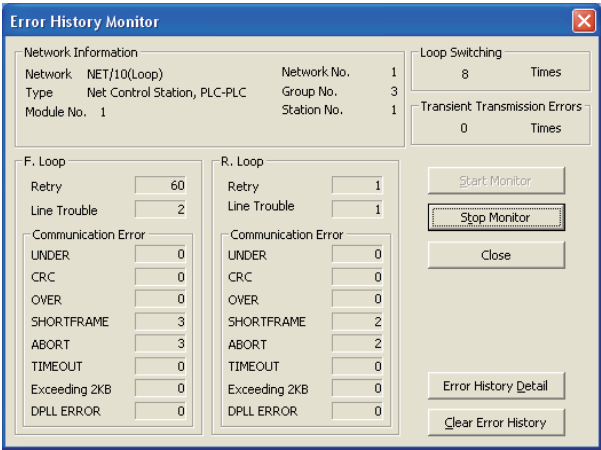
- **Another station is set in connection target setting.**
If the connection target is set to another station, the communication test cannot be executed.

17.2.6 Error history monitoring

This section explains a method for displaying the error history of MELSECNET/10(H).

Screen display

Select [Diagnostics] ⇒ [MELSECNET Diagnostics] ⇒ Error History Monitor...



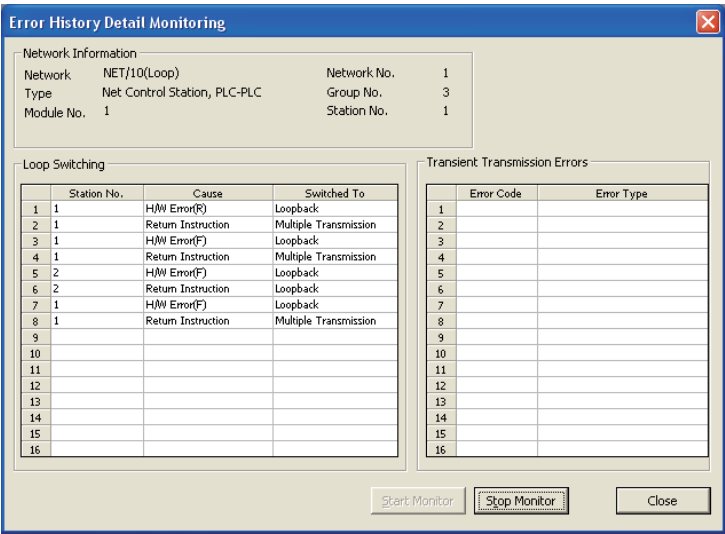
Display contents

Item	Description
Network Information	Displays the network information of the selected host station.
Loop Switching	Displays the number of times that a loop is switched.
Transient Transmission Errors	Displays the number of occurrences of transient transmission error.
F.Loop/R.Loop	Displays the items during monitoring.

Screen button

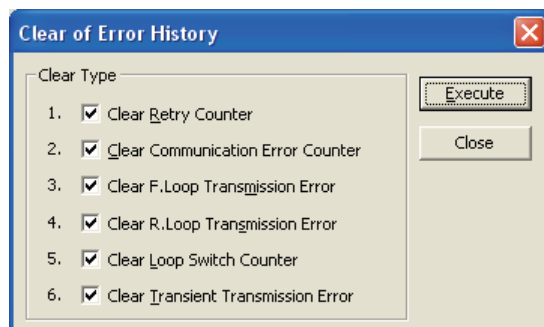
- Error History Detail

Displays the Error History Detail Monitoring screen that lists the details of loop switching and transient transmission error.



● **Clear Error History**

Displays the Clear of Error History screen. Select the items to be cleared and click the **Execute** button.

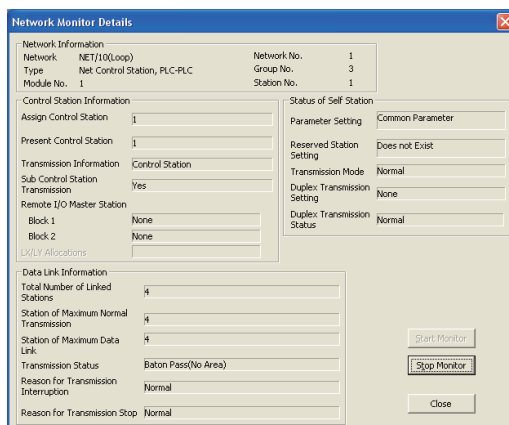


17.2.7 Network Monitor Details

This section explains the Network Monitor Details screen that displays the network line status of MELSECNET/10(H).

Screen display

Select [Diagnostics] ⇒ [MELSECNET Diagnostics] ⇒ **Network Monitor Details...**



Display contents

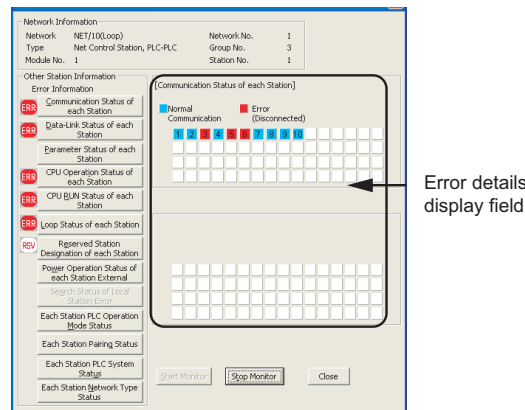
Item	Description
Network Information	Displays the network information of the selected host station.
Control Station Information	Displays the control station information. For the remote I/O master station, the information is displayed only for PLC to PLC network. LX/LY assignment is displayed only for the remote I/O network.
Data Link Information	Displays the data link information.
Status of Self Station	Displays the host station status. Parameter setting is displayed only for PLC to PLC network.

17.2.8 Monitoring other station information

This section explains a method for monitoring other station connected to MELSECNET/10(H).

Screen display

Select [Diagnostics] ⇒ [MELSECNET Diagnostics] ⇒ Other Station Info...



Display contents

Item	Description
Network Information	Displays the network information of the selected host station.
Other Station Information	Displays detail information in the error details display field when an item button is clicked. "ERR" is displayed in the error information display field if a faulty station or a stop station is detected. "RSV" is displayed in the error information display field if a reserved station exists. "PWR" is displayed in the error information display field if a power is supplied to a module with external power supply.
Error details display field	Displays the status of each station for the items selected in "Other Station Information".

The table below shows the items that can be selected in "Other Station Information" of QCPU (Q mode).

Table 17.2.8-1

	MELSECNET/10(H)					
	PLC to PLC network				Remote I/O network	
	Control station		Normal station		Master station	
	Loop	Bus	Loop	Bus	Loop	Bus
Communication Status of each Station	○	○	○	○	○	○
Data-Link Status of each Station	○	○	○	○	○	○
Parameter Status of each Station	○	○	×	×	○	○
CPU Operation Status of each Station	○	○	○	○	○	○
CPU RUN Status of each Station	○	○	○	○	×	×
Loop Status of each Station	○	×	○	×	○	×
Reserved Station Designation of each Station	○	○	○	○	○	○
Power Operation Status of each Station External	○	×	○	×	○	×
Search Status of Local Station Error	×	×	×	×	×	×
Each Station PLC Operation Mode Status ^{*1}	○	○	○	○	×	×
Each Station Pairing Status ^{*1}	○	○	○	○	×	×
Each Station PLC System Status ^{*1}	○	○	○	○	×	×
Each Station Network Type Status ^{*1}	○	○	○	○	×	×

○ Selection possible × Selection impossible (masked)

^{*1} : Available only for MELSECNET/H network modules

17.3 Diagnosing CC-Link IE Controller Network

This section explains the method for checking the CC-Link IE controller network status of a selected module.

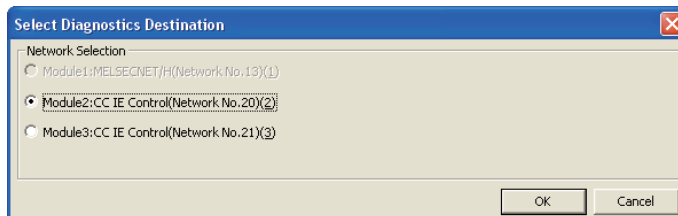
Point

- **When another station is set in connection target setting**
If the connection target is set to another station, the function cannot be executed.
- **Details of CC-Link IE controller network diagnostics**
Refer to the CC-Link IE Controller Network Reference Manual.

Selecting the diagnostics target

When two or more CC-Link IE controller network modules are connected to the connected station, the Select diagnostics destination screen as shown below is displayed before starting diagnostics.

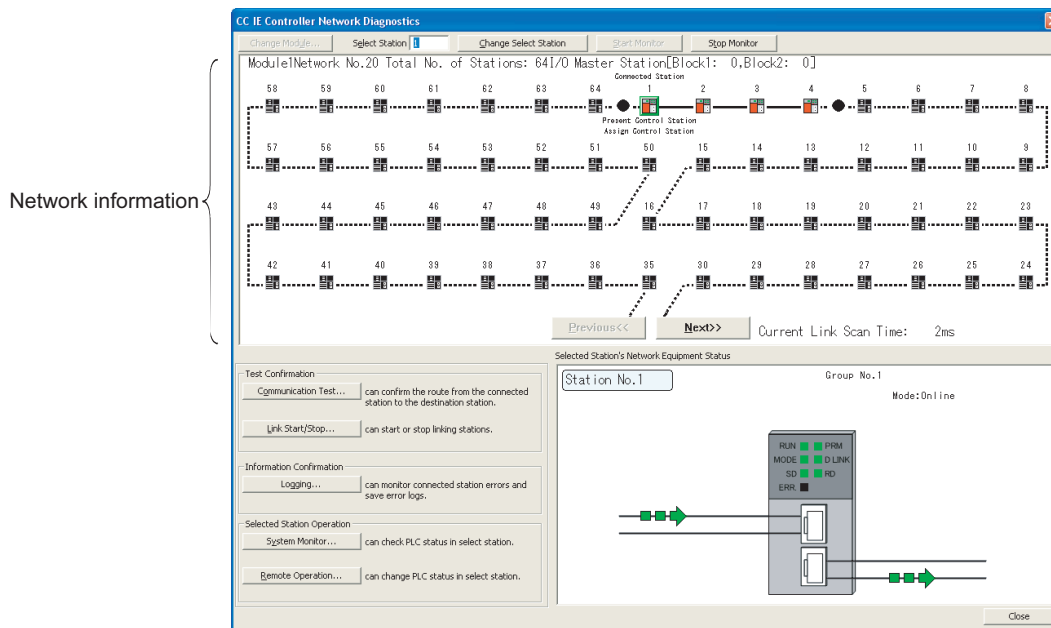
Select a network to be diagnosed and click the  button.



Diagnostics screen

Screen display

Select [Diagnostics] ⇒ [CC-Link IE Control Diagnostics].



Display contents

Item	Description																																			
Network information	Displays the network information of the selected module. The status is displayed by icons shown below.																																			
	<table><tr><th colspan="2">Icon</th><th rowspan="2">Station status</th></tr><tr><th>Module</th><th>Board</th></tr><tr><td></td><td></td><td>Normally operating station</td></tr><tr><td></td><td></td><td>Focusing (icon enclosed by dotted line)</td></tr><tr><td></td><td></td><td>Selected station</td></tr><tr><td></td><td></td><td>Error (cyclic transmission stopped)</td></tr><tr><td></td><td></td><td>Warning (Although cyclic transmission is executed, an error occurred with a module and/or a cable)</td></tr><tr><td></td><td></td><td>Module whose shared group is different</td></tr><tr><td></td><td>-</td><td>Reserved station (gray)</td></tr><tr><td></td><td>-</td><td>Disconnected station (black)</td></tr><tr><td></td><td>-</td><td>Current connected station, specified by Transfer setup</td></tr><tr><td></td><td>-</td><td>Number unspecified station (Although "Specify Station No. by Program" is selected in parameter (normal station only), a station number is not set in the program.)</td></tr></table>	Icon		Station status	Module	Board			Normally operating station			Focusing (icon enclosed by dotted line)			Selected station			Error (cyclic transmission stopped)			Warning (Although cyclic transmission is executed, an error occurred with a module and/or a cable)			Module whose shared group is different		-	Reserved station (gray)		-	Disconnected station (black)		-	Current connected station, specified by Transfer setup		-	Number unspecified station (Although "Specify Station No. by Program" is selected in parameter (normal station only), a station number is not set in the program.)
	Icon		Station status																																	
	Module	Board																																		
			Normally operating station																																	
			Focusing (icon enclosed by dotted line)																																	
			Selected station																																	
			Error (cyclic transmission stopped)																																	
			Warning (Although cyclic transmission is executed, an error occurred with a module and/or a cable)																																	
			Module whose shared group is different																																	
		-	Reserved station (gray)																																	
	-	Disconnected station (black)																																		
	-	Current connected station, specified by Transfer setup																																		
	-	Number unspecified station (Although "Specify Station No. by Program" is selected in parameter (normal station only), a station number is not set in the program.)																																		
	When an icon is clicked, the corresponding station is set as the selected station and details are displayed at "Selected Station's Network Equipment Status". Selected station can also be determined by moving the focus with right and left arrow keys and pressing the Space or Enter key. Double-click an icon and the <u>System Monitor</u> screen ( Section 17.6) of the station is displayed.																																			
Select station network device status display	Displays the status of the CC-Link IE controller network module in the station selected in the network information display field and the status of the connecting cable.																																			

Screen button

- **Change Module...**

Displays the Select Diagnostics Destination screen. On this screen, the diagnostic target module can be changed.

- **Change Select Station**

Click this button after entering a station number to the Select station entry field. Then, the selected station changes to the station of the entered station number. The status of the selected station is displayed in the Select station network device status display field.

- **Previous<< / Next>>**

Use these buttons when changing the screen if total number of stations is 61 or larger.

- **Communication Test...**

Displays the Communication Test screen. The screen is used to confirm the communication path from the connected station to the specified destination station. (☞ Section 17.3.1)

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● Link Start/Stop...

Displays the Link Start/Stop screen. The screen is used to start/stop data link for the specified station. (☞ Section 17.3.2)

● Logging...

Displays the Logging screen. This screen is used to monitor the communication path switch information and transient transmission error of the connected station. The monitor information can be saved in a file. (☞ Section 17.3.3)

● System Monitor...

Displays the System Monitor screen. This screen is used to confirm the system status of the selected station. (☞ Section 17.6)

● Remote Operation...

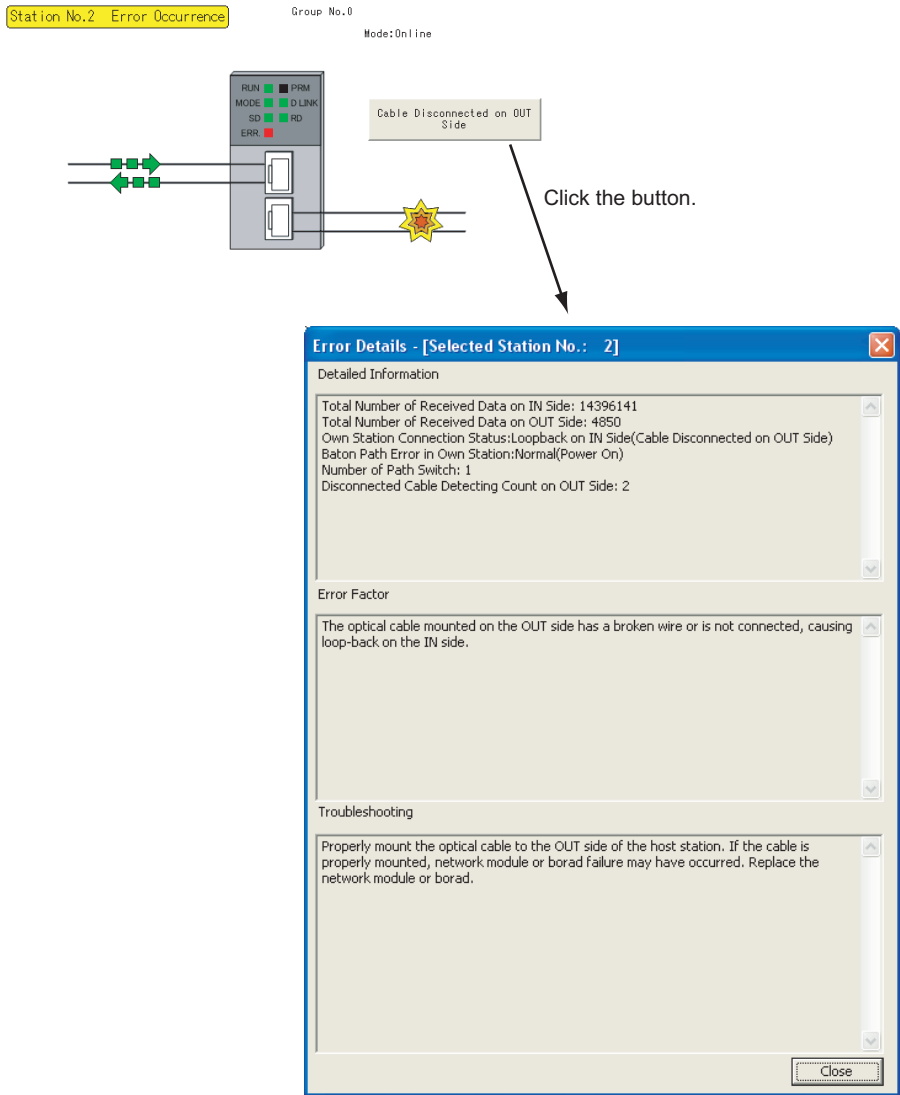
Displays the Remote Operation screen. This screen is used for remote operation of the programmable controller CPU of the selected station. (☞ Section 16.1)

Point

- **Connection target for executing CC-Link IE controller network diagnostics**
Communication test, link start/stop, and logging function are executable only when a connected station is selected.
- **CC-Link IE controller network interface board specified as the selected station**
When the selected station is the CC-Link IE controller network interface board, the System Monitor screen is not displayed even when the icon is double-clicked or the  button is clicked.
- **65 stations or more are set**
When 65 or a larger value is set for the total number of stations, and if the High Performance model QCPU is set as the connected station, selection of a station whose station number is 65 or more causes an error. However, this does not cause an error, if a cable is connected to the Universal model QCPU in multiple CPU configuration.
- **Monitoring other screens when performing CC-Link IE controller network diagnostics**
The monitoring stops if the CC-Link IE controller network diagnostics is performed while other screens are being monitored.

■ Select station network device status display at error occurrence

The following explains the display that is given if an error occurs with the CC-Link IE controller network module or in the connection cable. In this case, "Error Occurrence." is displayed in the Select station network device status display field as shown below. Also, the button and animated icon that indicate error contents are displayed at the error position. When a button is clicked, Detail information, Error factor, and Troubleshooting are displayed.



17.3.1 Communication test

This section explains the communication test that tests communications on CC-Link IE controller network.

Screen display

Select [Diagnostics] ⇒ [CC-Link IE Control Diagnostics] ⇒ Communication Test....

Display contents

Item	Description
Communication Test Result	Displays the result of inter-network communication test. Networks and stations routed from the host station (connected station) to the communication destination are displayed in the <<Outward>> tab and those routed from the communication destination to the host station (connected station) are displayed in the <<Inward>> tab.

Operating procedure

1. Set the items on the screen.

Item	Description
Communication Test Content	Set the contents of the test to be executed.
Target Station	Set the network number and station number.
Communication Data Setting	Set the data length (1 to 900 bytes), the number of communications (1 to 100 times), and monitoring time (1 to 100 seconds) to execute the test.

2. Click the Execute Test button.

The communication test is executed according to the set contents.

17.3.2 Link start/stop

This section explains the method for starting/stopping link to stations on CC-Link IE controller network.

Screen display

Select [Diagnostics] ⇒ [CC-Link IE Control Diagnostics] ⇒ Link Start/Stop...

Link Start/Stop

Network Information

Network

CC IE Control

Network No.

20

Type

Net Control Station between Controllers

Group No.

0

Station No.

1

All Station Status

Selective Status	Station No.	Link Status	Group	Type
☐	1	Linking	0	Control Station
☐	2	Linking	0	Normal Station
☐	3	Linking	0	Normal Station
☐	4	Linking	0	Normal Station
☐				
☐				
☐				
☐				
☐				
☐				

Link Start/Stop

☒ Link Start

☐ Link Stop

☐ Forced Link Start

Execute

Close

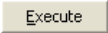
Display contents

Item	Description
Network Information	Displays the network information of the connected station.
All Station Status	Displays the link status of all stations in the same network that execute data link with the connected station. Select the target stations for which link start/stop is executed.
Link Start/Stop	Select the processing to be executed from Link Start, Link Stop, and Forced Link Start.

Operating procedure

1. Select the target station of link start/stop operation. The following table shows the usable selection methods.

Selection	Operation
Selection by station	Click "Selective Status" in the row of the station to be operated. ☒ 1
Selection in groups	Right-click any of the rows of the group to be operated to display the selection menu, and click [Group Selection]. All stations numbers of the same group number as the selected row are selected. It cannot be selected if a row whose group number is '0' is right clicked. Group Selection Select All Cancel Select All
Selecting all stations	Right-click the row where a station number is displayed to display the selection menu, and click [Select All]. Group Selection Select All Cancel Select All

2. Select the processing to be executed from "Link Start/Link Stop/Forced Link Start".
3. Click the  button.

Link start/stop is executed for all selected stations according to the set contents in a batch.
After the processing, "Selective Status" is cleared and the display contents of "Link Status" are updated.

17.3.3 Logging

This section explains a method for displaying the communication route switch information and transient transmission error information of the selected station.

Screen display

Select [Diagnostics] ⇒ [CC-Link IE Control Diagnostics] ⇒ Logging...

Logging

Display Station

Network No. Group No. Station No.

Monitor Details

Error Clear

Switch Transmission Path

	Loop Status	Loop Station	IN Side	OUT Side	Occurrence Date
1	Normal	-	-	-	2008/06/25 14:54:06
2	Loopback	3	4	-	2008/06/25 14:54:03
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Transient Transmission Errors

	Error Code	Target Network	Target Station No.	Occurrence Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Save Error Log...

Start Monitor

Stop Monitor

Close

Display contents

Item	Description
Display Station	Displays the network information of the currently selected station.

■ Displaying the communication route switch information and transient transmission error information

The <<Monitor Details>> tab displays the communication route switch information and transient transmission error information.
Maximum 100 logs can be displayed. If the number of logs exceeds 100, the logs will be deleted from the oldest one.

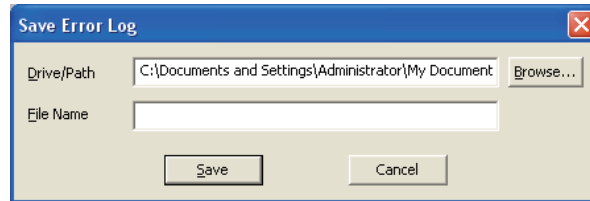
Display contents

Item	Description
Switch Transmission Path	Displays the loop status of communication route, a number of station where loopback occurred, and the date when communication route switching occurred.
Transient Transmission Errors	Displays the error code, network number and station number of the transient request target, and the date of error occurrence if transient transmission error occurs.

Screen button

● Save Error Log...

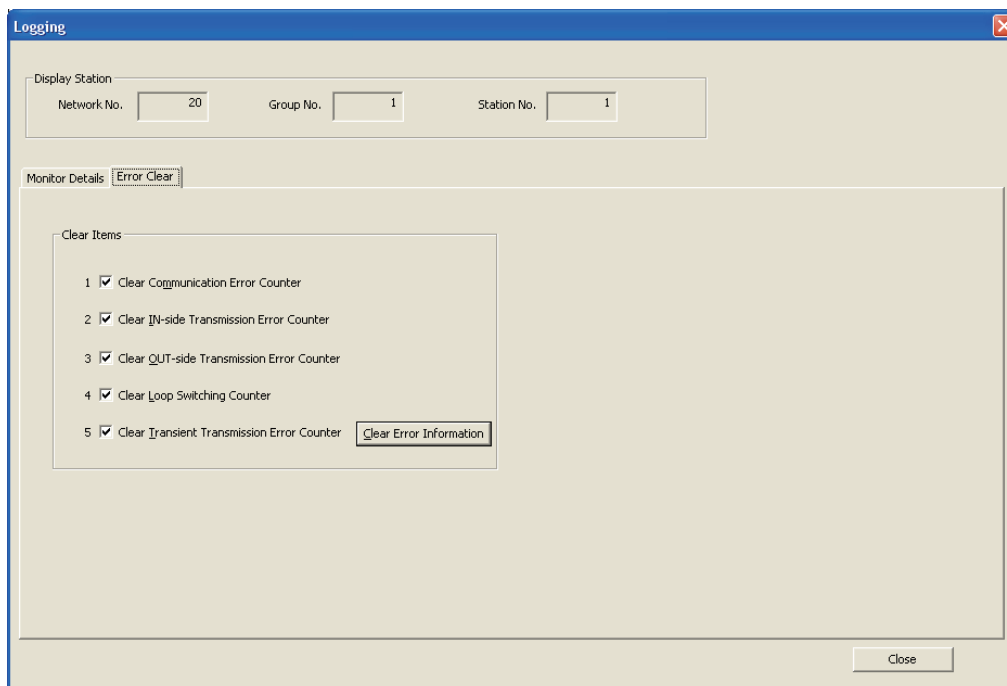
Displays the Save Error Log screen and the contents displayed on the <<Monitor Details>> tab can be saved in a CSV file.



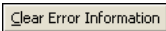
■ Clearing errors

The following explains the method for clearing the errors of the currently selected station using the <<Error Clear>> tab.

Screen display



Operating procedure

1. Select the item to be cleared.
2. Click the  button.

17.4 Diagnosing CC-Link and CC-Link/LT

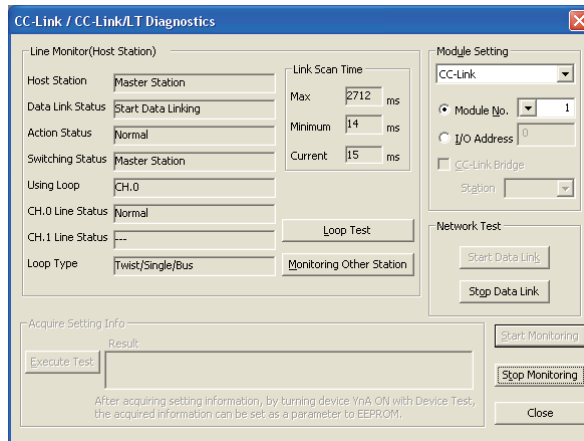
This section explains the method for monitoring the network information of each station, diagnosing the network status, and testing.

17.4.1 Monitoring line (host station)

This section explains a method for monitoring host station line in CC-Link or CC-Link/LT.

Screen display

Select [Diagnostics] ⇒ [CC-Link / CC-Link/LT Diagnostics].



Display contents

Item	Description
Line Monitor (Host Station)	Displays the status (contents of SB and SW) of the host station.
Module Setting	Select the CC-Link or CC-Link/LT to be monitored.
Module No.	Select this to specify the module by the module number. Setting is valid for CC-Link. (For CC-Link/LT, set it with I/O address.) For the first to eighth modules (four modules for Q02U) to be specified, specify the module that is set in the CC-Link list setting of Network parameter.
I/O Address	Select this to specify the I/O address of the master module to be monitored. (Enter in hexadecimal number.)
CC-Link Bridge	Set this to diagnose a CC-Link bridge module. CC-Link bridge module cannot be diagnosed if "CC-Link/LT" is selected. Select "CC-Link". During CC-Link monitoring, monitoring of a CC-Link bridge module cannot be started. To monitor a CC-Link bridge module, stop CC-Link monitor.
Network Test	Starts/stops data link for all stations connected to the CC-Link module set in "Module Setting". The function can be executed only when the selected module is a master station.

Screen button

- Loop Test

Displays the Loop Test screen. (☞ Section 17.4.2)

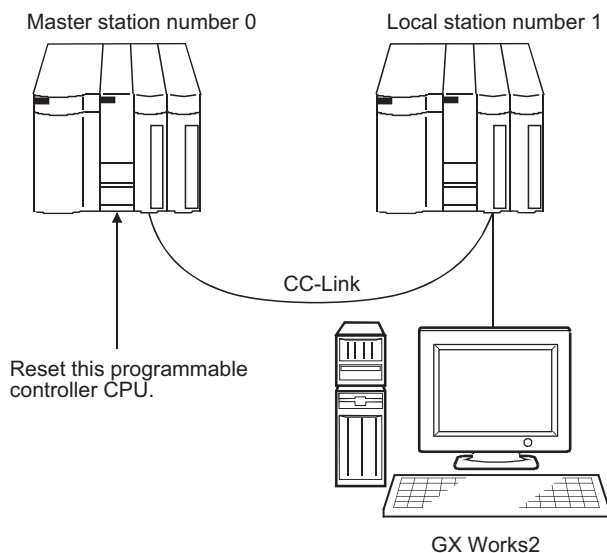
- Monitoring Other Station

Displays the CC-Link / CC-Link/LT Diagnostics (Other Station) screen. (☞ Section 17.4.3)

■ Precautions on network test

If "Stop Data Link" is executed when GX Works2 is connected to the master station via CC-Link in the system configuration as shown below, communication from GX Works2 is disabled.

To restart communication from GX Works2, reset the programmable controller CPU in the data link stop station and restart the data link.



Point

● Diagnostic target module

When the CC-Link system is configured with the QCPU (Q mode), only the QJ61BT11 and QJ61BT11N are diagnosed.

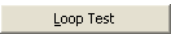
When the CC-Link/LT system is configured with the QCPU (Q mode), only the QJ61CL12 is diagnosed.

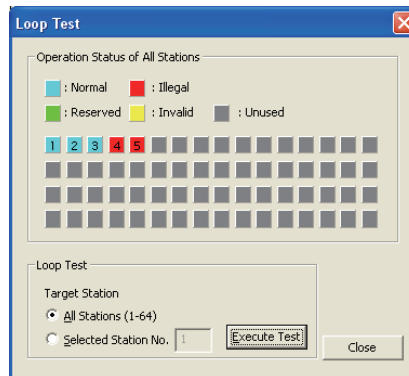
17.4.2 Loop test

This section explains a method for checking operating status of lines for all stations or specified stations.

The function can be executed only when the selected module is a master station.

Screen display

Select [Diagnostics] ⇒ [CC-Link / CC-Link/LT Diagnostics] ⇒ .

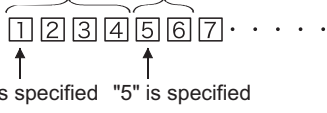


Display contents

Item	Description
Operation Status of All Stations	Monitors the operating status of all stations connected to the specified master module. Normal: Light blue, Illegal: Red. Reserved: Green, Invalid: Yellow, Unused: Grey

Operating procedure

1. Set the items on the screen.

Item	Description
Loop Test	Executes the loop test according to the specification of "All Stations" or "Selected Station No.". Setting is not possible when CC-Link/LT is selected. All Stations: Select this to execute the test for all of 64 stations. Selected Station No.: Select this to execute the test for the specified stations. To specify a station, specify the start address of an occupied station. <Example> When four occupied stations and two occupied stations are connected 4 stations occupied 2 stations occupied  "1" is specified "5" is specified If 2, 3, 4 or 6 is specified, the station becomes faulty station.

2. Click the button.

The loop test is executed according to set contents.

Point

● Precaution on executing the test

Do not execute the loop test by a sequence program at the same time. If executed, the loop test may not be executed correctly.

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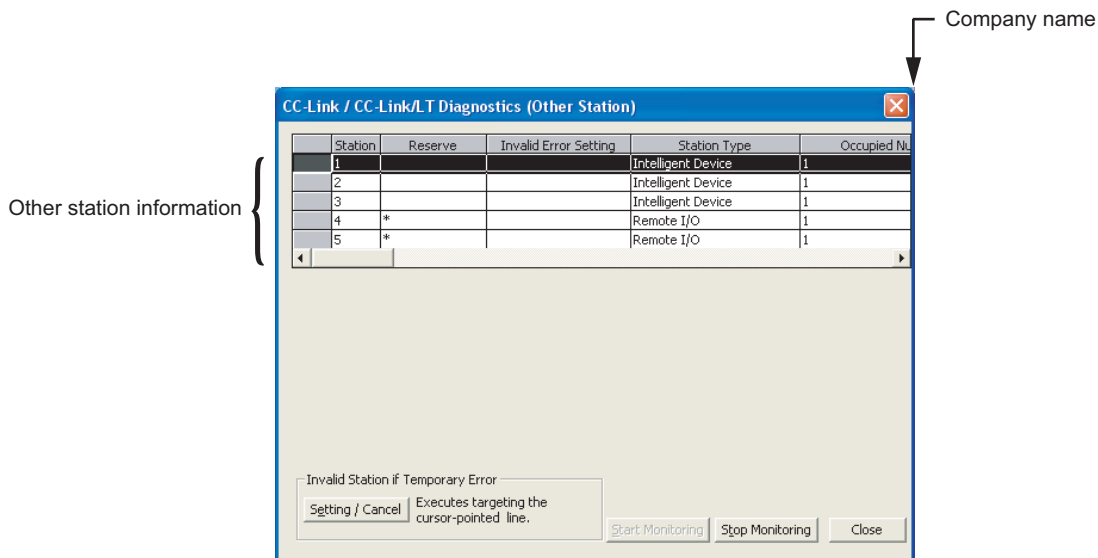
INDEX

17.4.3 Monitoring line (other stations)

This section explains a method for monitoring another station line in CC-Link or CC-Link/LT. The function can be executed only during data link.

Screen display

Select [Diagnostics] ⇒ [CC-Link / CC-Link/LT Diagnostics] ⇒ **Monitoring Other Station**.



Display contents

Item	Description
Other station information	Displays the information on another station. If the host station is a local station, the information on a station set as a reserved station is not displayed since another station monitor monitors the mounting status of CC-Link. If CC-Link/LT is selected, "Reserve", "Invalid Error Setting", "Transient Error", "Company", and "Invalid Station if Temporary Error" are masked.

Screen button

● **Setting / Cancel**

Replaces a module in online without detecting an error of the corresponding remote station.

When setting "Invalid Station if Temporary Error", select the station number by locating the cursor and then execute the setting.

If multiple stations are set as occupied station, specify the start station number of each occupied station for "Invalid Station if Temporary Error".

(If setting is made for a station that is not the start station in actual assignment, invalid setting is ignored.)

■ Company names in other station information

- 1) The field displays the company name or maker code of the device connected in CC-Link.
- 2) The field displays the maker code if company name is not entered in the maker code list.
- 3) The maker code list (PARTNER.DAT) is saved in the following folder and can be edited using text editor available in market.

C:/Program Files/MELSOFT/DnaviZero/DnaviSatellite/CCLink

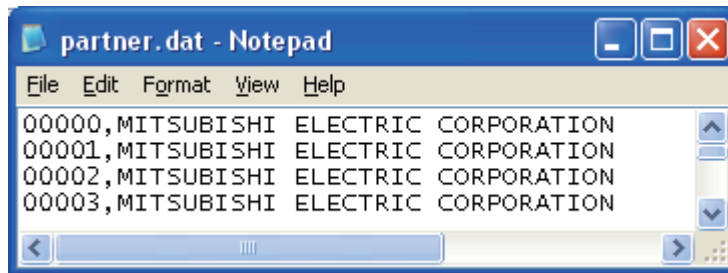
For some makers, maker codes are not listed. Edit the file according to the following file format specifications.

	Maker code	Company name
Max. number of characters	5	255
Usable characters*1	0 to 9	Alphanumeric characters Symbols
Remarks	Maker code other than 5 digits is ignored.	Display varies depending on the screen width. With small fonts, up to 75 characters are displayed, characters exceeding the limit are not displayed.

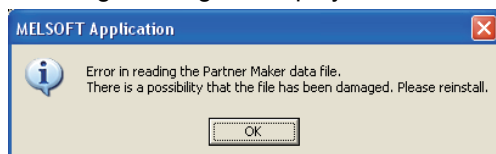
*1 : If "," is used in a company name, enclose the company name by double quotations (" ").

Example: "xxxxx Co., Ltd"

The following is an example of PARTNER.DAT displayed using a text editor.



If the maker code list does not exist in the install destination of GX Works2 or if it is corrupted, the following message is displayed.



Point

● Precaution on executing the operation

Do not execute the "Invalid Station if Temporary Error" by a sequence program at the same time. If executed, the "Invalid Station if Temporary Error" may not be executed correctly.

17.5 Diagnosing Ethernet



This section explains a method for checking various setting status of Ethernet modules.

For details, refer to the explanation of corresponding error code and buffer memory of the following manual.

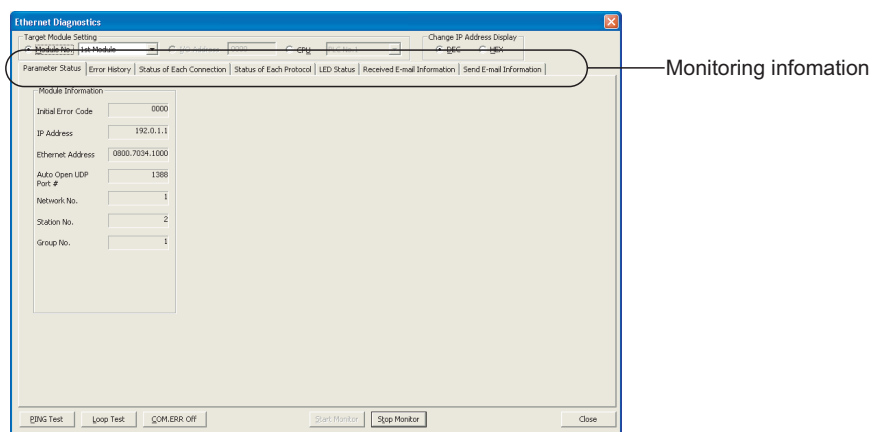
Q Corresponding Ethernet Interface Module User's Manual (Basic)

17.5.1 Q series-compatible E71 module

This section explains a method for checking Q series-compatible E71 module parameter status, error history, status of each connection, status of each protocol, LED status, receive e-mail information, and send e-mail information.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics].



Display contents

Item	Description
Target Module Setting	Select "Module No.", and specify an Ethernet module to be monitored. Setting range is 1st to 4th module.
Change IP Address Display	Switches decimal/hexadecimal notation of IP address display.
Monitoring information	The following Ethernet module information can be monitored. Parameter status (☞ ■ Monitoring the parameter status) Error history (☞ ■ Monitoring the error history) Status of each connection (☞ ■ Monitoring the status of each connection) Status of each protocol (☞ ■ Monitoring the status of each protocol) LED status (☞ ■ Monitoring the LED status) Receive e-mail information (☞ ■ Monitoring the receive e-mail information) Send e-mail information (☞ ■ Monitoring the send e-mail information)

● PING Test

Displays the PING Test screen. (☞ Section 17.5.3)

● Loop Test

Displays the Loopback Test screen. (☞ Section 17.5.4)

● COM.ERR OFF

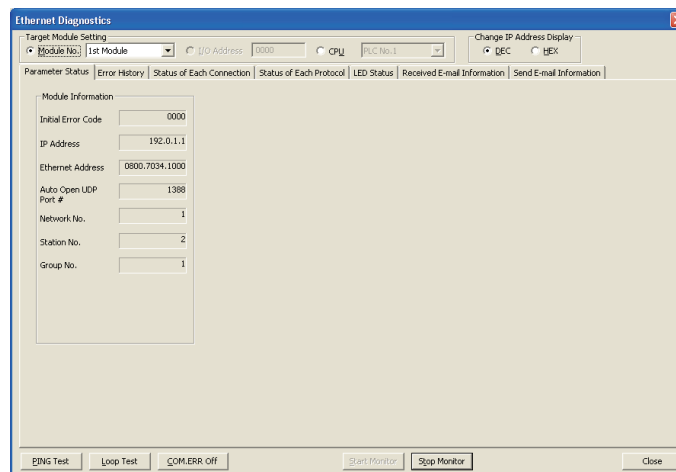
Turns OFF the [COM ERR] LED.

■ Monitoring the parameter status

The following explains a method for monitoring the Ethernet module parameter status.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<Parameter Status>>.

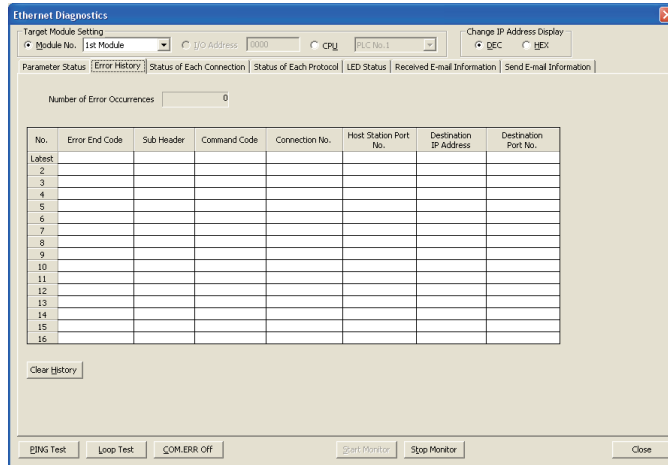


■ Monitoring the error history

The following explains a method for monitoring the error history area.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<Error History>>.



Screen button

- **Clear History**

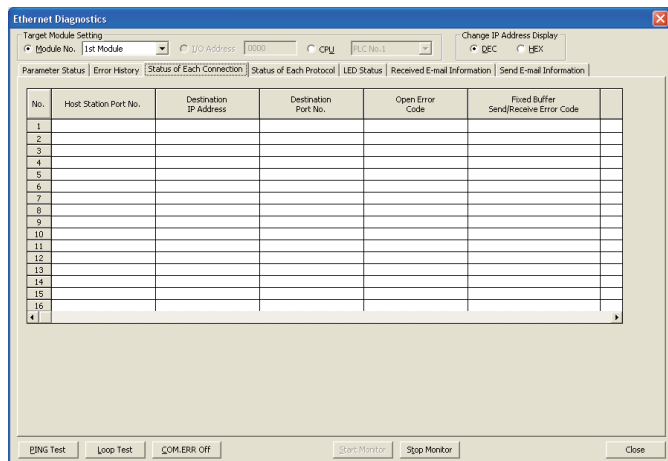
Clears the error history.

■ Monitoring the status of each connection

The following explains a method for monitoring the status of each connection.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<Status of Each Connection>>.

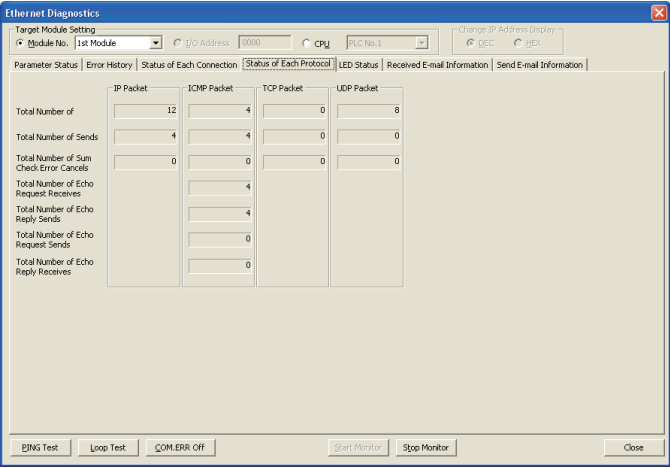


■ Monitoring the status of each protocol

The following explains a method for monitoring the status of each protocol.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<Status of Each Protocol>>.

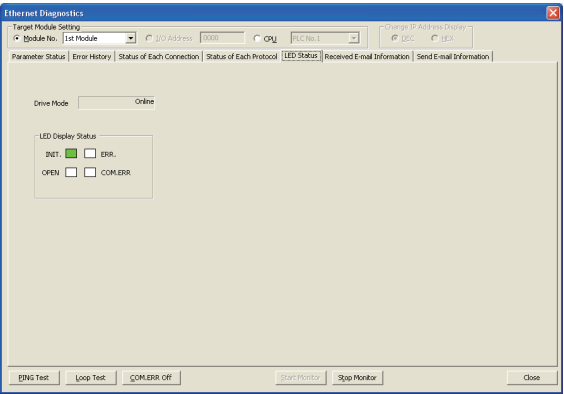


■ Monitoring the LED status

The following explains a method for monitoring the status of LED on the front of the Ethernet module.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<LED Status>>.



Point

● **Precautions on monitoring**

If RAM test or ROM test is set with the switch setting of an Ethernet module, programmable controller communication error occurs.

■ Monitoring the receive e-mail information

The following explains a method for monitoring the received e-mail information.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<Received E-mail Information>>.

The screenshot shows the 'Ethernet Diagnostics' window with the 'Received E-mail Information' tab selected. The window contains several status fields and a table of received emails.

No.	Error Code	Command Code	From	Receive Date	Subject
Latest					
2					
3					
4					
5					
6					
7					
8					

Screen button

● Clear Information

Clears the number of times set in each item by '0'.

● Clear History

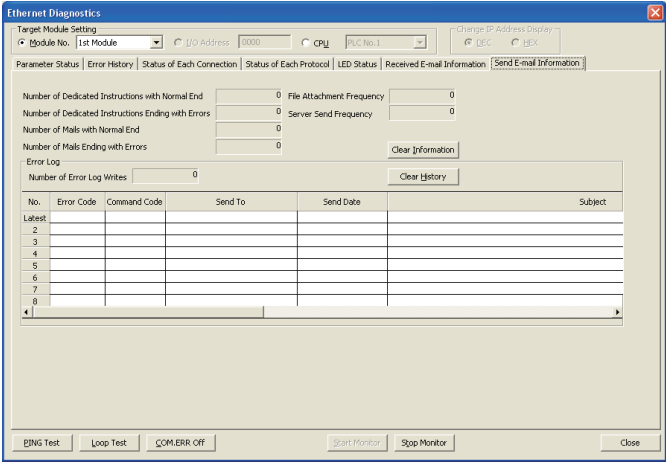
Clears the "Number of Error Log Writes" by '0' and the contents of "Error Log".

■ Monitoring the send e-mail information

The following explains a method for monitoring the send e-mail information.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<Send E-mail Information>>.



Screen button

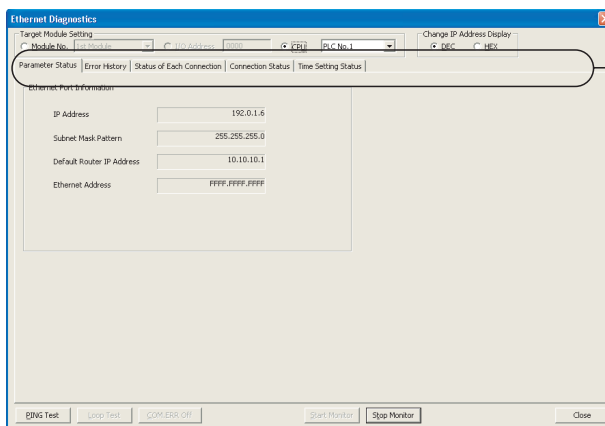
- **Clear Information**
Clears the number of times set in each item by '0'.
- **Clear History**
Clears the "Number of Error Log Writes" by '0' and the contents of "Error Log".

17.5.2 Built-in Ethernet port QCPU connection

This section explains a method for checking Built-in Ethernet port QCPU parameter status, error history, status of each connection, connection status, and time status setting.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics].



Display contents

Item	Description
Target Module Setting	Select "CPU", and specify the CPU to be monitored. Setting range is CPU number 1 to 4.
Change IP Address Display	Switches decimal/hexadecimal notation of IP address display.
Monitoring information	The following Ethernet module information can be monitored. Parameter status (■ Monitoring the parameter status) Error history (■ Monitoring the error history) Status of each connection (■ Monitoring the status of each connection) Connection status (■ Monitoring the connection status) Time status setting (■ Monitoring the time setting status)

Screen button

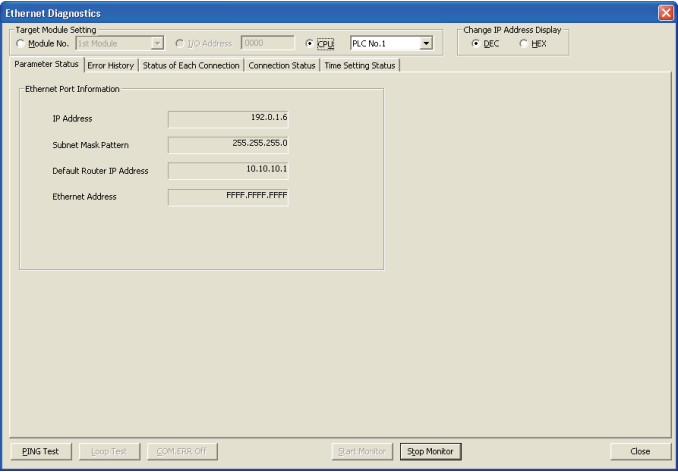
For the buttons displayed on the screen, refer to Section 17.5.

■ Monitoring the parameter status

The following explains a method for monitoring Built-in Ethernet port QCPU parameter status.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<Parameter Status>>.

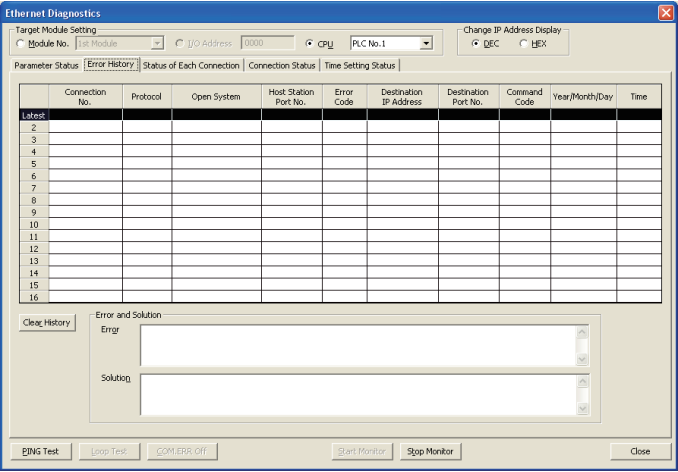


■ Monitoring the error history

The following explains a method for monitoring the error history area.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<Error History>>.



Screen button

- Clear History

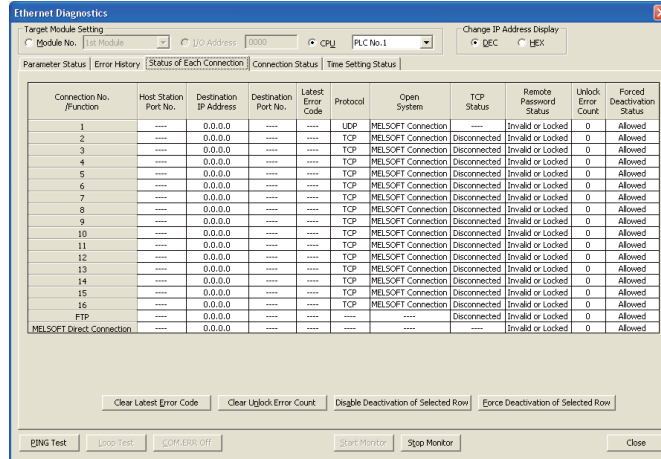
Clears the error history.

Monitoring the status of each connection

The following explains a method for monitoring the status of each connection.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<Status of Each Connection>>.



Screen button

● Clear Latest Error Code

Clears the error codes.

● Clear Unlock Error Count

Clears the "Unlock Error Count".

● Disable Deactivation of Selected Row

Allows the connection of the selected row.

● Force Deactivation of Selected Row

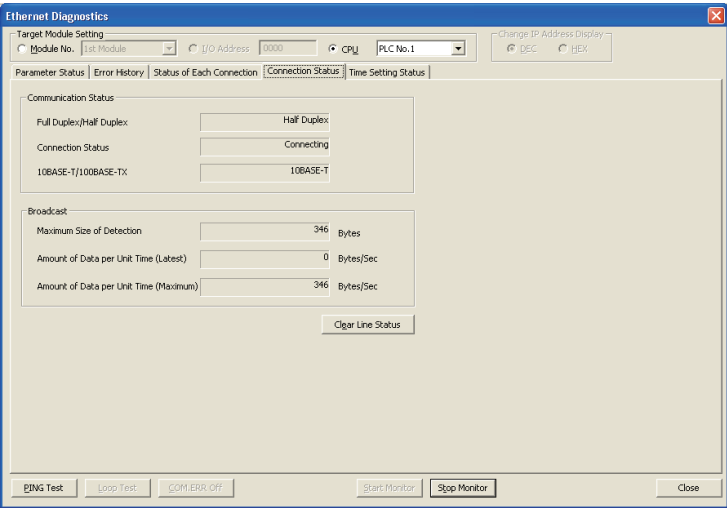
Cancels the connection of the selected row.

■ Monitoring the connection status

The following explains a method for monitoring the connection status.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<Connection Status>>.



Screen button

- Clear Line Status

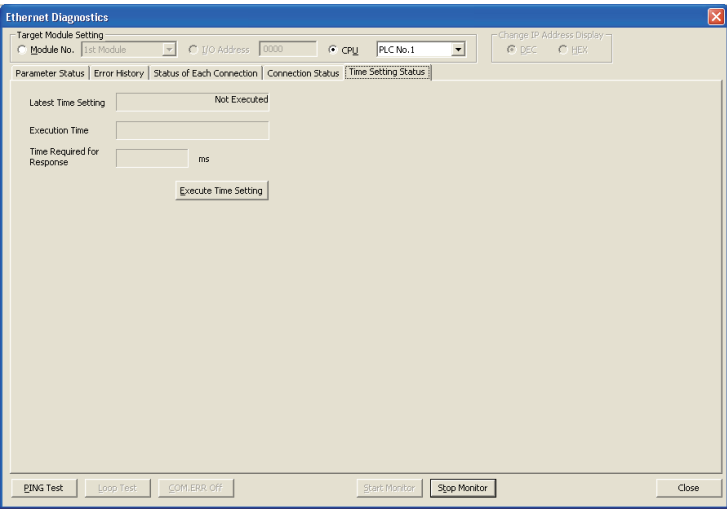
Clears the connection status.

■ Monitoring the time setting status

The following explains a method for monitoring the time setting status.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ <<Time Setting Status>>.



Screen button

- Execute Time Setting

Executes the time setting.

17.5.3 PING test

This section explains a method for checking the existence of the initial processed Ethernet module or specified IP address on the Ethernet line.

The PING test can be executed either by via an Ethernet board or programmable controller CPU direct coupled.

■ Mandatory setting items to execute the PING test

- Before executing the PING test, set Ethernet parameters and 'Station number ⇔ IP information'.
- Check that the RUN LED and INIT LED on the Ethernet module are ON.

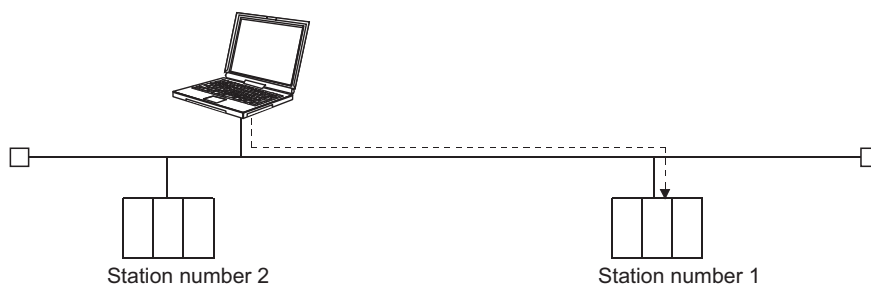
■ PING test overview

The PING test executed from GX Works2 is valid to Q/QnA/A-compatible Ethernet modules. The PING test, if executed to the system configured with the Q series, checks the following.

- Whether the line is connected correctly between the host station and the external device
- Whether the parameters are set correctly for the Ethernet module on host station
- Whether the initial processing has been completed correctly for the Ethernet module on host station

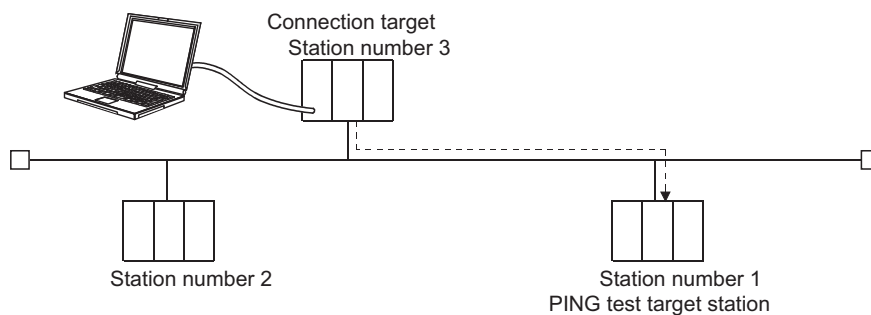
● Via the Ethernet board

The PING test can be executed only in the same segment.



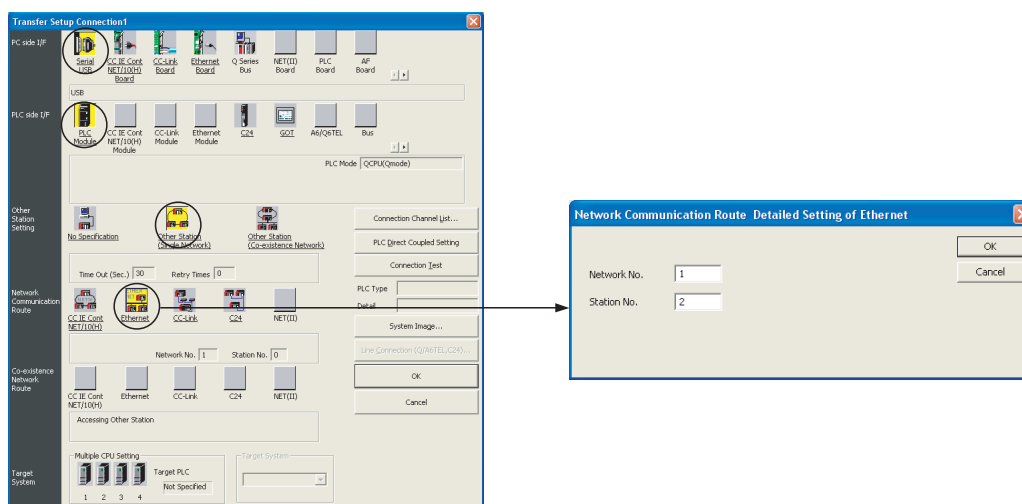
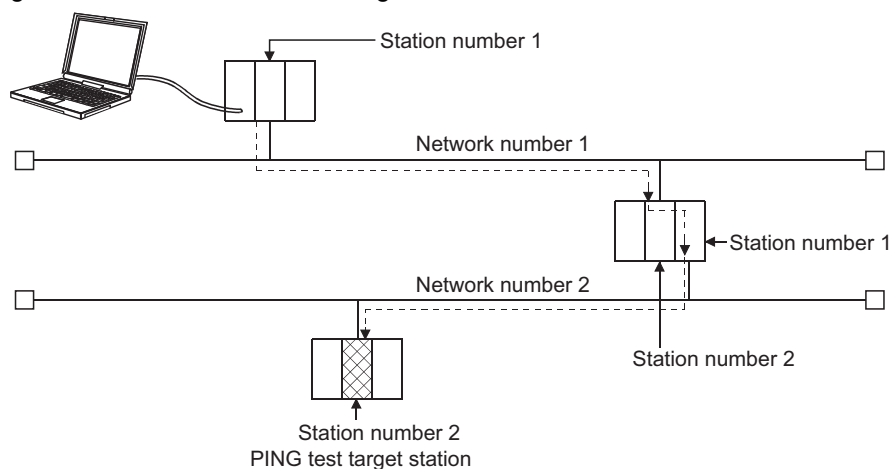
● Programmable controller CPU direct coupled

The PING test can be executed only when the Ethernet module (station number 3 in the system shown below) of the connection target is Q series-compatible E71 module (function version B or later).



The PING test can be executed only for Ethernet modules in the same segment as the PING test target station.

To execute the PING test for station number 2 on network number 2, in the following system configuration, set the connection target as indicated below.



Point

- **PING test executable system configuration**

The PING test is valid for the system configured by Ethernet, MELSECNET/10(H), and CC-Link IE controller network.

The PING test cannot be executed via CC-Link, computer link, etc.

- **Administrator authority to execute the PING test**

To execute the PING test, the user must log on Windows[®] as the user having the administrator authority.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ **PING Test**.

or

Select [Diagnostics] ⇒ [Ethernet Diagnostics] ⇒ **Loop Test** ⇒ **PING Test**.

● Via Ethernet board

PING Test

Input Item

Address Specification

☒ IP Address 192 0 1 1 ☐ IP Address/Host Name

IP Address Input Form

☒ DEC ☐ HEX

Setting Options

☐ Display the host name

Specify the data size 32 Bytes

Specify the time of the communication time check 1 Seconds

Specify the number of transmissions 4 Times

Execute Cancel

Result

Pinging 192.0.1.1 with 32 bytes of data:

```

Reply from 192.0.1.1: bytes=32 time<1ms TTL=250
Reply from 192.0.1.1: bytes=32 time<1ms TTL=250
Reply from 192.0.1.1: bytes=32 time<1ms TTL=250
Packets transmitted = 4, Received = 4, Lost = 0
Round-trip (ms) Min = 0, Max = 0, Avg = 0
  
```

Success/Transmissions = 4 / 4

Close

● Programmable controller CPU direct coupled

PING Test

Input Item

Transfer Setup

Execute Station of PING

Network No. 1 Station No. 1

Target of PING

IP Address 192 0 1 3 ☐ IP Address/Host Name

IP Address Input Form

☒ DEC ☐ HEX

Setting Options

Specify the time of the communication time check 1 Seconds

Specify the number of transmissions 4 Times

Execute Cancel

Result

Pinging 192.0.1.3:

```

Success
Success
Success
Success
Packets transmitted = 4, Received = 4, Lost = 0
  
```

Success/Transmissions = 4 / 4

Close

Display contents

Item		Description
Input Item	Address Specification	Set the IP address of the target Ethernet module for PING test.
	Transfer Setup	Specify the connection target for which the PING test is executed.
	Execution Station of PING	Set the network number and station number of the Ethernet module for which the PING test is executed.
	Target of PING	Set the IP address of the Ethernet module for which the PING test is executed.
	Setting Options	Set whether to display a host name in the result. Also set data size (1 to 8,192 bytes), communication time check (1 to 30 seconds), number of transmissions (1 to 50 times, or until interrupted).
Result	Test via Ethernet board	● When successful Reply from IP address (Example: 10.97.29.75): bytes=set size (Example: 32) time<1ms TTL=communication speed (Example: 128) ● When unsuccessful Request timed out.
	Test in direct connection of programmable controller CPU	● When successful Success Packets transmitted=Number of set times (Example: 4), Received=* (Example: 4), Lost=* (Example: 0) ● When unsuccessful Time Out Packets transmitted=Number of set times (Example: 4), Received=* (Example: 0), Lost=* (Example: 4)

17.5.4 Loopback test

This section explains a method for checking if the initial processing of each module has been completed by sending a loopback test message to a Q series-compatible E71 module (function version B or later) specified by a network number or station number.

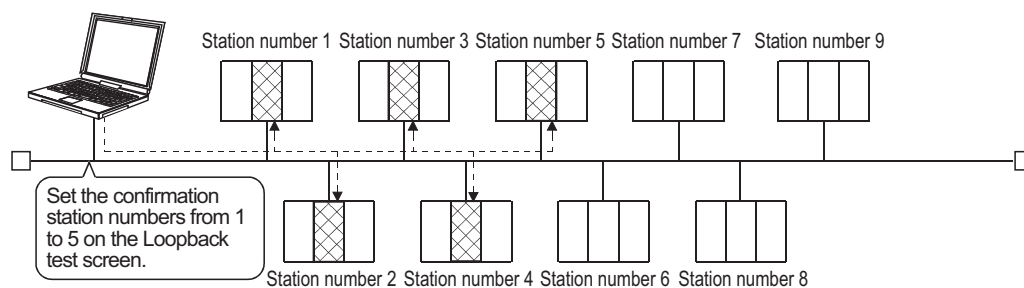
The loopback test can be executed either by via an Ethernet board or programmable controller CPU direct coupled.

■ Mandatory setting items to execute the loopback test

- Before executing the loopback test, set Ethernet parameters and 'Station number ⇔ IP information'.
- Check that the RUN LED and INIT LED on the Ethernet module are ON.

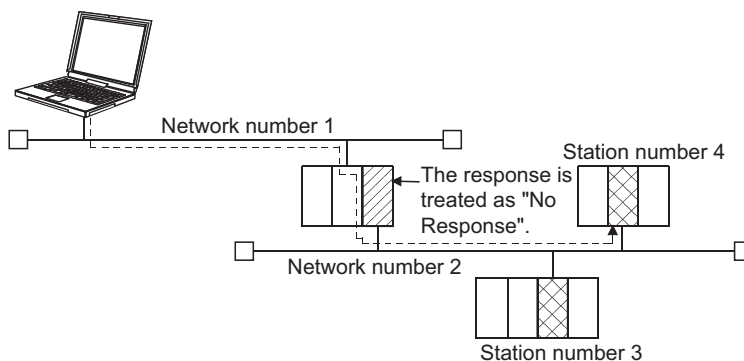
■ Loopback test overview

● Via the Ethernet board

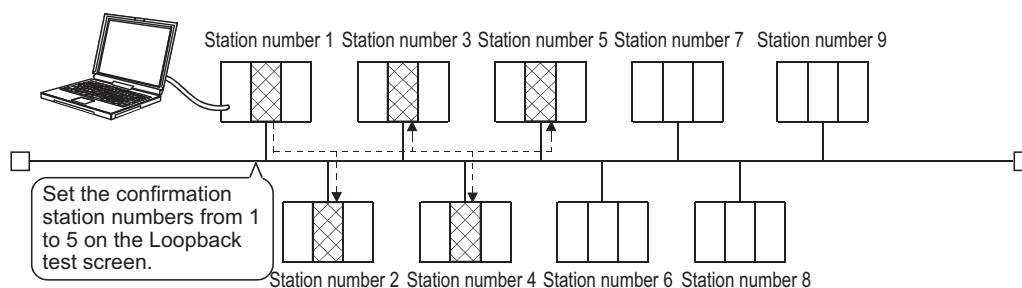


The loopback test can be executed for a module in another network number.

In the system as shown below, when the loopback test is executed for station numbers 2 to 4 in network number 2, the response from the station number 2 is treated as "No Response".

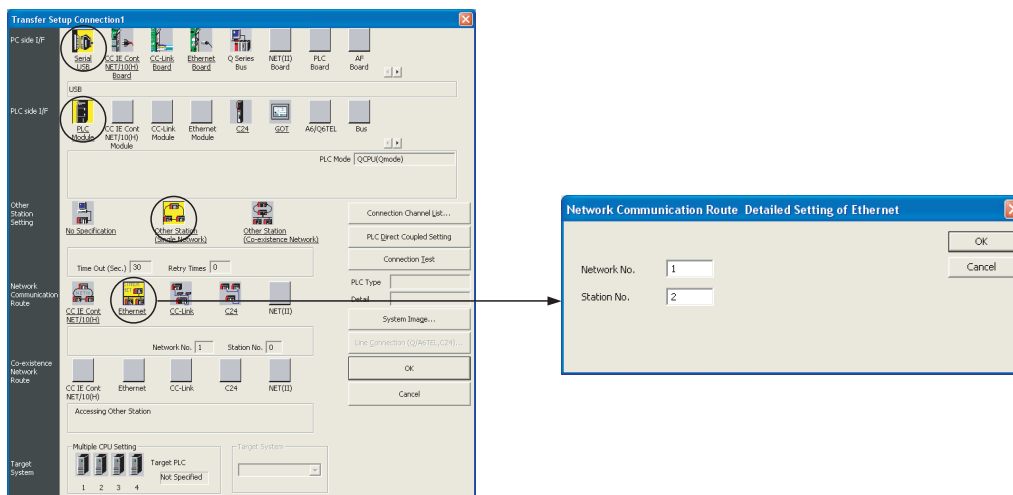
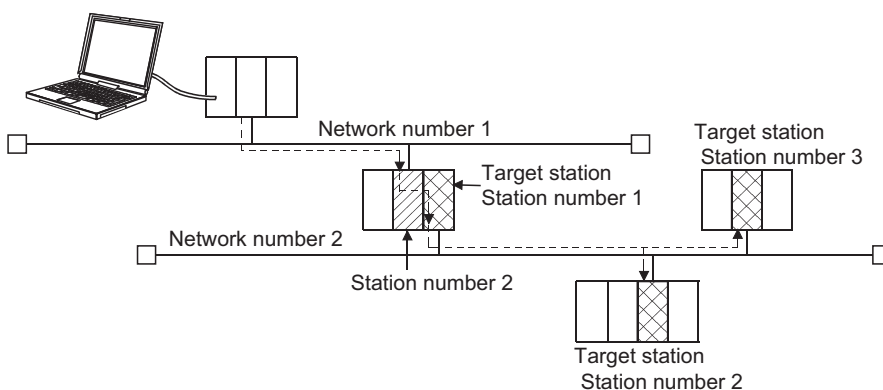


● Programmable controller CPU direct coupled



The loopback test can be executed only for an Ethernet module in the loopback test target network number.

To execute the loopback test for the Ethernet module in network number 2, in the system as shown below, set the connection target as indicated below.



Point

● Loopback test executable system configuration

- The loopback test is available only with Q series-compatible E71 module (function version B or later). Q series-compatible E71 module (function version A) and QnA/A series-compatible Ethernet module are treated as "No Response" even if connected.
- The loopback test is valid for the system configured only with Ethernet. The loopback test cannot be executed via MELSECNET/10(H), CC-Link IE controller network, CC-Link, computer link, etc.

● Precautions on executing the test

- In multiple network system, to execute the loopback test by specifying a station number in another network number, setting the routing parameters is necessary.

17.6 System Monitor

QCPU

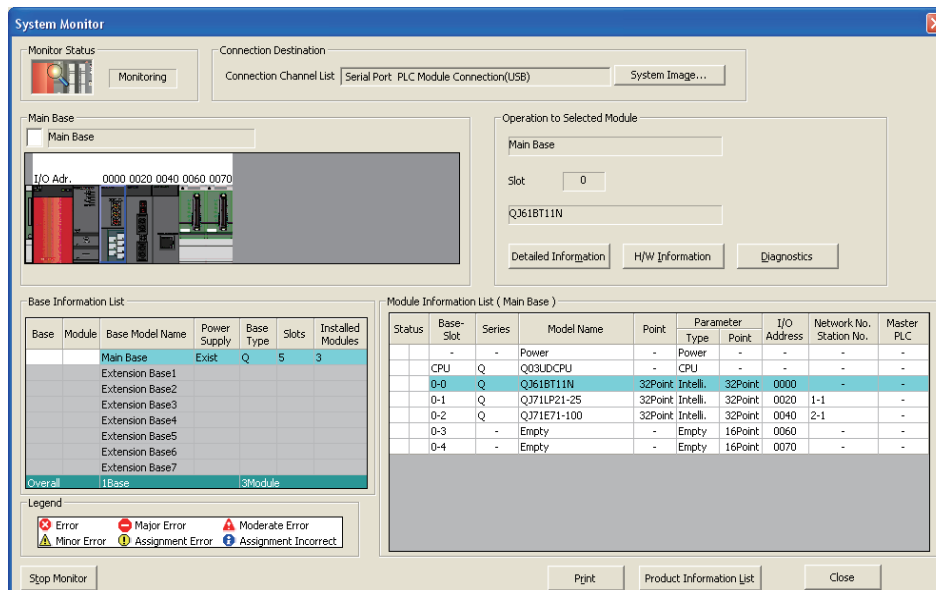


This section explains the method for displaying the system status of the programmable controller CPU.

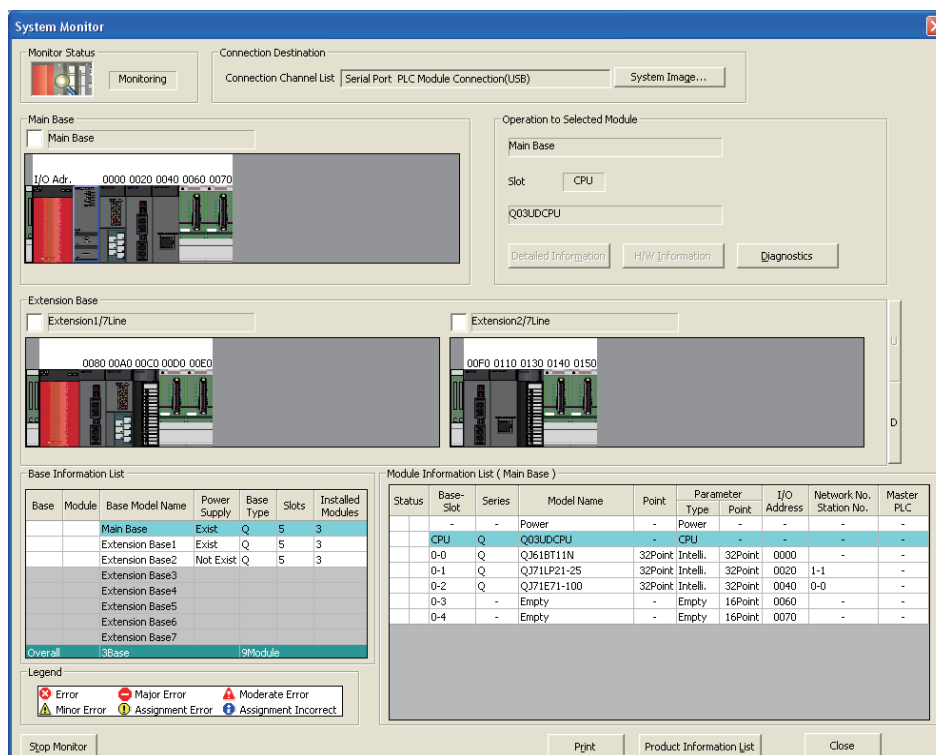
Screen display

Select [Diagnostics] ⇒ [System Monitor].

<Without extension base unit>



<With extension base unit>



Display contents

Item		Description
Monitor Status		Displays the current monitor status.
Connection Destination		Displays the information of the connection destination which has been set.
Main Base		Displays the base unit, operating status of the module, and I/O address.
Operation to Selected Module		Displays the name, slot number, and model name of the base unit to which the selected module is mounted.* ¹
Extension Base* ²		Displays the extension base unit in every two rows. The third row and later will be displayed by pressing the arrow button on the right. The base unit, operating status of the module and I/O address are displayed.
Base Information List		Displays the status of each base unit.
Base		Displays the status of the base unit.
Module		Displays the error status of each module mounted to the base unit.
Base Model Name		Displays the base name set to the parameter in the programmable controller CPU. If the parameter has not been set, "Main Base", "Extension Base 1" to "Extension Base 7" will be displayed.
Power Supply		Displays whether there is power supply.
Base Type		Displays the type of the base unit.
Slots		Displays the slot number.
Installed Modules		Displays the number of modules mounted to the base unit.
Module Information List		Displays the module information on the base unit where the selected module is mounted.
Status		Displays the status of each module.
Base-Slot		Displays the slot number of each module.
Series* ¹		Displays the series of each module.
Model Name* ¹		Displays the model name of each module.
Point* ¹		Displays the number of occupied I/O points of each module.
Parameter	Type	Displays the type of each module set to the parameter in the programmable controller CPU. If the parameter has not been set, the type of the mounted module will be displayed.
	Point* ¹	Displays the points of each module set to the parameter in the programmable controller CPU. If the parameter has not been set, the points of the mounted module will be displayed.
I/O Address* ¹		Displays the I/O address of each module set to the parameter in the programmable controller CPU.
Network No. Station No.* ¹		Displays the network number and the station number set to each module.
Master PLC		Displays the programmable controller CPU number that controls each module in a multiple CPU configuration. "-" is displayed for the programmable controller CPU or the blank slot.
Legend		Displays the legend of the icon displayed on the screen.

*1 : "*****", "-", "***" will be displayed if the module is not mounted or the parameter is different with the mounting status.

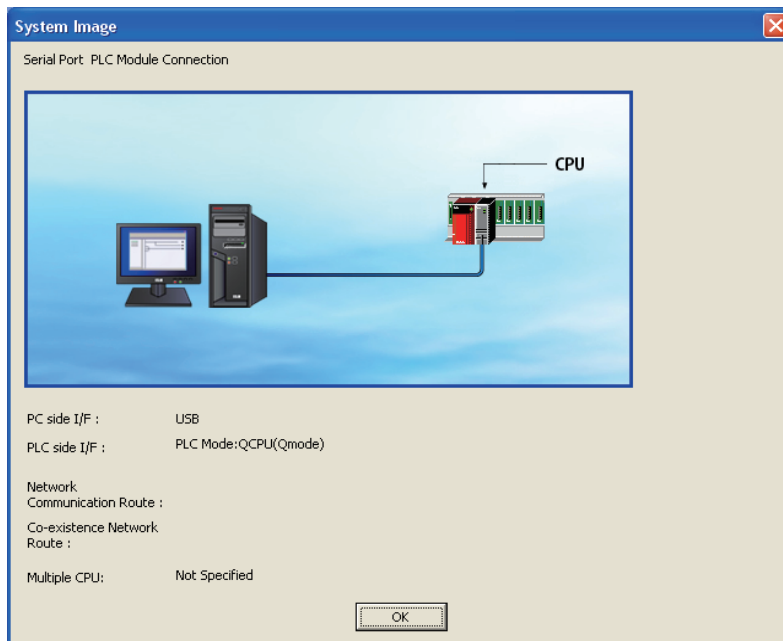
*2 : It will be displayed only when an extension base unit exists.

Screen button

● System Image...

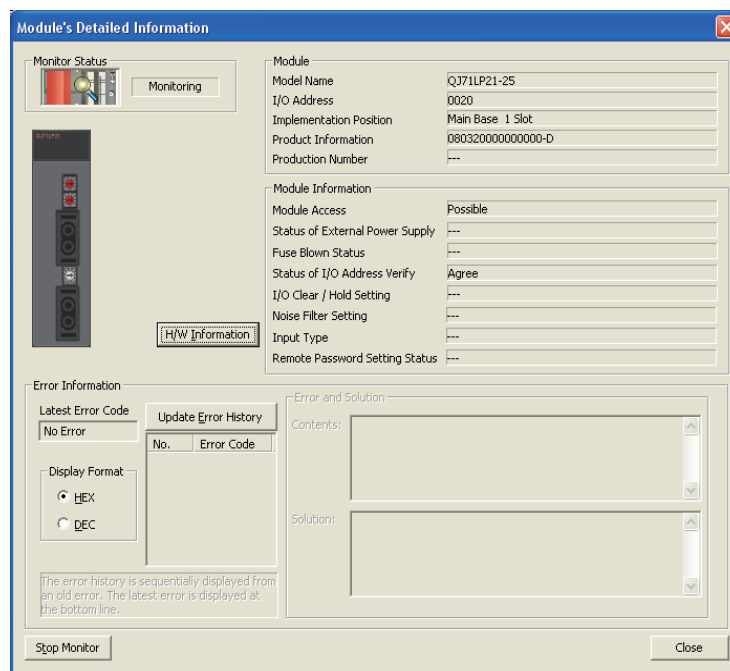
Displays the illustration of the connection route.

(☞ Section 11.1.1)



● Detailed Information

Displays the module information of the selected module.



H/W Information

Displays the information on LEDs and switches of hardware.
The H/W Information display depends on module version.
For details, refer to the User's Manual of each module.

H/W Information

Monitor Status: Monitoring

Module: Model Name QJ71FP21-25 Product Information 080320000000000-D

Display Format: ☒ HEX ☐ DEC

H/W LED Information

Item	Value	Item	Value
RUN	0001		
PC	0001	MNG	0000
REMOTE	0000	S.MNG	0000
DUAL	0000	D.LINK	0000
SW.E.	0000	T.PASS	0000
IMJ.E.	0000		
PRM.E.	0000		
CRC	0001	CRC	0001
OVER	0000	OVER	0000
AB.IF.	0000	AB.IF.	0000
TIME	0000	TIME	0000
DATA	0000	DATA	0000
UNDER	0000	UNDER	0000
LOOP	0000	LOOP	0000

H/W SW Information

Item	Value	Item	Value
STx10	0000	NETNO.	0001
STx1	0001	GRPNO.	0000
MODE	0000	STNO.	0001
		MODE	0000
		BAUD	0000
		CONFIG	0000

Stop Monitor Close

Diagnostics

Displays the diagnostic information of the selected module.
The following is the PLC Diagnostics screen when the programmable controller CPU module is selected. (➡ Section 17.1)

PLC Diagnostics

Monitor Status: Monitoring

The function menu is extended from the PLC image.

Connection Target Module: Q03UDCPU

Connection Channel List: Serial Port PLC Module Connection(USB) System Image...

Model Name	Operation Status	Switch
Q03UDCPU	RUN	RUN

Error Information

☒ Error Information ☐ PLC Status Information ☐ Serial Communication Error

Current Error

PLC	Status	No.	Current Error(Abbreviation)	Current Error(Detail)	Year/Month/Day	Time
1		0	No Error			
2						
3						
4						

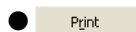
Error History(PLC No.1)

Status	No.	Error Message(Abbreviation)	Error Message(Detail)	Year/Month/Day	Time
▲	3103	LINK PARA. ERROR	LINK PARA. ERROR	2000-9-9	11:24:2
▲	2501	CANT EXE. PRG.	CANT EXE. PRG.	2000-9-9	11:24:32

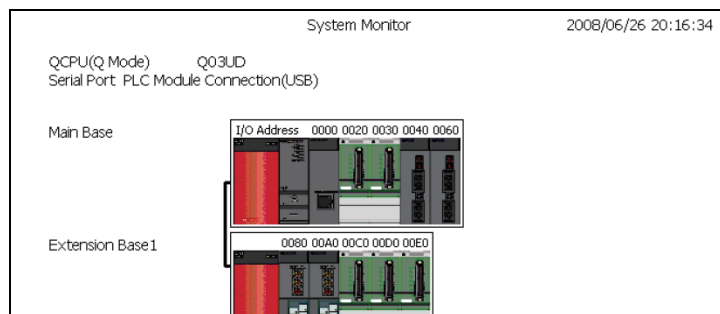
Stop Monitor Create CSV File Close

Status Icon Legend

- Major Error
- Moderate Error
- User-Specified
- Minor Error



Prints the figure of the system configuration.



Displays the product information of each module mounted to the base unit.

Product Information List

Sort
☒ Order by Installation ☐ Order by Type Name

Base	Slot	Type	Series	Model Name	Point	I/O Address	Master PLC	Serial No.	Ver	Production Number
0	CPU	CPU	Q	Q03UDCPU	-	-	-	0907200000000000	B	XXXXXXXXXXXXXXXX-7
0	0	Intelli.	Q	Q3618T11N	32Point	0000	-	0701300000000000	B	-
0	1	Intelli.	Q	Q371LP21-25	32Point	0020	-	0803200000000000	D	-
0	2	Intelli.	Q	Q371E71-100	32Point	0040	-	0910200000000000	D	-
0	3	-	-	Empty	-	-	-	-	-	-
0	4	-	-	Empty	-	-	-	-	-	-

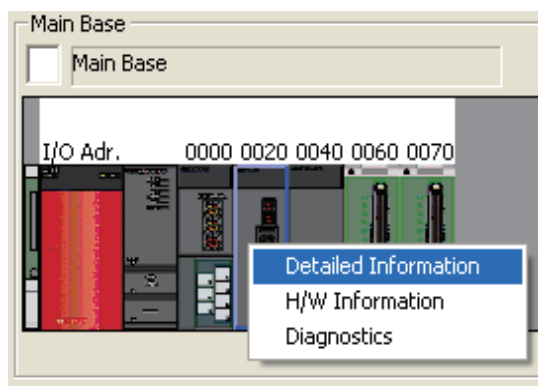
Create CSV File Close

- Clicking the button saves the product information data in CSV file format.

Point

- **Operation to selected module**

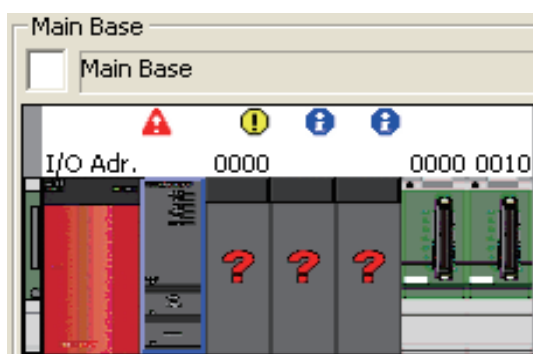
The functions of "Operation to Selected Module" can also be executed from the shortcut menu while selecting modules in "Main Base" or "Extension Base".



- **Displaying module status**

The following screen will be displayed if the mounting status of the module cannot be obtained due to the incorrect parameter settings.

Execute the system monitor function again after meeting the parameter to the mounting status.



17 DIAGNOSING PROGRAMMABLE CONTROLLER STATUS

■ Error icons

The following table shows the details of the error status icons of the programmable controller CPU and the modules.

Module	Icon	Error	Programmable controller CPU status
Programmable controller CPU		Serious error	MAIN CPU down
		Moderate error	Stop error
		Minor error	Error allowing operation
		Assignment error	Assignment error
Module		Error	H/W error
		Serious error	Module system error
		Moderate error	Module error
		Minor error	Module warning
		Assignment error	Assignment error
		Illegal assignment	Illegal assignment

■ Display when mounted modules do not match with the I/O assignment setting on PLC parameter

The following shows the "Module Information List" on the System monitor function according to the I/O assignment on PLC parameter. If module mounting status does not match with the I/O assignment, change "I/O Assignment" of the I/O assignment setting to match with the mounting status. "*****", "-," or "***" will be displayed if the module is not mounted or the parameter is different with the mounting status.

Module Information List (Main Base)									
Status	Base-Slot	Series	Model Name	Point	Parameter		I/O Address	Network No. Station No.	Master PLC
					Type	Point			
	-	-	Power	-	Power	-	-	-	-
	CPU	Q	Q03UDCPU	-	CPU	-	-	-	-
	0-0	-	Intelli.	32Point	Empty	128Point	0000	-	-
	0-1	-	Intelli.	32Point	-	**Point	0080	-	-
	0-2	-	*****	**Point	-	**Point	-	-	-
	0-3	-	Empty	-	-	**Point	-	-	-
	0-4	-	Empty	-	-	**Point	-	-	-



18 PRINTING

This chapter explains the method for printing sequence programs and device data created with GX Works2.

18.1	Setting up Printers	18-2
18.2	Previewing Printing Images	18-3
18.3	Printing	18-4

18.1 Setting up Printers

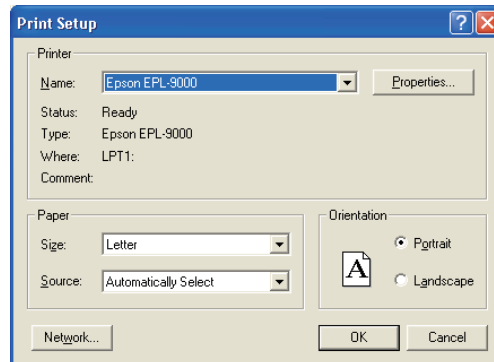
QCPU



This section explains the method for setting up a printer.

Screen display

Select [Project] ⇒ [Printer Setup].



Operating procedure

1. Set the items on the screen.

Item	Description
Name	Select the printer to be used.
Paper	Set the paper size and paper feed method of the printer.
Size	Select the size of paper.
Source	Select the paper feed method.
Orientation	Set the page orientation.
Portrait	Select this to print the page in portrait mode.
Landscape	Select this to print the page in landscape mode.

2. Click the button.

Point

● Printer settings

Printer settings changed in GX Works2 are not saved.

18.2 Previewing Printing Images



This section explains the method for checking the printing image of programs and parameters.

Screen display

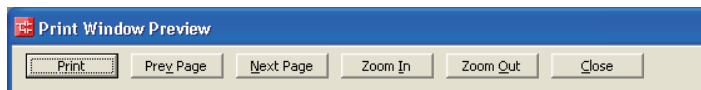
- Date other than parameters

Select [Project] ⇒ [Print Window Preview].

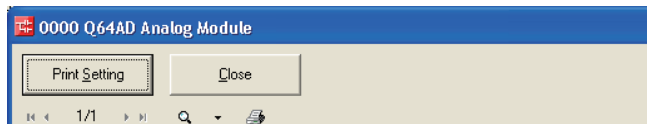
- Parameters

Click the **Print Window Preview** button on the PLC parameter setting screen or Network parameter setting screen.

<Date other than intelligent function module>



<Intelligent function module>



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A

APPENDIX

I

INDEX

18.3 Printing



This section explains the method for printing programs and parameters.

18.3.1 Printing screen

This section explains the method for printing using the print screen.

Screen display

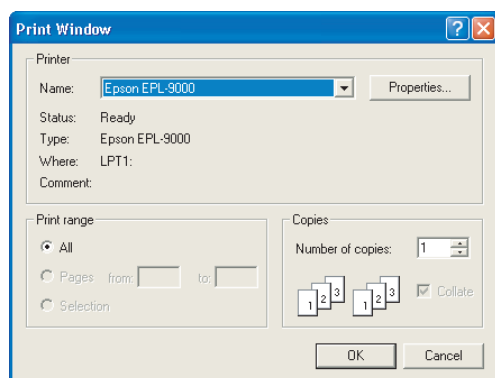
- Date other than parameters

Select [Project] ⇒ [Print Window].

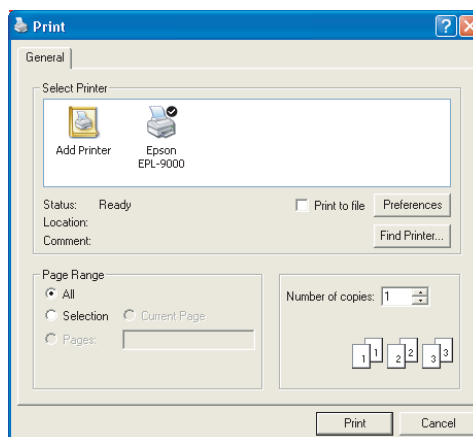
- Parameters

Click the **Print Window...** button on the PLC parameter setting screen or Network parameter setting screen.

<Data other than intelligent function module>



<Intelligent function module>



Operating procedure

1. Set the items on the screen.
2. Click the **OK** / **Print** buttons.
Printing starts.

Point

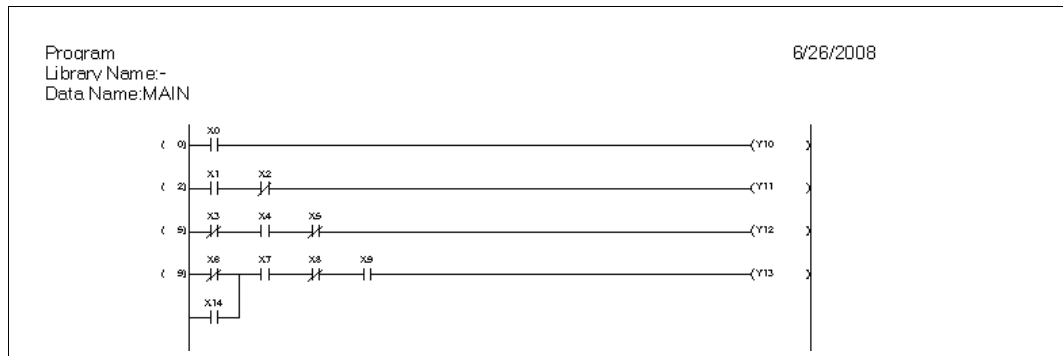
- Printer settings

- Click the **Properties...** or **Preferences** button to make detailed settings for the printer.

18.3.2 Printing examples

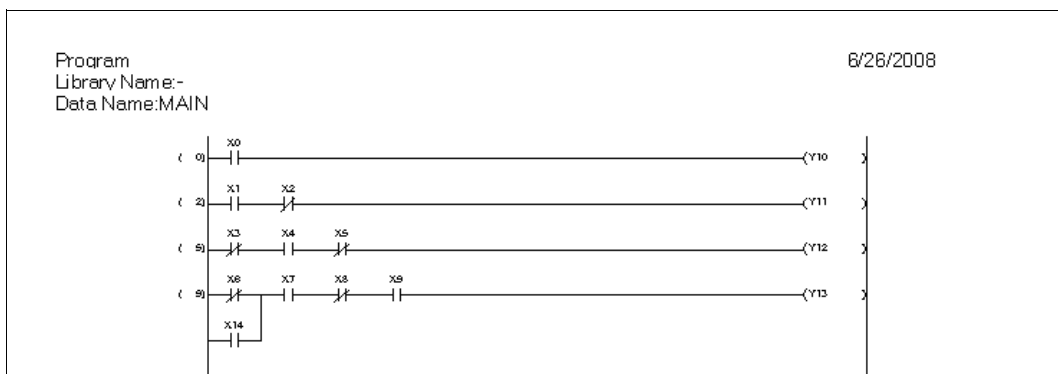
This section shows examples of printing.

■ Tasks

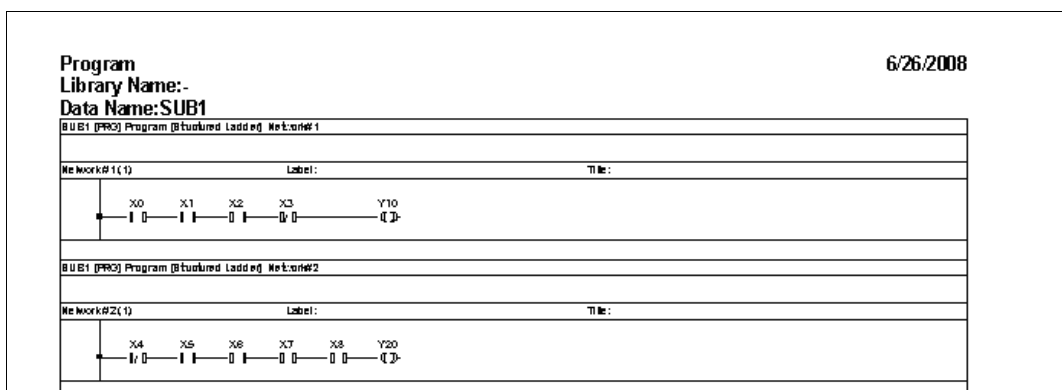


■ Programs

● Ladder



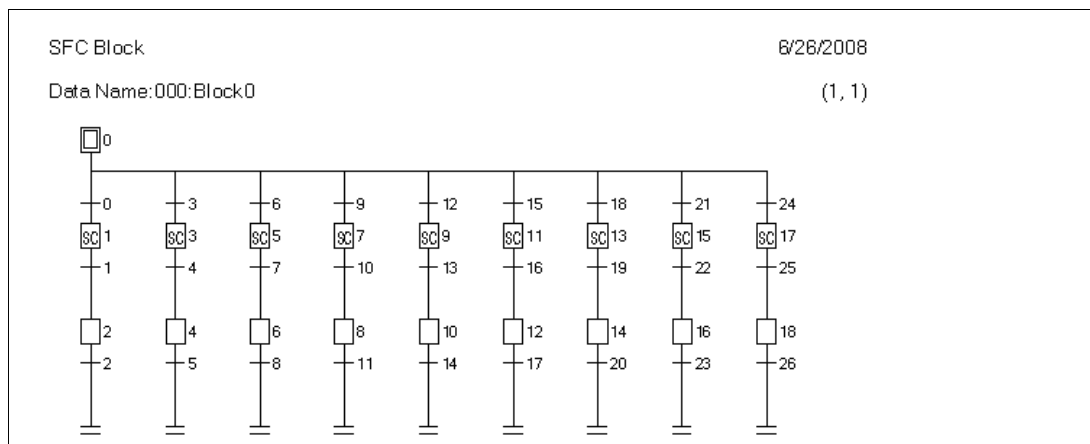
● Structured ladder



● ST

Program Library Name:- Data Name: SUB2 SUB2 (PRG) Program (BT)	6/26/2008
<pre> IF SHO KKA THEN; RYOHIN > 0; BUDOMARI > 0; ELSE FSYO KKA THEN; RYOHIN > RYOHIN + 1; ELSE FURYOHIN > FURYOHIN + 1; END_F; ; </pre>	

● SFC diagram



● SFC block list

SFC Block List 7/2/2008

Data Name: MAIN

No.	Data Name	Title	Block START	Step Transition	Block	Pause Mode	Number of Active Steps	Continuous Transition Bit
0	Block	First Process	M0	M1	M2	M3	D0	M4
1	Block1	Second Process	M10	M11	M12	M13	D10	M14
2	Block2	Third Process	M20	M21	M22	M23	D20	M24
3	Block3	In Process; DO NOT USE						

Labels

Structured data

Structured Data Setting

6/26/2008

Library Name:-

Data Name:STRUCT

	Label Name	Type	Constant	Comment
1	K01	Bit		
2	K02	Bit(0..4)		
3	K03	Bit(0..9)		
4	K04	Bit		
5	K05	Bit		
6	K06	Bit		
7	K07	Bit		
8	K08	Bit		
9	K09	Bit		

Global label

Global Label Setting

6/26/2008

Library Name:-

Data Name:Global1

	Class	Label Name	Type	Constant	Device	Address	Comment	Remark
1	VAR_GLOBAL	Label1	Bit					
2	VAR_GLOBAL	Label2	Bit					
3	VAR_GLOBAL_CONSTANT	Label3	Word(Signed)	0				
4	VAR_GLOBAL	Label4	Counter					
5	VAR_GLOBAL	Label5	Bit					
6	VAR_GLOBAL_CONSTANT	Label6	Bit	FALSE				
7	VAR_GLOBAL	Label7	Bit					
8	VAR_GLOBAL	Label8	Bit					
9	VAR_GLOBAL	Label9	Bit					
10	VAR_GLOBAL	Label10	Bit					
11	VAR_GLOBAL	Label11	Bit					
12	VAR_GLOBAL	Label12	Bit					

Function/function block label

Function/FB Label Setting

6/26/2008

Library Name:-

Data Name:FB_MLD

	Class	Label Name	Type	Constant	Comment
1	VAR_INPUT	FB label1	Bit		
2	VAR_INPUT	FB label2	Word(Signed)		
3	VAR_INPUT	FB label3	Word(Signed)		
4	VAR_CONSTANT	FB label4	Word(Signed)	0	
5	VAR_INPUT	FB label5	Bit		

Local label

Local Label Setting

6/26/2008

Library Name:-

Data Name:SUB1

	Class	Label Name	Type	Constant	Device	Address	Comment
1	VAR	Label1	Word(Signed)				
2	VAR	FB1	STRUCT		Detail Setting	Detail Setting	
3	VAR	FB2	STRUCT(0..2)				
4	VAR_CONSTANT	FB3	FB				
5	VAR	Label2	Bit				

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Structured data devices

Structured data device

Structured Data Device Setting 6/26/2008

Library Name:-
Data Name:Global1

	Label Name	Structured Data Type Name	Data Name	Type	Device
1	PE1	PE1	new1	ER	
			new2	ER(DI_3)	
			new3	ER(DI_2)	
			new4	ER	
			new5	ER	
			new6	ER	
			new7	ER(DI_2)	
			new8	ER(DI_1)	
			new9	ER	
			new10	ER	
			new11	ER	
			new12	ER	

Parameters

PLC system

PLC Parameter 6/26/2008

PLC System

[Timer Limit Setting]

Low Speed	100	ms
High Speed	10.00	ms

[RUN-PAUSE Contacts]

RUN	X
PAUSE	X

[Latch Data Backup Operation Valid Contact]

Device Name

Network parameter

Network Parameter 6/26/2008

Ethernet/CC IE/MELSECNET

[Ethernet/CC IE/MELSECNET]

	Module 1	Module 2	Module 3	Module 4
Network Name	ETHER/31 (Mod1/Normal Station)	ETHER/31 (Mod2/Normal Station)	ETHER/31 (Mod3/Normal Station)	ETHER/31 (Mod4/Normal Station)
Start I/O No.	0000	0000	0000	0000
Network No.	1	2	10	5
Total Station	10	-	-	15
Group No.	0	10	1	5
Station No.	-	-	1	2
Mode	Online	Online	Online	Online
Network Range Assignment End	-	-	-	-
Station Information Parameter Name	Station Information Parameter Name	Station Information Parameter Name	Station Information Parameter Name	Station Information Parameter Name
Network Parameter End	Network Parameter End	Network Parameter End	Network Parameter End	Network Parameter End
Network Setting Name	Network Setting Name	Network Setting Name	Network Setting Name	Network Setting Name
Station No. <1> IF Information Name	Station No. <1> IF Information Name	Station No. <1> IF Information Name	Station No. <1> IF Information Name	Station No. <1> IF Information Name
Station No. <2> IF Information Name	Station No. <2> IF Information Name	Station No. <2> IF Information Name	Station No. <2> IF Information Name	Station No. <2> IF Information Name
Station No. <3> IF Information Name	Station No. <3> IF Information Name	Station No. <3> IF Information Name	Station No. <3> IF Information Name	Station No. <3> IF Information Name
Station No. <4> IF Information Name	Station No. <4> IF Information Name	Station No. <4> IF Information Name	Station No. <4> IF Information Name	Station No. <4> IF Information Name

Device comment

Device Comment

6/26/2008

Data Name:COMMENT

Device Name	Comment
X0	Internal Relay1
X1	Internal Relay2
X2	Special Relay1
X3	Special Relay2

Device memory

Device Memory

6/26/2008

Data Name:MAIN

Device Name	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9
X0	0b	0b	0b	0b	0b					
D0	0d	4d	0d	0d	0d	0d	1d			
SW0	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h
WD	0h	1h	2h	3h	4h	5h				
SD0	"###"	"###"	"###"	"###"	"###"	"###"	"###"	"###"	"###"	"###"

Intelligent function modules

Intelligent Function Module

6/26/2008

Start I/O:0030 Q64AD Analog Module

Parameter

Item	CH1	CH2	CH3	CH4
Basic setting	Set the A/D conversion system.			
A/D conversion enable/disable setting	0:Enable	0:Enable	0:Enable	0:Enable
Sampling/Averaging process setting	0:Sampling Processing	0:Sampling Processing	0:Sampling Processing	0:Sampling Processing
Average time/Average number of times specification	0:Count Average	0:Count Average	0:Count Average	0:Count Average
Average time/average number of times	0 Times	0 Times	0 Times	0 Times

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■ Precautions on printing

The following explains the precautions on printing.

● Preview and printing of screen display

Preview and printing of screen display are not possible in the following cases.

- The print target data do not exist.
- The print target screen is monitored.
(Start printing after stopping monitoring.)
- Unconverted ladder exists.
(Execute the print function after ladder conversion.)

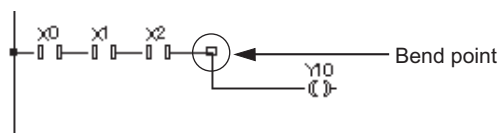
● Ladder

- On the preview screen, only the first page is displayed.
- The NOPLF instruction is not supported.

● Structured ladder

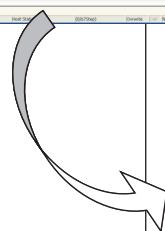
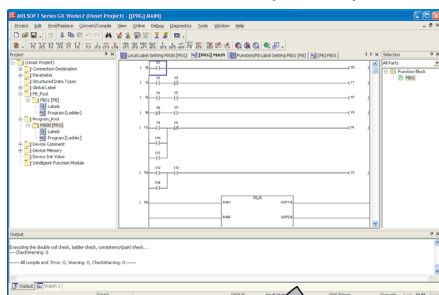
If a bend point is created in a structured ladder program, it will be printed as shown below. If the bend point is unnecessary to be printed, delete it on the structured ladder editor.

For details of bend points  GX Works2 Version1 Operating Manual (Structured Project)



● Page feed in printing

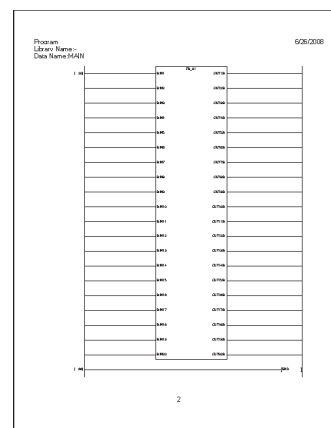
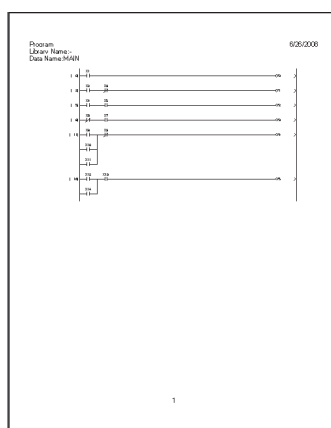
If one block of ladder or function block does not fit in one page, the page is automatically fed and the ladder block or ladder part is printed from the top of the next page.



Print result

<First page>

<Second page>



● Printing the structure/label setting screen

- Because the screen width is adjusted automatically to meet the page size when the structure/label setting screen is printed, the printing may be difficult to read according to the column width of the screen.

In order to improve the printing quality, adjust the column width of the structure/label setting screen. The visibility of the printing will be increased by adjusting the column width to narrow. However, if the words input into the "Remarks/comments" column are too long or one cell is divided into multiple pages, the contents in that cell cannot be printed completely.



19 SETTING OPTIONS

Option settings such as screen display format setting and detailed operation settings of each function are available.

19.1	Basic Operations	19-2
19.2	Option Setting List	19-3

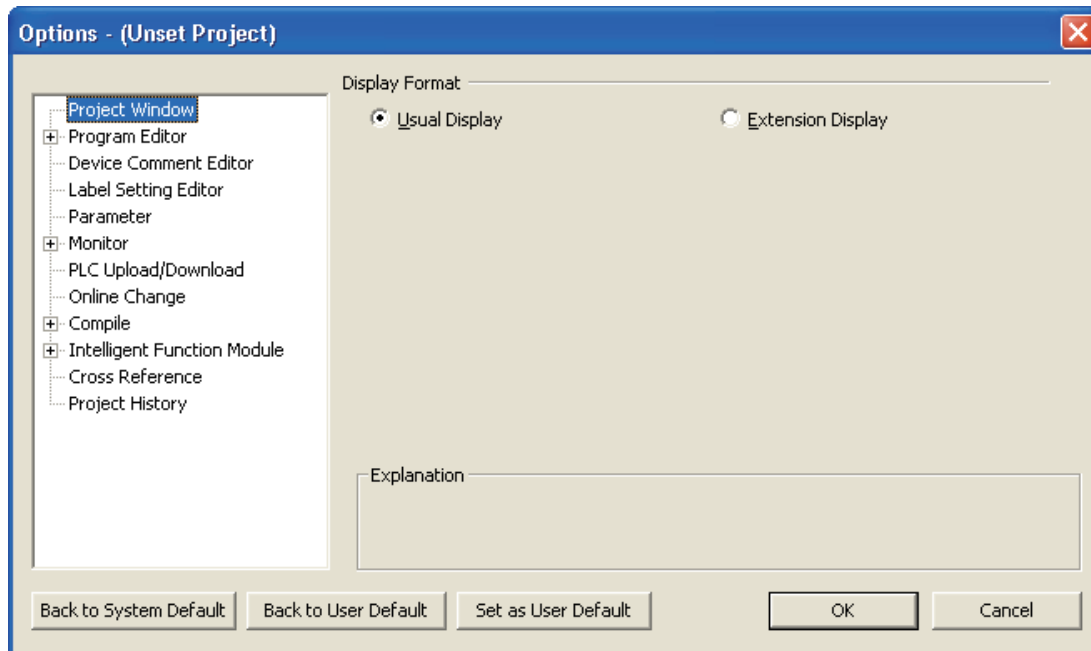
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19.1 Basic Operations

This section explains the method for setting options.

Screen display

Select [Tools] ⇒ [Options].



Operating procedure

- **Set the items on the screen.**

When the cursor is placed on a setting item, an explanation of the item is displayed in the "Explanation" field.

Screen button

- **Back to System Default**

Restores the initial settings.

- **Back to User Default**

Restores the user default settings.

- **Set as User Default**

Stores the current settings as the user default and applies them to a new project.

19.2 Option Setting List

The following table shows the option setting items.

For (Simple) and (Structured) indicated in the Reference column, refer to the following manuals respectively.

(Simple) GX Works2 Version1 Operating Manual (Simple Project)

(Structured) GX Works2 Version1 Operating Manual (Structured Project)

Table 19.2-1 Option setting items(1/4)

Tree item			Item	Description	Reference
Project Window			Display Format	Displays detail information on each data in selection of extension display.	Section 3.2.5
Program Editor	Structured Ladder/ST	Tool Hint	Tool Hint Display Items	Select items displayed on tool hint.	(Structured)
	Structured Ladder	Label	Tool Hint Display Format	Select display lines on tool hint.	
			Display label name/comment of contact or coil in multiline	Set display lines and characters per line.	
		FB/FUN	Declare new label name	Select display/non-display assignment dialog when declaring new label names.	
			Wrap instance name for function block	Select whether to wrap function block instance name at the function block width.	
			Specify the number of enable characters for label name/comment	Specify the number of display characters of function or function block label.	
			Automatic input/output variables	Select whether to add input/output variable when function block or function is pasted.	
			Automatic ENO variables	Select whether to add ENO output variable when function block or function is pasted.	
			Pin overwrites	Select whether to overwrite I/O variable with a grid line when ruling a grid line over function or function block.	
			Double clicking opens header	Select whether a label editor is displayed when function or function block is double clicked.	
			Double clicking opens body	Select whether a program editor is displayed when function or function block is double clicked.	
		Guided	Wrap ladder	Select whether to wrap ladder. The edited ladder shall be object after changing the setting.	
			Set guided mode as default editing mode	Set the default at opening structured ladder editor as guided mode.	
			Allow hotkey repeater	Select whether to display grid line ruling dialog at drawing lines.	
			Enter variable names after contacts and coils	Select whether to input label names or devices after entering contacts and coils.	
			Auto Comment Block Width	Set comment length added in network with grid numbers.	
	ST		Auto Indention	Select whether to use the automatic indent when entering ST control syntax, such as IF or FOR, and starting a new line.	
			Label Name Prediction	Select whether to display label name by List starting with the input character at entering label name.	
			Tabulator Length	Set the number of characters at entering tabulator.	

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Table 19.2-1 Option setting items(2/4)

Tree item			Item	Description	Reference	
Program Editor	Ladder/SFC	Comment	Reference of Device Comment	Set a reference target for device comment of each program/program File Name.	Section 9.1.1	
			Refer to the other device comment when device comment is not set.	Refers to the other device comment when the reference target device comment is not set.		
	Ladder	Device	Check double coil	Select whether to check duplicated coils when entering instruction. Unconverted ladder is not the object for duplicated coil check.	(Simple)	
			Enter device comment	Select whether to enter device comment continuously after entering instructions.		
		Comment	Device comment	Select whether to display the label comment or the device comment at ladder editor.	(Simple)	
			Note	Select whether to display the note comment at ladder editor.		
			Statement	Select whether to display the statement comment at ladder editor.		
			Device Comment Display Format	Set the display rows and columns for label comment or device comment.		
		Ladder Diagram	Display Connection of Ladder Diagram	Set the number of contacts to be displayed.		
			Display Instruction Help at symbol error occurrence	Select whether to automatically display Instruction Help when symbol errors occur.		
		SFC	Comment	Block list	Display device comment on SFC block list.	(Simple)
				Step/Transition	Display step/transition comment on SFC editor.	
	SFC Diagram		SFC Edit Area	Set SFC edit area when create SFC. Please change by "Row of SFC" after creating a SFC.		
	Zoom		Setting of Zoom Display	Set whether to open window to each zoom or fix window and change display when open a zoom window.		
Device Comment Editor			Number of Device Comment Edit/Display Characters	Set the number of input and display characters for device comment.	Section 9.1	
Label Setting Editor			Automatic copy and increment when inserting a row.	Select whether to copy the texts in the upper row after incrementing it when inserting a row.	(Simple) (Structured)	
			Copy data type/comment items	Select if the data type, comment, and remark shall be object for auto copy.		
			Default Length of String Data Type	Set the default string length for string data type.		
Parameter			Use user defined parameter	Select whether to use user-defined parameters. Do not set this item.	—	

Table 19.2-1 Option setting items(3/4)

Tree item		Item	Description	Reference
Monitor	Structured Ladder/ST	Display Format of Monitoring Value	Select whether to display monitored value in Decimal or Hexadecimal.	(Structured)
		Character String Monitor Setting	Set the number of displayable characters to monitor character-string data.	
	Ladder	Display Format of Monitoring Value	Select the display format of the monitored value in decimal or hexadecimal.	(Simple)
		Monitor Buffer memory and link memory	Select whether to monitor buffer memory and link memory during Ladder-monitoring. Scan time of PLC will be lengthened depending on the setting.	
		Display lines of monitored current value	Select whether to display rows of the current value monitor during Ladder-monitoring.	
	SFC	Watch Step Not Transferring within Watching Time	Select whether to display a warning dialog when detect a step that does not transfer even if specified time passes while monitoring.	
		Program/Program File Name	Select watch target program/program file.	
		Target All Blocks	Specify watch target block.	
		Specify the Block	Specify watch target block.	
		Stop Transfer Watch Monitor when Detected	Select whether to detect other step that does not transfer while displaying warning dialog.	
PLC Read/Write		Keep last file selection for PLC read/write dialog	Select whether to store file selection status to PLC read/write dialog.	Section 12.1
Online Change	Execute fall instruction		Select whether to execute fall instruction (LDF, ANDF, ORF, MEF, PLF, FCALLP, EFCALLP) at online change.	Section 12.8
	Transfer cache memory to program memory		Select whether to transfer the program cache memory to program memory when online change completed. (For Universal model QCPU only)	
	Execute online change based on relative step No.		Select whether to execute online change based on relative step No. from pointer. Even if real step No. is different, online change is available as long as relative step No. from the pointer is corresponding.	

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Table 19.2-1 Option setting items(4/4)

Tree item			Item	Description	Reference
Compile	Basic Setting		Call Function Block	A function block will be enabled to call from ladder to ST or form ST to ladder. And the steps after compiling is reduced when a function block is called.	(Simple) (Structured)
			Execution of Program Check	Set when you do not execute the program check after the build, compile+online change. This setting can shorten the compile time.	
	Output Result		Stop Build	Set the number of error and warning to stop the compile.	
			Disable Warning Codes	Register warning codes to invalidate. The registered warning codes shall not be displayed in output window.	
	Structured Ladder/ST	Compile Condition 1	Use the same label name in global label and local label	Select whether to use the same label name in global label and local label.	(Structured)
			Use lower-case device names as labels	Select whether to use device names typed with lower case as labels.	
			Function Output Setting	Select whether to connect directly from the objective function output to other input.	
		Compile Condition 2	Structured Ladder	Select whether to assign each system device to output of functions that maintains bit type.	
		Compile Condition 3	Generation of Code Keeping bit Type Output	Select whether to generate a code to keep bit type output of objective function.	
Intelligent Function Module	QD75 Type Positioning		Display Specification of Positioning Data	Set the range of positioning data to be displayed.	Section 4.3
			Confirm PLC operation status when writing a Data	Select whether to check an operation status of sequencer PLC and allow to be written in the status of STOP.	Section 12.1.4
			Display a confirmation message when writing to flash ROM	Select to display a confirmation message when writing to flash ROM.	
Cross Reference			Disable Extension Column Display	Select whether to limit item (column) that display to cross reference information.	Section 10.2
			Disable Declaration Data Display	Select whether to display only reference data to cross reference information.	
			Disable Digit/Multiple Search	Select whether to search and display a digit/multiple word device.	
			Disable Structure/Array/FB Tree Display	Select whether to display the structure/array/FB by tree.	
Project History			Operation Setting	Select whether to register the history after saving a project.	Section 4.5



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Appendix 1 List of Toolbars and Shortcut Keys



This section shows the list of toolbars and shortcut keys that can be used for GX Work2.

For (Simple) and (Structured) indicated in the Reference column, refer to the following manuals respectively:

(Simple).....GX Works2 Version1 Operating Manual (Simple Project)

(Structured) GX Works2 Version1 Operating Manual (Structured Project)

Appendix 1.1 Common toolbars and shortcut keys

The following explains the toolbars that are available regardless of the editing target and the corresponding shortcut keys.

■ "Standard" toolbar icons

The following table shows the "Standard" toolbar icons and the corresponding shortcut keys.

Table App.1.1-1 "Standard" toolbar icons and shortcut keys

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + N	New	Creates a new project.	Section 4.1.1
	Ctrl + O	Open	Opens an existing project.	Section 4.1.2
	Ctrl + S	Save	Saves the project.	Section 4.1.3

■ "New Object" toolbar icons

The following table shows the "New Object" toolbar icon.

Table App.1.1-2 "New Object" toolbar icon

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	—	New Object	Adds data to a project.	Section 4.2.1

■ "Program Common" toolbar icons

The following table shows the "Program Common" toolbar icons and the corresponding shortcut keys.

Table App.1.1-3 "Program Common" toolbar icons and the shortcut keys

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	Property	Displays properties of the selected data.	Section 4.2.5
	 + 	Cut	Cuts the selected data.	–
	 + 	Copy	Copies the selected data.	–
	 + 	Paste	Pastes the cut/copied data at the cursor position.	–
	 + 	Undo	Cancels the previous operation.	–
	 +  + 	Find	Searches for a character string.	Section 10.1
	–	Write to PLC	Writes data to the programmable controller CPU.	Section 12.1
	–	Read from PLC	Reads data from the programmable controller CPU.	Section 12.1
		Start Monitoring	Starts monitoring the window being operated.	Section 14.1
	 + 	Stop Monitoring	Stops monitoring the window being operated.	Section 14.1
	 +  + 	Build	Compiles uncompiled programs.	Section 5.2
	–	Rebuild All	Compiles all programs.	Section 5.2
	–	Start/Stop Simulation	Starts/stops simulation.	Section 15.3

■ Other shortcut keys

The following table shows other shortcut keys that are available regardless of the editing target.

Table App.1.1-4 Other shortcut keys common to various programs(1/2)

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	 + 	–	Switches the display of the project data list and the uppermost work window.	–
–	 + 	–	Closes the window displayed in the uppermost position.	–
–	 + 	–	Moves to the next uppermost window.	–
–	 + 	Quit	Closes the project being edited and exits GX Works2.	Section 3.1
–	 +  + 	Copy	Copies data in the project.	Section 4.2.2
–	 +  + 	Paste	Pastes the copied data to a folder.	Section 4.2.2
–		Rename	Changes the name of the selected data or library in the Project window.	Section 4.2.3
–	 +  + 	Add New Module	Adds the intelligent function module data to the project being edited.	Section 4.3.1

Table App.1.1-5 Other shortcut keys common to various programs(2/2)

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
-	 +  + 	Replace	Replaces the character string.	Section 10.1
-	 + 	Cross Reference	Creates the cross reference information.	Section 10.2
-	 + 	Device List	Displays the device usage list.	Section 10.3
-	 +  + 	Down	Searches for a device or instruction in the downward direction.	Section 10.1
-	 +  + 	Up	Searches for a device or instruction in the upward direction.	Section 10.1
-	 +  + 	Online Program Change	Compiles the program and executes online program change.	Section 12.8
-	 + 	Start Watching	Starts monitoring devices/labels registered to the Watch window.	Section 14.2
-	 +  + 	Stop Watching	Stops monitoring devices/labels registered to the Watch window.	Section 14.2

Appendix 1.2 Toolbar icons and shortcut keys for setting labels

The following explains the toolbar icons and the corresponding shortcut keys used for setting labels.

■ "Label" toolbar icons

The following table shows the "Label" toolbar icons and the corresponding shortcut keys.

Table App.1.2-1 "Label" toolbar icons and shortcut keys

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	 + 	New Declaration (Before)	Adds a line above the cursor position.	(Simple) (Structured)
	—	New Declaration (After)	Adds a line below the cursor position.	
	 + 	Delete Line	Deletes the line at the cursor position.	

■ Other shortcut keys

The following table shows other shortcut keys that are available for setting labels.

Table App.1.2-2 Other shortcut keys for setting labels

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
—	 + 	Expand Declaration	Displays the comment and remarks of the selected line in multiple lines.	(Simple) (Structured)
—	 + 	Collapse Declaration	Displays only the first line of the comment and remarks of the selected line.	
—	 + 	Select All	Selects all lines.	
—		—	Moves the cursor one cell to the right.	
—	 + 	—	Moves the cursor one cell to the left.	
—		—	Changes the mode to the text entry mode if the cell is text entry enabled.	
—	 +  /  +  /  + 	—	Selects cells in one line.	
—	Select the button and press the  /  /  key	—	The related setting screen is displayed.	
—	 + 	—	Allows a line feed while entering a text in the "Comment" and "Remark" items.	

Appendix 1.3 Toolbar icons and shortcut keys for setting device memory

The following explains the toolbar icons and the corresponding shortcut keys used for setting device memory.

■ "Device Memory" toolbar icons

The following table shows the "Device Memory" toolbar icons and the corresponding shortcut keys.

Table App.1.3-1 "Device Memory" toolbar icons and shortcut keys

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	Display Mode/Binary	Changes display format to binary.	Section 7.2.4
	–	Display Mode/Octal	Changes display format to octal.	Section 7.2.4
	–	Display Mode/Decimal	Changes display format to decimal.	Section 7.2.4
	–	Display Mode/Hexadecimal	Changes display format to hexadecimal.	Section 7.2.4
	–	Display Mode/Float	Changes display format to real numbers.	Section 7.2.4
	–	Display Mode/ASCII	Changes display format to ASCII.	Section 7.2.4
	–	Register/16-bit	Displays data in units of words.	Section 7.2.4
	–	Register/32-bit	Displays data in units of double words.	Section 7.2.4
	–	Register/64-bit	Displays data in units of 64 bits.	Section 7.2.4
	–	Upload Device Memory from PLC	Reads data in device memory from a programmable controller CPU.	Section 7.4.1
	–	Download Device Memory to PLC	Writes data in device memory to a programmable controller CPU.	Section 7.4.1
	–	Import from Excel File	Reads data from an Excel file.	Section 7.4.2
	–	Export to Excel File	Writes data to an Excel file.	Section 7.4.2
	+	Insert Device	Enters a device.	Section 7.2.2

■ Other shortcut keys

The following table shows other shortcut keys available for setting device memory.

Table App.1.3-2 Other shortcut keys for setting device memory

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–		Insert Row	Inserts a row at the cursor position.	Section 7.2
–	+	Find Device	Searches for a device.	Section 7.3

Appendix 1.4 Toolbar icons for executing sampling trace

The following table shows the toolbar icons used for executing sampling trace.

Table App.1.4-1 "Sampling Trace" toolbar icons

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	—	Trace Setting	Displays the <u>Trace Setting</u> screen.	Section 15.2.2
	—	Trace Start/Stop	Starts or stops sampling trace. To start sampling trace, the trace ready signal (SM800) must be ON.	Section 15.2.4
	—	Display Trace Status	Displays the <u>Trace Data Storage Status</u> screen.	
	—	Monitor Status	Displays the current sampling trace status	-
	—	Execution Failed	Indicates the sampling trace stop status, or the status sampling trace has not started.	
	—	Before Trigger	Indicates the status sampling trace is executed but a trigger is not generated.	
	—	After Trigger	Indicates the status sampling trace is executed and a trigger is generated.	
	—	Stop	Indicates the status sampling trace is interrupted.	
	—	Completion	Indicates the status sampling trace has ended normally by acquiring trace data up to the specified total number of samplings after generation of a trigger.	
	—	Error	Indicates the status a sampling trace error occurred during sampling trace.	
	—	Buffer Status	Displayed when the trace data have been acquired up to the specified total number of samplings.	
	—	Trigger Occurrence	Displayed when a trigger is generated during sampling trace.	
	—	Zoom Out Timing Chart	Zooms the scale of timing chart	Section 15.2.4
	—	Zoom In Timing Chart		
	—	Zoom Out Trend Graph	Zooms the scale of trend graph	
	—	Zoom In Trend Graph		
	—	Chart/Switching Detail	Switches the trace result display on the <u>Sampling Trace</u> screen between the timing chart (graph) and the detailed data (value).	

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Appendix 1.5 Toolbar icons and shortcut keys in program editors

The following explains the toolbar icons and the corresponding shortcut keys used for editing programs in each program editor.

■ "Ladder" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys available in the ladder editor.

Table App.1.5-1 "Ladder" toolbar icons and shortcut keys (1/2)

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
		Open Contact	Inserts an open contact at the cursor position.	(Simple)
	 + 	Open Branch	Inserts an open branch at the cursor position.	
		Close Contact	Inserts a close contact at the cursor position.	
	 + 	Close Branch	Inserts a close branch at the cursor position.	
		Coil	Inserts a coil at the cursor position.	
		Application Instruction	Inserts an application instruction at the cursor position.	
		Horizontal Line	Inserts a horizontal line at the cursor position.	
	 + 	Vertical Line	Inserts a vertical line at the cursor position.	
	 + 	Delete Horizontal Line	Deletes the horizontal line at the cursor position.	
	 + 	Delete Vertical Line	Deletes the vertical line at the cursor position.	
	 + 	Rising Pulse	Inserts a rising pulse at the cursor position.	
	 + 	Falling Pulse	Inserts a falling pulse at the cursor position.	
	 + 	Rising Pulse Branch	Inserts a rising pulse branch at the cursor position.	
	 + 	Falling Pulse Branch	Inserts a falling pulse branch at the cursor position.	
	 + 	Operation Result Rising Pulse	Inserts an operation result rising pulse at the cursor position.	
	 +  + 	Operation Result Falling Pulse	Inserts an operation result falling pulse at the cursor position.	
	 +  + 	Invert Operation Results	Inserts an operation result inversion at the cursor position.	
		Edit Line	Inputs a line at the cursor position.	
	 + 	Delete Line	Deletes the line at the cursor position.	
	–	Device Comment	Edits device comments.	
	–	Statement	Edits the ladder statement at the cursor position.	
	–	Note	Edits the note at the cursor position.	
	 + 	Find Device	Searches for a device.	
	–	Find Instruction	Searches for an instruction.	
	–	Address Display	Displays a device actually assigned with compilation.	
	–	Zoom	Changes the display magnification ratio of the ladder.	

Table App.1.5-1 "Ladder" toolbar icons and shortcut keys (2/2)

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	+	Insert Row	Inserts a row at the cursor position.	(Simple)
–	+	Delete Row	Deletes the row at the cursor position.	
–	+	Insert Column	Inserts a column at the cursor position.	
–	+	Delete Column	Deletes the column at the cursor position.	
–		Ladder Conversion	Converts the program being edited.	
–	+	Ladder Conversion (Online Change)	Converts the program and executes online program change.	
–	+ / / /	–	Moves the cursor on the editing screen while the <u>Enter Symbol</u> screen is displayed.	
–	+	Jump	Displays the specified row.	
–	+	Comment	Displays device comments.	
–	+	Statement	Displays statements.	
–	+	Note	Displays notes.	
–	+	Back to SFC Block	Opens the SFC diagram corresponds to the program on the Zoom screen.	

■ "ST" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys available in the ST editor.

Table App.1.5-2 "ST" toolbar icons and shortcut keys

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	+	Redo	Redoes the operation canceled with <<Undo>>.	(Structured)
		List Operands	Displays the screen (label list screen) for selecting an existing label to be inserted.	
–	+	New Label	Displays the screen (label list screen for creating new labels) for adding a new label to be inserted.	
–	+	Create Template	Displays the template of argument determined for each instruction/function.	
	+	Toggle Bookmark	Sets a bookmark at the cursor line. If a bookmark has already been set, deletes the set bookmark.	
		Next Bookmark	Displays the next bookmark position.	
	+	Previous Bookmark	Displays the previous bookmark position.	
	+ +	Delete All Bookmarks	Deletes all bookmarks.	
	–	Zoom In	Zooms in the screen being edited one level.	
	–	Zoom Out	Zooms out the screen being edited one level.	
–		Start Monitoring	Starts monitoring of the ST program editor being edited.	–
–	+	Split Window	Starts monitoring in the split window format that displays the monitor data of numerical values and character strings.	–

■ "Structured ladder" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys available in the structured ladder editor.

Table App.1.5-3 "Structured ladder" toolbar icons and shortcut keys (1/2)

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
—	+	Redo	Redoes the operation canceled with <<Undo>>.	(Structured)
	+	Select Mode	Changes the input mode for positioning contacts/coils.	
	+	Interconnect Mode	Changes the input mode for drawing lines.	
—	+	Auto Connect	Connects the start and end points to draw a line.	
	+	Guided Mode/Guided Editing	Changes the input mode for entry with keyboard.	
—		Guided Mode /Overwrite, Insert Mode	Switches the input mode between Overwrite/ Insert in the guided mode.	
—	+	Guided Mode/Line Mode	Changes the input mode for drawing lines in Guided editing.	
	+ +	Guided Mode/Auto Comment	Adds a comment entry field at the start of the network added in Guided editing.	
	+	Insert Row	Inserts a row in the ladder being edited.	
	+	Insert Column	Inserts a column in the ladder being edited.	
	+	New Network (Before)	Inserts a new network in front of the network being edited.	
	+	New Network (After)	Inserts a new network in back of the network being edited.	
		Contact	Inserts a contact at the cursor position.	
		Contact Negation	Inserts a contact negation at the cursor position.	
		Coil	Inserts a coil at the cursor position.	
	+	Jump	Inserts a jump at the cursor position.	
	+	Return	Inserts a return at the cursor position.	
		L-Connect Contact	Inserts an L-connect contact at the cursor position.	
		L-Connect Contact Negation	Inserts an L-connect contact negation at the cursor position.	
		Input Variable	Inserts an input variable at the cursor position.	
		Output Variable	Inserts an output variable at the cursor position.	
		Vertical Line	Inserts a vertical line at the cursor position.	
		Horizontal Line	Inserts a horizontal line at the cursor position.	
	+	Comment	Inserts a comment entry field.	
	+ +	Network Label	Displays the <u>Network Header</u> screen.	
		List Operands	Displays the screen (label list screen) for selecting an existing label to be inserted.	
—	+	New Label	Displays the screen (label list screen) for creating new labels) for adding a new label setting to be inserted.	
		Increment Pins	Increments the number of arguments of functions and function blocks.	

Table App.1.5-3 "Structured ladder" toolbar icons and shortcut keys (2/2)

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
		Decrement Pins	Decrements the number of arguments of functions and function blocks.	(Structured)
—		Signal Configuration/Configure	Sets the type of contact and coil.	
—		Signal Configuration/Toggle	Changes the type of contact and coil in the order shown below: • Contact → Contact negation • Coil → Reversal → Set → Reset	
—		Change Display Label-Device-Address	Switches the display format in order (label, device address).	
—		Change Display Label-Comment	Switches the display between label and comment.	
	—	Zoom In	Zooms in the screen being edited one level.	
	—	Zoom Out	Zooms out the screen being edited one level.	
—		Zoom Header/Body/Header	Opens the label setting screen for the selected POU.	

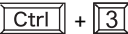
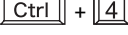
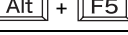
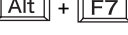
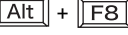
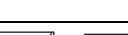
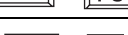
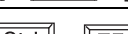
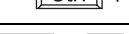
■ "SFC Symbol" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys available in the SFC editor.

Table App.1.5-4 "SFC Symbol" toolbar icons and shortcut keys (1/2)

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
—		Insert Row	Inserts a row at the cursor position.	(Simple)
—		Delete Row	Deletes a row at the cursor position.	
—		Insert Column	Inserts a column at the cursor position.	
—		Delete Column	Deletes a column at the cursor position.	
		Step	Inserts at the cursor position.	
		Block START Step - with END check	Inserts at the cursor position.	
		Block START Step - with no END check)	Inserts at the cursor position.	
		Jump	Inserts at the cursor position.	
		END Step	Inserts at the cursor position.	
		Dummy Step	Inserts at the cursor position.	
		Transition	Inserts at the cursor position.	
		Selection Divergence	Inserts a selection divergence.	
		Simultaneous Divergence	Inserts a simultaneous divergence.	
		Selection Convergence	Inserts a selection convergence.	
		Simultaneous Convergence	Inserts a simultaneous convergence.	
		Vertical Line	Inserts a vertical line.	
		Normal	Sets the step attribute to Normal.	
		Coil Saving	Sets the step attribute to Stored Coil.	

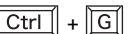
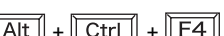
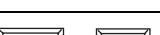
Table App.1.5-4 "SFC" toolbar icons and shortcut keys (2/2)

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
		Action Saving - with no transition check	Sets the step attribute to Stored Operation (SE).	(Simple)
		Action Saving - with transition check	Sets the step attribute to Stored Operation (ST).	
		Reset	Resets the step attribute.	
		Vertical Line (Draw Line)	Inserts  at the cursor position.	
		Selection Divergence (Draw Line)	Inserts  at the cursor position.	
		Simultaneous Divergence (Draw Line)	Inserts  at the cursor position.	
		Selection Convergence (Draw Line)	Inserts  at the cursor position.	
		Simultaneous Convergence (Draw Line)	Inserts  at the cursor position.	
		Delete Line	Deletes a line at the cursor position.	
		SFC Step/Edit Step Comment	Edits the SFC step/transition comments.	
	–	SFC Step No. Sort	Sorts the SFC block step numbers.	
	–	SFC All Block Batch Monitor	Batch monitors all blocks in the SFC program.	
	–	SFC Auto Scroll Monitor	Scrolls the screen to display active steps automatically when they are out of the screen during monitoring.	
	–	Zoom	Changes the display magnification ratio of the ladder.	
–		Build All SFC Program	Converts all SFC programs in the project.	
–		SFC Step/Transition Comment	Displays the SFC step/transition comments.	
–	 /  + double click	Open Step/Transition	Displays the Zoom screen or the start destination block.	
–		–	Displays the start destination block.	
–		Back to SFC Block	Displays the start source block.	

■ SFC block list shortcut keys

The following table shows the shortcut keys available in the SFC block list.

Table App.1.5-5 SFC block list shortcut keys

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–		Jump	Jumps to the specified block number/data name.	(Simple)
–	Numeric key	–	Jumps to the selected block number.	
–		Build All SFC Program	Converts all SFC programs in the project.	
–		SFC Block List Comment	Displays comments of the SFC block list.	

Other shortcut keys

The following table shows other shortcut keys available in program editors.

Table App.1.5-6 Other shortcut keys available in program editors

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	 /  /  / 	–	Moves the cursor in the arrow direction.	(Structured)
–		–	Operates in the same way as the mouse button click during editing.	
–		–	Scrolls up the screen.	
–		–	Scrolls down the screen.	
–	 + 	–	Scrolls the screen to the right.	
–	 + 	–	Scrolls the screen to the left.	
–		–	Moves the cursor to its leftmost position in the row.	
–		–	Moves the cursor to its rightmost position in the row.	
–	 + 	–	Moves the cursor to the start of the program.	
–	 + 	–	Moves the cursor to the end of the program.	
–	 +  /  /  / 	–	Sets a range.	
–	 +  + 	–	Selects the range from the current position up to the start of the program.	
–	 +  + 	–	Selects the range from the current position down to the end of the program.	
–		–	Deletes the selected target.	

Appendix 1.6 Shortcut key for editing intelligent function module data

The following explains the shortcut key used for editing intelligent function module data.

■ Shortcut key for editing type QD75 positioning module data

The following table shows the shortcut key used for editing type QD75 positioning module data.

Table App.1.6-1 Shortcut key for editing type QD75 positioning module data

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	 + 	–	Selects all data on the Positioning Data and Block Start Data screens.	–

Appendix 2 Simulation Function



The simulation function debugs sequence programs on the virtual programmable controller in the personal computer.

The created sequence programs can be debugged without connecting the personal computer to the programmable controller CPU.

This section explains the simulation function and the restrictions.

Appendix 2.1 Available functions

The following table shows the GX Works2 functions can be used in the simulation function.

Table App.2.1-1 GX Works2 functions supported in the simulation function

Function	Description	Reference
Read from PLC	Reads parameter files and program files from the virtual programmable controller.	Section 12.1
Write to PLC	Writes parameter files and program files to the virtual programmable controller.	Section 12.1
Online program change	Writes programs to a virtual programmable controller in RUN status.	Section 12.8
Verify	Verifies data in the virtual programmable controller against project data.	Section 12.2
Delete PLC Data	Deletes data in the virtual programmable controller.	Section 12.3
Monitor	Monitors the status of operation processing.	Section 14.1.1
Monitor status	Displays the monitoring status of the virtual programmable controller.	Section 14.1.2
Watch	Registers and monitors data such as virtual programmable controller devices.	Section 14.2
Device memory/Buffer memory batch monitor	Batch monitors the device memory/buffer memory of the virtual programmable controller.	Section 14.3
Modify value	Modifies the current value of the virtual programmable controller.	Section 15.1
Sampling trace	Traces the device value of the virtual programmable controller.	Section 15.2
Start/Stop PLC	Switches the execution status of the virtual programmable controller, such as STOP or PAUSE.	Section 16.1
PLC Memory Operation	Performs memory format, memory clear, memory arrangement for the virtual programmable controller.	Section 16.2 Section 16.3 Section 16.4
PLC Diagnostics	Checks the virtual programmable controller status and errors.	Section 17.1

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Appendix 2.2 Supported devices

This section explains the devices supported in the simulation function.

Devices SM/SD1000 and later are not supported in the Simulation function.

Table App.2.2-1 Supported devices

CPU type	Device
QCPU (Q mode)	Operates in the device range of the selected CPU type.

However, some devices may be restricted or not supported. No processing is performed for unsupported devices (NOP processing). Unsupported devices can be checked by selecting [Debug] ⇒ [Show Restricted Instructions].

● Device list

Table App.2.2-2 Devices supported in the simulation function (1/2)

Category	Type	Device name	Range set by parameter	Support	Remarks
Internal user device	Bit device	Input (X)	Up to 29k words can be set.	☐	Actual inputs are invalid.
		Output (Y)		☐	Actual outputs are invalid.
		Internal relay (M) ^{*1}		☐	–
		Latch relay (L)		☐	–
		Annunciator (F)		☐	–
		Edge relay (V) ^{*1}		☐	–
		Step relay		☐	–
		Link special relay (SB)		☐	–
		Link relay (B)		☐	–
	Word device	Timer (T) ^{*1*2}		☐	No operation is performed in actual time. The high-speed timer can be set in units of 0.1ms (by parameter).
		Retentive timer (ST) ^{*2}		☐	No operation is performed in actual time. The high-speed retentive timer can be set in units of 0.1ms (by parameter).
		Counter (C) ^{*2}		☐	–
		Data register (D) ^{*1}		☐	–
		Link register (W)		☐	–
		Link special register (SW)		☐	–
Internal system device	Bit device	Function input	Not settable	☐	–
		Function output		☐	–
		Special relay		☐	For the supported special relays, refer to the Special relay list.
	Word device	Function register (FD)		☐	–
		Special register		☐	For the supported special registers, refer to the Special register list.
Link direct device	Bit device	Link input (Jn\X)	Not settable	☐	–
		Link output (Jn\Y)		☐	–
		Link relay (Jn\B)		☐	–
		Link special relay (Jn\SB)		☐	–
	Word device	Link register (Jn\W)		☐	–
		Link special register (Jn\SW)		☐	–
Intelligent function module device	Word device	Intelligent function module device (Un\G)	Not settable	☐	I/O assignment setting in PLC parameter is required.

☐: Supported ☐: Not supported –: Irrelevant

Table App.2.2-2 Devices supported in the simulation function (2/2)

Category	Type	Device name	Range set by parameter	Support	Remarks
Index register	Word device	Index register (Z)	Not settable	○	–
File register	Word device	File register (ZR)	0 to 1018 k points (in units of 1k)	○	File register setting in PLC parameter is required.
Nesting	–	Nesting (N)	Not settable	○	–
Pointer	–	Pointer (P)	Not settable	○	–
		Interrupt pointer (I)		○	–
Others	Bit device	SFC block device (BL)	Not settable	×	–
		SFC transition device (TR)		×	–
	–	Network number specifying device (J)		○	–
		I/O number specifying device (U)		○	–
		Macro instruction argument device (VD)		○	–
		CPU shared memory (Un\G)			Memory for reading/writing data among CPU modules in a multiple CPU system. Enabled only when multiple CPU settings are made.
Constant	–	Decimal constant	K-2147483648 to 2147483647	○	–
		Hexadecimal constant	H0 to FFFFFFFF	○	–
		Real constant	E±1.17550-38 to E±3.40282+38	○	–
			E±2.22507-308 to E±1.79770+308	○	Universal model QCPU only
		String constant	"ABC", "123"	○	Up to 32 characters per instruction

○: Supported ×: Not supported –: Irrelevant

*1 : Devices that can be used for local devices

*2 : Timer/Retentive timer/Counter: Contact and coil are bit devices and current value is a word device.

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● Special relay list

Table App.2.2-3 shows the list of special relays supported in the simulation function when using the QCPU (Q mode).

For details of special relays  QCPU User's Manual (Function Explanation, Program Fundamentals)

Table App.2.2-3 Special relays supported in the simulation function (1/2)

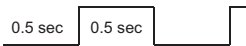
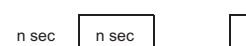
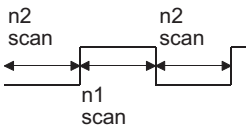
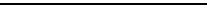
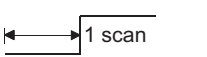
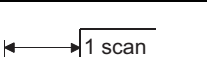
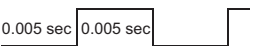
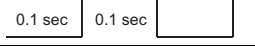
No.	Name	Description	No.	Name	Description
SM0	Diagnostic error	OFF: No error ON: Error	SM412*1	1-second clock	
SM1	Self-diagnostic error	OFF: No self-diagnostic error ON: Self-diagnostic error	SM413*1	2-second clock	
SM5	Error common information	OFF: No error common information ON: Error common information	SM414*1	2n-second clock	
SM16	Error individual information	OFF: No error individual information ON: Error individual information	SM415*1	2n (ms) clock	
SM50	Error reset	OFF→ON: Error reset	SM420	User timing clock No.0	
SM56	Operation error	OFF: Normal ON: Operation error	SM421	User timing clock No.1	
SM62	Annunciator detection	OFF: Not detected ON: Detected	SM422	User timing clock No.2	
SM203	STOP contact	STOP status	SM423	User timing clock No.3	
SM205	STEP-RUN contact	STEP-RUN status	SM424	User timing clock No.4	
SM213	Clock data read request	OFF: Ignored ON: Read request	SM430	User timing clock No.5	
SM400	Always ON	ON 	SM431	User timing clock No.6	
SM401	Always OFF	ON 	SM432	User timing clock No.7	
SM402	ON for only 1 scan after RUN	ON 	SM433	User timing clock No.8	
SM403	OFF for only 1 scan after RUN	OFF 	SM434	User timing clock No.9	
SM404	Low-speed execution type program ON for 1 scan only after RUN	ON 	SM510	Low-speed execution type program execute flag	OFF: Completed or not executed ON: Being executed
SM405	Low-speed execution type program OFF for 1 scan only after RUN	OFF 	SM620	Memory card B enabled flag	OFF: Disabled ON: Enabled
SM409*1	0.01-second clock				
SM410*1	0.1-second clock				
SM411*1	0.2-second clock				

Table App.2.2-3 Special relays supported in the simulation function (2/2)

No.	Name	Description
SM621	Memory card B protect flag	OFF: Not protected ON: Protected
SM622	Drive 3 flag	OFF: No drive 3 ON: With drive 3
SM623	Drive 4 flag	OFF: No drive 4 ON: With drive 4
SM624	Drive 3, drive 4 in-use flag	OFF: Not used ON: Being used
SM640	File register use	OFF: File register not used ON: File register in use
SM700	Carry flag	OFF: Carry OFF ON: Carry ON
SM703	Sort order	OFF: Ascending order ON: Descending order
SM704	Block comparison	OFF: Non-match found ON: All match
SM722	BIN/DBIN instruction error disabling flag	OFF: Error detection performed ON: Error detection not performed
SM777	Enable/disable setting for local devices in interrupt program	OFF: Local device disabled ON: Local device enabled
SM800	Trace ready	OFF: Not ready ON: Ready
SM801	Trace start	OFF: Aborted ON: Started
SM802	Trace in-execution	OFF: Aborted ON: Started
SM803	Trace trigger	OFF → ON: Started
SM804	After trace trigger	OFF: Not after trigger ON: After trigger
SM805	Trace completion	OFF: Not completed ON: Completed
SM826	Trace error	OFF: Normal ON: Error

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● Special register list

Table App.2.2-4 shows the list of special registers supported in the simulation function.
For details of special registers  QCPU User's Manual (Function Explanation, Program Fundamentals)

Table App.2.2-4 Special registers supported in the simulation function (1/2)

No.	Name	Description	No.	Name	Description
SD0	Diagnostic error	Diagnostic error code	SD76	Table of detected annunciator numbers	Annunciator detection number
SD1	Diagnostic error occurrence time	Diagnostic error occurrence time	SD77		
SD2			SD78		
SD3			SD79		
SD4	Error information category	Error information category code	SD200	Switch status	Switch status on CPU module
SD5	Error common information	Error common information	SD201	LED status	LED status on CPU module
SD6			SD202	LED OFF instruction	Bit pattern of LED to be turned OFF
SD7			SD203	CPU operating status	Operating status of CPU *3
SD8			SD210	Clock data	Clock data (year, month)
SD9			SD211	Clock data	Clock data (day, hour)
SD10			SD220	LED display data	LED display data
SD11			SD221		
SD12			SD222		
SD13			SD223		
SD14			SD224		
SD15			SD225		
SD16			SD226		
SD17			SD227		
SD18	Error individual information	Error individual information	SD290	Device assignment	Number of X points assigned
SD19			SD291		Number of Y points assigned
SD20			SD292		Number of M points assigned
SD21			SD293		Number of L points assigned
SD22			SD294		Number of B points assigned
SD23			SD295		Number of F points assigned
SD24			SD296		Number of SB points assigned
SD25			SD297		Number of V points assigned
SD26			SD298		Number of S points assigned
SD50	Error reset	Error code to be reset	SD299		Number of T points assigned
SD62	Annunciator No.	Annunciator number	SD300		Number of ST points assigned
SD63	Number of annunciators detected	Number of annunciators detected	SD301		Number of C points assigned
SD64	Table of annunciator detection number	Annunciator detection number	SD302		Number of D points assigned
SD65			SD303		Number of W points assigned
SD66			SD304		Number of SW points assigned
SD67			SD305	Device assignment 1 (Index register)	16-bit modification Number of Z points assigned
SD68			SD306	Device assignment 1 (Same as parameter contents)	Number of ZR points assigned (Extended)
SD69			SD307		
SD70			SD308	Device assignment 2 (Assignment including extended data register and extended link register setting)	Number of D points assigned (Internal + extended)
SD71			SD309		Number of W points assigned (Internal + extended)
SD72			SD310		
SD73			SD311		
SD74			SD412*1	1-second counter	Number of counts in units of 1 sec.
SD75			SD414*1	2n-second clock setting	2n-second clock units

Table App.2.2-4 Special registers supported in the simulation function (2/2)

No.	Name	Description	No.	Name	Description
SD415 ^{*1}	2n(ms) clock setting	2n-ms clock units	SD647	File register capacity	File register capacity
SD420	Scan counter	The number of counts per scan	SD648	File register block No.	File register block number
SD430	Low-speed scan counter	The number of counts per scan	SD715	IMASK Instruction mask pattern	Mask pattern
SD500	Execution program No.	Program execution type	SD716		
SD510	Low-speed execution type program No.	Current low-speed execution file name	SD717		
SD520 ^{*2}	Current scan time	Current scan time (in units of 1ms)	SD781		
SD521 ^{*2}		Current scan time (in units of 1μs)	SD782		
SD522 ^{*2}	Initial scan time	Initial scan time (in units of 1ms)	SD783		
SD523 ^{*2}		Initial scan time (in units of 1μs)	SD784		
SD524 ^{*2}	Minimum scan time	Minimum scan time (in units of 1ms)	SD785		
SD525 ^{*2}		Minimum scan time (in units of 1μs)	SD786		
SD526 ^{*2}	Maximum scan time	Maximum scan time (in units of 1ms)	SD787		
SD527 ^{*2}		Maximum scan time (in units of 1μs)	SD788		
SD528 ^{*2}	Current scan time for low-speed execution type programs	Current scan time (in units of 1ms)	SD789		
SD529 ^{*2}		Current scan time (in units of 1μs)	SD790		
SD532 ^{*2}	Minimum scan time for low-speed execution type programs	Minimum scan time (in units of 1ms)	SD791		
SD533 ^{*2}		Minimum scan time (in units of 1μs)	SD792		
SD534 ^{*2}	Maximum scan time for low-speed execution type programs	Maximum scan time (in units of 1ms)	SD793		
SD535 ^{*2}		Maximum scan time (in units of 1μs)			

*1 : Values are derived from the constant scan setting value and the number of scans.

*2 : All values are equal to constant scan setting values.

*3 : SD203 supports the operating status of CPU only. STOP/PAUSE cause is fixed to 0.

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Appendix 2.3 Supported instructions

This section explains the instructions supported in the simulation function.
Instructions/functions used in Structured projects can also be simulated.

Table App.2.3-1 Supported instructions

CPU type	Instruction
QCPU (Q mode)	Operates with instructions supported by the QCPU (Q mode).

However, some instructions may be restricted or not supported. No processing is performed for unsupported instructions (NOP processing). Unsupported instructions can be checked by selecting [Debug] ⇒ [Show Restricted Instructions].

● Sequence instructions

Table App.2.3-2 Sequence instructions supported in the simulation function

Category	Symbol	Restrictions
Contact instruction	LD, LDI, AND, ANI, OR, ORI, LDP, LDF, ANDP, ANDF, ORP, and ORF	—
Bond instruction	ANB, ORB, MPS, MRD, MPP, INV, MEP, MEF, EGP, and EGF	—
Output instruction	OUT, OUT T, OUT C, OUT F, OUTH T, SET, RST, SET F, RST F, PLS, PLF, and FF	—
Shift instruction	SFT(P)	—
Master control instruction	MC and MCR	—
End instruction	FEND and END	—
Other instruction	STOP, NOP, NOPLF, and PAGE	—

● Basic instructions

Table App.2.3-3 Basic instructions supported in the simulation function

Category	Symbol	Restrictions
Comparison operation instruction	=, <, >, <=, <, >=, D=, D<, D>, D<=, D<, D>=, E=, E<, E>, E<=, E<, E>=, and BKCMP□(P)	—
	\$=, \$<, \$>, \$<=, \$<, and \$>=	—
Arithmetic operation instruction	+(P), -(P), D+(P), D-(P), *(P), /(P), D*(P), D/(P), B+(P), B-(P), DB+(P), DB-(P), B*(P), B/(P), DB*(P), DB/(P), E+(P), E-(P), E*(P), E/(P), BK+(P), BK-(P), INC(P), DEC(P), DINC(P), and DDEC(P)	—
	\$(P)	—
Data conversion instruction	BCD(P), DBCD(P), BIN(P), DBIN(P), INT(P), DINT(P), FLT(P), DFLT(P), DBL(P), WORD(P), GRY(P), DGRY(P), GBIN(P), DGBIN(P), NEG(P), DNEG(P), ENEG(P), BKBCD(P), and BKBIN(P)	—
Data transfer instruction	MOV(P), DMOV(P), EMOV(P), \$MOV(P), CML(P), DCML(P), BMOV(P), FMOV(P), XCH(P), DXCH(P), BXCH(P), and SWAP(P)	—
Program branch instruction	CJ, SCJ, JMP, and GOEND	—
Other convenient instruction	TTMR, STMR, RAMP, and MTR	—

● Application instructions

Table App.2.3-4 Application instructions supported in the simulation function

Category	Symbol	Restrictions
Logical operation instruction	WAND(P), DAND(P), BKAND(P), WOR(P), DOR(P), BKOR(P), WXOR(P), DXOR(P), BKXOR(P), WXNR(P), DXNR(P), and BKNXR(P)	—
Rotation instruction	ROR(P), RCR(P), ROL(P), RCL(P), DROR(P), DRCR(P), DROL(P), and DRCL(P)	—
Shift instruction	SFR(P), SFL(P), BSFR(P), BSFL(P), DSFR(P), and DSFL(P)	—
Bit processing instruction	BSET(P), BRST(P), TEST(P), DTEST(P), and BKRST(P)	—
Data processing instruction	SER(P), DSER(P), SUM(P), DSUM(P), DECO(P), ENCO(P), SEG(P), DIS(P), UNI(P), NDIS(P), NUNI(P), WTOB(P), BTOW(P), MAX(P), MIN(P), DMAX(P), DMIN(P), SORT(P), DSORT(P), WSUM(P), and DWSUM(P)	The SORT(P) and DSORT(P) instructions are executed in one scan.
Structured instruction	FOR, NEXT, BREAK(P), CALL(P), RET, FCALL(P), XCALL, IX, IXEND, IXDEV, and IXSET	—
	ECALL(P) and EFCALL(P)	—
Data table operation instruction	FIFW(P), FIFR(P), FPOP(P), FINS(P), and FDEL(P)	—
Buffer memory access instruction	FROM(P), DFRO(P), TO(P), and DTO(P)	—
String processing instruction	STR(P), DSTR(P), VAL(P), DVAL(P), ESTR(P), and EVAL(P)	—
	BINDA(P), DBINDA(P), BINHA(P), DBINHA(P), BCDDA(P), DBCDDA(P), DABIN(P), DDABIN(P), HABIN(P), DHABIN(P), DABCD(P), DDABCD(P), LEN(P), ASC(P), HEX(P), RIGHT(P), LEFT(P), MIDR(P), MIDW(P), INSTR(P), EMOD(P), and EREXP(P)	—
Special function instruction	SIN(P), COS(P), TAN(P), RAD(P), DEG(P), SQR(P), EXP(P), LOG(P), RND(P), and SRND(P)	—
	ASIN(P), ACOS(P), ATAN(P), BSQR(P), BDSQR(P), BSIN(P), BCOS(P), BTAN(P), BASIN(P), BACOS(P), and BATAN(P)	—
Data control instruction	LIMIT(P), DLIMIT(P), BAND(P), DBAND(P), ZONE(P), and DZONE(P)	—
Switch instruction	RSET(P) and QDRSET(P)	—
Clock instruction	DATERD(P), DATE+(P), DATE-(P), SECOND(P), and HOUR(P)	The DATERD(P) instruction reads the personal computer clock data.
Program control instruction	PSTOP(P), POFF(P), PSCAN(P), and PLOW(P)	—
Display instruction	LEDR	—
Other instruction	DUTY, ZRRDB(P), ZRWRB(P), ADRSET(P), ZPUSH(P), ZPOP(P), TIMCHK, and WTD(P)	—

● QCPU instructions

Table App.2.3-5 QCPU instructions supported in the simulation function

Category	Symbol	Restrictions
QCPU instruction	TRACE, TRACER, RBMOV(P), FROM(P), S(P), TO, TO(P), and UNIRD(P)	The RBMOV instruction operates as the BMOV instruction.

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Appendix 2.4 Enable/disable setting of parameter items

Some parameter setting items of GX Works2 are not supported in the simulation function.
The following table shows the parameter setting items supported in the simulation function.
The remote password is not supported.

Table App.2.4-1 Support for PLC parameter setting items (1/2)

Parameter	Item	Support
PLC Name	Label	×
	Comment	×
PLC System	Timer Limit Setting	○
	RUN-PAUSE Contacts	×
	Latch Data Backup Operation Valid Contact	×
	Remote Reset	×
	Output Mode at STOP to RUN	○
	Floating Point Arithmetic Processing	○ ^{*1}
	Intelligent Function Module Setting (Interrupt Pointer Setting)	×
	Module Synchronization	×
	Common Pointer No.	×
	Points Occupied by Empty Slot	○
	System Interrupt Setting	×
	High Speed Interrupt Setting	×
	Interrupt Program/Fixed Scan Program Setting	×
	A-PLC	○
	Service Processing Setting	×
PLC File	File Register	○
	Comment File Used in a Command	○
	Initial Device Value	○
	File for Local Device	○
	File used for SP.DEVST/S.DEVLD Instruction	×
PLC RAS	WDT (Watchdog Timer) Setting	○
	Error Check	×
	Operating Mode When There is an Error	○ ^{*2}
	Constant Scanning	○
	Breakdown History	×
	Low Speed Program Execution Time	×
Boot File	Boot Option	×
	Boot File Setting	×
Program		○ ^{*3}
SFC	SFC Program Start Mode	○
	Start Conditions	○
	Output Mode When the Block is Stopped	○
Device	Device Points	○
	Latch (1) Start (latch clear key enabled)	×
	Latch (2) Start (latch clear key disabled)	×
	Local Device Start/End	○

*1 : Internal operations are performed with double precision. However, the processing speed does not change.

*2 : Supports "Computation Error" and "Intelligent Module Program Execution Error".

*3 : There are restrictions for "Low Speed" and "Fixed Scan" type programs. (☞ Appendix 2.5)

Table App.2.4-1 Support for PLC parameter setting items (2/2)

Parameter	Item		Support
I/O Assignment	Type		○
	Model Name		×
	Points		○
	Start XY (Start I/O number)		○
	Base Setting	Base Model Name	×
		Power Model Name	×
		Extension Cable	×
		Slots	×
	Switch Setting		×
	Detailed Setting	Error Time Output Mode	○
		PLC Operation Mode at H/W Error	×
I/O Response Time		×	
Control PLC		×	
Multiple CPU Setting	No. of PLC		×
	Operating Mode		×
	Online Module Change		×
	I/O Sharing When Using Multiple CPUs		×
	Refresh Parameters		×
Acknowledge XY Assignment			×

Table App.2.4-2 Support for Network parameter setting items

Parameter	Item	Support
Network Parameter	Ethernet / CC IE / MELSECNET	×
	CC-Link	×

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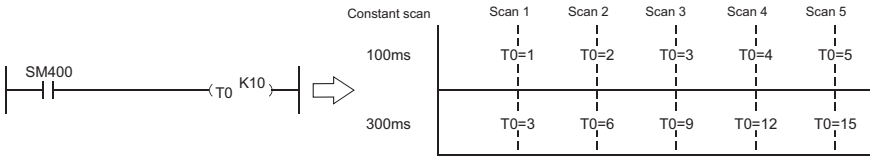
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Appendix 2.5 Restrictions and precautions

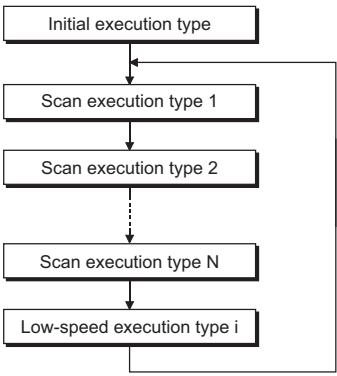
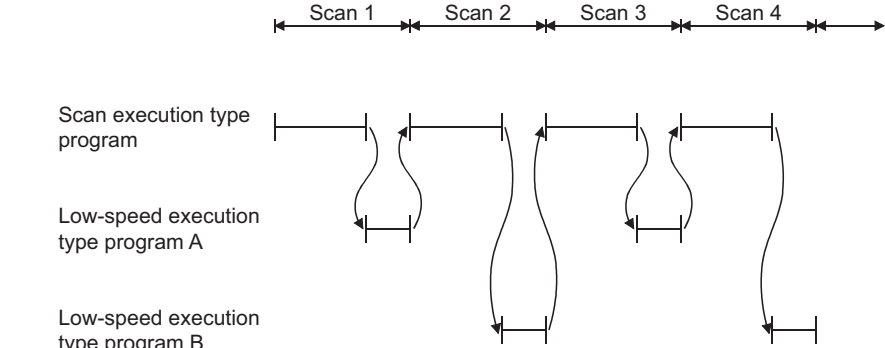
This section explains the restrictions and precautions on debugging programs using the simulation function.

Table App.2.5-1 Restrictions and precautions for debugging using the simulation function (1/3)

No.	Item	Debugging using the simulation function
1	Time processing	Time processing of the timer instruction/function is performed by assuming that the scan time is 100 ms. If the constant scan time is set in parameter, the set constant scan time is used as the scan time.
2	Supported instructions	Some instructions including the data refresh instruction are not supported in the simulation function. Unsupported instructions are processed as NOP. (Supported instructions  Appendix 2.3)
3	Operation of instructions/functions	Operates with the Q25HCPU when QCPU (Q mode) is selected.
4	The capacity is not set when "Use the following file" is selected for a file register in <<PLC file>> of PLC parameter	Regardless of the existence of the file specified in "Use the following file", the file register capacity is assumed to be "0k points" in operation. Therefore, if a file register is used in the program, the "PARAMETER ERROR" occurs.
5	"Use the same file name as the program" is selected for a file register in <<PLC file>> of PLC parameter	The file register capacity is assumed to be "0k points" in operation. However, if file register is written, the capacity up to the number of points of the written file register can be used.
6	File register capacity is changed during program execution	
7	"-0" is specified as the floating-point type real number	An error does not occur. (Processed as '0' in operation.) In debugging with the PLC CPU connected, an error occurs in some CPU modules.
8	Processing time	The time set for constant scan is used for updating the timer current value.  In the virtual programmable controller, the number of counts per scan of the timer instruction changes depending on the constant scan setting. When the constant scan time is set to 100ms, the count of the 100ms timer is +1 per scan. The count of the same timer is +3 per scan when the constant scan time is set to 300ms.
9	Programmable controller CPU status display	If the SD device read from the programmable controller CPU is written to the virtual programmable controller, the status when the SD device was read from the programmable controller CPU is displayed at the 'RUN/STOP status' in the monitor status.*1 Therefore, immediately after writing the SD device to the virtual programmable controller, the display at the 'RUN/STOP status' may not be the same as the actual programmable controller CPU status. (The display does not change until the execution status changes.)

*1 : The 'RUN/STOP status' in the monitor status is displayed based on the SD device information.

Table App.2.5-1 Restrictions and precautions for debugging using the simulation function (2/3)

No.	Item	Debugging using the simulation function
10	Monitoring	- If [Local device not executed] is selected in the GX Works2 local device monitor, the simulation function monitors the devices of the program executed at the end of each scan. However, the function may monitor the devices of the low-speed execution type or fixed scan execution type programs processed at the end of each scan if these types of program are included in the programs for simulation. For details, refer to 11 and 12 in this table. - If a program for local device monitoring is specified in the GX Works2 local device monitor, the simulation function monitors the local devices in the specified program regardless of the existence of a scan execution type program.
11	Operation of low-speed execution type programs	In the virtual programmable controller, one low-speed execution type program is always executed after the execution of scan execution type programs. This execution is not affected by the constant scan time and the program execution time set for low-speed execution type programs. The following shows the operation procedure of programs. (The procedure does not change in step operation.)  (Assume that one scan takes 100ms, then five scans takes 500ms. Changing reference time is possible by changing the constant scan setting value. (Refer to Table App.2.5-1 No.8.) All scan execution type programs are executed in each scan, whereas one low-speed execution type program is executed. Therefore, when N number of low-speed execution type programs are set, the execution of all programs completes in N scans.  In the virtual programmable controller, the monitor value of SM510 remains OFF since a low-speed execution type program is always executed within one scan.

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Table App.2.5-1 Restrictions and precautions for debugging using the simulation function (3/3)

No.	Item	Debugging using the simulation function
12	Operation of fixed scan execution type programs	The simulation function measures the time at the end of scan execution type and low-speed execution type programs and judges whether to execute fixed scan execution type programs. The following shows the processing timing of the simulation function when the scan time is set to 100ms and the timing of fixed scan execution type programs is set to 200ms. Scan execution type program Low-speed execution type program Fixed scan execution type program A (200ms cycle) Fixed scan execution type program B (200ms cycle)
13	Automatic write at the start of simulation	At the start of simulation, PLC parameters and programs registered in the program setting of PLC parameter are written to the virtual programmable controller. The file register specified in "Use the following file" in the PLC file setting of PLC parameter is automatically created.
14	Writing file registers to a programmable controller CPU	When writing file registers to the virtual programmable controller, set the execution status of virtual programmable controller to STOP.
15	Interrupt programs	Not supported in the simulation function. Even created, an interrupt program is not processed.
16	Floating point numbers	Since a rounding error always occurs in the operation result of an instruction using floating point numbers, the result does not match with the result of the operation executed on the programmable controller CPU.
17	Using memory card	The simulation is performed in the following capacity depending on the CPU type. High Performance model QCPU : 2M Universal model QCPU : 8M
18	Using standard RAM/standard ROM	The simulation is performed in the following capacity depending on the CPU type. High Performance model QCPU : Capacity of Q25H Universal model QCPU : Capacity of Q06UD
19	I/O module	Not supported in the simulation function.
20	Network	Not supported in the simulation function.
21	Intelligent function module (Intelligent parameters)	The virtual programmable controller has a buffer memory area of 64k points for 64 modules to be used for accessing intelligent function modules. This buffer memory can be used for saving and reading data. To use intelligent function modules in the simulation function, the I/O assignment must be set in PLC parameter.
22	Double-precision operation for the floating-point arithmetic processing	The double-precision operation of the simulation function performs the internal operation with double precision and converts the final result to the single precision. The processing speed will not change even if the double-precision operation has been set not to be performed in the <<PLC system>> tab of PLC parameter.
23	Monitoring SFC program	The monitoring is possible even if a program written in the virtual programmable controller is not an SFC program. For High Performance model QCPU, the monitoring is possible only when a program in the programmable controller CPU is an SFC program.

Appendix 3 ASCII Code Table



—			MSD							
			0	1	2	3	4	5	6	7
			000	001	010	011	100	101	110	111
LSD	0	0000	NUL	DLE	(SP)	0	@	P	`	p
	1	0001	SOH	DC1	!	1	A	Q	a	q
	2	0010	STX	DC2	"	2	B	R	b	r
	3	0011	ETX	DC3	#	3	C	S	c	s
	4	0100	EOT	DC4	\$	4	D	T	d	t
	5	0101	ENQ	NAK	%	5	E	U	e	u
	6	0110	ACK	SYN	&	6	F	V	f	v
	7	0111	BEL	ETB	ə	7	G	W	g	w
	8	1000	BS	CAN	(	8	H	X	h	x
	9	1001	HT	EM	)	9	I	Y	i	y
	A	1010	LF	SUB	*	:	J	Z	j	z
	B	1011	VT	ESC	+	;	K	[	k	{
	C	1100	FF	FS	,	<	L	\ (¥)	l	
	D	1101	CR	GS	-	=	M	]	m	}
	E	1110	SO	RS	.	>	N	^	n	~
	F	1111	SI	US	/	?	O	—	o	DEL

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Appendix 4 Precautions on GX Works2 and its differences with GX Developer



This section describes the precautions when using GX Works2 and the differences between GX Works2 and GX Developer.

Appendix 4.1 Before using GX Works2

Compared with GX Developer, GX Works2 has some differences in supported CPU modules, features, and operability. Please review the following precautions prior to use.

Table App.4.1-1

Item to be confirmed	Reference
Supported CPU modules	Appendix 4.2
Unsupported features	Appendix 4.3
Supported project types	Appendix 4.4
Using project functions	
Program languages supported by each project type	Appendix 4.5
Using ladder language	
Using SFC language	
Using label	
Using function block	
Using device comment	Appendix 4.6
Using device memory	Appendix 4.7
Using device initial value	Appendix 4.8
Using online function	Appendix 4.9
Using monitor/debug function	Appendix 4.10
Using printing function	Appendix 4.11
Copying saved project data	Appendix 4.12
Compatibility with GX Developer	Appendix 4.13
Compatibility with GX IEC Developer	Appendix 4.14
Key operation	Appendix 4.15

Appendix 4.2 Supported CPU modules

The following table shows the supported CPU modules in GX Works2.

Table App.4.2-1

Programmable controller series	Programmable controller type
QCPU (Q mode)	High Performance model QCPU (Q02, Q02H, Q06H, Q12H, Q25H)
	Universal model QCPU (Q02U, Q03UD, Q03UDE, Q04UDH, Q04UDEH, Q06UDH, Q06UDEH, Q13UDH, Q13UDEH, Q26UDH, Q26UDEH)

The following CPU modules are not supported in GX Works2.
Use GX Developer for the following CPU modules.

Table App.4.2-2

Programmable controller series	Programmable controller type
QCPU (Q mode)	Basic model QCPU (Q00J, Q00, Q01)
	Process CPU (Q12PH, Q25PH)
	Redundant CPU (Q12PRH, Q25PRH)
	Remote I/O master (QJ71LP21, QJ71BR11)
QCPU (A mode)	All programmable controller types
QSCPU	All programmable controller types
QnACPU	All programmable controller types
ACPU	All programmable controller types
FXCPU	All programmable controller types
Motion controller (SCPU)	All programmable controller types
CNC(M6,M7)	All programmable controller types

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Appendix 4.3 Unsupported features

The following table shows the features that are not supported in GX Works2.
Use GX Developer, GX Simulator or GX Configurator for the following features.

Table App.4.3-1

Unsupported feature		Alternate S/W
Online	TEL function	GX Developer GX Simulator
Debug function for ladder program	Monitor condition/Monitor stop condition setting	
	Program/Interrupt program list monitoring	
	Scan time measurement	
	Forced input/output registration/cancellation	
	Skip/Partial/Step execution	
ST program debug function	Debug function	GX Configurator-SC
	Breakpoint function	
Intelligent function module programming function	Protocol FB support	
Intelligent function module debug function	Debug support	GX Configurator-QP
Positioning module online function	Tracing	
	System monitoring	GX Developer
Device initial value	Device memory registration	
	Printing	GX Developer
Password	Password registration for data in project	
Cooperation with GX Explorer	Boot by GX Explorer	GX Developer
Cooperation with PX Developer	Boot by PX Developer	GX Developer
Cooperation with GX Converter	Output using GX Converter	GX Developer
MEDOC print format import	Import in MEDOC print format	GX Developer
Online	Intelligent module diagnostics from system monitor	GX Developer GX Configurator
Sampling trace	Sampling trace conditionally on step number	GX Developer

Appendix 4.4 Supported project types

The following table shows the supported project types in GX Works2.

Table App.4.4-1

Project type	Description
Simple project	–
Without labels	This is the equivalent of the "Do not use label" project of GX Developer. (1) When a project created in the "Do not use label" of GX Developer is read with GX Works2, the project becomes the simple project (without labels). (2) When a project created in the simple project (without labels) of GX Works2 is read with GX Developer, the project becomes the "Do not use label" project.
With labels	This is the equivalent of the "Use label" project of GX Developer. (1) When a project created in the "Use label" of GX Developer without using ST is read with GX Works2, the project becomes the simple project (with labels). (2) When a project created in the simple project (with labels) of GX Works2 is read with GX Developer, the project becomes the "Use label" project.
Structured project	In GX Works2, 'structured programming' is available. The structured programming proceeds while creating POU's and combining them (register tasks in the program file). (1) When a project created in the "Use label" of GX Developer without using ST is read with GX Works2, the project becomes 'structured project'. (2) The projects created in 'structured project' of GX Works2 cannot be read with GX Developer.

■ Using project functions

Before using the project functions in GX Works2, please review the following precautions.

Table App.4.4-2

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Protect projects	By installing as 'monitoring only', projects were protected on each personal computer.	By setting projects as 'read-only' with the 'Security' function, project-by-project protection is now available.
Change project types	Project types cannot be changed from "Do not use label" to "Use label".	The following project type changes are now available. (1) Project type change from 'Simple project (without labels)' to 'Simple project (with labels)' (2) Project type change from 'Simple project (with labels)' to 'Structured project' *: Direct project type change from 'Simple project (without labels)' to 'Structured project' is not available.
Change programmable controller type of projects	Programmable controller type change between QCPUs (High Performance model QCPU and Universal model QCPU) was available.	Programmable controller type change between QCPUs (High Performance model QCPU and Universal model QCPU) is available. Note: For programmable controller type change from Universal model QCPU to High Performance model QCPU, please use the copy and paste function in the program editor.
Read GX Developer format projects	–	Selecting [Project] ⇒ [Open Other Data] ⇒ [Open Other Project] enables GX Developer format projects to be read out.
Read GX Configurator-QP format projects	–	Selecting [Project] ⇒ [Intelligent Function Module] ⇒ [Read GX Configurator-QP] enables GX Configurator-QP format data to be read out.
Copy data in a project to different projects	It was enabled on the project copy dialog.	Copy and paste is now available in the Project window.

Appendix 4.5 Programming languages supported by each project type

The following table shows the programming languages that are supported by each project type of GX Works2.

Table App.4.5-1

Project type	Supported programming language
Simple project	–
Without labels	Ladder, SFC (MELSAP3)
With labels	Ladder, SFC (MELSAP3)
	Supported program element
	Label, structure, function block
Structured project	Ladder, ST, SFC (MELSAP3), structured ladder
	Supported program element
	Label, structure, function block, function, library

The following programming languages are not supported in GX Works2.

Use GX Developer for the following programming languages.

Table App.4.5-2

Unsupported programming language	Description
List	(1) If GX Works2 reads out a program created with lists in GX Developer, it can be displayed or edited in ladder. (2) If GX Developer reads out a program created with ladder in GX Works2, it can be displayed or edited in list.
MELSAP-L	(1) If GX Works2 reads out a program created with MELSAP-L in GX Developer, it can be displayed or edited in SFC (MELSAP3). (2) If GX Developer reads out a program created with SFC (MELSAP3) in GX Works2, it can be displayed or edited in MELSAP-L.

■ Using ladder language

Before using the ladder language in GX Works2, please review the following precautions.

Table App.4.5-3

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Program giving devices an alias	It was enabled by the 'Alias' function.	Please use 'Label'.
Segment a part of program into POU's (macros)	It was enabled by the 'Macro definition/import' function.	Please use 'Function Block'.
Change TC set values	It was enabled by the 'TC set value change' function.	Please change by directly editing TC coils on the ladder editor. To change the TC set values in the programmable controller at the same time, please edit the TC coils directly on the ladder editor and change them through 'online change'.
Find/Replace instructions/devices/labels	Find was enabled by directly typing an instruction/device/label in 'Read mode'. 'Find/Replace/Batch Replace Device', 'Find/Replace Instruction', 'Change I/O number', and 'Switch Statement/Note Type' were available for multiple programs.	Pressing the  key on the ladder editor allows the simple find. It is available only for an editor to be edited. To execute the find/replace function for multiple programs, please select [Find/Replace] ⇒ [Find] / [Replace] or [Find/Replace] ⇒ [Cross Reference].
Check use status of device/label	It was enabled by the 'Cross Reference List' function and 'List of Used Devices' function.	Please select [Find/Replace] ⇒ [Cross Reference] or [Find/Replace] ⇒ [List of Used Device].
Combine programs	It was enabled by the 'Merge data' function.	Please use the 'copy and paste' function on the ladder editor.
Verify	No corresponding function.	The verify result window clearly shows the followings: 'unmatched area of the programs', 'only verify source contains the program' and 'only verify destination contains the program'.

■ Using SFC (MELSAP3) language

Before using the SFC (MELSAP3) language in GX Works2, please review the following precautions.

Table App.4.5-4

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Change block number	It was enabled by the 'copy and paste' function in block list.	Each block data is displayed in the Project window, and the block number can be changed in the property of each block data. Selecting [View] ⇒ [Open SFC Block List] can display the block list equivalent to that of GX Developer.
Auto scroll monitoring	A new block diagram can be automatically opened by block start.	Selecting [View] ⇒ [Open Zoom/START Destination SFC Block] can open it.
Open a start source block by block start	No corresponding function.	Selecting [View] ⇒ [Open START Source SFC Block] can open it.
Open operation output/transition condition programs	By moving the cursor on the SFC diagram, Zoom (operation output/transition condition) can be displayed. —	Selecting [View] ⇒ [Open Zoom/START Destination SFC Block] can open it. Or, it can be opened by pressing and holding the  key and double clicking. Multiple Zooms (operation output/transition condition data) can be simultaneously displayed. * Changing the "Setting of Zoom Display" option can switch the display in a window in the same way as GX Developer.

■ Using labels

Before using labels in GX Works2, please review the following precautions.

Table App.4.5-5

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Check devices automatically assigned labels	It was enabled by the 'Show assigned device' function of label editor.	Please check by selecting [View] ⇒ [Address Display].
Import/Export device comments to labels	It was enabled by the 'device comment import' function and 'device comment export' function.	Please use the copy and paste on the label editor and device comment editor.
Use pointer type labels	Local pointers were assigned.	Common pointers are now assigned. For the projects with labels, 2048 points is set by default in "Common Pointer" in the "PLC Parameter" ⇒ "PLC System" setting.
Unusable reserved words for label name	The definition of reserved words are different between GX Developer and GX Works2.	

■ Using function block

Before using function blocks in GX Works2, please review the following precautions.

Table App.4.5-6

Function	Description
Use function blocks created with ladder	Function blocks created with ladder can be used for ladder program, ST program, and SFC program operation outputs.
Use function blocks created with structured ladder	Function blocks created with structured ladder can be used for structured ladder programs and ST programs.
Use function blocks created with ST	Function blocks created with ST can be used for ladder programs, structured ladder programs, and ST programs.
Check the "Enable to Call Function Block from Ladder to ST, or from ST to Ladder" option	When the VAR_IN_OUT input variable and output variable have different label/device, the input variable value is always equal to the output variable value.

Appendix 4.6 Using device comments

Before using device comments in GX Works2, please review the following precautions.

Table App.4.6-1

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Delete unused device comments	It was enabled by the 'Delete unused comments' function.	Please check unused devices by selecting [Find/Replace] ⇒ [List of Used Device], and then delete on the device comment editor.
Sample comment	Sample comments of special relay/special register were provided in project format.	Comments of special relay/special register and intelligent function module can be imported by the 'Import from Sample Comment' function on the device comment editor.

Appendix 4.7 Using device memory

Before using the device memory in GX Works2, please review the following precautions.

Table App.4.7-1

Function	Description
Device memory display	Multiple device ranges can be displayed in a window. By selecting "All Range" when entering a device, all the device range can be displayed in a window in the same way as that of GX Developer.
Copy and past device memory data to Excel	To copy and paste device memory data to Excel, please select [Tools] ⇒ [Import from Excel File] / [Export to Excel File].

Appendix 4.8 Using device initial value

Before using device initial values in GX Works2, please review the following precautions.

Table App.4.8-1

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Maximum amount of device initial value data to be created	Only 1 data was able to be created.	Up to 800 data can be created.
Restriction of device number	It was able to create within the range of maximum points for each programmable controller of devices.	It now can be created within the range of PLC parameter device setting.
PLC write/read IC memory card write/read	Only 1 data was able to be read and written.	Selected multiple data can be read and written.

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Appendix 4.9 Using online function

Before using the online function in GX Works2, please review the following precautions.

Table App.4.9-1

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Transfer setup	A project was able to contain only 1 'transfer setup' information.	A project can contain multiple pieces of 'transfer setup' information.
Data write/read for intelligent function module	Data write/read was not able to be executed for CPU modules and intelligent function modules at once.	Selecting [Online] ⇒ [Write to PLC], allows simultaneous data write for CPU modules and intelligent function modules. Selecting [Online] ⇒ [Read from PLC], allows simultaneous data read for CPU modules and intelligent function modules.
Flash ROM data write of CPU module	It was enabled by the 'PLC write (Flash ROM)' function.	The 'PLC write (Flash ROM)' function is now integrated in the 'Download to PLC' function. Please select [Online] ⇒ [Write to PLC].
Remote operation PLC diagnostics System monitor	—	Selecting [Online] ⇒ [Start/Stop PLC] and [Diagnostics] ⇒ [System Monitor] / [PLC Diagnostics] can display the module image and the programmable controller CPU operation status is now easy to see. Remote operation, memory operation, and clock setup can be started from the PLC diagnostics window.
Read from PLC	—	Symbolic information in GX Developer format does not include SFC programs. Please read on the 'Simple project (without labels)'. If symbolic information of GX Developer or GX IEC Developer is read out, the project becomes uncompiled.

Appendix 4.10 Using monitor/debug function

Before using the monitor/debug function in GX Works2, please review the following precautions.

Table App.4.10-1

Function	Description
Entry data monitor	The 'entry data monitor' function is now a docking window as a 'watch' function so that it can be displayed without overlapping with the program editor.
	Device/label is now enabled to be entered by dragging and dropping from the program editor and the ON/OFF status of bit device and current values of word device can be modified on the monitoring window.
Device batch monitoring Buffer batch monitoring	The 'device batch monitor' and 'buffer memory batch monitor' functions are now integrated to realize the same operability.
	ON/OFF status of bit device and current values of word device can be modified on the monitoring window.
Intelligent function module monitor/test	To execute a monitoring/test for intelligent function modules, please select 'Watch' or 'Device/Buffer Memory Batch Monitor'.

Appendix 4.11 Using printing function

Before using the printing function in GX Works2, please review the following precautions.

Table App.4.11-1

Function	Description
Additional information print such as statement or device comment	Displayed image is subject to print/print window preview. To print with additional information such as statement or device comment, please put the desired information on the screen and then select [Project] ⇒ [Print Window] / [Print Window Preview].

Appendix 4.12 Copying saved project data

Before copying project data saved in GX Works2, please review the following precautions.

Table App.4.12-1

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Copy saved project data	Save project data was able to be copied by copying files under the project name folder.	Please copy all the workspace name folders and "workspacelist.xml" created in the same hierarchy as the workspace name folders.

Appendix 4.13 Compatibility with GX Developer

For the compatibility between GX Developer and GX Works2, please review the following precautions.

Table App.4.13-1

Function	Description
Open other project	Before opening a GX Developer "Use label" project of which program name and function block name have the same name, please change the data name in GX Developer.
	Function names of ST language are different between GX Developer and GX Works2. Please compile and correct errors.
Export to GX Developer format file	Target projects are: (1) Simple project (without labels) (2) Compiled Simple project (with labels) Note: Projects using labels in SFC language are executed.
	To execute, the following requirements must NOT be satisfied in the global label settings. (1) No device is set. (2) The lengths of label name exceeds 16 characters. (3) Label name contains a device name or reserved word. (4) An invalid character is used. (5) Data type that is not supported by GX Developer is used. (6) A value that is not constant is used in the constant.
	Data registered to the global label is set as "Auto External" for all the local labels.

Appendix 4.14 Compatibility with GX IEC Developer

For the compatibility between GX IEC Developer and GX Works2, please review the following precautions.

Table App.4.14-1

Function	Description
Open other project	Function names of ST language are different between GX IEC Developer and GX Works2. Please compile and correct errors.
User library	Before using GX IEC Developer user libraries with passwords enabled, please disable the passwords in GX IEC Developer.

Appendix 4.15 Key operation

This section explains the differences of key operation between GX Developer and GX Works2.

Table App.4.15-1

Function		Contents	Shortcut key	
			GX Developer	GX Works2
Edit	Read mode	Changes to the read mode.	+	_*1
	Write mode	Changes to the write mode.		_*1
Find/ Replace	Cross reference	Displays the cross reference.	–	+
	List of Used Device	Displays the device list.	–	+
Compile	Compile (all programs being edited)	Compiles all the programs being edited at once.	+ +	–
View	Project data list	Switches display/non-display of project data list.	+	–
	Switch between project data list and window	Switches the project data list and each window.	+	–
	Switch ladder/list	Switches the ladder window/list window.	+	–
Online	Monitor	Monitor (all windows)	+	–
		Monitor (write mode)	+	_*2
		Stop monitor (all windows)	+ +	–
	Debug	Device test	+	–
		Skip execution	+	–
		Partial execution	+	–
		Step run	+	–
	Remote operation		+	–

*1 : In GX Works2, switching the read mode/write mode of the ladder editor is not necessary. Editing is always allowed.

*2 : In GX Works2, switching the monitor (write mode) during ladder monitoring is not necessary. Both editing and changing program online during ladder monitoring are always allowed.

Appendix 5 Compatibility with Projects Created with Existing Applications



This section explains the compatibility of GX Works2 projects with projects created with existing applications.

Appendix 5.1 Application compatibility

■ Reading projects created with existing application to GX Works2

● Reading projects created with GX Developer and IEC Developer

The following table shows the applicability of reading project files created with existing applications to GX Works2.

Projects and data created with the CPU types or programming languages not supported in GX Works2 cannot be read.

When ST programs created with GX Developer are read to GX Works2, they are opened as Structured projects.

(Method for reading projects created with existing applications Section 4.6)

Table App.5.1-1

Programmable controller type	Application	Reading applicability
High Performance model QCPU	GX Developer Version 8.00A or later	△*1
	GX IEC Developer Version 7.00A or later	○
Universal model QCPU (excluding Q02UCPU and Built-in Ethernet port QCPU)	GX Developer Version 8.45X or later	△*1
Universal model QCPU (Built-in Ethernet port QCPU)	GX Developer Version 8.68W or later	△*1
Universal model QCPU (Q02UCPU)	GX Developer Version 8.48A or later	△*1

○: Applicable

△ Applicable with restrictions

×: Not applicable

*1 : When MELSAP-L format SFC programs are read, they are opened in the MELSAP3 format.

● Reading projects created with GX Configurator

GX Configurator flash ROM setting saved files (*.UMD) cannot be read in GX Works2.

To use GX Configurator flash ROM setting saved files in GX Works2, write the data to the intelligent function module with GX Configurator, and then read the data using GX Works2.

(Reading intelligent function module data Section 12.1.4)

■ Reading projects created with GX Works2 to existing applications

● Reading projects using GX Developer and IEC Developer

Projects created with GX Works2 can be read to GX Developer by saving them using "Export to GX Developer Format File". (☞ Section 4.6.4)

Reading projects to GX IEC Developer or non-Windows applications such as GPPQ is not possible.

When reading projects with GX Developer, application versions that can read projects differ depending on the programmable controller type of the project. The following table shows the relationship between the programmable controller types of project and the read-applicable versions.

Table App.5.1-2

Programmable controller type	Application	Reading applicability
High Performance model QCPU	GX Developer Version 8.00A or later	△*1
Universal model QCPU (excluding Q02UCPU and Built-in Ethernet port QCPU)	GX Developer Version 8.45X or later	△*1
Universal model QCPU (Built-in Ethernet port QCPU)	GX Developer Version 8.68W or later	△*1
Universal model QCPU (Q02UCPU)	GX Developer Version 8.48A or later	△*1

○: Applicable

△ Applicable with restrictions

*1 : For the restrictions in reading, refer to "SW D5[]-GPPW Compatibility" of the GX Developer Operating Manual.

● Reading projects using GX Configurator

As projects cannot be saved in formats such as the GX Configurator-QP format or the GX Configurator flash ROM setting saved file format (*.UMD) in GX Works2, data set in GX Works2 cannot be read using GX Configurator.

To use GX Works2 data in GX Configurator, write the data to the intelligent function module with GX Works2, and then read the data using GX Configurator.

(Writing intelligent function module data ☞ Section 12.1.4)

Appendix 6 Compatibility of Data Read from Programmable Controller CPU

This section explains the compatibility between the data written in the programmable controller CPU using GX Developer or GX IEC Developer and the data read using GX Works2.

Appendix 6.1 Application compatibility

■ Reading data written in the programmable controller CPU using existing applications to GX Works2

The following table shows the applicability of reading data written in the programmable controller CPU using existing applications to GX Works2.

Data created with the CPU types or programming languages not supported in GX Works2 cannot be read.

Table App.6.1-1

Programmable controller type	Application	Reading applicability
High Performance model QCPU	GX Developer Version 8.00A or later	○
	GX IEC Developer Version 7.00A or later	○
Universal model QCPU (excluding Q02UCPU and Built-in Ethernet port QCPU)	GX Developer Version 8.45X or later	○
Universal model QCPU (Built-in Ethernet port QCPU)	GX Developer Version 8.68W or later	○
Universal model QCPU (Q02UCPU)	GX Developer Version 8.48A or later	○

○: Applicable
×: Not applicable

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■ Reading data written in the programmable controller CPU using GX Works2 to existing applications

The following table shows the applicability of reading data written in the programmable controller CPU using GX Works2 to existing applications.

Data created with the CPU types or programming languages not supported in existing applications cannot be read.

Table App.6.1-2

Programmable controller type	Application	Reading applicability
High Performance model QCPU	GX Developer Version 8.00A or later	△ *1, *2, *4
	GX IEC Developer Version 7.00A or later	○ *3
Universal model QCPU (excluding Q02UCPU and Built-in Ethernet port QCPU)	GX Developer Version 8.45X or later	△ *1, *2, *4
Universal model QCPU (Built-in Ethernet port QCPU)	GX Developer Version 8.68W or later	△ *1, *2, *4
Universal model QCPU (Q02UCPU)	GX Developer Version 8.48A or later	△ *1, *2, *4

△ Applicable with restrictions

×: Not applicable

*1 : Only execution programs can be read.
They can be displayed/edited in ladder or list.

*2 : Programs cannot be read to GX Developer Version 8.03D or later if projects are opened with the setting of "Use labels". To enable reading of programs to GX Developer Version 8.03D or later, create projects without the "Use labels" setting.

*3 : Only execution programs can be read.
They can be displayed/edited as MELSEC-IL programs.

*4 : When structured ladder/ST programs are read from a programmable controller CPU using existing applications, there may be cases where ladders cannot be restored. Be sure to check the programs after they have been read from the programmable controller CPU using existing applications.

When programs are read from a programmable controller CPU using GX Developer, ladder blocks which cannot be displayed as ladders are displayed in yellow.

Appendix 6.2 Data compatibility

■ Reading data written in the programmable controller CPU using GX Developer to GX Works2

The following table shows the reading applicability depending on the label setting when reading data written in the programmable controller CPU using GX Developer to GX Works2.

Data created with the CPU types or programming languages not supported in GX Works2 cannot be read.

● Reading data with labels

Table App.6.2-1

Data		Project type of GX Works2		
		Simple project		Structured project
		Without labels	With labels	
Parameter	PLC parameter	○	○	○
	Network parameter	○	○	○
	Intelligent function module parameter	○	○	○
Program	Program	○	×	×
	SFC program	△ ^{*2, *3}	×	×
Symbolic information	–	×	△ ^{*1, *4}	△ ^{*4}
Device comment	Global comment (COMMENT)	○	○	○
	Local comment	○	○	○
Device memory	Device memory	○	○	○
Device initial value	Device initial value	○	○	○

○: Applicable

△: Applicable with restrictions

×: Not applicable

*1 : Programs containing ST programs cannot be read as Simple projects. Read programs containing ST programs as Structured projects.

*2 : When MELSAP-L format SFC programs are read, they are opened in the MELSAP3 format.

*3 : Block statements written with GX Developer are read as SFC block comments in GX Works2.

*4 : Use 'Simple project (without labels)' when reading SFC programs.

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● Reading data without labels

Table App.6.2-2

Data		Project type of GX Works2		
		Simple project		Structured project
		Without labels	With labels	
Parameter	PLC parameter	○	○	○
	Network parameter	○	○	○
	Intelligent function module parameter	○	○	○
Program	Program	○	×	×
	SFC program	△ *1, *2	×	×
Device comment	Global comment (COMMENT)	○	○	○
	Local comment	○	○	○
Device memory	Device memory	○	○	○
Device initial value	Device initial value	○	○	○

○: Applicable

△: Applicable with restrictions

×: Not applicable

*1 : When MELSAP-L format SFC programs are read, they are opened in the MELSAP3 format.

*2 : Block statements written with GX Developer are read as SFC block comments in GX Works2.

■ Reading data written in the programmable controller CPU using GX IEC Developer to GX Works2

The following table shows the applicability of reading data written in the programmable controller CPU using GX IEC Developer to GX Works2.

Data created with the CPU types or programming languages not supported in GX Works2 cannot be read.

Table App.6.2-3

Data		Project type of GX Works2		
		Simple project		Structured project
		Without labels	With labels	
Parameter	PLC parameter	○	○	○
	Network parameter	○	○	○
	Intelligent function module parameter	○	○	○
Program	Program file	○	×	×
Symbolic information (Symbolic data)	—	×	×	△ *2

○: Applicable

△: Applicable with restrictions

×: Not applicable

*1 : Only actual programs are read.

*2 : Programs which contain data not supported in GX Works2 cannot be read.

■ Reading data written in the programmable controller CPU using GX Works2 to existing applications

The following table shows the applicability of reading data written in the programmable controller CPU using GX Works2 to existing applications.

Data created with the CPU types or programming languages not supported in existing applications cannot be read.

Table App.6.2-4

Data		Existing applications	
		GX Developer	GX IEC Developer
Parameter	PLC parameter	○	○
	Network parameter	○	○
	Intelligent function module parameter	○	○
Program	Program/Program file	△ *1, *2, *4	△ *3
	SFC program/ SFC program file	△ *2, *5	×
Symbolic information	—	×	×
Device comment	Global comment	○	×
	Local comment	○	×
Device memory	Device memory	○	○

○: Applicable

△: Applicable with restrictions

×: Not applicable

- *1 : Only execution programs can be read.
They can be displayed/edited in ladder or list.
- *2 : Programs cannot be read to GX Developer Version 8.03D or later if projects are opened with the setting of "Use labels". To enable reading of programs to GX Developer Version 8.03D or later, create projects without the "Use labels" setting.
- *3 : Only execution programs can be read.
They can be displayed/edited as MELSEC-IL programs.
- *4 : When structured ladder/ST programs are read from a programmable controller CPU using existing applications, they are read as ladders, but there may be cases where the ladders cannot be restored. Be sure to check the programs after they have been read from the programmable controller CPU using existing applications.
When programs are read from a programmable controller CPU using GX Developer, ladder blocks which cannot be displayed as ladders are displayed in yellow.
- *5 : SFC block titles set in "Simple project (with labels)" are not restored when programs are read from a programmable controller CPU in GX Developer. They are restored when the device comments are read using GX Developer, after they have been set to the BL device and written in GX Works2.

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Appendix 7 Character Strings that cannot be Used for Label Names and Data Names

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Character strings used for application function names, common instruction names, special instruction names, instructions and so on are called reserved words.

These reserved words cannot be used for label names or data names. If the character string defined as a reserved word is used for a label name or data name, an error occurs during registration or compilation.

The following table shows character strings that cannot be used for label names or data names.

Table App.7-1 Character strings that cannot be used for label names and data names (1/2)

Category	Character string
Class identifier	VAR, VAR_RETAIN, VAR_ACCESS, VAR_CONSTANT, VAR_CONSTANT_RETAIN, VAR_INPUT, VAR_INPUT_RETAIN, VAR_OUTPUT, VAR_OUTPUT_RETAIN, VAR_IN_OUT, VAR_IN_EXT, VAR_EXTERNAL, VAR_EXTERNAL_CONSTANT, VAR_EXTERNAL_CONSTANT_RETAIN, VAR_EXTERNAL_RETAIN, VAR_GLOBAL, VAR_GLOBAL_CONSTANT, VAR_GLOBAL_CONSTANT_RETAIN, VAR_GLOBAL_RETAIN
Data type	BOOL, BYTE, INT, SINT, DINT, LINT, UINT, USINT, UDINT, ULINT, WORD, DWORD, LWORD, ARRAY, REAL, LREAL, TIME, STRING
Data type hierarchy	ANY, ANY_NUM, ANY_BIT, ANY_REAL, ANY_INT, ANY_DATE, ANY_SIMPLE, ANY16, ANY32
Device name	X, Y, D, M, T, B, C, F, L, P, V, Z, W, I, N, U, J, K, H, E, A, SD, SM, SW, SB, FX, FY, DX, DY, FD, TR, BL, SG, VD, ZR, ZZ
Character string recognized as device (Device name + Numeral)	Such as X0
ST operator	NOT, MOD
IL operator	LD, LDN, ST, STN, S, S1, R, R1, AND, ANDN, OR, ORN, XOR, XORN, ADD, SUB, MUL, DIV, GT, GE, EQ, NE, LE, LT, JMP, JMPC, JMPCN, CAL, CALC, CALCN, RET, RETC, RETCN, LDI, LDP, LDF, ANI, ANDP, ANDF, ANB, ORI, ORP, ORF, ORB, MPS, MRD, MPP, INV, MEP, MEF, EGP, EGF, OUT(H), SET, RST, PLS, PLF, FF, DELTA(P), SFT(P), MC, MCR, STOP, PAGE, NOP, NOPLF
Application instruction in GX Works2	Application instructions such as DMOD, PCHK, INC(P)  QCPU (Q Mode)/QnACPU Programming Manual (Common Instructions), QCPU Structured Programming Manual (Common Instructions)
SFC instruction	SFCP, SFCPEND, BLOCK, BEND, TRANL, TRANO, TRANA, TRANC, TRANCA, TRANOA, SEND, TRANOC, TRANOCA, TRANCO, TRANCOC, STEP, STEP, STEPSC, STEPSE, STEPST, STEPR, STEPC, STEPG, STEPI, STEPID, STEPISE, STEPIST, STEPIR, TRANJ, TRANOJ, TRANOCJ, TRANCJ, TRANCOJ, TRANCOCJ
ST code body	RETURN, IF, THEN, ELSE, ELSIF, END_IF, CASE, OF, END_CASE, FOR, TO, BY, DO, END_FOR, WHILE, END_WHILE, REPEAT, UNTIL, END_REPEAT, EXIT, TYPE, END_TYPE, STRUCT, END_STRUCT, RETAIN, VAR_ACCESS, END_VAR, FUNCTION, END_FUNCTION, FUCTION_BLOCK, END_FUCTION_BLOCK, STEP, INITIAL_STEP, END_STEP, TRANSITION, END_TRANSITION, FROM, TO, UNTILWHILE

Table App.7-1 Character strings that cannot be used for label names and data names (2/2)

	Character string
Standard function name	Function names in application functions such as AND_E, NOT_E
Standard function block name	Function block names in application functions such as CTD, CTU
Symbol	", %, ' , ~ , ^ , , @ , [,] , { , } , ; , : , , , . , ? , \ , ! , # , \$, % , ' , _ , * , / , + , < , > , = , & , (,) , -
Date and time literal	DATE, DATE_AND_TIME, DT, TIME, TIME_OF_DAY, TOD
Others	ACTION, END_ACTION, CONFIGURATION, END_CONFIGURATION, CONSTANT, F_EDGE, R_EDGE, AT, PROGRAM, WITH, END_PROGRAM, TRUE, FALSE, READ_ONLY, READ_WRITE, RESOURCE, END_RESOURCE, ON, TASK, EN, ENO, BODY_CCE, BODY_FBD, BODY_IL, BODY_LD, BODY_SFC, BODY_ST, END_BODY, END_PARAMETER_SECTION, PARAM_FILE_PATH, PARAMETER_SECTION, SINGLE, TRUE, FALSE, RETAIN, INTERVAL, L, P
String that starts with K1 to K8	Such as K1AAA
Address	Such as %IX0
Statement in ladder language	;FB BLK START, ;FB START, ;FB END, ;FB BLK END, ;FB IN, ;FB OUT, ;FB_NAME;, INSTANCE_NAME, ;FB, ;INSTANCE
Common instruction	Such as MOV
Windows reserved word	COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9, LPT1, LPT2, LPT3, LPT4, LPT5, LPT6, LPT7, LPT8, LPT9, AUX, CON, PRN, NUL

■ Precautions on using labels

- For label names and instance names, the same name as the one used for data names of task, structured data, and POU cannot be used.
- A space cannot be used.
- A numeral cannot be used in the first character of a label name.
- A label name is case-sensitive during compilation.

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Appendix 8 Restrictions when Changing Programmable Controller Types

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The following explains the restrictions applied when changing a programmable controller series or type.

Appendix 8.1 Common restrictions when changing programmable controller series/types

The following table shows the common restrictions applied when changing a programmable controller series or type.

Table App.8.1-1 Common restrictions when changing programmable controller series/types

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Transfer setup	Connection target data other than "Connection 1" are deleted. Connection 1 is changed to the setting when accessing the programmable controller CPU directly coupled to a personal computer.	△	△	△
Compilation status	Programs are set in the uncompiled status.	-	△	△
Saved project status	Programs are changed in the project-unsaved status.	△	△	△
Online password status	Passwords returns to the registered status if unlocked.	△	△	△
PLC Parameter Network Parameter	- Data which do not exist in the CPU of the changed programmable controller series/type, are deleted. - The default values in the CPU of the changed programmable controller series/type are set to the data, which do not exist or cannot be edited, in the CPU of the programmable controller series/type prior to its change. - The default values in the CPU of the changed programmable controller series/type are set to the data which cannot be edited in the CPU of the changed programmable controller series/type.	△	△	△

△: With restrictions

Appendix 8.2 Restrictions when changing to Universal model QCPUs (excluding Q02U)

The following tables show the restrictions applied when changing programmable controller series/types to Universal model QCPUs (excluding Q02U).

■ High Performance model QCPU → Universal model QCPU (excluding Q02U)

Table App.8.2-1

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	- A series-compatible SM/SD devices (SM/SD1000 to SM/SD1255) are changed to the corresponding devices for Q series. - Devices with unsupported instructions and those outside the range are changed to SM1255 or SD1255.	△	—	—
Ladder language	Programs which exceed the program capacity of the CPU with the changed programmable controller type are deleted.	△	—	—
SFC language	Delete the property settings of "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated", and "Act at Step Multi-Activated".	△	△	△
Library	Common instructions/application functions are changed to libraries appropriate for the programmable controller CPU.	—	—	△
PLC Parameter	—	—	—	—
PLC System	If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set for the service processing setting in the PLC system setting.	△	△	△
Program	If "Low Speed" is set to "Execute Type" in the program setting, setting is changed to "Wait".	△	△	△
Boot File	If "Standard ROM" is set to "Transfer from", setting is changed to "Memory Card (ROM)".	△	△	△
Network Parameter	—	—	—	—
MELSECNET/10(H)	If "MNET/H Standby Station" is set, setting is deleted.	△	△	△

△: With restrictions

■ Universal model QCPU (Q02U) → Universal model QCPU (excluding Q02U)

Table App.8.2-2

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	A series-compatible SM/SD devices (SM/SD1000 to SM/SD1255) are changed to the corresponding devices for Q series.	△	—	—
Remote Password	Any existing settings are cleared.	△	△	△

△: With restrictions

■ Built-in Ethernet port QCPU → Universal model QCPU (excluding Q02U)

Table App.8.2-3

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	–	–	–	–
Ladder language	• Programs which exceed the program capacity of the CPU with the changed programmable controller type are deleted.	△	–	–
Remote Password	• Only the settings of the Built-in Ethernet port QCPU are cleared. (The settings of the QJ71E71 and QJ71C24/CMO are not cleared.)	△	△	△

△: With restrictions

Appendix 8.3 Restrictions when changing to Universal model QCPUs (Q02U)

The following tables show the restrictions applied when changing programmable controller series/types to Universal model QCPUs (Q02U).

■ Common restrictions when changing to Universal model QCPUs (Q02U)

Table App.8.3-1

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• Devices outside the range are changed to SM1255 or SD1255.	△	–	–
Ladder language	• Programs which exceed the program capacity of the CPU with the changed programmable controller type are deleted.	△	–	–
Global Comment	• Devices not supported in Q02U are deleted.	△	△	△
Local Comment				
Remote Password	• Any existing settings are cleared.	△	△	△
Library	• Common instructions/application functions are changed to libraries appropriate for the programmable controller CPU.			△
Network Parameter	–	–	–	–
MELSECNET/10(H), CC-Link IE controller network	• The third and later modules of MELSECNET/10(H) and the CC-Link IE controller network modules combined are deleted. • When the "Valid Module During Other Station Access" is set as the module to be deleted at the programmable controller type change (unsupported module in the changed programmable controller type), the 1st module is set as the valid module.	△	△	△
CC-Link	• The fifth and later modules are deleted.	△	△	△
Ethernet	• The third and later modules of the Ethernet module in the module settings are deleted.	△	△	△

△: With restrictions

High Performance model QCPU → Universal model QCPU (Q02U)

Table App.8.3-2

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	–	–	–	–
SFC language	Delete the property settings of "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated", and "Act at Step Multi-Activated".	△	△	△
Device Memory	Devices not supported in Q02U are deleted.	△	△	△
Device Initial Value				
PLC Parameter	–	–	–	–
PLC System	If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set for the service processing setting in the PLC system setting.	△	△	△
Program	- If the number of programs exceeds the allowable number, the settings are set to default. - If "Low Speed" is set to "Execute Type" in the program setting, setting is changed to "Wait".	△	△	△
Boot File	If "Standard ROM" is set to 'Transfer from', setting is changed to "Memory Card (ROM)".	△	△	△
I/O Assignment	If a value which exceeds the maximum base number for Q02U is set, the base setting which exceeds the maximum is deleted.	△	△	△
Multiple CPU	Default is set.	△	△	△
Network Parameter	–	–	–	–
MELSECNET/10(H), CC-Link IE controller network	If "MNET/H Standby Station" is set, setting is deleted.	△	△	△

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■ Universal model QCPU (excluding Q02U) → Universal model QCPU (Q02U)

Table App.8.3-3

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Device Memory	• Devices not supported in Q02U are deleted.	△	△	△
Device Initial Value				
PLC Parameter	–	–	–	–
PLC File	• If the capacity exceeds 16K points in "File used for SP.DEVST/S.DEVLD Instruction", the setting is set to 16K points.	△	△	△
Program	• If the number of programs exceeds the allowable number, the settings are set to default.	△	△	△
I/O Assignment	• If the module type is multiple CPU, it is deleted. • If a value which exceeds the maximum base number for Q02U is set, the base setting which exceeds the maximum is deleted.	△	△	△
Multiple CPU	• Default is set	△	△	△

△: With restrictions

■ Built-in Ethernet port QCPU → Universal model QCPU (Q02U)

Table App.8.3-4

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
PLC Parameter	–	–	–	–
PLC File	• If the capacity exceeds 16K points in "File used for SP.DEVST/S.DEVLD Instruction", the setting is set to 16K points.	△	△	△
Program	• If the number of programs exceeds the allowable number, the settings are set to default.	△	△	△
I/O Assignment	• If the module type is multiple CPU, it is deleted. • If a value which exceeds the maximum base number for Q02U is set, the base setting which exceeds the maximum is deleted.	△	△	△
Multiple CPU	• Default is set	△	△	△

△: With restrictions

Appendix 8.4 Restrictions when changing to Built-in Ethernet port QCPUs

The following tables show the restrictions applied when changing programmable controller series/types to Built-in Ethernet port QCPUs.

■ High Performance model QCPU → Built-in Ethernet port QCPU

Table App.8.4-1

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	- A series-compatible SM/SD devices (SM/SD1000 to SM/SD1255) are changed to the corresponding devices for Q series. - Devices with unsupported instructions and those outside the range are changed to SM1255 or SD1255.	△	—	—
Ladder language	Programs which exceed the program capacity of the CPU with the changed programmable controller type are deleted.	△	—	—
SFC language	Delete the property settings of "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated" and "Act at Step Multi-Activated".	△	△	△
Library	Common instructions/application functions are changed to libraries appropriate for the programmable controller CPU.	—	—	△
PLC Parameter	—	—	—	—
PLC System	If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set for the service processing setting in the PLC system setting.	△	△	△
Program	If "Low speed" is set to "Execute Type" in the program setting, setting is changed to "Wait".	△	△	△
Boot File	If "Standard ROM" is set to "Transfer from", setting is changed to "Memory Card (ROM)".	△	△	△
Network Parameter	—	—	—	—
MELSECNET/10(H)	If "MNET/H Standby Station" is set, setting is deleted.	△	△	△

△: With restrictions

■ Universal model QCPU (excluding Q02U) → Built-in Ethernet port QCPU

Table App.8.4-2

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	—	—	—	—
Ladder language	Programs which exceed the program capacity of the CPU with the changed programmable controller type are deleted.	△	—	—

△: With restrictions

■ Universal model QCPU (Q02U) → Built-in Ethernet port QCPU

Table App.8.4-3

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	A series-compatible SM/SD devices (SM/SD1000 to SM/SD1255) are changed to the corresponding devices for Q series.	△	—	—
Remote Password	Any existing settings are cleared.	△	△	△

△: With restrictions

Appendix 9 Restrictions when saving projects in GX Developer format



This section explains the restrictions applied when saving projects in GX Developer format. In cases other than those listed below when data cannot be saved, a message will appear, and saving will be cancelled. In such cases, follow the instructions of the message.

Table App.9-1 Restrictions when saving projects in GX Developer format

GX Works2 data			Restrictions
Project	Title		The 33rd and later characters are deleted.
	Comment		Deleted.
Parameter	Comment		Deleted.
Structure	Comment		Deleted.
	Label	Comment	The 65th and later characters are deleted. If a line feed is entered, delete anything following the line feed.
Global label	Number of data		The data are combined into one unit.
	Data name		A fixed character string (LABELTBL) is created to combine data into one unit.
	Title		Deleted.
	Comment		Deleted.
	Label	Comment	The 65th and later characters are deleted. If a line feed is entered, delete anything following the line feed.
		Remarks	Deleted.
		FB instance	Deleted.
FB	Comment		Deleted.
	Label	Comment	The 65th and later characters are deleted. If a line feed is entered, delete anything following the line feed.
		FB instance	Deleted*1.
Program	Comment		Deleted.
	Label	Comment	The 65th and later characters are deleted. If a line feed is entered, delete anything following the line feed.
		FB instance	Deleted*1.
SFC program	Comment		Deleted.
SFC block	Data name		Deleted.
	Comment		Converted to a block statement. (Characters exceeding 10 lines times 65 characters are deleted.)
Device comment	Comment		Deleted.
Device memory	Comment		Deleted.
	Duplicated devices		Latter device is preferred.

*1 : The function block instances created for global labels in GX Works2 are created as local labels in GX Developer. However, in GX Developer, the function block instances are not displayed on the local label setting screen.

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GX Works2 Version1

Operating Manual

(Common)

MODEL	GXW2-VER 1-O-KY-E
MODEL CODE	13JU63
SH(NA)-080779ENG-A(0807)KWIX	



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