MITSUBISHI

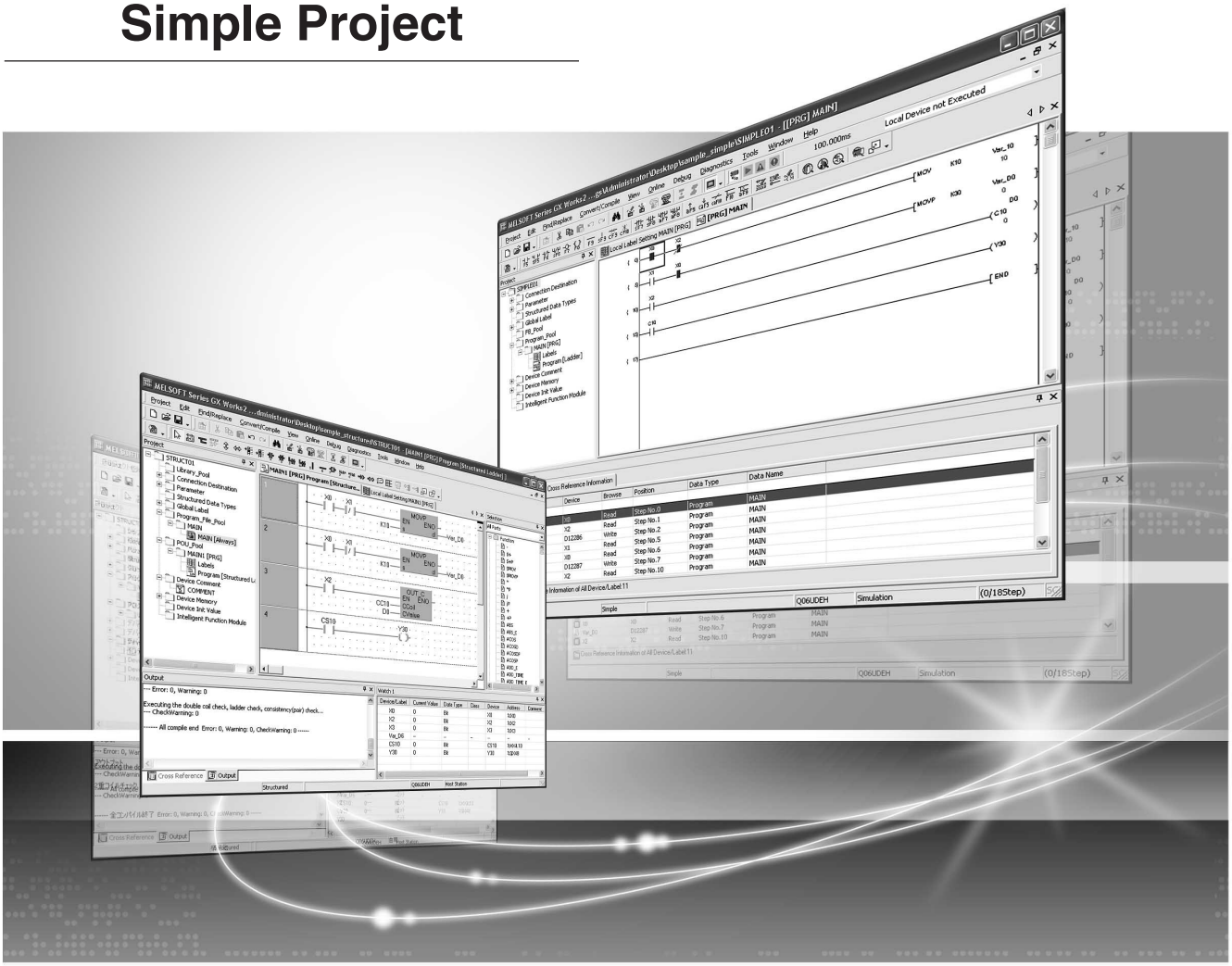
MELSOFT

Integrated FA Software

GX Works2 Version 1

Operating Manual

Simple Project



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 GX Works2 Version1 Operating Manual (Common) before use.

REVISIONS

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

Print date	Manual number	Revision
Jul., 2008	SH(NA)-080780ENG-A	First edition

Japanese Manual Version SH-080731-B

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.

CONTENTS

CONTENTS

CONTENTS

■ 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 (Common) Explains the system configuration of GX Works2 and the functions common to a Simple project and Structured project such as parameter setting, operation method for the online function. (Sold separately)	SH-080779ENG (13JU63)
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 methods, 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 operations for creating sequence programs in Simple project using the functions supported with 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	Details					
Operation of Simple project	Learning the basic operations and operating procedures		Details		Outline	Outline	
	Learning the functions and operation methods for programming				Outline	Details	
	Learning all functions and operation methods except for programming				Details		
Operation of Structured project	Learning the basic operations and operating procedures			Details	Outline		Outline
	Learning the functions and operation methods for programming				Outline	Details	Details
	Learning all functions and operation methods except for programming				Details		

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					Details		
	Learning the types and details of instructions for intelligent function modules							Details
	Learning the types and details of instructions for network modules							Details
	Learning the types and details of instructions for the PID control function						Details	
Programming in Structured project	Learning the fundamentals for creating a structured program for the first time	Details						
	Learning the types and details of common instructions		Details					
	Learning the types and details of instructions for intelligent function modules			Details				Details
	Learning the types and details of instructions for network modules			Details				Details
	Learning the types and details of instructions for the PID control function			Details			Details	
	Learning the descriptions of error codes, special relays, and special registers					Details		
	Learning the types and details of application functions				Details			

● 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.

Chapter heading

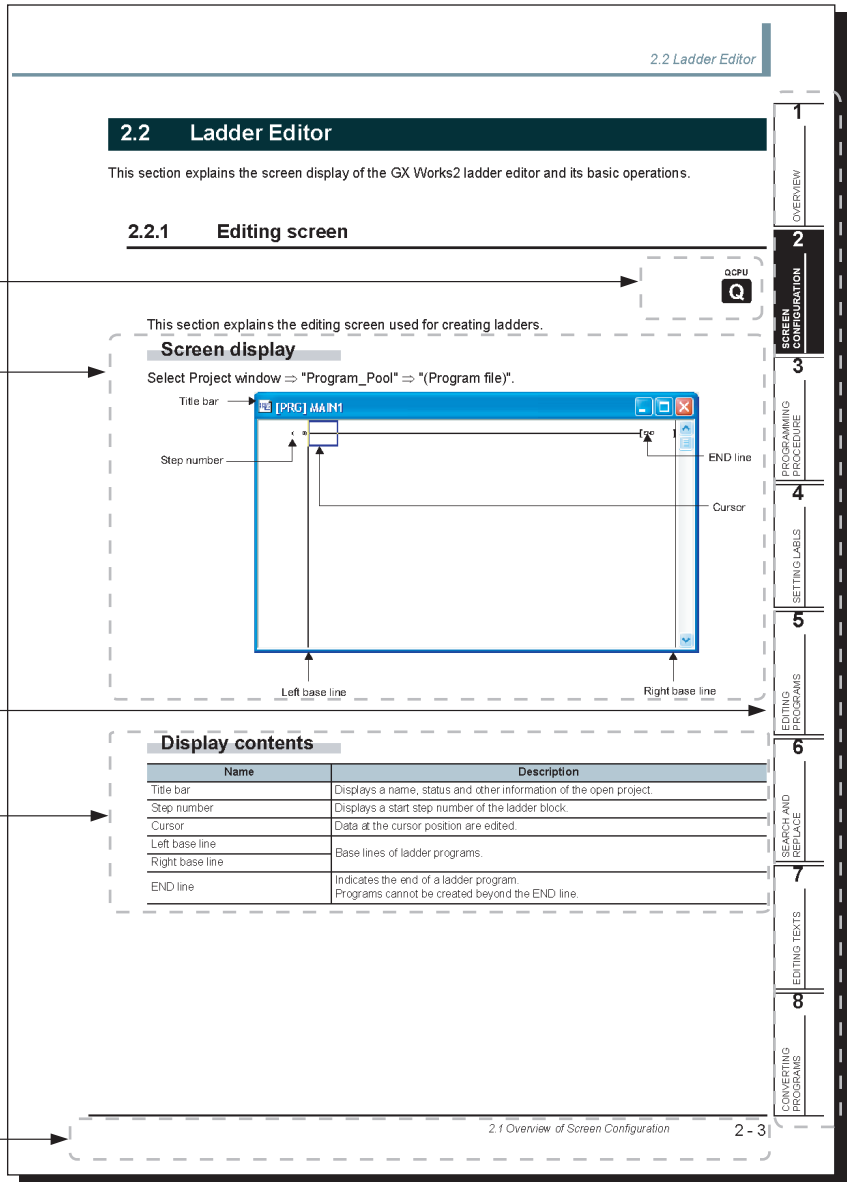
Index on the right of the page number clarifies the chapter of currently open page.

Display contents

Describes the display contents in the screen.

Section title

Clarifies the section of currently open page.



Operating procedure

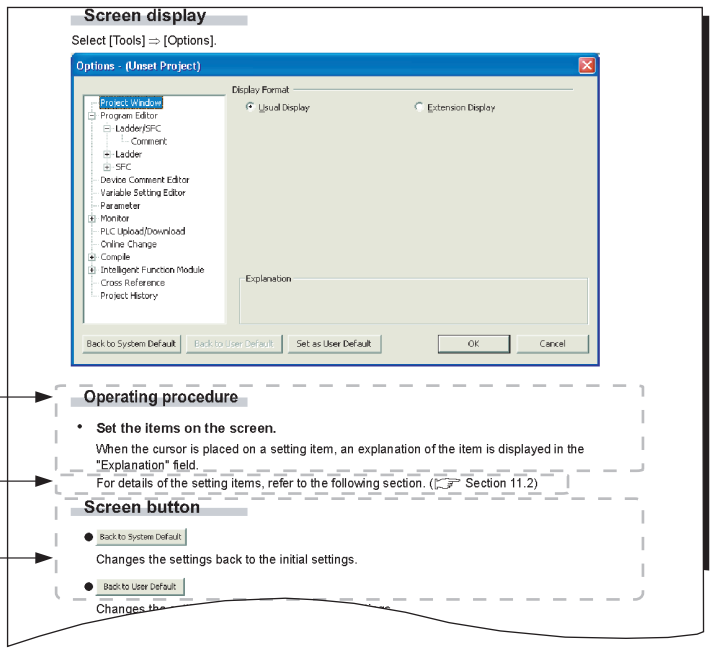
Describes the operating procedure of the function.

Reference location

leads to the reference location and reference manual.

Screen button

Describes the buttons in the screen.



This manual also uses the following columns:

Point

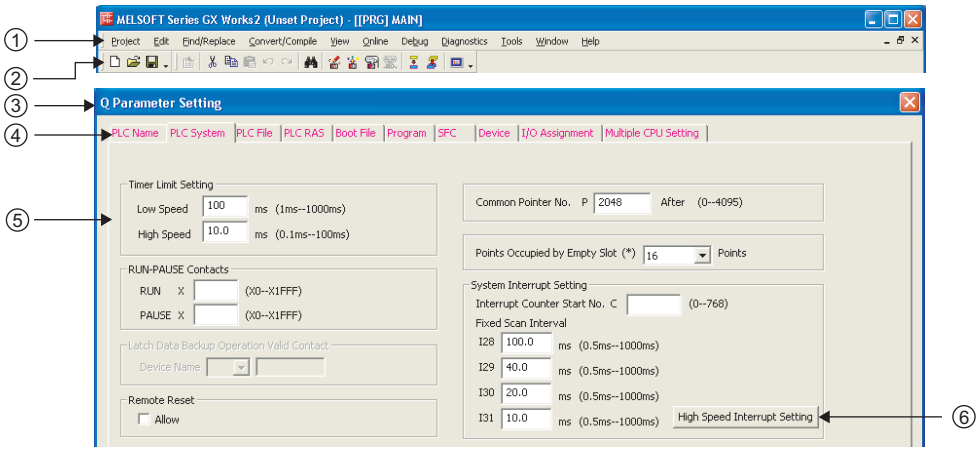
This explains notes requiring attention or useful functions relating to the information given on the same page.

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.



No.	Symbol	Description	Example
①	[ ]	Menu name on a menu bar	[Project]
②		Toolbar icon	
③	(Underline)	Screen name	Q Parameter Setting screen
④	<< >>	Tab name in a screen	<<PLC System>>
⑤	" "	Item name in a screen	"Timer Limit Setting"
⑥		Button on a screen	 button
–		Keyboard key	

■ 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)
GX Developer	Generic product name for the SWnD5C-GPPW-E, SWnD5C-GPPW-EA, SWnD5C-GPPW-EV, and SWnD5C-GPPW-EVA (n: version)
Personal computer	Generic term for personal computers on which Windows® operates
High Performance model QCPU	Generic term for the Q02, Q02H, Q06H, Q12H, and Q25H
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
Simple project	Generic term for projects created by using the ladder/SFC language
Structured project	Generic term for projects created by using the ladder/SFC/ST/structured ladder language
Project without labels	Generic term for the Simple projects that do not use labels (Projects created without selecting "Use Labels" when creating new projects.)
Project with labels	Generic term for the Simple projects and Structured projects that use labels (Projects created with selecting "Use Labels" when creating new projects.)
Project with security	Generic term for the projects whose securities are set
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

1 OVERVIEW

This manual describes the programming method using Simple project and the operation method of the related functions.
For the features and functions of GX Works2, refer to the following manual.
☞GX Works2 Version1 Operating Manual (Common)

1.1 What is Simple Project?

The Simple project is used to create sequence programs using instructions for Mitsubishi programmable controller CPUs.
Programs in Simple project can be created in a similar way with the existing GX Developer.

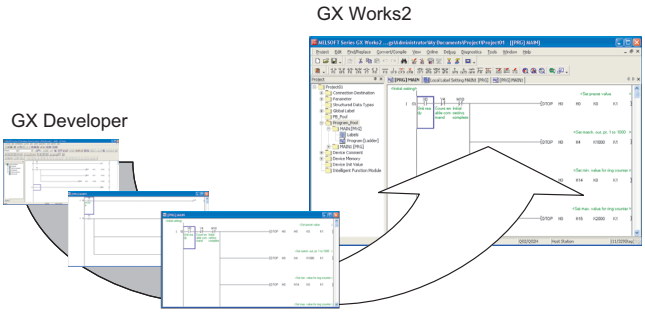
1.2 Features of Simple Project

The features of the Simple project are as follows.

■ Inheritance of operational performances and enhanced use of program assets

GX Works2 inherits excellent operational performances from the existing GX Developer.

Therefore, GX Works2 can edit the sequence programs created by the existing GX Developer, making it possible to reuse program assets effectively.

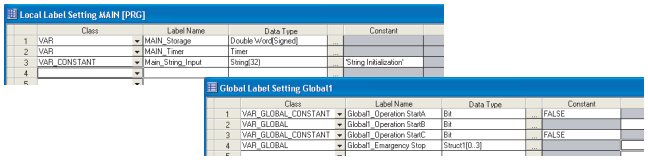


■ Programming using labels

Execution programs can be created by associating label names with actual devices when the equipment configurations (equipment names) are finalized.

Therefore, programs can be created with flexibility that can respond to conditions such as changing equipment configurations (equipment names).

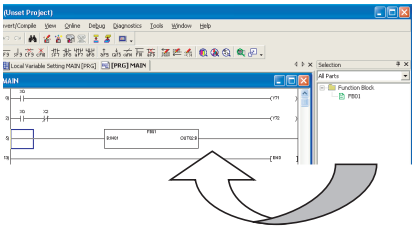
Whether labels are used or not can be selected when creating a new project.



■ Program components using function blocks

The function blocks can be used to convert and register ladder blocks that are used repeatedly as components.
Therefore, registered ladder blocks can be easily reused when creating sequence programs.

Function blocks can be used only for a project that uses labels.



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 and setting target (Edit, Find/Replace, Convert/Compile, and View).
For (Common) and (Structured) indicated in the Reference column, refer to the following manuals respectively:
(Common) ..... GX Works2 Version1 Operating Manual (Common)
(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.	(Common)
Open		Opens an existing project.	
Close		Closes an open project.	
Save		Saves a project.	
Save As		Names and saves a project.	
Delete		Deletes an existing project.	
Verify		Verifies between two project data.	
Project Revision			–
	Revision Entry	Registers the project change history.	(Common)
	Revision List	Displays the list of project change history.	
Change PLC Type		Changes the programmable controller CPU type.	
Change Project Type		Changes the project type from a Simple project to a Structured project.	
Object			–
	New	Adds data to a project.	(Common)
	Rename	Renames the selected data.	
	Delete	Deletes the selected data.	
	Data Copy	Copies the selected data.	
	Data Paste	Pastes the copied data.	
	Set as Default Connection	Specifies data in selected connection target as a connection target for regular use.	
	Property	Displays the selected data properties.	
Intelligent Function Module			–
	Add New Module	Adds new intelligent function module data.	(Common)
	Delete Module	Deletes intelligent function module data.	
	Property	Displays properties of an intelligent function module data.	
	Intelligent Function Module Parameter List	Shows a list of set/unset parameters of an intelligent function module.	

Project (common function)			Reference
Open Other Data			–
	Open Other Project	Opens a project created with GX Developer.	(Common)
	Read GX IEC Developer Data	Reads a project created with GX IEC Developer.	
	Read GX Configurator-QP Data	Reads a project created with GX Configurator-QP.	
Export to GX Developer Format File		Saves an open project in GX Developer format.	
Library			(Structured)
	Create	Creates a new library.	
	Install	Installs 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.	(Common)
	User Management	Manages user information of the project. Adds/deletes a user or changes the user information.	
	Data Security Setting	Sets the access authorization of each user related to reading/writing data.	
Print Window		Prints the open screen.	
Print Window Preview		Displays the print preview of the open screen.	
Printer Setup		Changes the printer settings.	
The Latest File		Displays the recently used GX Works2 project paths and opens the selected project.	
Quit		Exits GX Works2.	

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.	(Common)
Replace	Replaces the character string.	
Cross Reference	Displays the usage of selected device or label.	
List of Used Device	Displays the usage of devices.	

Convert/Compile (common function)		Reference
Build	Compiles (converts) a program being edited.	Section 8.5
Compile + Online Change	Writes a sequence program to the programmable controller CPU after compilation.	Section 8.7
Rebuild All	Compiles (converts) all programs in the project.	Section 8.4
Change SFC All	Converts all SFC programs in the project.	Section 8.2

View (common function)			Reference
Toolbar			–
	Toolbar name	Displays/hides the tool bar.	(Common)
Statusbar		Displays/hides the status bar.	
Colors		Sets the display color such as labels, device comments on the work window.	
Docking Window			–
	Project Window	Displays/hides the Project window. In the Project window, the data in the open project is displayed in a list.	(Common)
	Function Block Selection Window	Displays/hides the Function Block Selection window. Select a part such as FB on the window for utilizing it to a program.	Section 5.1.3
	Output Window	Displays/hides the Output window. In the Output window, the conversion (compilation) result is displayed.	Chapter 8
	Cross Reference Window	Displays/hides the Cross Reference window. In the Cross Reference window, devices/labels used in the project are displayed.	(Common)
	List of Used Device Window	Displays/hides the List of Used Device window. In the List of Used Device window, the usage of selected device is displayed.	
	Watch Window 1 to 4	Displays/hides the Watch window. In the Watch window, the monitoring result is displayed.	
	Find/Replace Window	Displays/hides the Find/Replace window. In the Find/Replace window, the search/replace result is displayed.	

Online (common function)			Reference
Read from PLC		Reads data from the programmable controller CPU.	Section 9.1
Write to PLC		Writes data to the programmable controller CPU.	
Verify with PLC		Verifies a project being edited against the data in the programmable controller CPU.	(Common)
Start/Stop PLC		Remotely controls RUN/PAUSE/STOP of the programmable controller CPU from GX Works2.	
PLC Keyword			–
	New	Sets a password to the programmable controller CPU.	(Common)
	Delete	Cancels the password set to the programmable controller CPU.	
	Disable	Temporarily unlocks the password set to the programmable controller CPU.	
PLC Memory Operation		Formats, arranges, and clears the memory of the programmable controller CPU.	
	Format PLC Memory	Formats the programmable controller CPU memory.	
	Clear PLC Memory	Clears the programmable controller CPU memory.	
	Arrange PLC Memory	Arranges the programmable controller CPU memory.	
Delete PLC Data		Deletes data in the programmable controller CPU.	
PLC User Data			–
	PLC User Data Read	Reads the programmable controller CPU user data.	(Common)
	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.	
Program Memory Batch Download		Transfers the contents of program cashe memory to program memory in a batch.	
Latch Data Backup			–
	Backup	Backs up device memory/file register/error history data in the Universal model QCPU to the standard ROM.	(Common)
	Delete Backup Data	Deletes the backup data in the Universal model QCPU.	
Set Clock		Sets the clock in the programmable controller CPU.	

Online (common function)			Reference
Monitor			–
	Start Monitoring (All Windows)	Starts monitoring of all open windows.	(Common)
	Stop Monitoring (All Windows)	Stops monitoring of all open windows.	
	Start Monitoring	Starts monitoring of the open window.	Section 10.1
	Stop Monitoring	Stops monitoring of the open window.	
	Start Watch	Starts monitoring the current values of registered devices/ labels.	(Common)
	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.	Section 10.3.1
	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.	(Common)
	Change Instance (Function Block)	Selects an instance of the function block to be monitored.	Section 10.2
	SFC All Block Batch Monitor	Batch monitors all blocks in the SFC program.	Section 10.5.4
Register to Watch Window		Registers the selected devices to the Watch window.	(Common)
Modify Value		Changes the ON/OFF status and values of devices and labels used in the program.	(Common)

Debug (common function)			Reference
Start/Stop Simulation		Starts/stops simulation.	(Common)
Show Restricted Instructions		Displays a list of the instructions and devices used in the program unsupported for the simulation function.	
Sampling Trace			–
	Open Sampling Trace	Executes sampling trace.	(Common)

Diagnostics (common function)		Reference
PLC Diagnostics	Diagnoses the operating status of the programmable controller CPU.	(Common)
Ethernet Diagnostics	Diagnoses the Ethernet.	
CC-Link IE Control Diagnostics	Diagnoses the CC-Link IE controller network.	
MELSECNET Diagnostics	Diagnoses the MELSECNET/10(H).	
CC-Link / CC-Link/LT Diagnostics	Diagnoses the CC-Link and CC-link/LT.	
System Monitor	Monitors the system status of the programmable controller CPU.	

Tools (common function)			Reference
IC Card			–
	Read IC Card	Reads data from the IC memory card.	(Common)
	Write IC Card	Writes data to the IC memory card.	
Program Check		Checks programs and displays errors.	Section 8.3
Parameter Check		Checks parameters and displays errors.	(Common)
Options		Sets various options.	Chapter 11
System Label Setting		Sets device range to be automatically assigned to a label.	Section 4.7
Block Password		Sets a block password to data.	(Common)
Intelligent Function Module Parameter Check			–
	Auto Refresh Duplication Check	Checks the duplication of devices set in the Auto refresh function and displays the result.	(Common)

Window (common function)		Reference
Cascade	Tiles windows in overlapping display.	(Common)
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.	(Common)
Special Relay/Register		Displays the explanation for each special relay and special register.	
Changes from GX Developer		Displays the changes from GX Developer to GX Works2.	
Operating Manual			
	GX Works2 Beginner's Manual (Simple Project)	Displays the operating manuals.	(Common)
	GX Works2 Beginner's Manual (Structured Project)		
	GX Works2 Operating Manual (Common)		
	GX Works2 Operating Manual (Simple Project)		
	GX Works2 Operating Manual (Structured Project)		
Connect to MELFANSweb		Connects to the MELFANSweb website.	
About GX Works2		Displays product information such as the version.	

■ 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.	Section 4.5.2
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.	(Common)
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.	
	Intelligent Function Module	Utilizes sample comments of intelligent function module device.	
Clear All		Deletes all device comment data.	

■ 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.	(Common)
Insert Row	Inserts a row at the cursor position.	
Insert Device	Enters a device.	

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

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

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

■ 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			(Common)
	Move to Trigger Position	Displays the trigger position.	
Switching Display Items			–
	Device	Display/hides the display item titles.	(Common)
	Address		
	Comment		
	Data Types		
	Radix		
Timing Chart Scale			–
	Narrow Scale	Changes the display width of the timing chart scale.	(Common)
	Wide Scale		
Trend Graph Scale			
	Narrow Scale	Changes the display width of the trend graph scale.	(Common)
	Wide Scale		
	Initial Display		
Additional Information			–
	Past Time	Display/hides the additional information.	(Common)
	Program Name		

Debug (function for executing sampling trace)			Reference
Sampling Trace			–
	Trace Settings	Displays the screen on which the sampling trace conditions are set.	(Common)
	Start Trace	Starts sampling trace.	
	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".	
	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.	
	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 Sampling Trace 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.	Section 5.1.10
Restore after ladder conversion		Returns a ladder being edited to the last converted status.	Section 5.1.11
Insert Row		Inserts a row at the cursor position.	Section 5.1.7
Delete Row		Deletes a row at the cursor position.	
Insert Column		Inserts a column at the cursor position.	
Delete Column		Deletes the column at the cursor position.	
NOP Batch Insert		Inserts an NOP in front of the ladder block at the cursor position.	Section 5.1.8
NOP Batch Delete		Batch-deletes NOPs in the program being edited.	
Edit Line		Enters a line at the cursor position.	Section 5.1.4
Delete Line		Deletes a line at the cursor position.	Section 5.1.6
Ladder Symbol			–
	Open Contact	Inserts  at the cursor position.	Section 5.1.2
	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.	Section 5.1.4
	Horizontal Line	Inserts  at the cursor position.	
	Delete Vertical Line	Inserts  at the cursor position.	Section 5.1.6
	Delete Horizontal Line	Inserts  at the cursor position.	
	Rising Pulse	Inserts  at the cursor position.	Section 5.1.2
	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 an FB instance name.	Section 5.1.3
Documentation			–
	Device Comment	Edits device comments.	(Common)
	Statement	Edits statements.	Section 7.2
	Note	Edits notes.	
	Statement/Note Batch Edit	Batch-edits the statements/notes in the program.	Section 7.3

Find/Replace (function for editing in ladder language)		Reference
Jump	Moves the cursor to the specified step position.	Section 6.1.4
Find Device	Searches for a device.	Section 6.1.1
Find Instruction	Searches for an instruction.	Section 6.1.2

Find/Replace (function for editing in ladder language)		Reference
Replace Device	Replaces a device.	Section 6.1.1
Replace Instruction	Replaces an instruction.	Section 6.1.2
Find Contact or Coil	Searches for a contact or coil corresponds to the selected device.	Section 6.1.3
Device Batch Replace	Batch-replaces multiple devices.	Section 6.1.1
Change Open/Close Contact	Replaces an open contact with a close contact, and vice versa.	Section 6.1.5
Change Module Start I/O No.	Replaces the start module I/O number of the buffer memory address instruction.	Section 6.1.6
Switch Statement/Note Type	Changes the type (PLC/Peripheral) of a statement/note.	Section 7.4

Convert/Compile (function for editing in ladder language)		Reference
Ladder Conversion	Converts a program being edited.	Section 8.1
Ladder Conversion (Online Change)	Converts a program and writes it online.	(Common)

View (function for editing in ladder language)		Reference
Comment	Displays device comments.	Section 2.2.4
Statement	Displays statements.	
Note	Displays notes.	
Address Display	Displays the device assigned by compilation.	Section 2.2.7
Zoom	Changes the display magnification of the ladder.	Section 2.2.2
Text Size		–
Bigger	Enlarges the text display size on the editing screen.	Section 2.2.3
Smaller	Reduces the text display size on the editing screen.	
Open Zoom Source SFC Block	Displays the SFC diagram of the Zoom screen.	Section 5.2.8
Open Header	Opens the setting screen for the label set for a program being edited.	Section 5.1.2

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.	–
Review SFC	Redisplays the SFC diagram.	Section 5.2.7
Insert Row	Inserts a row at the cursor position.	Section 5.2.2
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.	Section 5.2.2
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.	

Edit (function for editing SFC diagrams)			Reference
SFC Step Attribute			–
	Normal	Sets the step attribute to Normal.	Section 5.2.4
	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.	Section 5.2.2
	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.	Section 5.2.6
Documentation			–
	SFC Step/Edit Step Comment	Changes to the SFC step/transition comment entry mode.	Section 7.6

Find/Replace (function for editing SFC diagrams)		Reference
Jump	Moves the cursor to the specified position.	Section 6.2
Replace SFC Step No.	Replaces the SFC step number.	Section 6.2.3

View (function for editing SFC diagrams)		Reference
SFC Step/Display Step Comment	Displays the SFC step/transition comments.	Section 2.3.3
Zoom	Changes the display magnification ratio of the SFC diagram.	Section 2.3.2
Row of SFC	Sets the number of row of SFC diagram.	Section 2.3.4
Open SFC Block List	Displays the SFC block list screen.	Section 5.2.10
Open Zoom/START Destination SFC Block	Displays the Zoom screen or the start destination block.	Section 5.2.8
Open START Source SFC Block	Displays the SFC block of the start source.	Section 5.2.8
Open Header	Opens the setting screen of labels set for the program being edited.	Section 5.2

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	Section 10.5.1

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.	Section 6.2.4
Find Device	Searches for a device.	Section 6.2.5

View (function for editing SFC block list)		Reference
Display SFC Block List Comment	Displays comments of the SFC block list.	Section 5.2.10
Address Display	Displays devices.	
Open SFC	Opens the SFC diagram.	
Open Header	Displays the label setting screen.	

1.3.5 List of functions for Structured project

For the functions available for editing in the ST/structured ladder language, refer to the following manual.

☞ GX Works2 Version 1 Operating Manual (Structured Project)

MEMO

2 SCREEN CONFIGURATION

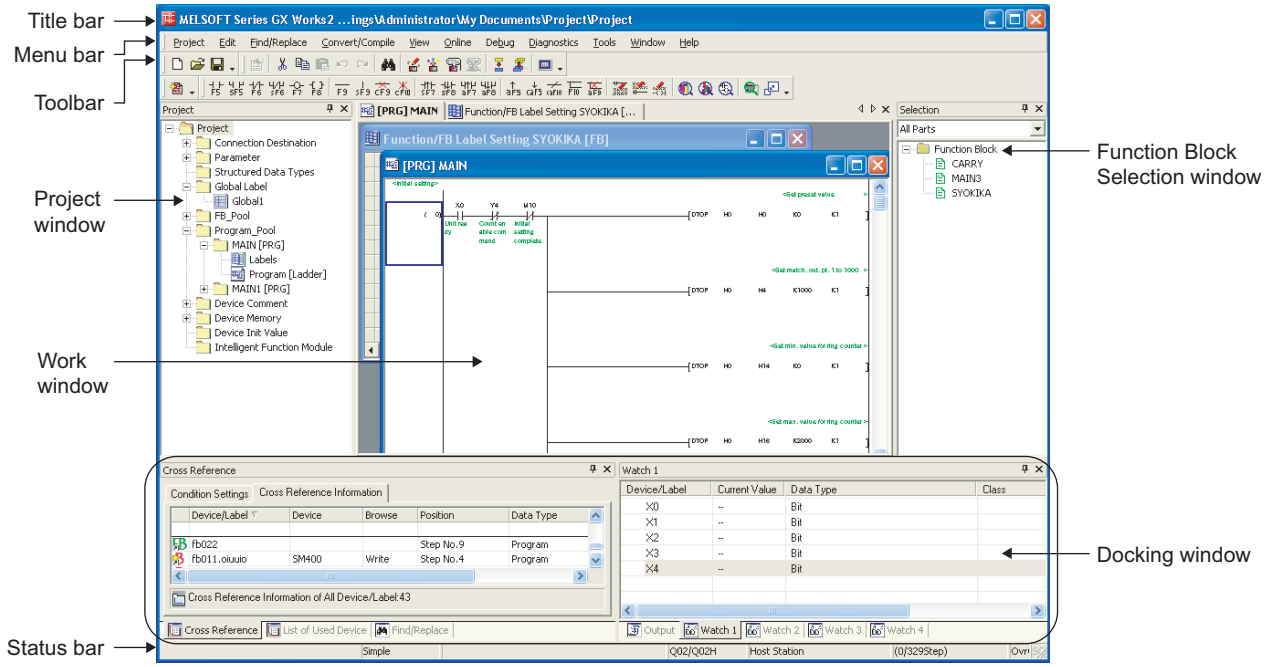
This chapter explains the screen configuration of GX Works2.

2.1 Overview of Screen Configuration

QCPU
Q

This section explains the main frame (basic screen) of GX Works2 that is displayed when it is started up.
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.	Appendix 1
Work window	A main screen used for operations such as programming, parameter setting, and monitoring.	GX Works2 Version1 Operating Manual (Common)
Docking window	A sub screen to support operations performed on a work window.	
Project window	Displays contents of a project in tree format.	
Function Block Selection window	Displays a list of functions (such as function blocks) used for programming.	Section 5.1.3
Output window	Displays compilation and check results (errors and warnings).	Section 8.4
Cross Reference window	Displays cross reference results.	GX Works2 Version1 Operating Manual (Common)
List of Used Device window	Displays the device usage list.	
Watch window 1 to 4	A screen used for monitoring and changing current device values.	
Find/Replace window	A screen used for searching and replacing character strings in the project.	
Status bar	Displays information about a project being edited.	

2.2 Ladder Editor

This section explains the screen display of the GX Works2 ladder editor and its basic operations.

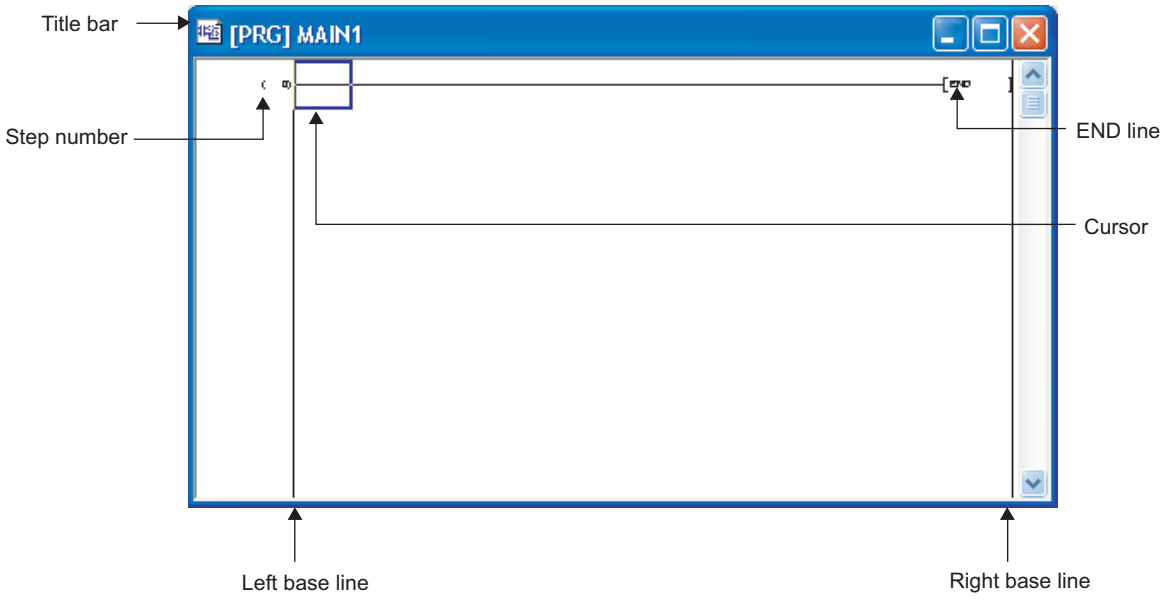
2.2.1 Editing screen

QCPU
Q

This section explains the editing screen used for creating ladders.

Screen display

Select Project window ⇒ "Program_Pool" ⇒ "(Program file)".



Display contents

Name	Description
Title bar	Displays a name, status and other information of the open project.
Step number	Displays a start step number of the ladder block.
Cursor	Data at the cursor position are edited.
Left base line	Base lines of ladder programs.
Right base line	
END line	Indicates the end of a ladder program. Programs cannot be created beyond the END line.

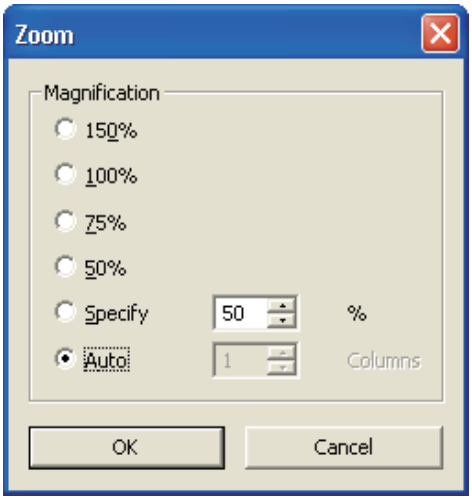
2.2.2 Changing display size of editing screen

QCPU Q

This section explains the method for changing the display size of the editing screen.

Screen display

Select [View] ⇒ [Zoom] ( ).



Display contents

Item	Description
150%, 100%, 75%, 50%	Changes the display size according to the selected zoom ratio.
Specify	Changes the display size according to the specified zoom ratio.
Auto	Adjusts the width of the ladder automatically to display the entire ladder.

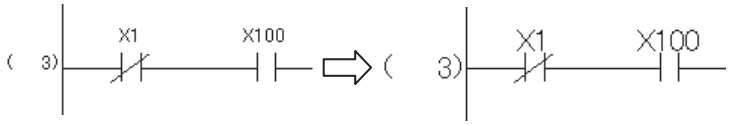
2.2.3 Changing text size on editing screen

QCPU Q

This section explains the method for changing the text size displayed on the editing screen.

Operating procedure

- Select [View] ⇒ [Text Size] ⇒ [Bigger]/[Smaller].
  The text size is changed one step at each setting within the range of 10 steps.



2.2.4 Displaying/hiding comments

QCPU
Q

This section explains the method for displaying/hiding device comments (label comments), notes, and statements.

Operating procedure

- Select [View] ⇒ [Comment]/[Statement]/[Note].

Point

● **Displaying/hiding comments**
Comments also can be displayed/hidden by the following operation.
Select [Tools] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder" ⇒ "Comment".

2.2.5 Setting number of rows and columns for displaying comments

QCPU

The following shows the method for setting the number of rows and columns for displaying a device comment using the option setting.

Screen display

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

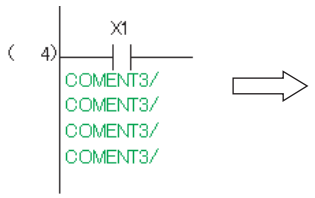
Operating procedure

- Set the items on the screen.

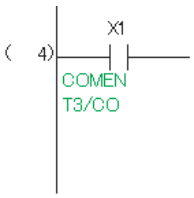
Item	Description
Row	Set the number of display rows in the range from 1 to 4 rows.
Column	Set the number of display columns to 5 or 8 columns.

Examples)

4 rows × 8 columns



2 rows × 5 columns



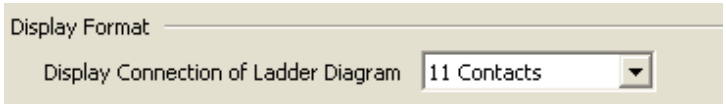
2.2.6 Setting number of contacts to be displayed in ladder programs

QCPU

The following shows the method for setting the number of contacts to be displayed in a single row using the option setting.

Screen display

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



Operating procedure

- Set the items on the screen.

Item	Description
Display Connection of Ladder Diagram	Set the number of contacts (9 or 11 contacts) to be displayed in a single row.

2.2.7 Switching display between label names and devices

QCPU Q

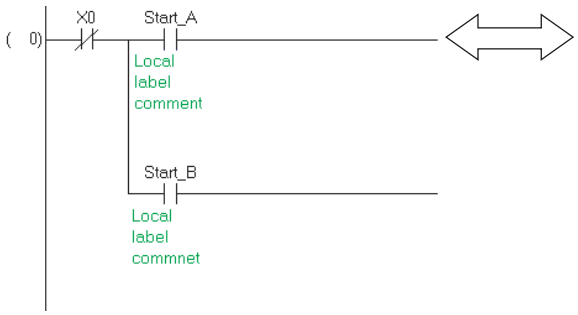
The following explains the method for switching the display of a program that uses labels between label name display and device display.
If label comments or device comments are set, the corresponding comments are displayed.
Devices assigned by the compilation can be checked by switching the program display from label name display to device display.

Operating procedure

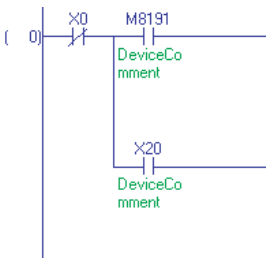
- Select [View] ⇒ [Address Display] ( ).

  Example)

Label name display



Device display



Point

● **Displaying/hiding label comments and device comments**
To check the set label comments and device comments, set the setting to display comments. (☞ Section 2.2.4)

2.3 SFC Editor

This section explains the screen display of the SFC editor and its basic operations.

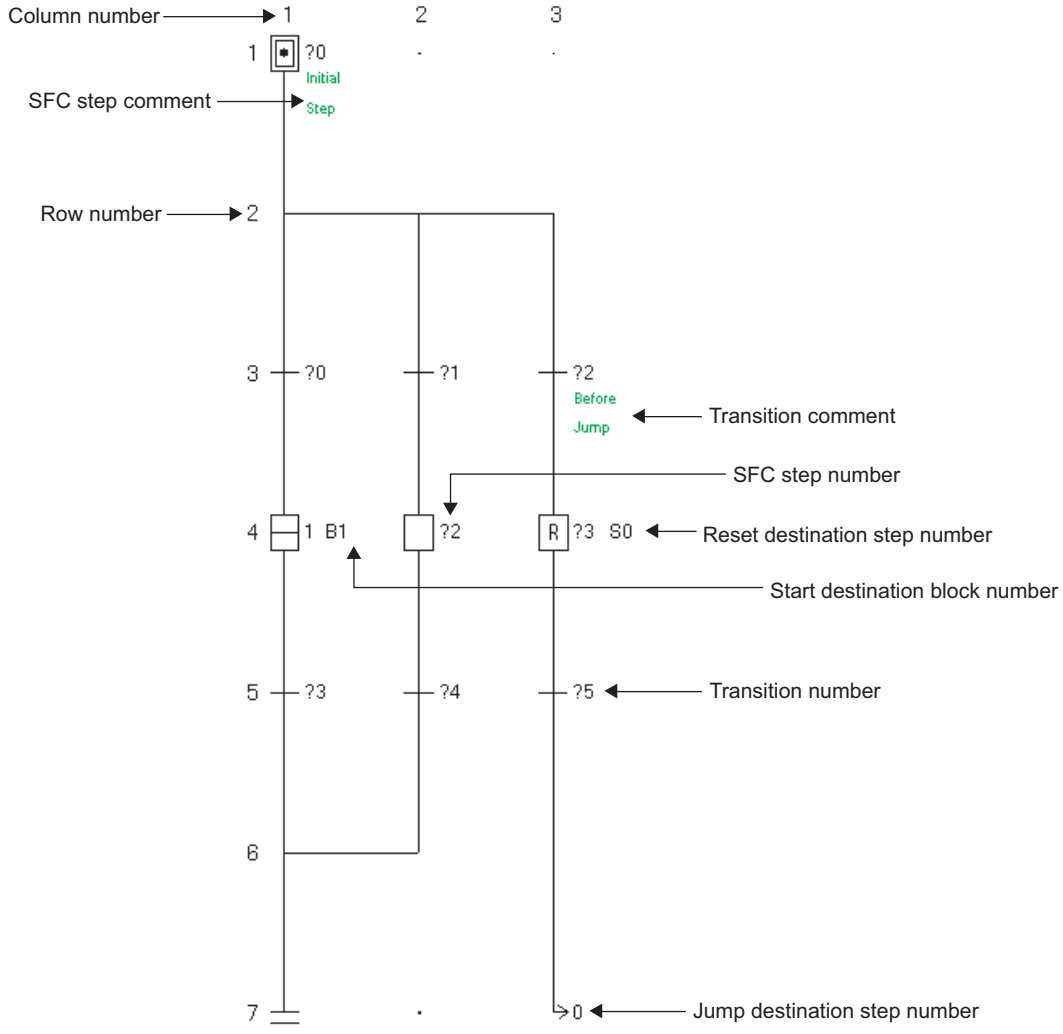
2.3.1 Editing screen

QCPU
Q

This section explains the editing screen used for creating SFC diagrams.

Screen display

Select Project window ⇒ "Program_Pool" ⇒ "(SFC program file)".



Display contents

Item	Description
Row number	Displays row numbers in the SFC diagram.
Column number	Displays column numbers in the SFC diagram.
SFC step number	Displays SFC step numbers for each step.
Transition number	Displays transition numbers for each transition.
Start destination block number	Displays start destination block numbers for the block start step.
Reset destination step number	Displays reset destination step numbers for the reset step.
Jump destination step number	Displays jump destination step numbers for the jump step.
SFC step comment	Displays comments for each SFC step.
Transition comment	Displays comments for each transition.

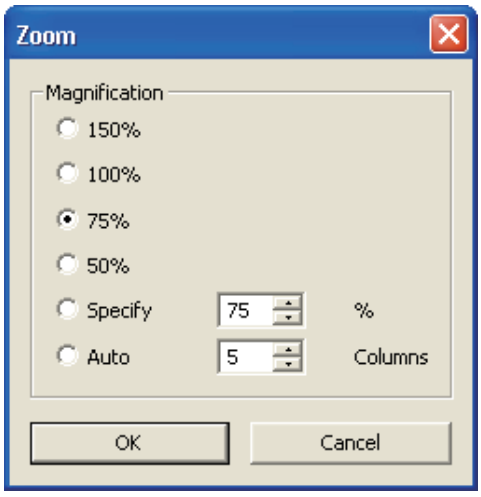
2.3.2 Changing display size of editing screen

QCPU Q

This section explains the method for changing the display size of the editing screen.

Screen display

Select [View] ⇒ [Zoom] ( ).



Display contents

Item	Description
150% 100% 75% 50%	Changes the display size according to the selected zoom ratio.
Specify	Changes the display size according to the specified zoom ratio.
Auto	Changes the display size according to the specified number of columns.

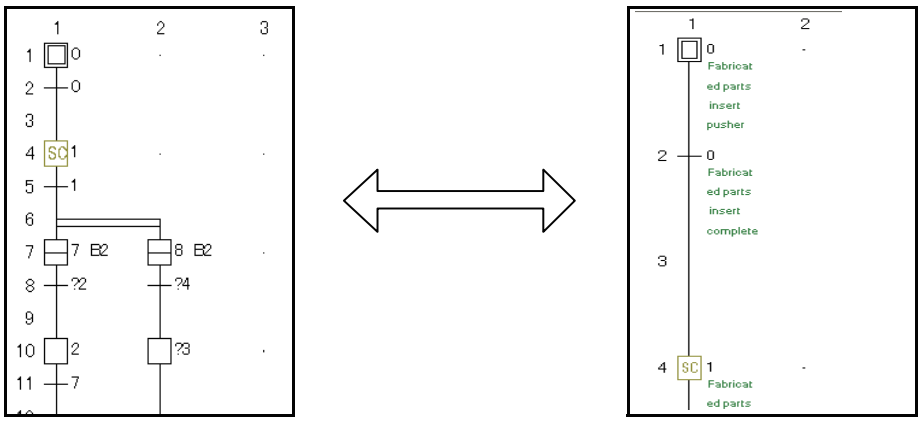
2.3.3 Displaying/hiding SFC step/transition comments

This section explains the method for displaying/hiding SFC step/transition comments in the created SFC diagram.

Operating procedure

- Select [View] ⇒ [SFC Step/Display Step Comment] (Ctrl + F5).

  Select the menu again to hide SFC step/transition comments.

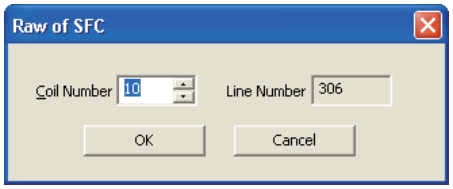


2.3.4 Setting number of columns for SFC diagram display

This section explains the method for setting the number of divergences that can be edited and displayed for the SFC diagram.

Screen display

Select [View] ⇒ [Row of SFC].



Operating procedure

1. Set the items on the screen.

Item	Description
Coil Number	Enter the number of columns.
Line Number	Displays the number of rows. The value is changed automatically according to the specified number of columns.

2. Click the OK button.

The SFC diagram is displayed according to the specified number of columns.

3 PROGRAMMING PROCEDURE

This chapter explains the method for creating programs in Simple project.

3.1 Creating Programs

QCPU
Q

This section explains the general operating steps from the creation of a program in Simple project to the execution of the created program in the programmable controller CPU.

1. Creating a new project

Procedure	Reference
Start up GX Works2.	GX Works2 Version1 Operating Manual (Common)
Create a new Simple project. To reuse an existing Simple project, open that Simple project.	

2. Setting parameters

Procedure	Reference
Set parameters.	GX Works2 Version1 Operating Manual (Common)
Check parameters.	

3. Setting labels (when using labels)

Procedure	Reference
Define global labels.	Chapter 4
Define local labels.	

4. Editing and converting/compiling programs (for ladder programs)

Procedure	Reference
Edit ladder programs and convert ladders.	Section 5.1
Check programs.	Chapter 8
Compile all programs. (when using labels)	

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5. Editing and converting/compiling programs (for SFC programs)

Procedure	Reference
Edit SFC diagrams.	Chapter 5
Edit operation output programs and convert ladders.	
Edit transition condition programs and convert ladders.	
Set properties of SFC programs and SFC blocks.	
Convert SFC diagrams. (when not using labels)	Chapter 8
Check programs. (when not using labels)	
Compile all programs. (when using labels)	

6. Connecting a personal computer to the programmable controller CPU

Procedure	Reference
Connect a personal computer to the programmable controller CPU.	GX Works2 Version1 Operating Manual (Common)
Set the connection target.	

7. Writing data to the programmable controller CPU

Procedure	Reference
Write parameters to the programmable controller CPU.	Chapter 9
Write sequence programs to the programmable controller CPU.	

8. Checking the operation

Procedure	Reference
Monitor the execution status of sequence programs.	Chapter 10

9. Ending the project

Procedure	Reference
Save the project.	GX Works2 Version1 Operating Manual (Common)
Exit GX Works2.	

MEMO

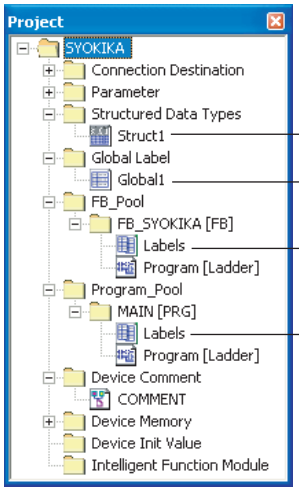
4 SETTING LABELS

This chapter explains the method for setting labels.

4.1 Label Setting Screens

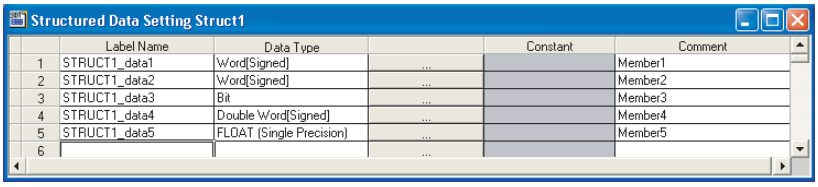
QCPU
Q

This section shows label setting screens.
When "Use Labels" is selected on the New Project screen, labels are created as shown below.
Labels are set on each screen according to the type of label.



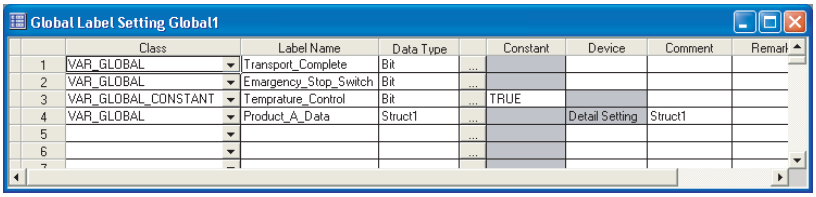
Structured Data Setting screen

Defines structured data types to be used in the label setting. (☞ Section 4.6.1)



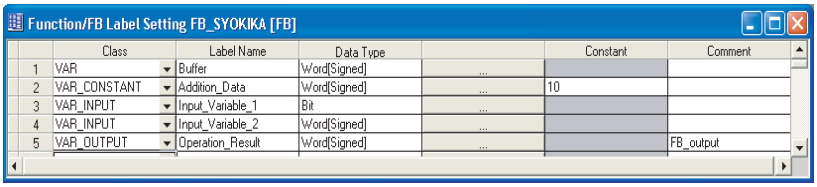
Global Label Setting screen

Defines labels that can be used for all sequence programs in the project. (☞ Section 4.2)



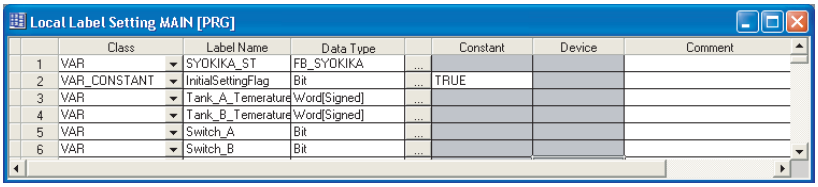
Function/FB Label Setting screen

Defines labels that can be used only for function blocks in the project. (☞ Section 4.4)



Local Label Setting screen

Defines labels that can be used only for each specified sequence program in the project. (☞ Section 4.3)



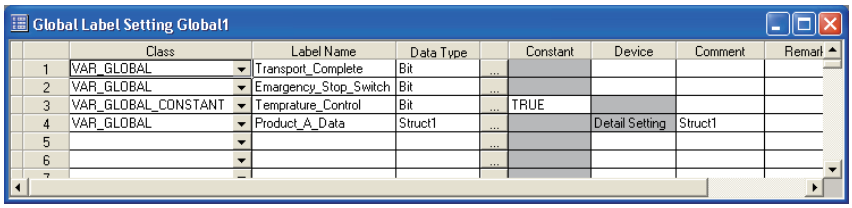
4.2 Setting Global Labels

QCPU
Q

This section explains the method for setting global labels.

Screen display

Select Project window ⇒ "Global Label" ⇒ "(Global label)".



Operating procedure

- Set the items on the screen.

Item	Description	Number of characters
Class	Select a class name of label from the list displayed by clicking ▼. **Class** / **Description** VAR_GLOBAL: A common label that can be used for programs and function blocks. VAR_GLOBAL_CONSTANT: A common constant that can be used for programs and function blocks.	–
Label Name	Enter a desired label name.	0 to 32 characters
Data Type	Enter the data type of label which can be set on the Type Selection screen displayed by clicking [...]. (☞ Section 4.5.1)	0 to 128 characters
Constant	Displays the constant value of the selected data type. When "VAR_GLOBAL_CONSTANT" is selected for "Class" and simple type is selected for "Data Type", the constant value can be set.	0 to 128 characters
Device	Set a device name to be assigned. • When "VAR_GLOBAL" is selected for "Class", the cell is left blank. • When the data type is Structure, click the "Detail Setting" cell and set devices on the Structured Data Device Setting screen. (☞ Section 4.6.3)	0 to 50 characters
Comment	Enter comments. A new line can be inserted in a cell by pressing the Ctrl + Enter keys. To display comments on the program editor, select "Device Comment" in "Comment Display Items". (☞ Section 2.2.4)	0 to 1024 characters
Remark	Enter supplementary information for comments. A new line can be inserted in a cell by pressing the Ctrl + Enter keys.	0 to 1024 characters

Point

● **Characters that can be used for label names**
The maximum number of characters that can be used for a label name is 32.
Note that any of the following label names causes an error at compilation.
- A label name that includes a space.
- A label name that begins with a numeral.
- A label name which is same as the one used for devices.

For characters that cannot be used for label names, refer to the following manual.
☞ GX Works2 Version1 Operating Manual (Common)

● **Specifying devices/addresses**
The digit specification for bit devices (K4M0) or bit specification for word devices (D0.1) can be specified for devices/addresses.

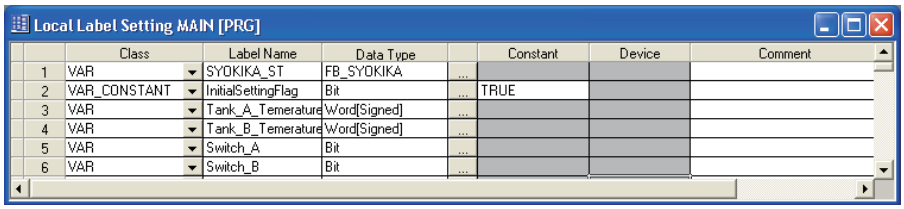
4.3 Setting Local Labels for Programs

QCPU
Q

This section explains the method for setting local labels used for each program.

Screen display

Select Project window ⇒ "Program_Pool" ⇒ "(Program)" ⇒ "Labels".



Operating procedure

- Set the items on the screen.

Item	Description	Number of characters
Class	Select a class name of label from the list displayed by clicking ▼. **Class** / **Description** VAR: A label that can be used within the range of declared programs. Cannot be used for other programs. VAR_CONSTANT: A constant that can be used within the range of declared programs. Cannot be used for other programs. VAR_RETAIN: A latch type label that can be used within the range of declared POUs. Cannot be used for other POUs.	–
Label Name	Enter a desired label name.	0 to 32 characters
Data Type	Enter the data type of label which can be set on the Type Selection screen displayed by clicking [...]. (☞ Section 4.5.1)	0 to 128 characters
Constant	Displays the constant value of the selected data type. When "VAR_CONSTANT" is selected for "Class" and simple type is selected for "Data Type", the constant value can be set.	0 to 128 characters
Device	When the data type is Structure, click the "Detail Setting" cell and set devices on the Structured Data Device Setting screen. (☞ Section 4.6.3)	–
Comment	Enter comments. A new line can be inserted in a cell by pressing the Ctrl + Enter keys. To display comments on the program editor, select "Device Comment" in "Comment Display Items". (☞ Section 2.2.4)	0 to 1024 characters

Point

● **Assigning devices automatically**
Devices are automatically assigned to labels when a program is compiled. The device assignment range can be changed on the System Label Setting screen. (☞ Section 4.7)

● **Characters that can be used for label names**
The maximum number of characters that can be used for a label name is 32.
Note that any of the following label names causes an error at compilation.
- A label name that includes a space.
- A label name that begins with a numeral.
- A label name which is same as the one used for devices.

For characters that cannot be used for label names, refer to the following manual.
☞ GX Works2 Version1 Operating Manual (Common)

● **Confirming devices on the editing screen**
The assigned devices can be confirmed by selecting [Address Display]. (☞ Section 2.2.7)

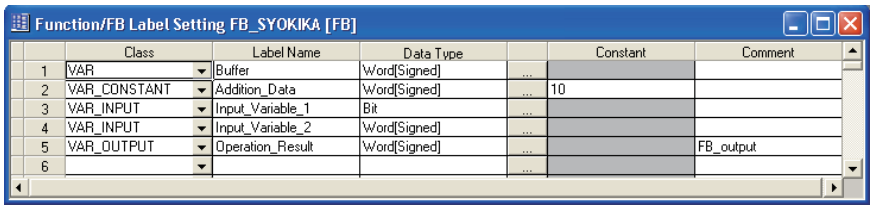
4.4 Setting Local Labels for Function Blocks

QCPU
Q

This section explains the method for setting local labels for each function block.
Create a new function block in advance.
For the method for creating new function blocks, refer to the following manual.
☞ GX Works2 Version1 Operating Manual (Common)

Screen display

Select Project window ⇒ "FB_Pool" ⇒ "(Function block)" ⇒ "Labels".



Operating procedure

- Set the items on the screen.

Item	Description	Number of characters
Class	Select a class name of label from the list displayed by clicking ▼. **Class** / **Description** VAR: A label that can be used within the range of declared function blocks. Cannot be used for other function blocks. VAR_CONSTANT: A constant that can be used within the range of declared function blocks. Cannot be used for other function blocks. VAR_INPUT: A label that receives a value. Cannot be changed in a function block. VAR_OUTPUT: A label that outputs data from a function block. VAR_IN_OUT: A label that receives a value and outputs data from a function block. Can be changed in a function block. VAR_RETAIN: A latch type label that can be used within the range of declared POUs. Cannot be used for other POUs.	–
Label Name	Enter a desired label name.	0 to 32 characters
Data Type	Enter the data type of label which can be set on the Type Selection screen displayed by clicking [...]. (☞ Section 4.5.1)	0 to 128 characters
Constant	Displays the constant value of the selected data type. When "VAR_CONSTANT" is selected for "Class" and simple type is selected for "Data Type", the constant value can be set.	0 to 128 characters
Comment	Enter comments. A new line can be inserted in a cell by pressing the Ctrl + Enter keys. To display comments on the program editor, select "Device Comment" in "Comment Display Item". (☞ Section 2.2.4)	0 to 1024 characters

Point

- **Maximum number of labels**
  1 to 24 labels can be set for inputs (input variables and I/O variables), and 1 to 24 labels can be set for outputs (output variables and I/O variables). The I/O variable is counted as '1 input + 1 output'.
- **Assigning devices automatically**
  Devices are automatically assigned to labels when a program is compiled. The device assignment range can be changed on the System Label Setting screen. (☞ Section 4.7)
- **Characters that can be used for label names**
  The maximum number of characters that can be used for a label name is 32.
  Note that any of the following label names causes an error at compilation.
  - A label name that includes a space.
  - A label name that begins with a numeral.
  - A label name which is same as the one used for devices.

  For characters that cannot be used for label names, refer to the following manual.
  ☞ GX Works2 Version1 Operating Manual (Common)

4.5 Common Operations for Setting Labels

QCPU
Q

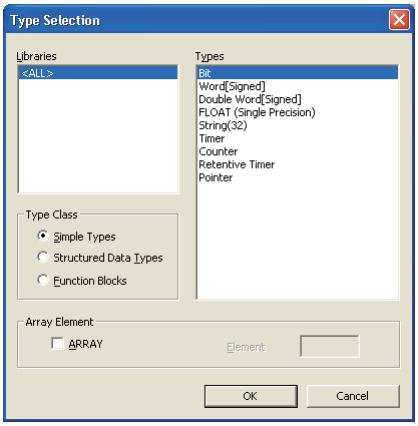
This section explains the common operations for each label setting screen.

4.5.1 Selecting data types

To define a label, a data type must be specified by directly entering the type in text or selecting it on the Type Selection screen.

Screen display

Click [...] in the data type entry field on each label setting screen.



Operating procedure

1. **Select a type in the "Type Class".**

Item	Description
Simple Types	Specify this to select a data type from basic types such as bit and word.
Structured Data Types	Specify this to select a data type from the defined structures.
Function Blocks	Specify this to select a data type from the defined function blocks. (Not displayed for the FB label settings)

2. **In the "Libraries" field, select the reference source such as the defined structure that is used as the data type.**

Item	Description
<ALL>	Browses data types and structures/function blocks defined in the project, and all libraries.
<Project>	

3. **In the "Types" field, select the data type, structure or function block name.**

4. **Click the [OK] button when the setting is completed.**

   The settings are displayed in the "Data Type" column on the label setting screen.

Point

● **Method for displaying the Type Selection screen**
The Type Selection screen can be opened by any of the following operations when [...] is in the selected status.

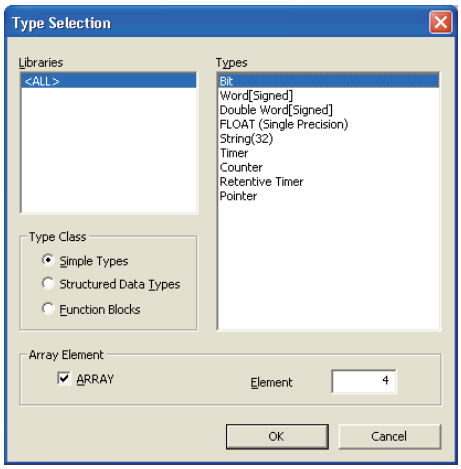
- Press the [Enter] key.
- Press the [Space] key.
- Press the [F2] key.

■ Setting arrays for data type

The following explains the method for defining a data type as an array.
To define a data type as an array, set the items in the "Array Element" field on the Type Selection screen.

Operation

1. Click [...] in the data type entry field on each label setting screen.
2. Check the check box in the "Array Element" field.
3. Enter the number of elements in the "Element" field.
4. Set the data type of the array element in the same manner as setting the normal data type.



● To change the offset

To change the offset ([Array start value]..[Array end value]) to a value other than 0, edit the offset value by directly entering the array type declaration in text on each label setting screen.

	Class	Label Name	Data Type
1	VAR_GLOBAL	Initial Setting_A	Bit[0..2]
2	VAR_GLOBAL	Initial Setting_B	Bit[2..6]
3	VAR_GLOBAL	Initial Setting_C	String(32)

● To change the array to a two- or three-dimensional array

Edit two- or three-dimensional array by directly entering the array type declaration in text on each label setting screen.

	Class	Label Name	Data Type
1	VAR_GLOBAL	Initial Setting_A	Bit[0..2]
2	VAR_GLOBAL	Initial Setting_B	Bit[2..6,2..8]
3	VAR_GLOBAL	Initial Setting_C	Bit[0..2,0..2,0..2]

Point

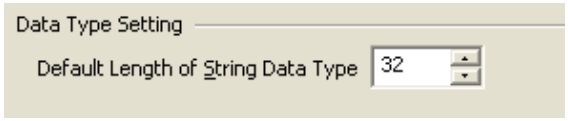
- **When a constant type is set for Class**
  For labels whose classes are set as VAR_CONSTANT or VAR_GLOBAL_CONSTANT, arrays cannot be set for the data type. If they are set, an error occurs at compilation.
- **Offset values**
  Minus values can be set for offset values.

■ Setting data length of character string data type

The following explains the method for setting the data length of the character string data type.
To change the data length of the character string data type, directly edit the data length on each label setting screen.
The data length of the character string data type is set in the option setting.

Operation

- Select [Tools] ⇒ [Options] ⇒ "Label Setting Editor" ⇒ "Default Length of String Date Type", and set the data length.



4.5.2 Editing lines

This section explains the method for editing lines on the label setting screen.

■ Adding lines

The following explains the method for adding a line on the label setting screen.

● New Declaration (Before)

This function inserts a line above the selected line.

Operation

• Select [Edit] ⇒ [New Declaration (Before)] ( ).

● New Declaration (After)

This function inserts a line below the selected line.

Operation

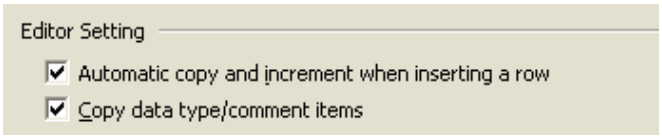
• Select [Edit] ⇒ [New Declaration (After)] ( ).

Point

● **Adding lines**

When using the New Declaration (After) function, label names, data types or other attributes can be set automatically to the added lines.

Select [Tools] ⇒ [Option] ⇒ "Label Setting Editor".

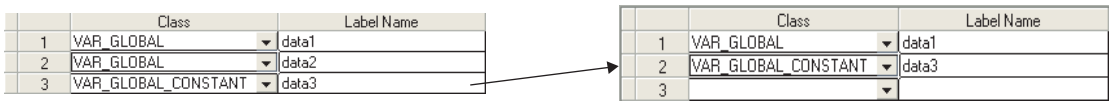


■ Deleting lines

The following shows the method for deleting a line on the label setting screen.

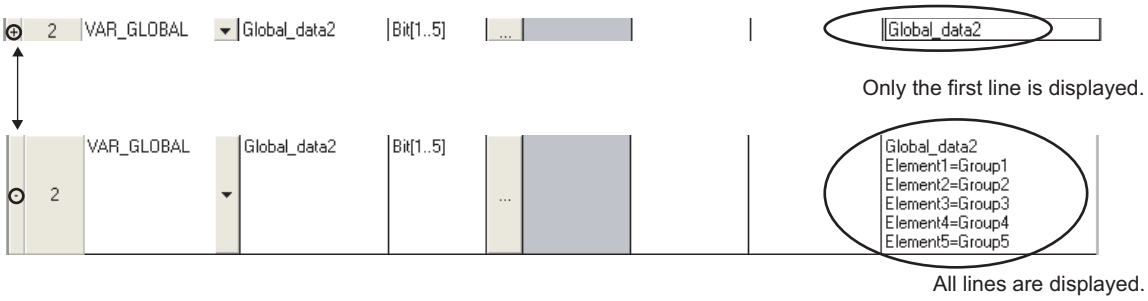
Operation

• Select [Edit] ⇒ [Delete Line].



■ Displaying comments and remarks of the first line only or all lines

For the "Comment" and "Remark" columns, data can be entered in multiple lines. The expand declaration and collapse declaration functions are provided to select whether to display all lines or only the first line by double clicking " + " or " - ".

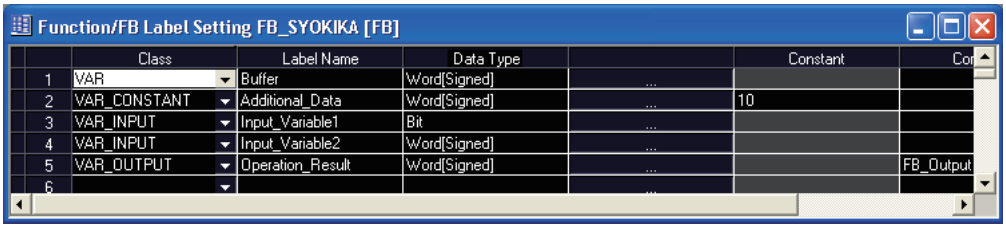


■ Selecting all lines

All lines can be selected by the following operation.

Operation

- Select [Edit] ⇒ [Select All].



4.6 Setting Structured Data Type Labels

QCPU
Q

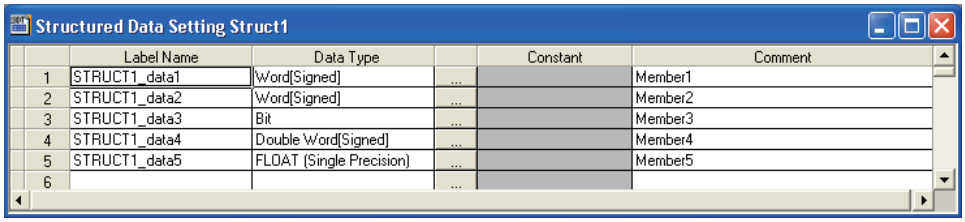
This section explains the method for setting structured data type labels.

4.6.1 Setting data type of structure

Set the elements of the structure on the Structured Data Setting screen.

Screen display

Select Project window ⇒ "Structured Data Types" ⇒ "(Structure)".



Operating procedure

- Set the items on the screen.

Item	Description	Number of characters
Label Name	Enter a desired label name.	0 to 32 characters
Data Type	Enter the data type of label which can be set on the Type Selection screen displayed by clicking [...]. (☞ Section 4.5.1)	0 to 128 characters
Constant	Displays the constant value of the selected type.	0 to 128 characters
Comment	Enter comments. A new line can be inserted in a cell by pressing the Ctrl + Enter keys. To display comments on the program editor, select "Device Comment" in "Comment Display Item". (☞ Section 2.2.4)	0 to 1024 characters

Point

● **Creating new structured data**
Create structured data using the Project window.
(☞ GX Works2 Version1 Operation Manual (Common))

4.6.2 Setting data type as structure

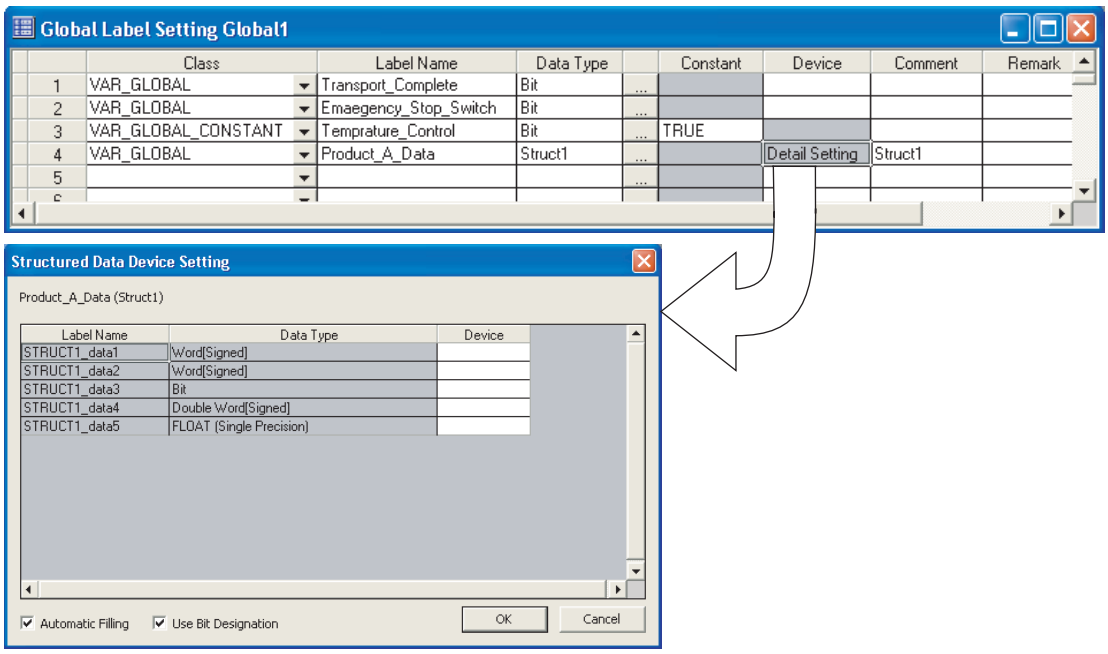
To define the data type of label as a structure, set a structure in the data type entry field on each label setting screen. In addition to direct text entry, a structure can be selected on the Type Selection screen (Section 4.5.1).

4.6.3 Assigning devices to structured data type labels

Devices of the structured data type global labels are set on the Structured Data Device Setting screen. If the structure is set for data type on the Global Label Setting screen, "Detail Setting" is displayed in the "Device" column. Click "Detail Setting" to display the Structured Data Device Setting screen.

Screen display

Click "Detail Setting" on the label setting screen.



Operating procedure

- Set the items on the screen.

Item	Description
Label Name	Displays label names defined as structure.
Data Type	Displays data types set to data names.
Device	Set device names to be assigned.
Automatic Filling	Check this to set devices automatically to cells in which devices are not set with the same data type.
Use Bit Designation	Check this to enter bit devices automatically by using bit specification for word devices.

Point

● **Display on the Local Label Setting screen**
For the Structured Data Device Setting screen, the read-only screen is displayed.

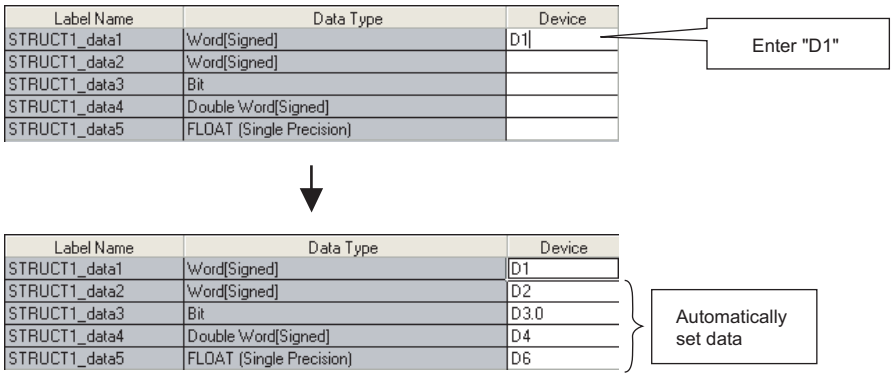
■ Entering device names automatically

The Automatic filling function can be used when setting series of devices for the same data type data on the Structured Data Device Setting screen.
When using the Automatic filling function, whether to use bit specification for word devices can be selected.

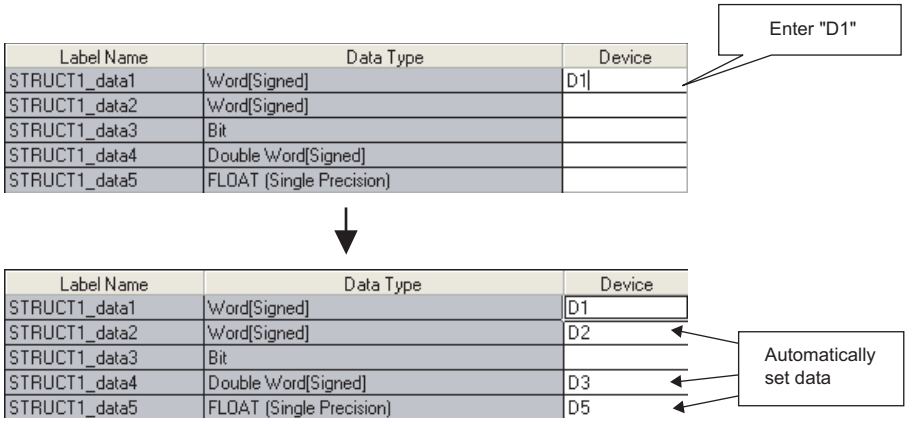
Operation

1. Click "Detail Setting" on the label setting screen.
   The Structured Data Device Setting screen is displayed.
2. Enter the device name to the "Device" column.
   Series of devices are automatically set in the cells following the one entered, skipping the cells where devices are already set.

● When using bit specification



● When not using bit specification



Point

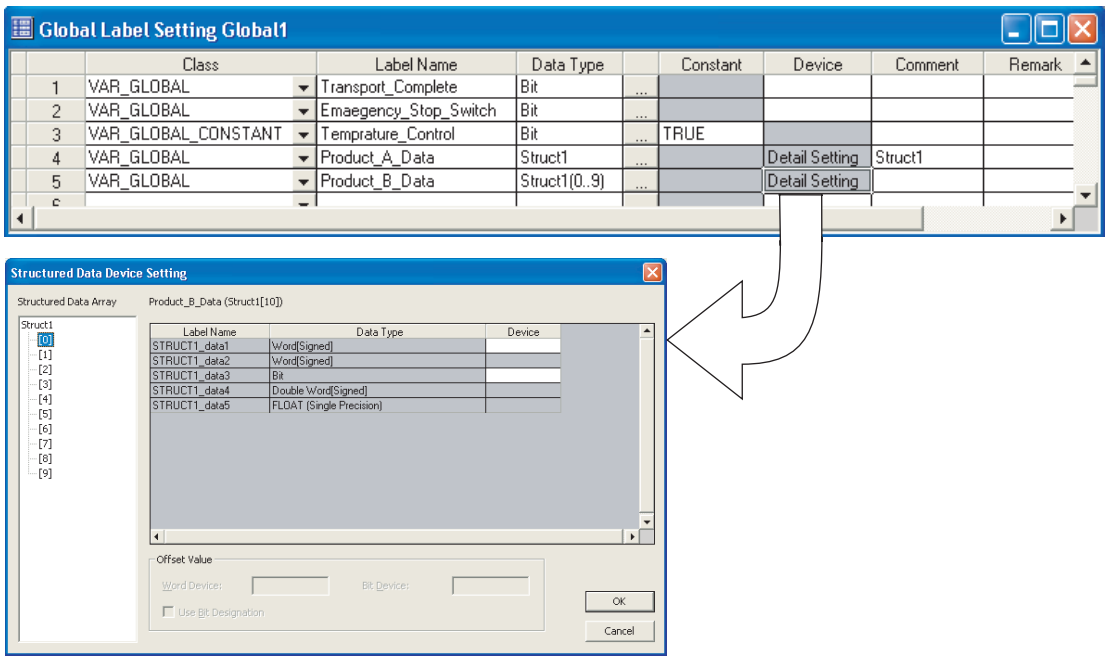
● **When not using bit specification**
When the bit specification is not used, uncheck the "Use Bit Designation" item on the Structured Data Device Setting screen.

4.6.4 Assigning devices to structured array type labels

This section explains the method for setting the devices for structured array type global labels on the Structured Data Device Setting screen.
When VAR_GLOBAL is set for "Class" and the structured array is set for "Data Type" on the Global Label Setting screen, "Detail Setting" is displayed in the "Device" column. Click "Detail Setting" to display the Structured Data Device Setting screen.

Screen display

Click "Detail Setting" on the label setting screen.



Operating procedure

- Set the items on the screen.

Item		Description
Structured Data Array		Displays elements of the structured array in tree format. The device setting of the element selected in the tree is displayed in the right area of the screen.
Label Name		Displays label names defined as structure.
Data Type		Displays data types set to data names.
Device		Set device names to be assigned. Device names can be entered for the start array element only. For the subsequent array elements, device names offset from the device number set for the start element are automatically set.
Offset Value	Word Device/Bit Device	Specify the device offset value to be set to the same data type cells in the array element.
	Use Bit Designation	Check this to enter bit devices automatically by using bit specification for word devices.

Point

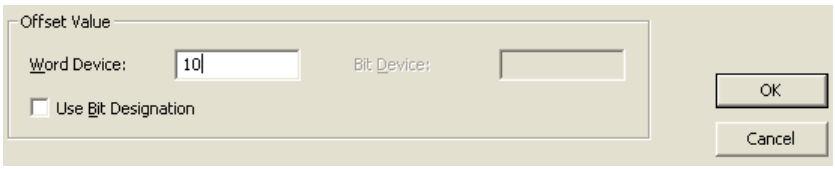
● **Display on the Local Label Setting screen**
For the Structured Data Device Setting screen, the read-only screen is displayed.

■ Entering device names automatically by setting offset values

On the Structured Data Device Setting screen, device numbers to be entered automatically can be set in fixed spacing for each array element of the structured array. Specify the difference in device numbers between the array elements as an offset value for the start device of the same data type.

Operation

1. Click "Detail Setting" on the label setting screen.
   The Structured Data Device Setting screen is displayed.
2. Set the "Offset Value".



3. Set the device name for the start element data of the array.
   Devices are set to the same data type of the array elements in the screen.

・ Offset value is not specified.

<Array [0]>

Label Name	Data Type	Device
STRUCT1_data1	Word[Signed]	D1
STRUCT1_data2	Word[Signed]	D2
STRUCT1_data3	Bit	
STRUCT1_data4	Double Word[Signed]	D3
STRUCT1_data5	FLOAT (Single Precision)	D5

Enter "D1"

<Array [1]>

Label Name	Data Type	Device
STRUCT1_data1	Word[Signed]	D7
STRUCT1_data2	Word[Signed]	D8
STRUCT1_data3	Bit	
STRUCT1_data4	Double Word[Signed]	D9
STRUCT1_data5	FLOAT (Single Precision)	D11

Devices starting from "D7" are assigned.

・ Offset value is 10.

<Array [0]>

Label Name	Data Type	Device
STRUCT1_data1	Word[Signed]	D1
STRUCT1_data2	Word[Signed]	D2
STRUCT1_data3	Bit	
STRUCT1_data4	Double Word[Signed]	D3
STRUCT1_data5	FLOAT (Single Precision)	D5

Enter "D1"

<Array [1]>

Label Name	Data Type	Device
STRUCT1_data1	Word[Signed]	D11
STRUCT1_data2	Word[Signed]	D12
STRUCT1_data3	Bit	
STRUCT1_data4	Double Word[Signed]	D13
STRUCT1_data5	FLOAT (Single Precision)	D15

Devices starting from "D11" are assigned.

● Using bit specification

Devices can be set using the bit specification for word devices when entering devices automatically.

Operation

1. Click "Detail Setting" on the label setting screen.
   The Structured Data Device Setting screen is displayed.
2. Check the "Use Bit Designation" item.
3. Set the device name for the start element data of the array.
   Devices are set to the same data type or bit device data type.

Point

● **Data for which device name can be entered**
For the structured array type, a device name can be entered only for the start element of array.
For the subsequent array elements, device names offset from the device number set for the start element are automatically set.

● **Offset values**
- An expression such as '1\2' can be specified for an incremental value of device such as U0\G0.
- When 0 is specified for the incremental value, the device number same as the data set to the start of devices is set to all data in the array.

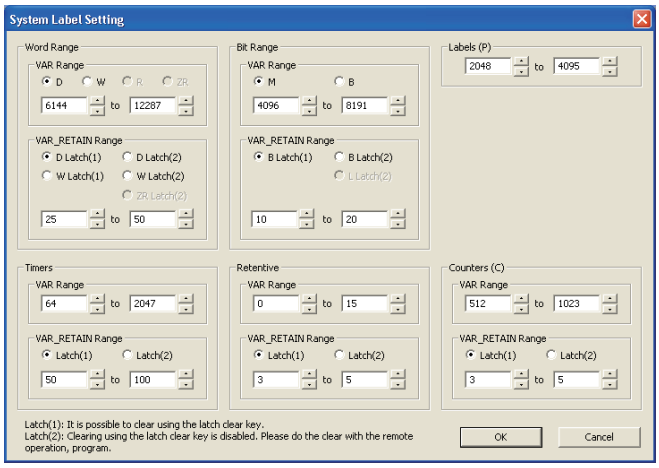
4.7 Setting Ranges for Devices Assigned Automatically

QCPU
Q

This section explains the method for setting the ranges for devices that are automatically assigned to local labels.

Screen display

Select [Tools] ⇒ [System Label Setting].



Operating procedure

- Select the device type, and set the start and end addresses to be assigned.

Point

- **Device types**
  The types of automatically assigned devices differ by the type of CPU.
- **Setting ranges**
  The setting ranges depend on the number of device points set in PLC parameter.
  For details of PLC parameter, refer to the following manual.
  ☞ GX Works2 Version1 Operating Manual (Common)
- **Assigning devices automatically**
  Word devices, bit devices, and timer/counter devices are automatically assigned in the order from larger device number within the device range set on the System Label Setting screen.
- **Confirming devices on the editing screen**
  The assigned devices can be confirmed by selecting [Address Display]. (☞ Section 2.2.7)

5 EDITING PROGRAMS

This chapter explains the functions of the program editor for editing sequence programs.

5.1 Editing Ladder Programs

This section explains the methods for operating the ladder editor.

5.1.1 Creating ladders

QCPU Q

This section explains the method for creating ladders and related functions.

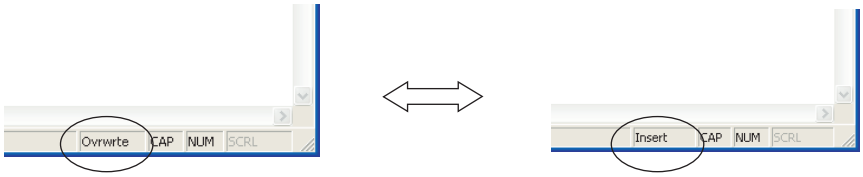
■ Overwrite mode and insert mode

When creating ladders, either 'Overwrite mode' or 'Insert mode' can be selected. Select the appropriate mode for the operation.
The operation procedures in this chapter are explained under the 'Overwrite mode' as the basic setting.

Operating procedure

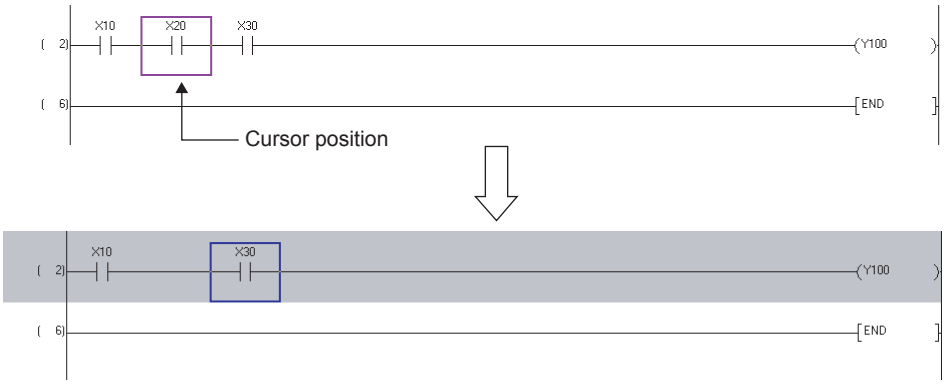
- Press the Insert key.

  The mode switches alternately between 'Overwrite' and 'Insert' each time the key is pressed. The color of the cursor on the editing screen changes according to the active mode.

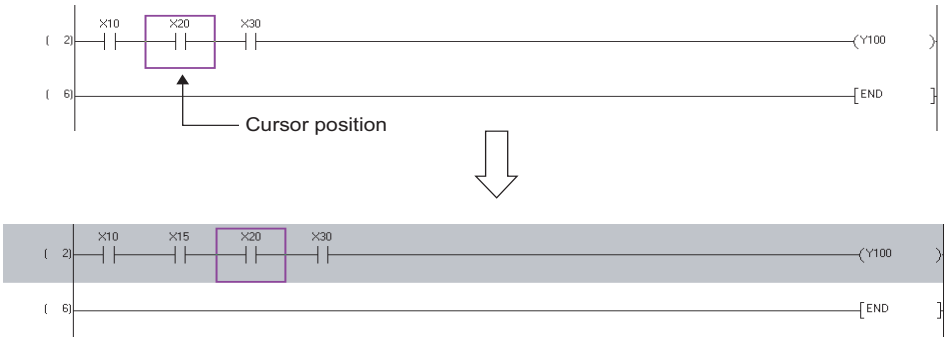


● In the 'Overwrite mode', contacts, coils, or application instructions newly input at the cursor position overwrite the existing ones.

Example) Changing X20 to a horizontal line in the 'Overwrite mode'.



In the 'Insert mode', contacts, coils, or application instructions newly input at the cursor position are inserted in front of the cursor.
Example) Inserting X15 in front of X20 in the 'Insert mode'.



■ Instruction help

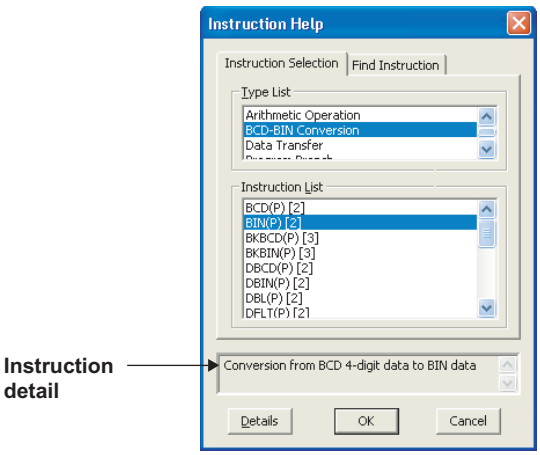
The following explains the help function that supports entering ladder symbols. The help function can be used on the ladder editor only.

Operating procedure

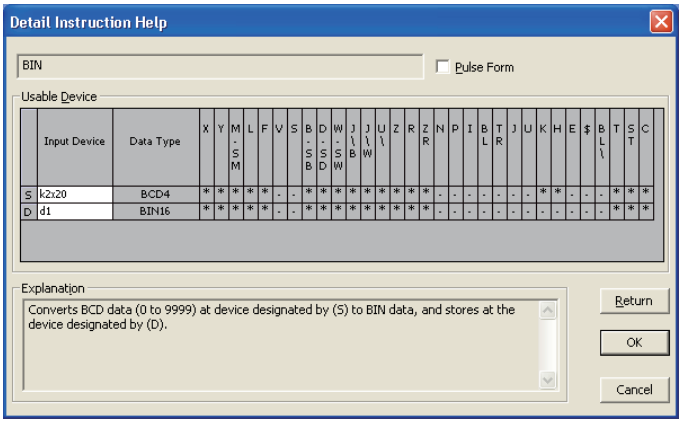
1. **Click the [Help] button on the Enter Symbol screen.**
   The <<Instruction Selection>> tab on the Instruction Help screen is displayed.

2. **Select the instruction type in the "Type List".**
   The instructions of the selected type are displayed in the "Instruction List".
   (For details of the <<Find Instruction>> tab, refer to the Point.)

3. **Select an instruction from the "Instruction List".**
   The information of the selected instruction is displayed in the instruction detail field.



4. **Click the [Details] button.**
   The Detail Instruction Help screen is displayed.



5. **Set the items on the screen.**

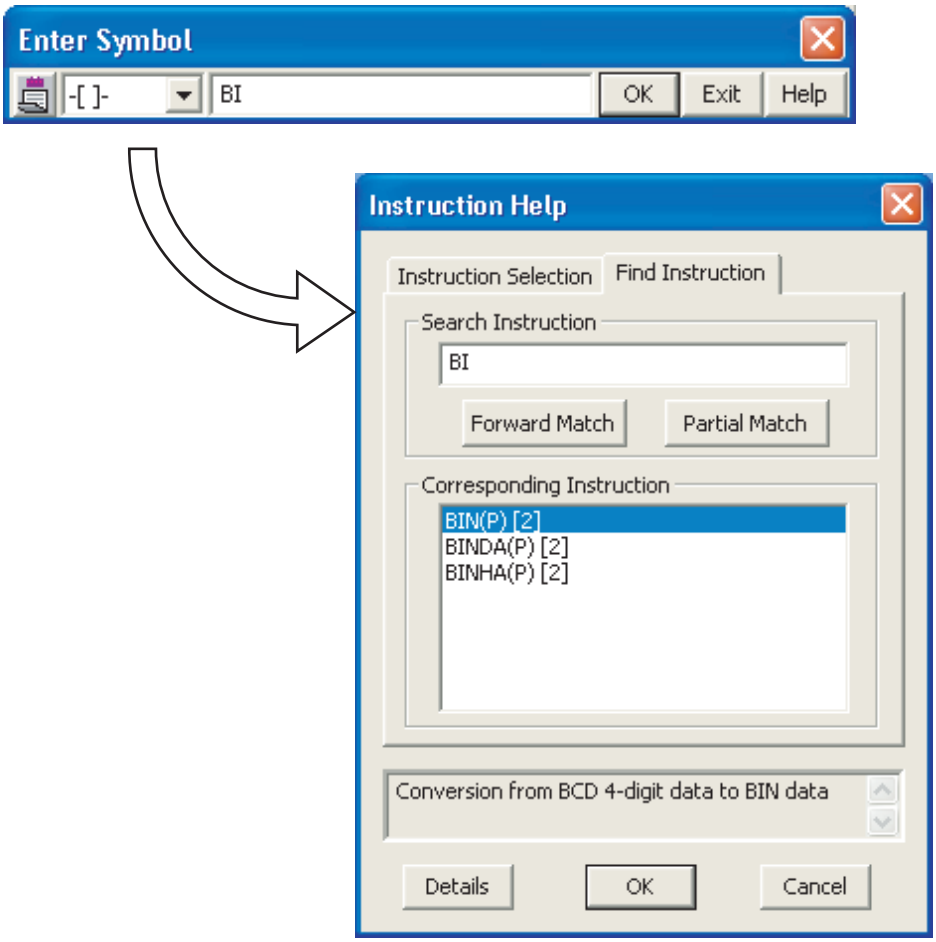
Item	Description
Pulse Form	Check this item to convert the instruction into pulse.
Input Device	Enter devices. Indication of the symbols: " * ": Settable " - ": Not settable

6. **Click the [OK] button on the Detail Instruction Help screen.**
   The instruction is entered at the cursor position.

Point

- **Instruction help function**
  The Instruction help function has the <<Instruction Selection>> and <<Find Instruction>> tabs.
  The <<Instruction Selection>> tab is displayed when no instruction is entered in the device instruction entry field, and the <<Find Instruction>> tab is displayed when an instruction is entered in the device instruction entry field.
- **Instruction retrieval function**
  If the instruction is entered incompletely or the entered instruction is not supported, the <<Find Instruction>> tab is displayed on the Instruction Help screen when the "Display Instruction Help at symbol error occurrence" item is checked in the option setting.
  If the starting characters of the instructions match with the entered characters, the corresponding instructions are displayed in the "Corresponding Instruction" field.

  Search method can be switched by clicking the Forward Match or Partial Match buttons.
  Option settings (☞ Section 11.2)



5.1.2 Entering contacts, coils, and application instructions

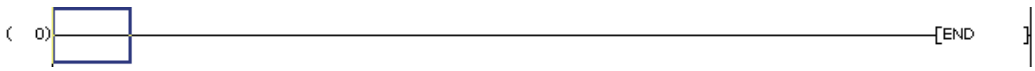
QCPU

This section explains the method for entering contacts, coils, and application instructions.
Contacts, coils, and application instructions are entered by using the Enter Symbol screen.

Item		Toolbar	Shortcut key
Ladder Symbol	Open Contact	F5	F5
	Open Branch	sF5	Shift + F5
	Close Contact	F6	F6
	Close Branch	sF6	Shift + F6
	Coil	F7	F7
	Application Instruction	F8	F8
	Rising Pulse	sF7	Shift + F7
	Falling Pulse	sF8	Shift + F8
	Rising Pulse Branch	sF7	Alt + F7
	Falling Pulse Branch	sF8	Alt + F8
	Operation Result Rising Pulse	sF5	Alt + F5
	Operation Result Falling Pulse	csF5	Alt + Ctrl + F5
	Invert Operation Results	csF10	Alt + Ctrl + F10

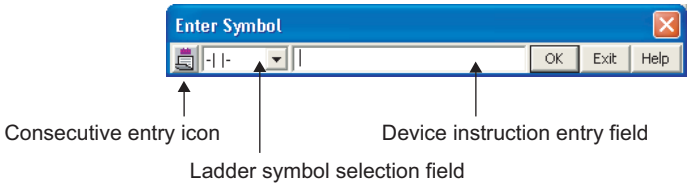
Operating procedure

1. **Move the cursor to the position where a ladder symbol is entered.**



2. **Select [Edit] ⇒ [Ladder Symbol] ⇒ [(Ladder symbol)].**

The Enter Symbol screen is displayed.



The following table shows the display contents of the screen.

Name	Description
Consecutive entry icon	Allows consecutive entry of ladder symbols by changing the status. Consecutive entry ON Consecutive entry OFF
Ladder symbol selection field	Allows changing the setting of ladder symbols. Clicking the button displays the list of ladder symbols.
Device instruction entry field	Enter a device and/or instruction.

3. Enter a device and/or instruction.

4. Click the OK button.

The entered ladder symbol is displayed on the editing screen.

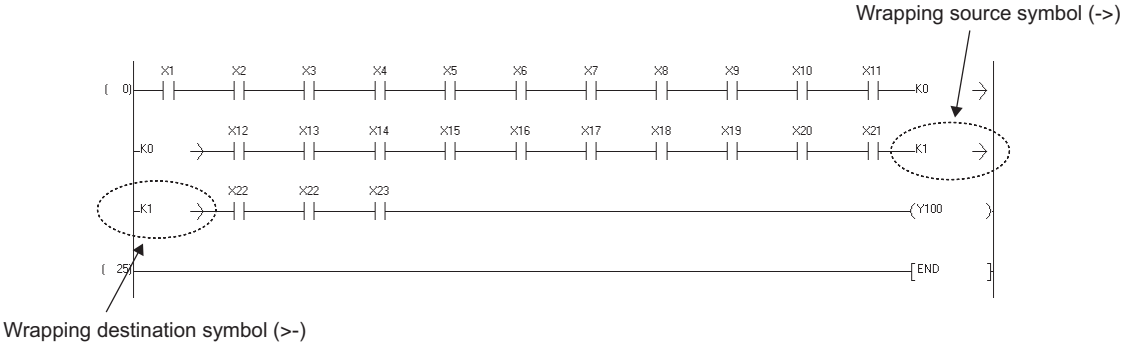
Point

● **Allowable number of lines for creating ladders**

- The maximum number of lines that can be used for one ladder block is 24 lines.
- The maximum number of lines that can be processed in a single ladder conversion operation is 48 lines. Perform ladder conversion appropriately during editing so that the number of ladder lines that has not been converted does not exceed over 48 lines.

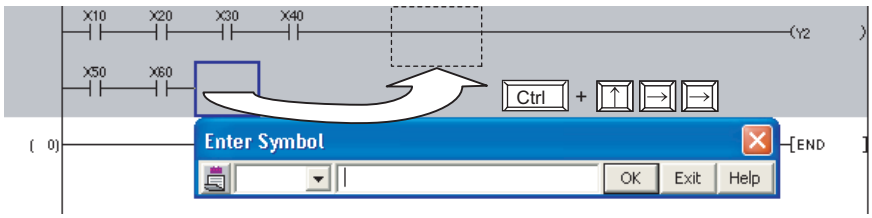
● **Wrapping a row**

The maximum number of contacts that can be created in a single row is 11 contacts + 1 coil or 9 contacts + 1 coil (varies depending on the option setting).
If this limit is exceeded, the wrapping source symbol (->) and the wrapping destination symbol (>-) are automatically created and the ladder is wrapped.
The same numbers (serial numbers) are assigned to the wrapping source symbol (->) and the wrapping destination symbol (>-) that are created in pairs.



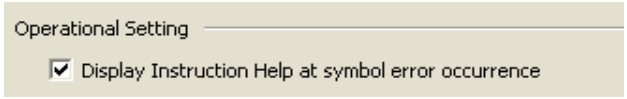
● **Changing the cursor position on the editing screen while the Enter Symbol screen is displayed**

Use the Ctrl key + ↑ ↓ ← → keys to change the cursor position on the editing screen.



● **Displaying the Instruction Help screen at the occurrence of ladder symbol entry error**

The Instruction Help screen can be displayed automatically by the following setting.
Select [Tools] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder" ⇒ "Ladder Diagram", and check the "Display Instruction Help at symbol error occurrence" item.

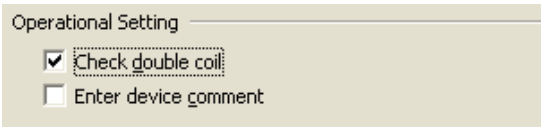


■ Selecting the duplicated coil check function

The following explains the method for selecting whether the duplicated-coil check function is used by the option setting.

Screen display

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



Operating procedure

- Check the "Check double coil" item.

When a coil is entered, duplicated coils are checked for the converted ladder.

Table 5.1.2-1 Duplicated coil check availability

Device		Instruction								
		DELTA	EGP EGF	FF	MC	OUT	SET	SFT	PLS	PLF
Q series	Y, M, L, B, F, SM, SB	×	×	○	○	○	○	○	○	○
	D, SD, W, SW, R, ZR	×	×	○	○	○	○	○	○	○
	DY	○	×	○	○	○	○	○	○	○
	T, C	×	×	×	×	○	×	×	×	×
	V	×	○	×	×	×	×	×	×	×
	BL	×	×	×	×	×	○	×	×	×

○: Available ×: Not available

■ Entering device comments

The following explains the method for entering a device comment following the entry of a contact, coil, or application instruction.

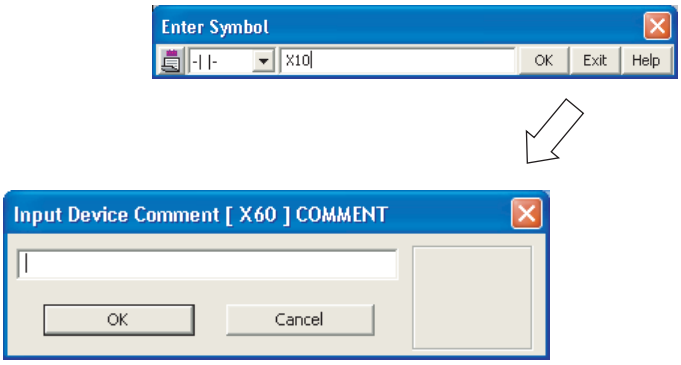
Screen display

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

Operating procedure

- Check the "Enter device comment" item.

The Input Device Comment screen is displayed by clicking the OK button after entering a contact, coil or application instruction.



For the method for entering device comments, refer to the following manual.

☞ GX Works2 Version1 Operating Manual (Common)

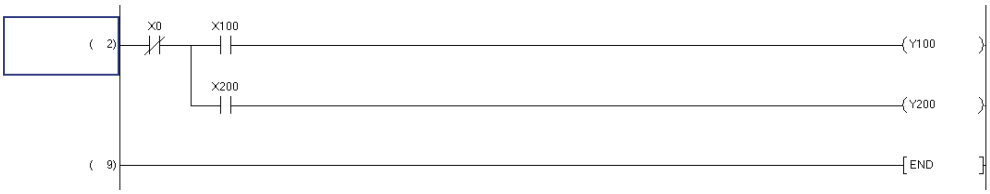
■ Entering pointer numbers and interrupt pointer numbers

The following explains the method for entering a pointer number or an interrupt pointer number.
Pointer numbers or interrupt pointer numbers are entered by using the Enter Symbol screen.

Operating procedure

1. **Move the cursor to the position where a pointer number or an interrupt pointer number is entered.**

   Enter a pointer number or an interrupt pointer number at the position where a step number is displayed.



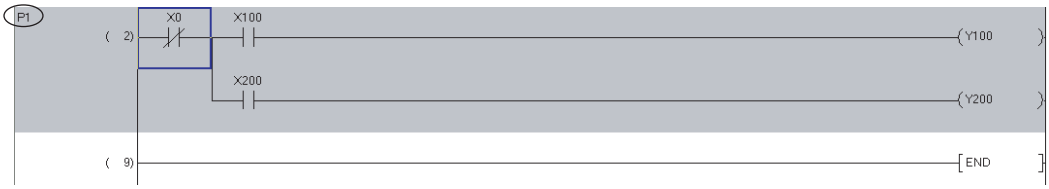
2. **Press the Enter key.**

   The Enter Symbol screen is displayed.

3. **Enter a pointer number or an interrupt pointer number.**

4. **Click the OK button.**

   The entered pointer number or interrupt pointer number is displayed on the editing screen.

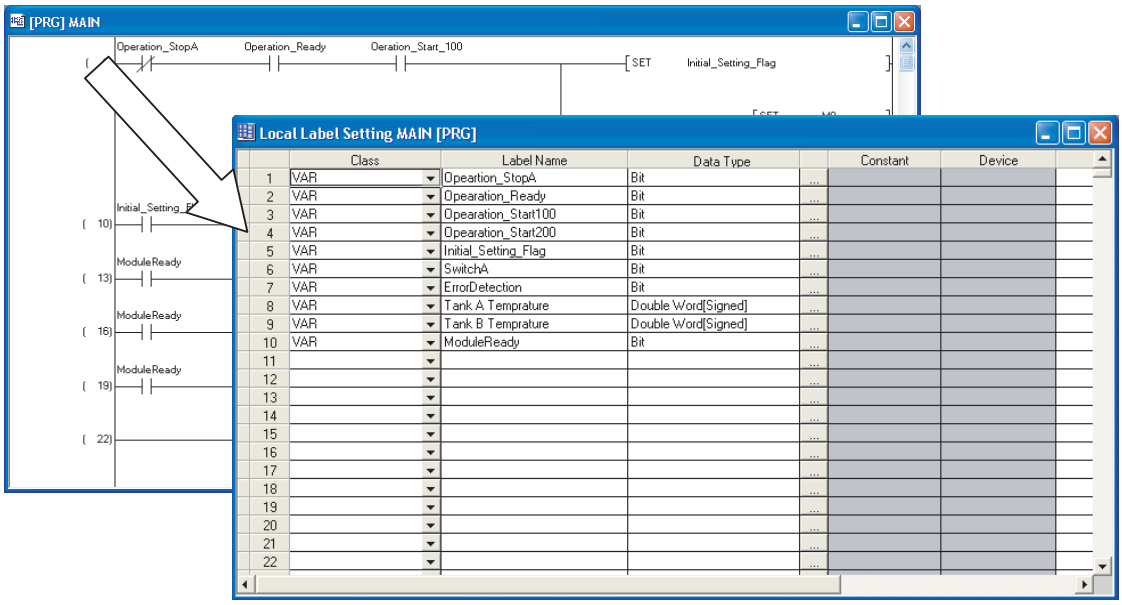


■ Opening label setting screen for the program being edited

The following explains the method for opening the label setting screen for the program being edited.

Operating procedure

- Select [View] ⇒ [Open Header].



■ Creating wrapping rows

Wrapping symbols are automatically created if wrapping of a row is required when creating a ladder block. However, wrapping symbols can be entered manually as desired. The following explains the method for wrapping rows by manually entering wrapping symbols.

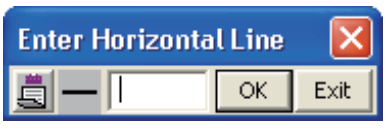
Operating procedure

1. **Move the cursor to the position where a wrapping source symbol (->) is entered.**

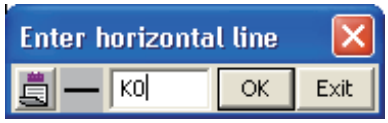
   When entering a wrapping source symbol (->), move the cursor to the second or subsequent columns.

2. **Select [Edit] ⇒ [Ladder Symbol] ⇒ [Horizontal Line] (F9).**

   The Enter Horizontal Line screen is displayed.

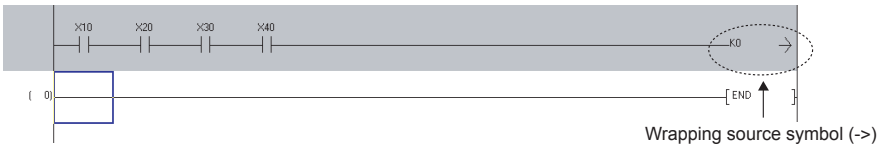


3. **Enter 'K (+ desired number)'.**



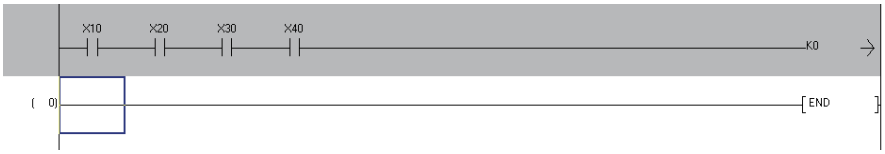
4. Click the [OK] button.

The wrapping source symbol (->) is entered and the row is wrapped.



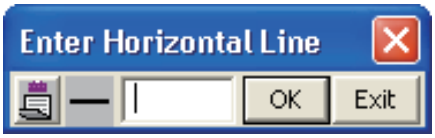
5. Move the cursor to the position where a wrapping destination symbol (>-) is entered.

When entering a wrapping destination symbol (>-), move the cursor to the first column.



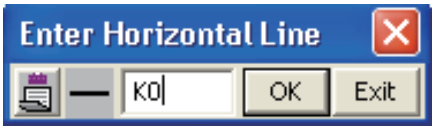
6. Select [Edit] ⇒ [Ladder Symbol] ⇒ [Horizontal Line] (F9).

The Enter Horizontal Line screen is displayed.



7. Enter 'K (+ number input in step 3)'.

A wrapping source symbol (->) and a wrapping destination symbol (>-) are used in pairs for wrapping symbols.
Enter the same number for the paired wrapping symbols.



8. Click the [OK] button.

The wrapping destination symbol (>-) is entered.

Point

● **Changing the number of contacts displayed in a ladder program**
The number of contacts displayed in a single row can be changed to 9 contacts or 11 contacts.
(☞ Section 2.2.6)

5.1.3 Using function blocks

QCPU

This section explains the method for utilizing function blocks as components in sequence programs.
To use function blocks, select "Use Labels" when creating a new project.

■ Creating function blocks

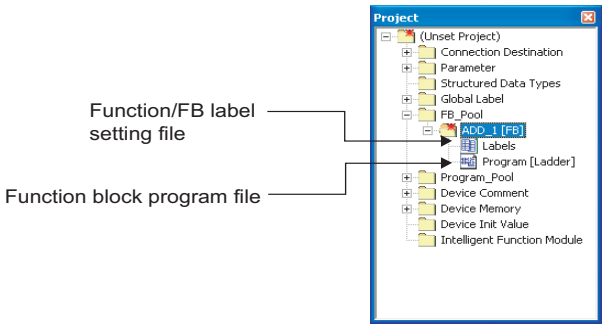
The following explains the method for creating a function block.

Operating procedure

1. **Create a new function block.**

   For the procedure for adding new data in a project, refer to the following manual.
   ☞GX Works2 Version1 Operating Manual (Common)

   The function block program file and the function block label setting file are added to the project.

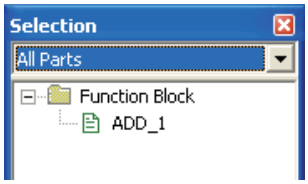


2. **Set the function block label.**

   The created function block can be used as a component.
   (☞ Section 4.4)

3. **Edit the function block ladder.**

   The same procedure as for creating a ladder can be used to edit a function block ladder.
   Created function blocks are displayed in the Function Block Selection window and can be used as function blocks.



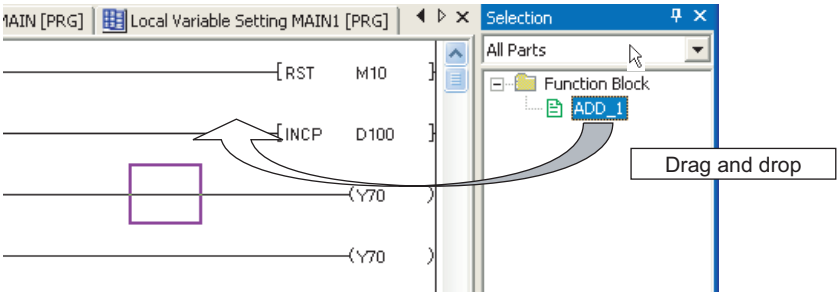
■ Pasting function blocks to sequence programs

The following explains the method for pasting a function block to the sequence program.

Operating procedure

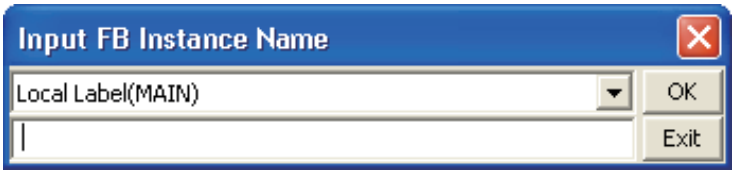
1. **Select a function block from the Function Block Selection window and locate it to the pasting position using the drag and drop operation.**

   The Input FB Instance Name screen is displayed.



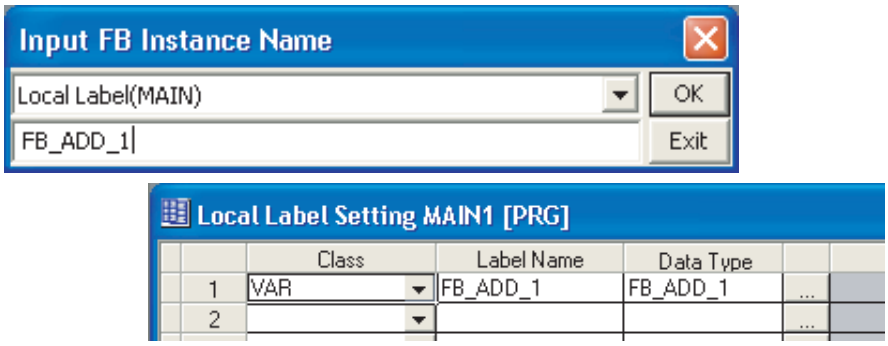
2. **Select the registering destination of the function block to be pasted from the local or global label.**

   In the sequence program, the function block is automatically entered to the selected label.



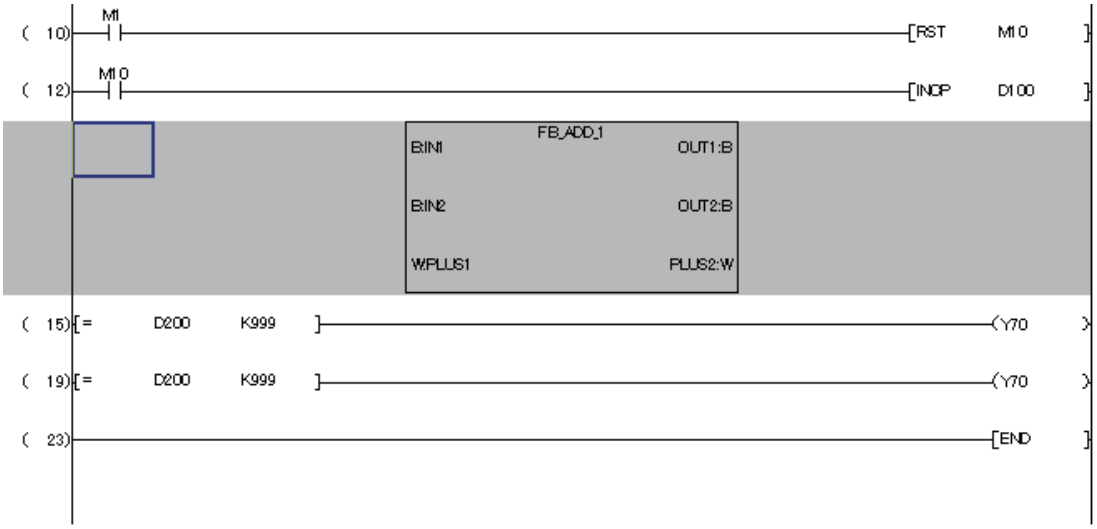
3. **Enter the FB instance name.**

   In the sequence program, the entered FB instance name is automatically entered to "Label Name".



4. Click the OK button.

The function block is pasted on the editing screen.



Point

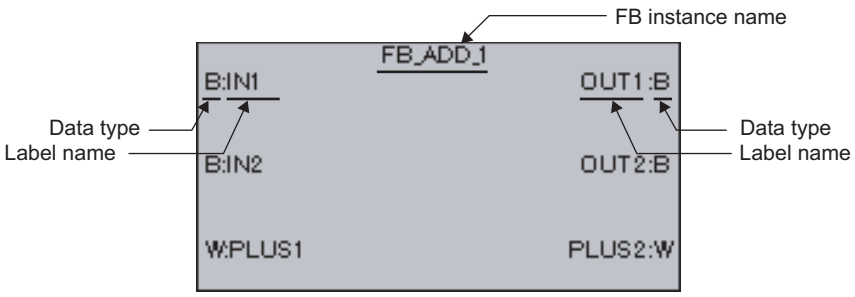
● **Pasting function blocks**

The following methods can also be used to paste function blocks.

- On the editing screen, move the cursor to the pasting position and double click the function block on the Function Block Selection window.
- On the editing screen, move the cursor to the pasting position and select a function block on the Function Block Selection window, and press the Enter key.

● **Display of pasted function blocks**

In the pasted function block, label names of I/O variables and their corresponding data types are displayed.

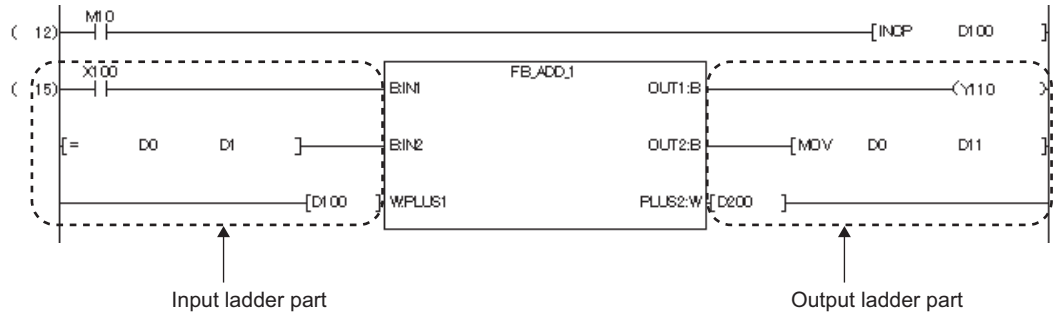


The followings are the representation of data types.

- B: Bit
- W: Word (signed)
- D: Double word (signed)
- E: Single-precision real
- L: Double-precision real
- S: String

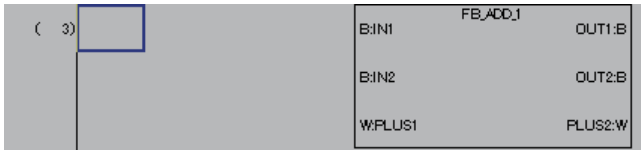
■ Creating input and output ladder parts of function blocks

The following explains the method for creating input and output ladder parts of a function block.



Operating procedure

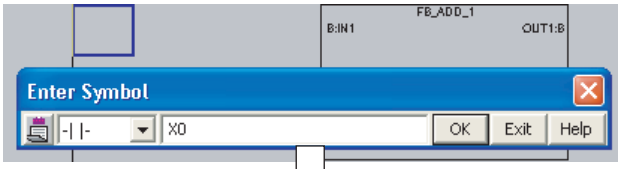
1. Move the cursor to the position where an input ladder part is created.

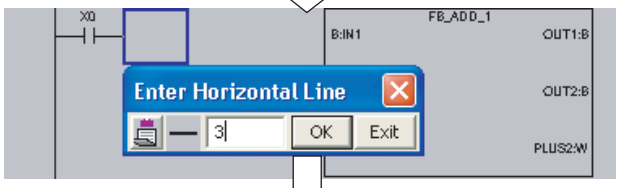


2. **Enter the ladder symbol of the input ladder part.**

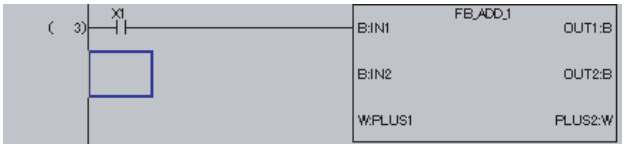
   Enter the ladder symbols in the same manner as creating ladders.
   Create the ladder meeting the data type of input variable.

<Bit type>



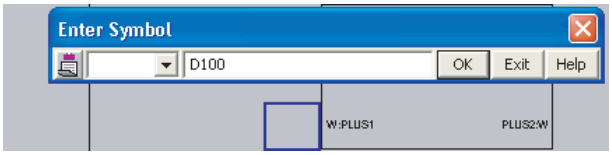


3. **Enter the output ladder part in the same manner as entering the input ladder part.**



If the data type of input variable is not a bit type, enter the device directly on the Enter Symbol screen

<Other than bit type>

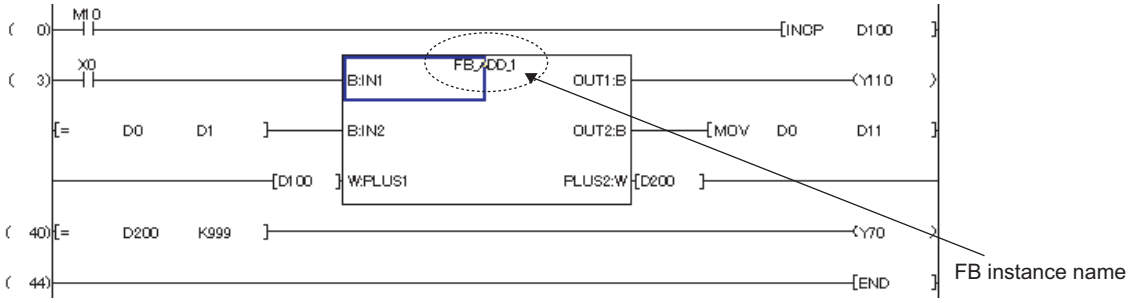


■ Changing FB instance names of pasted function blocks

The following explains the method for changing a FB instance name of the pasted function block.

Operating procedure

1. Move the cursor to the function block whose FB instance name is to be changed.



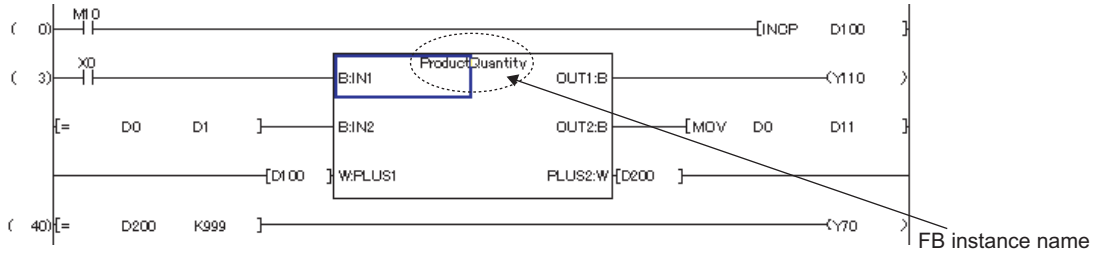
2. Select [Edit] ⇒ [Edit FB Instance].

The Enter FB Instance Name screen is displayed.
The current FB instance name is displayed in the entry field.

3. Enter a new FB instance name.

4. Click the OK button.

The function block is displayed on the editing screen with the changed FB instance name.



Point

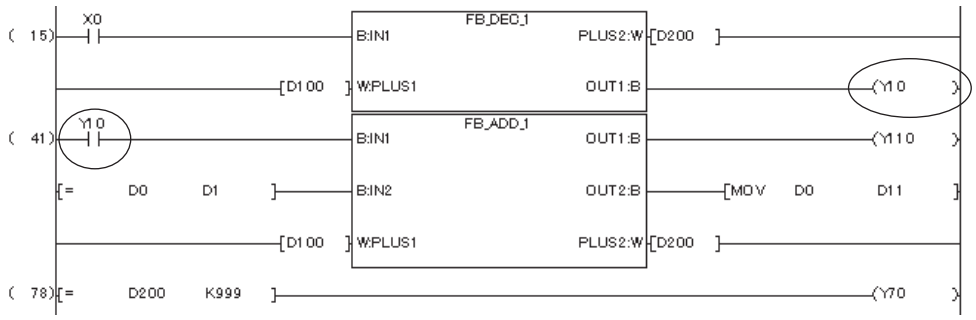
● **Changing FB instance of the same name**
When the same FB instance name is set to the FB instances created from the same function block, changing one of the FB instance name causes to change all FB instances of the same name in the program. However, note that FB instance names are case-sensitive.

■ Precautions on using function blocks

The following explains the precautions on using function blocks.

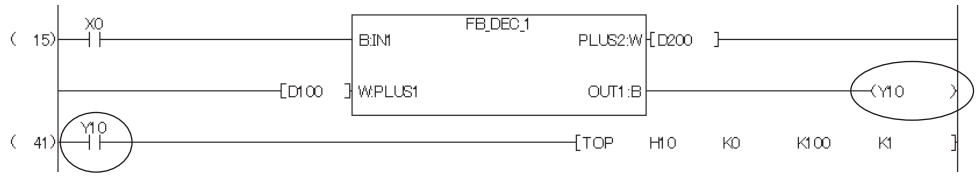
1) One function block can be pasted to a single ladder block.

When connecting function blocks, use a coil to initially receive the function block outputs.
Paste the function block to be connected to another ladder block and connect it with the input.



2) The wrapping rows cannot be created in the input and output ladder parts.

Insert a coil to receive the output and use the contact of the coil as the target instruction condition.



3) The device type of the input or output ladder part of the function block, and the device type of the contact/coil/application instruction to be connected must be the same.

Using different device types at the connection causes an error at compilation.
The followings are the six device types for function blocks.

- Bit: Data expressed by ON/OFF
- Word (signed): Data expressed in 16 bits
- Double word (signed): Data expressed in 32 bits
- Single-precision real: Floating-point data expressed in 32 bits
- Double-precision real: Floating-point data expressed in 64 bits
- String: Character string data expressed in ASCII code

Point

● **Checking duplicated coils in the ladder programs**
When the same devices are used in the source ladder program and the target function block, and "Check double coil" is selected under "Program Editor" ⇒ "Ladder" ⇒ "Device" in the option setting, the duplicated coils are not detected. Check the duplicated coils in the source ladder program and the target function block by the Cross reference function.
For the projects without labels, the duplicated coils can be checked by unchecking the item in "Execution of Program Check" under [Tools] ⇒ [Options] ⇒ "Compile" ⇒ "Basic Setting".

5.1.4 Drawing lines

QCPU Q

This section explains the method for drawing lines.

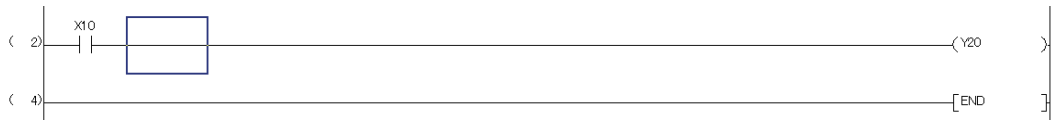
Item	Toolbar	Shortcut key
Edit Line	F10	F10
Vertical Line	sF9	Shift + F9
Horizontal Line	F9	F9

■ Drawing lines

The following explains the method for drawing vertical and horizontal lines consecutively.

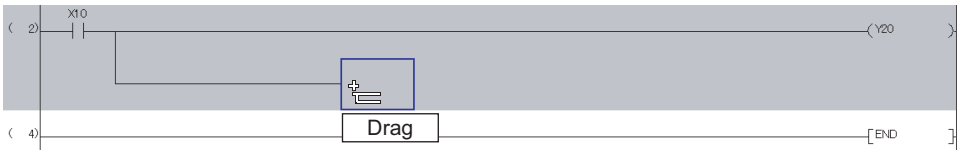
Operating procedure

1. **Move the cursor to the position where a vertical line is drawn.**
   A line is drawn taking the left edge of the cursor as a base point.



2. **Select [Edit] ⇒ [Edit Line] (F10).**

3. **Drag the cursor in the line drawing direction.**



4. **The line is drawn upon completion of dragging.**

5. **To end the line drawing function, select [Edit] ⇒ [Edit Line] (F10) again.**
   The edit line mode is disabled.

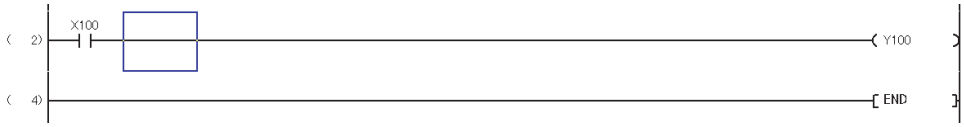
■ Entering vertical or horizontal lines

The following explains the method for entering a vertical or horizontal line.

Operating procedure

1. Move the cursor to the position where a vertical or horizontal line is entered.

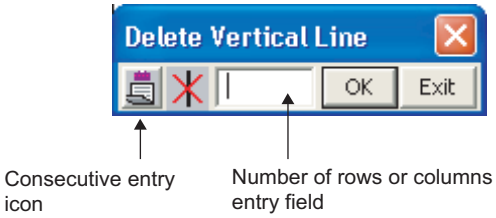
A vertical line is entered taking the left edge of the cursor as a base point.



2. Select [Edit] ⇒ [Ladder Symbol] ⇒ [Vertical Line] (sF9).

The Enter Vertical Line screen is displayed.

To enter a horizontal line, select [Edit] ⇒ [Ladder Symbol] ⇒ [Horizontal Line] (F9).



3. Set the items on the screen.

Name	Description
Consecutive entry icon	Allows consecutive entry of vertical or horizontal lines by changing the status. Consecutive entry ON Consecutive entry OFF
Number of rows or columns entry field	Enter the number of rows or columns to be entered. If no value is entered, one row of vertical line or one column of horizontal line is entered.

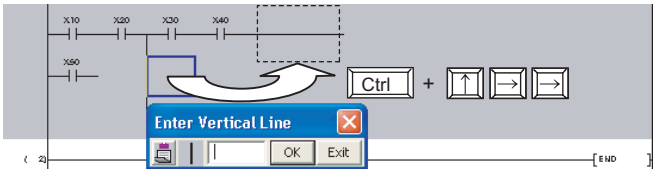
4. Click the OK button.

The entered vertical line or horizontal line is displayed on the editing screen.

Point

● **Changing the cursor position on the editing screen while the Enter Vertical Line or Enter Horizontal Line screen is displayed**

Use the Ctrl key + ↑ ↓ ← → keys to change the cursor position on the editing screen.



5.1.5 Deleting contacts, coils, and application instructions

QCPU Q

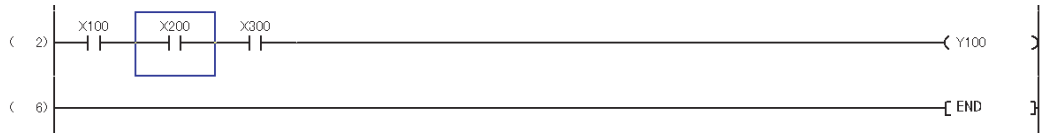
This section explains the method for deleting contacts, coils, and application instructions.

■ Deleting contacts, coils, and application instructions in unit of instruction

The following explains the method for deleting a contact, coil or application instruction in unit of instruction.

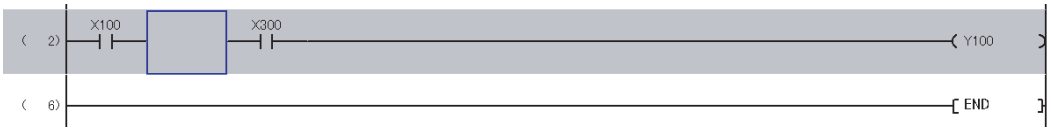
Operating procedure

1. **Move the cursor to the position where the instruction is deleted.**



2. **Press the Delete key.**

   The instruction is deleted.



Point

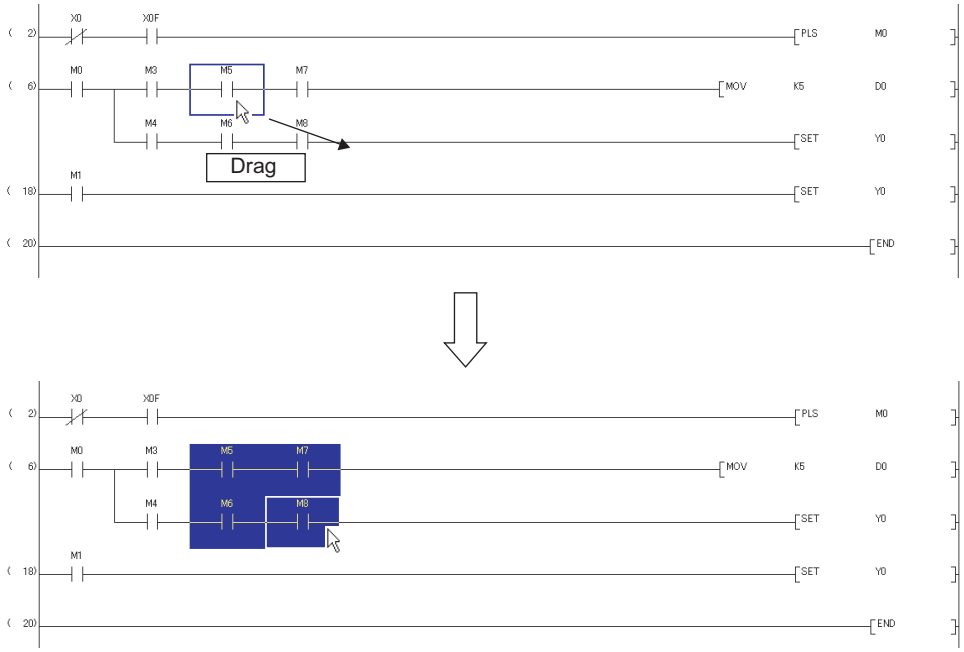
- **Deletion in the 'Insert mode'**
  If the instruction is deleted in the 'Insert mode', the instructions that follow the deleted instruction are shifted forward.
  With wrapping lines, the instructions are shifted when the ladder is converted.

■ Deleting contacts, coils, and application instructions by setting a range

The following explains the method for deleting contacts, coils, and/or application instructions by setting a range.

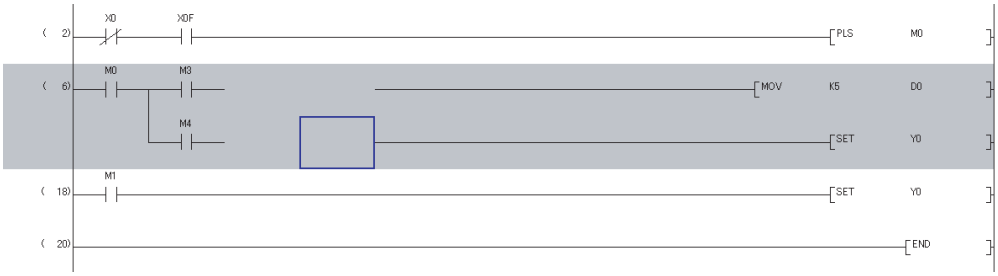
Operating procedure

1. Set the range by dragging the cursor from the start position of deletion.



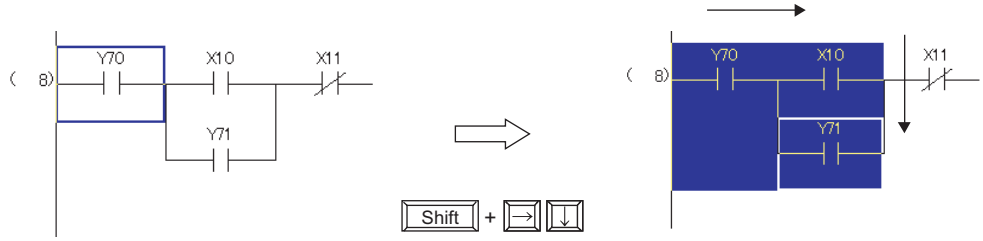
2. Press the Delete key.

The instructions in the set range are deleted.



Point

● **The range can be set by pressing the Shift key + ↑ ↓ ← → key.**



■ Deleting a ladder block

The following explains the method for deleting one ladder block at a time.

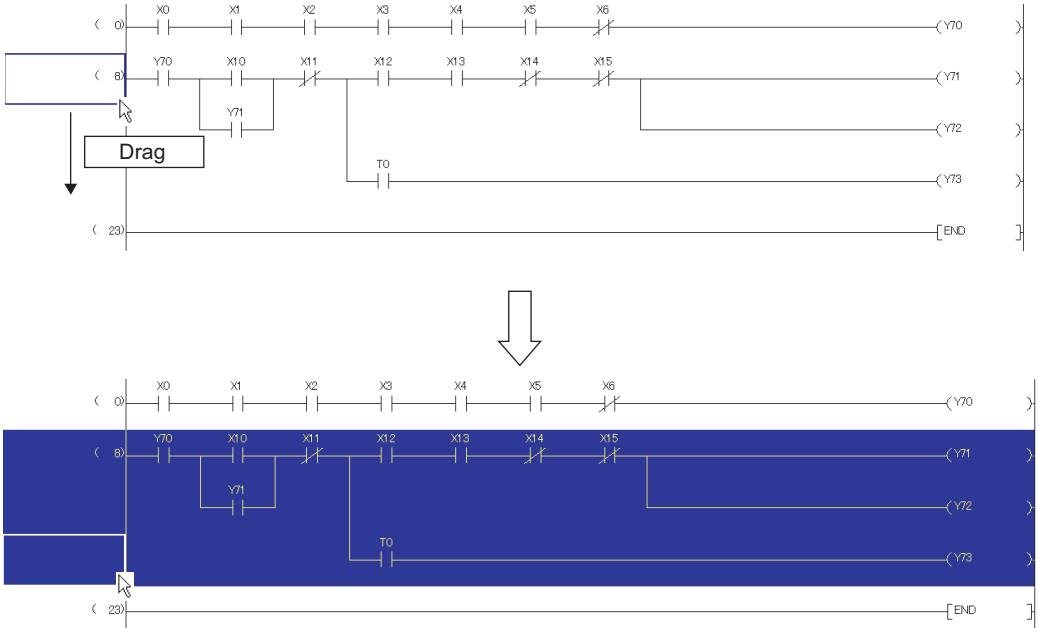
Restrictions

This operation is applicable only to the converted data.

Operating procedure

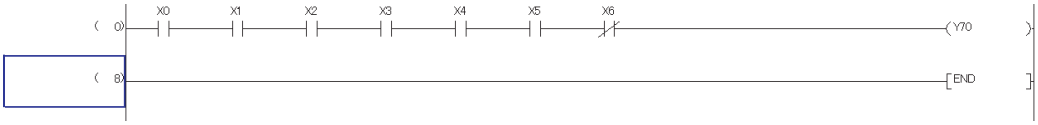
1. **Place the cursor at the start position of deletion and drag it up or down to set the range.**

   Specify the range of a ladder block at the position where step numbers are displayed.



2. **Press the Delete key.**

   The ladder block is deleted.



5.1.6 Deleting lines

QCPU
Q

This section explains the method for deleting lines.

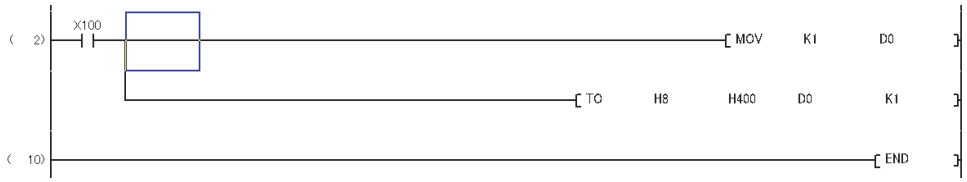
Item	Toolbar	Shortcut key
Delete Line	aF9	Alt + F9
Delete Vertical Line	cF10	Ctrl + F10
Delete Horizontal Line	cF9	Ctrl + F9

■ Deleting lines

The following explains the method for deleting vertical and horizontal lines consecutively.

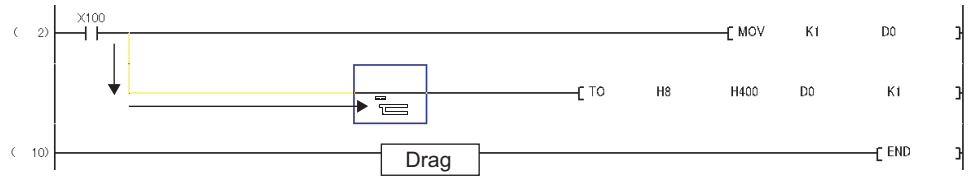
Operating procedure

1. **Move the cursor to the position where the lines are deleted.**
   The vertical line is deleted taking the left edge of the cursor as a base point.



2. **Select [Edit] ⇒ [Delete Line] (aF9).**

3. **Drag the cursor in the direction for line deletion.**
   The selected lines are displayed in yellow.



4. **The lines are deleted upon completion of dragging.**

5. **To end the Delete Line function, select [Edit] ⇒ [Delete Line] (aF9) again.**
   The line deletion mode is disabled.

■ Deleting vertical or horizontal lines

The following explains the method for deleting a vertical or horizontal line.

Operating procedure

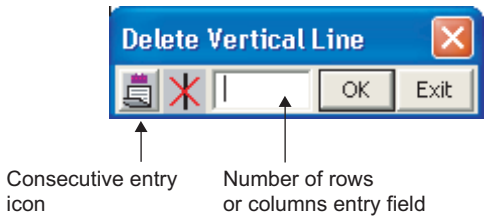
1. Move the cursor to the start of the vertical or horizontal line to be deleted.

The vertical line is deleted taking the left edge of the cursor as a base point.

2. Select [Edit] ⇒ [Ladder Symbol] ⇒ [Delete Vertical Line] (cF10).

The Delete Vertical Line screen is displayed.

To delete a horizontal line, select [Edit] ⇒ [Ladder Symbol] ⇒ [Delete Horizontal Line] (cF9).

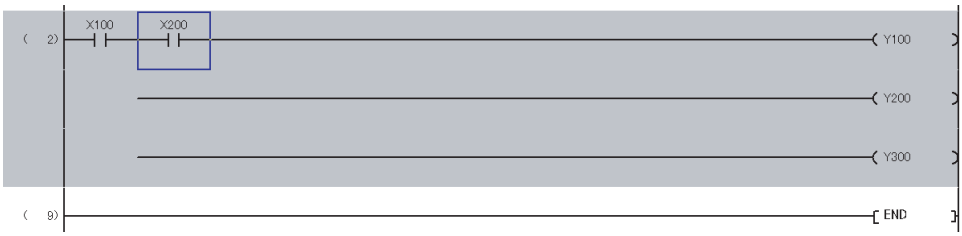


3. Set the items on the screen.

Name	Description
Consecutive entry icon	Allows consecutive deletion of vertical lines by changing the status. Consecutive entry ON Consecutive entry OFF
Number of rows or columns entry field	Enter the number of rows or columns to be deleted. If no value is entered, one row of vertical line or one column of horizontal line is deleted.

4. Click the OK button.

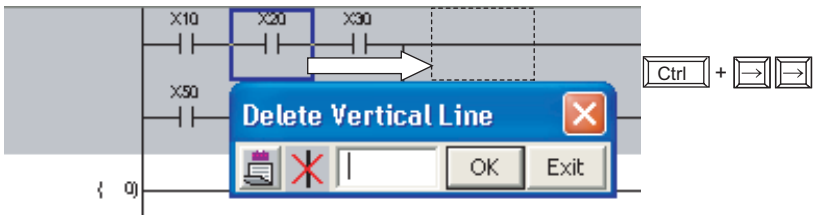
Vertical lines are deleted.



Point

- **Changing the cursor position on the editing screen while the Delete Vertical Line screen or Delete Horizontal Line screen is displayed**

  Use the Ctrl key + ↑ ↓ ← → keys to change the cursor position on the editing screen.



5.1.7 Inserting and deleting rows and columns

QCPU Q

This section explains the method for inserting and deleting rows and columns.

Item	Shortcut key
Insert Row	Shift + Insert
Delete Row	Shift + Delete
Insert Column	Ctrl + Insert
Delete Column	Ctrl + Delete

■ Inserting rows

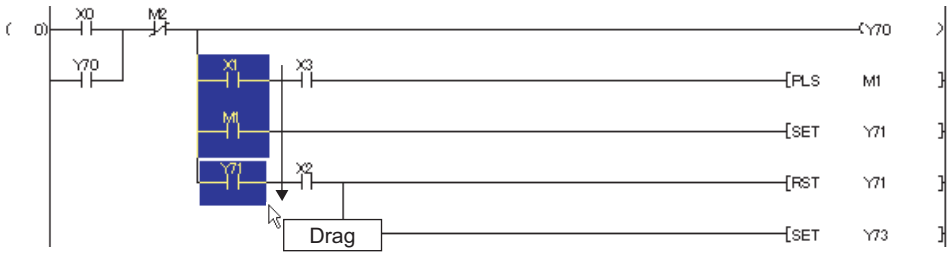
The following explains the method for inserting rows.

Operating procedure

1. **Move the cursor to the position where a row is inserted.**

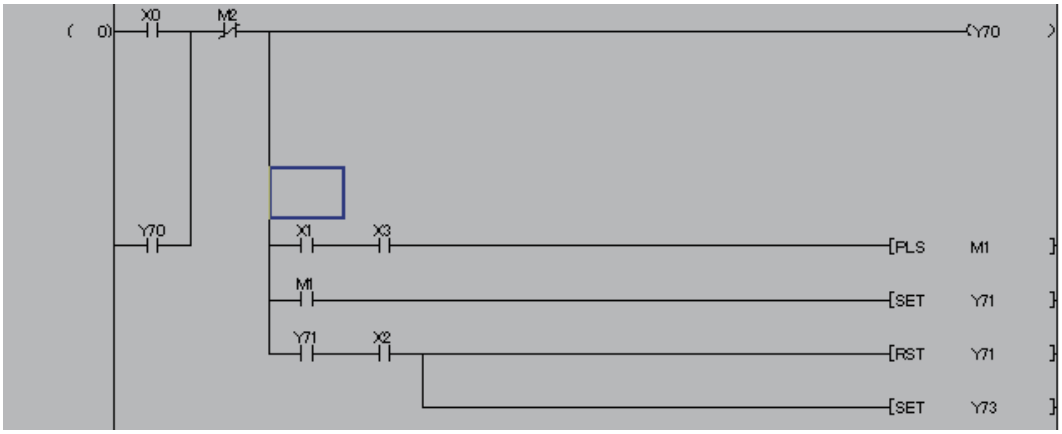
2. **To insert multiple rows, drag the cursor and set the range corresponding to the number of rows to be inserted.**

   The rows in the set range are inserted.
   To insert a single row, it is not necessary to set the range.
   In the screen image below, the range for inserting three rows is set.



3. **Select [Edit] ⇒ [Insert Row].**

A space is inserted above the cursor position.
The screen image below shows insertion of a space for three rows.



■ Deleting rows

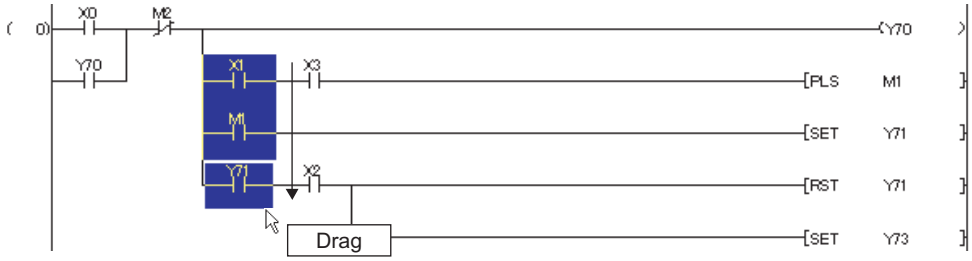
The following explains the method for deleting rows.

Operating procedure

1. **Move the cursor to the position where the row is deleted.**

2. **To delete multiple rows, drag the cursor and set the range corresponding to the number of rows to be deleted.**

The rows in the set range are deleted.
To delete a single row, it is not necessary to set the range. The row at the cursor position is deleted.



3. **Select [Edit] ⇒ [Delete Row].**

The rows are deleted.

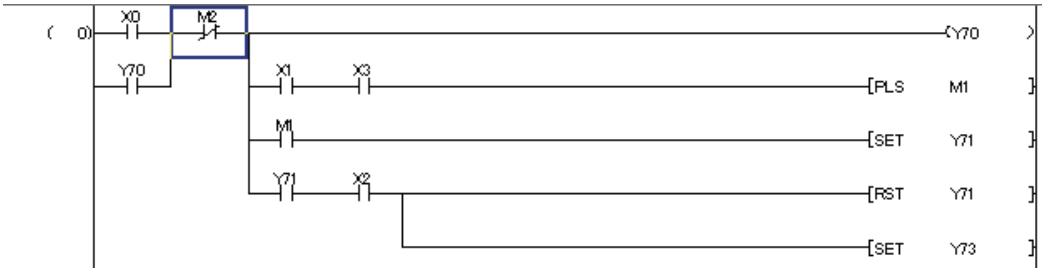
■ Inserting columns

The following explains the method for inserting columns. Columns are inserted through the whole rows of ladder block.

Operating procedure

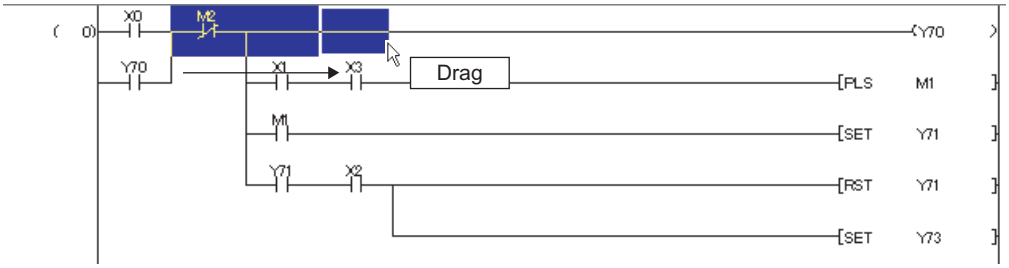
1. **Move the cursor to the position where a column is inserted.**

A column is inserted in front of the cursor position.



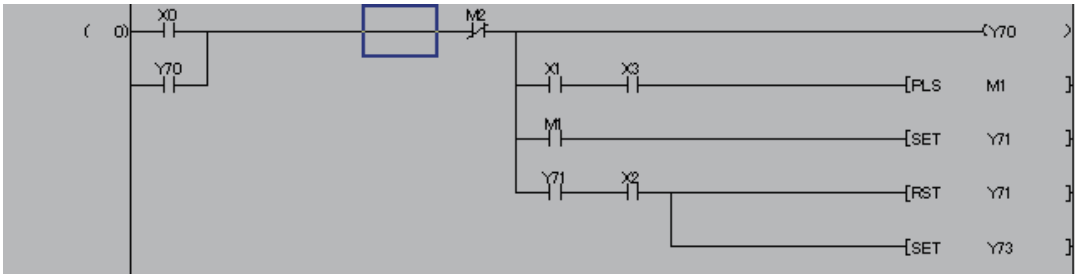
2. **To insert multiple columns, drag the cursor and set the range corresponding to the number of columns to be inserted.**

The columns in the set range are inserted.
In the screen image below, the range for inserting three columns is set.



3. **Select [Edit] ⇒ [Insert Column].**

The columns are inserted. The screen image below shows the insertion of three columns.

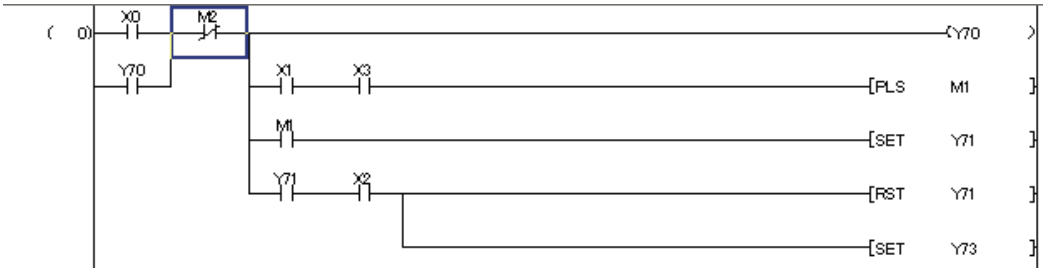


■ Deleting columns

The following explains the method for deleting columns. Columns are deleted within the ladder block.

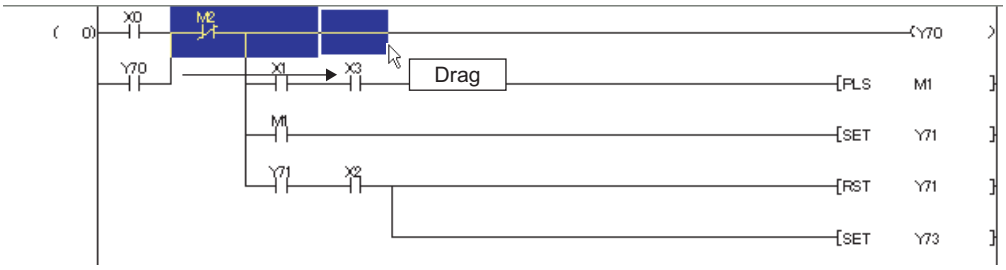
Operating procedure

1. **Move the cursor to the position where the column is deleted.**



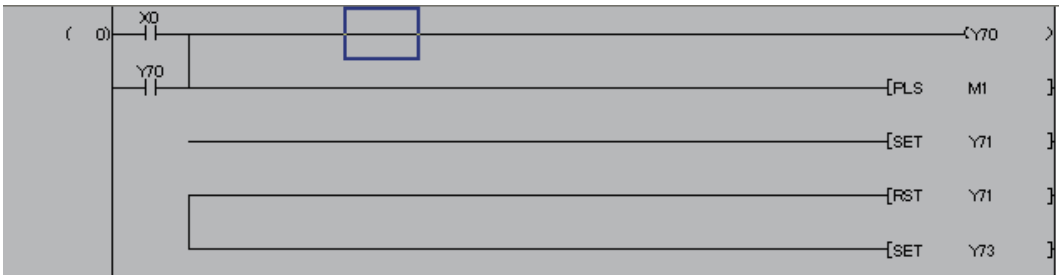
2. **To delete multiple columns, drag the cursor to set the range corresponding to the number of columns to be deleted.**

   The columns in the set range are deleted.
   To delete a single column, it is not necessary to set the range. The column at the cursor position is deleted.



3. **Select [Edit] ⇒ [Delete Column].**

   The columns are deleted. The screen image below shows the deletion of three columns.



5.1.8 Batch inserting and deleting NOP instructions

QCPU Q

This section explains the method for batch inserting and deleting NOP instructions.

Restrictions

This operation is applicable only to the converted data.

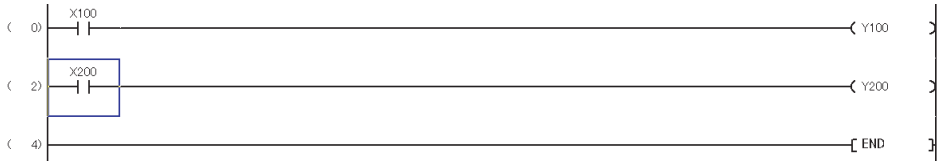
■ Batch inserting NOP instructions

Step numbers of the program can be adjusted by batch inserting NOP instructions.

Operating procedure

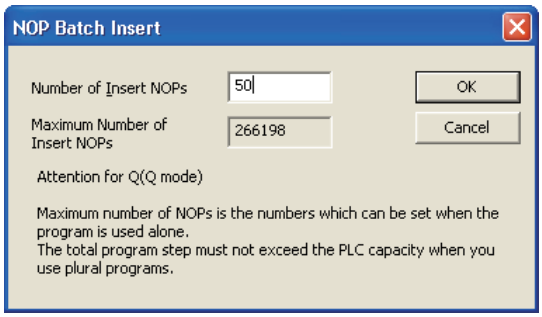
1. **Move the cursor to the position where NOP instructions are inserted.**

   NOP instructions are inserted in front of the cursor position.



2. **Select [Edit] ⇒ [NOP Batch Insert].**

   The NOP Batch Insert screen is displayed.



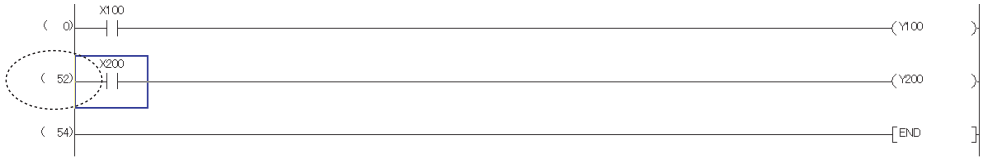
3. **Set the items on the screen.S**

Item	Description
Number of Insert NOPs	Set the number of NOP instructions to be inserted.
Maximum Number of Insert NOPs	Displays the maximum number of NOP instructions that can be inserted.

4. **Click the OK button.**

   The set number of NOP instructions is inserted in the program.

The step number is changed.



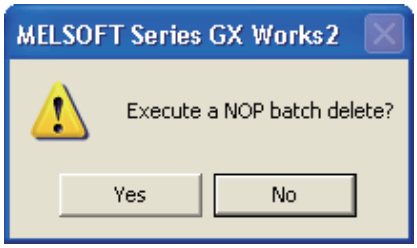
■ Batch deleting NOP instructions

The following explains the method for batch deleting NOP instructions in the program.

Operating procedure

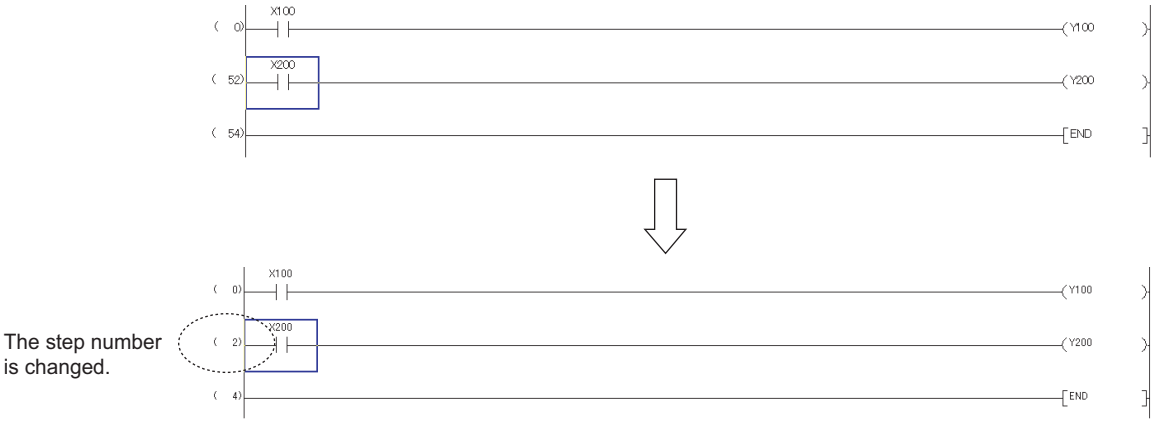
1. **Select [Edit] ⇒ [NOP Batch Delete].**

   The confirmation message is displayed.



2. **Click the Yes button.**

   All NOP instructions in the program are deleted.



5.1.9 Cutting, copying, and pasting ladders

QCPU Q

This section explains the method for cutting, copying, and pasting existing ladders.

Item	Toolbar	Shortcut key
Cut		Ctrl + X
Copy		Ctrl + C
Paste		Ctrl + V

■ Pasting the cut or copied ladders in unit of instruction

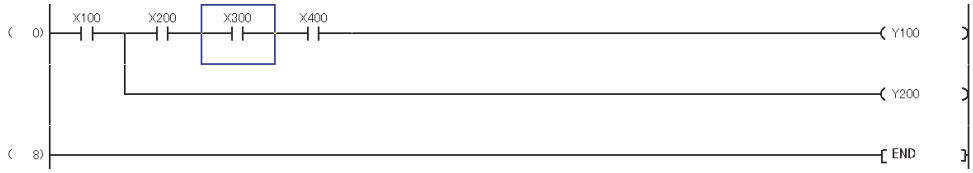
The following explains the method for pasting a cut or copied ladder in unit of instruction.

Restrictions

Cutting and copying in unit of instruction are applicable to contacts, coils, application instructions, device comments, and notes. Cutting and copying are not applicable to line statements, P and I statements, and END instructions.

Operating procedure

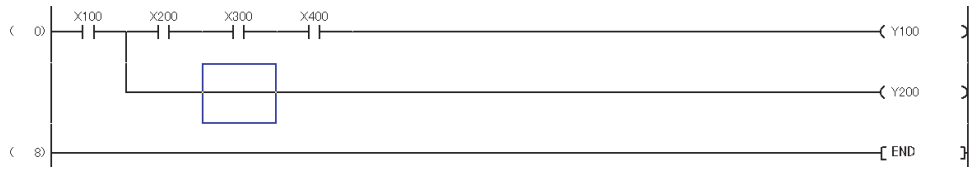
1. **Move the cursor to the position where the instruction is cut or copied.**



2. **Select [Edit] ⇒ [Cut] ( ) or [Copy] ( ).**

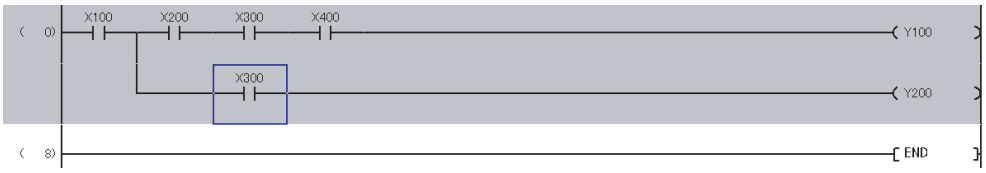
   When [Cut] ( ) is selected, the instruction at the cursor position is deleted.

3. **Move the cursor to the position where the cut or copied instruction is pasted.**



4. **Select [Edit] ⇒ [Paste] ( ).**

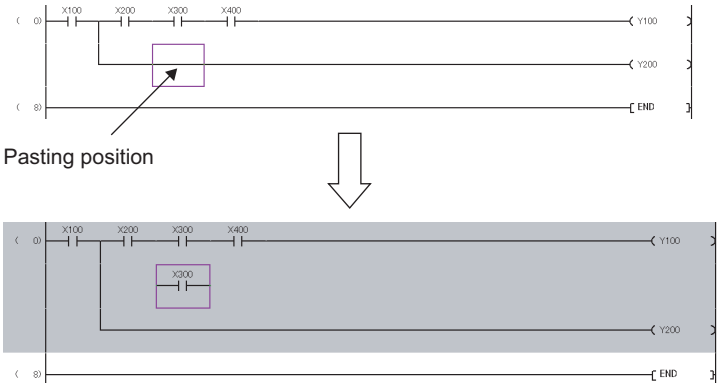
The instruction is pasted.



Point

● **Pasting in the 'Insert mode'**

A row is inserted at the cursor position and the instruction is pasted there.

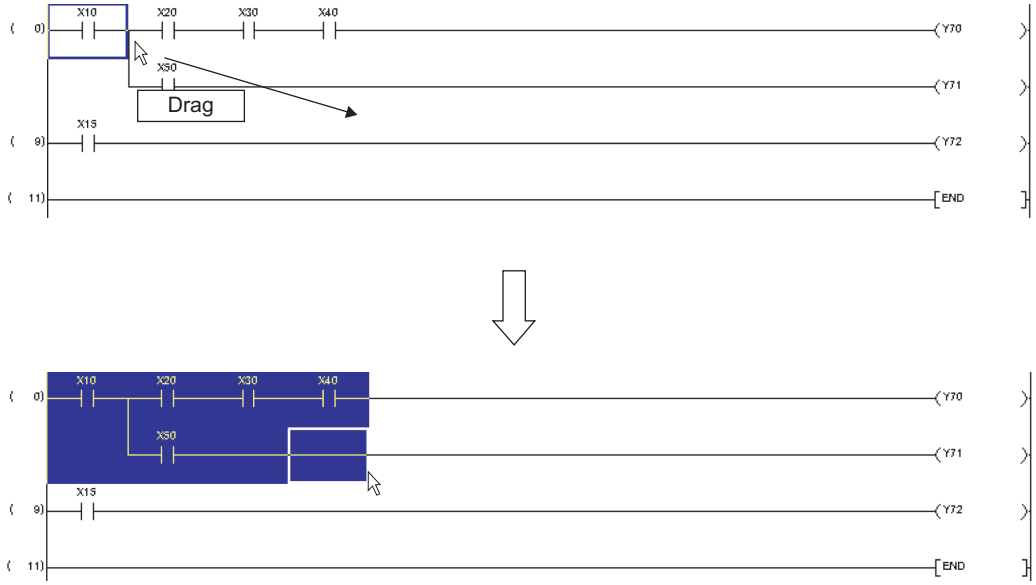


■ Pasting cut or copied ladders by setting a range

The following explains the method for pasting cut or copied ladders by setting a range.

Operating procedure

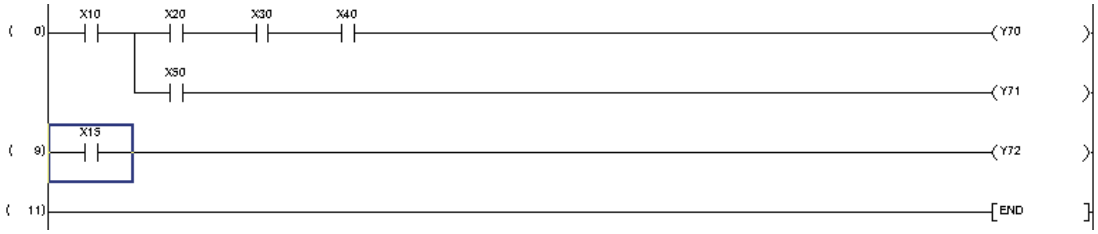
1. **Set the range by dragging the cursor from the start position of cut or copy.**



2. **Select [Edit] ⇒ [Cut] ( ) or [Copy] ( ).**

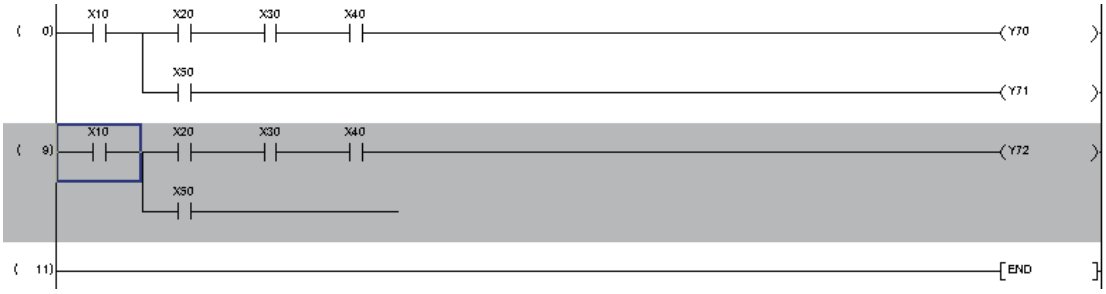
   When [Cut] ( ) is selected, the ladders in the set range are deleted.

3. **Move the cursor to the position where the cut or copied ladders are pasted.**



4. **Select [Edit] ⇒ [Paste] ( ).**

   The ladders are pasted.



■ Pasting cut or copied ladder block

The following explains the method for pasting a cut or copied ladder block.

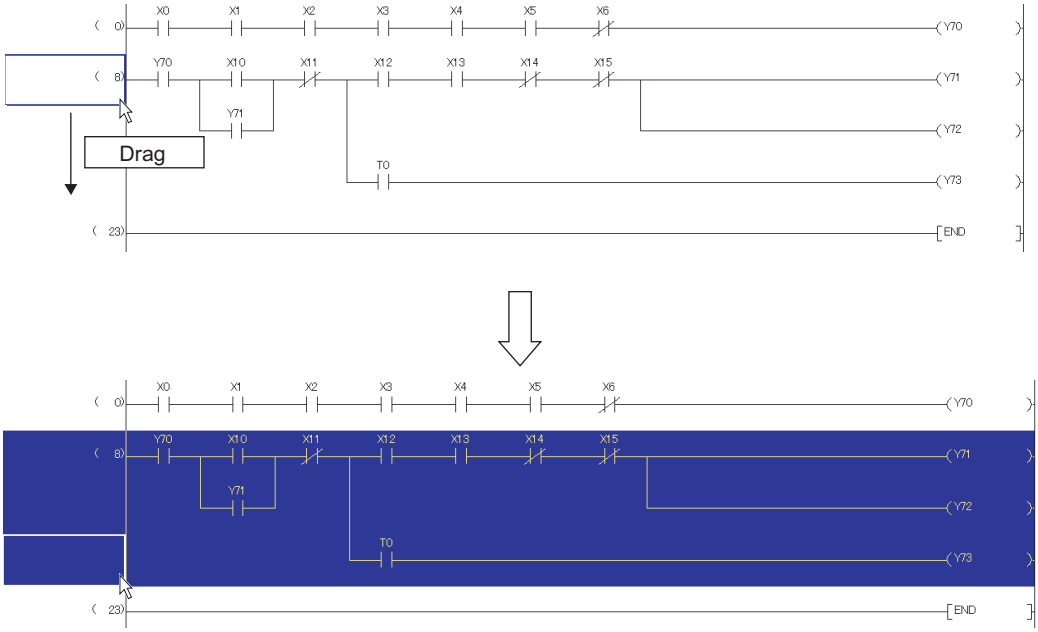
Restrictions!

This operation is applicable only to the converted data.

Operating procedure

1. **Set the range by dragging the cursor up or down from the start position of cut or copy.**

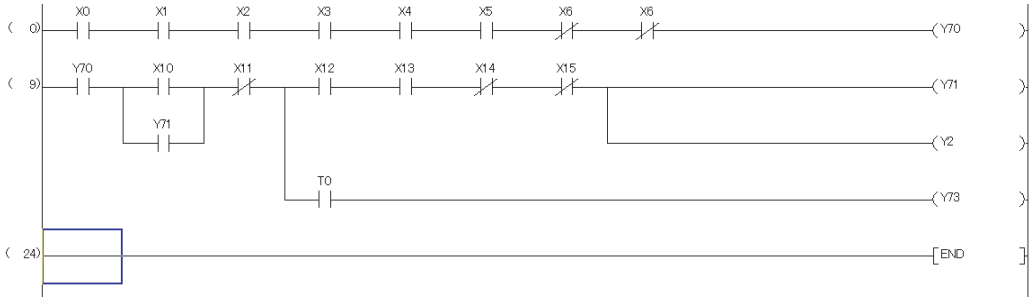
   Specify the range of a ladder block at the position where step numbers are displayed.



2. **Select [Edit] ⇒ [Cut] ( ) or [Copy] ( ).**

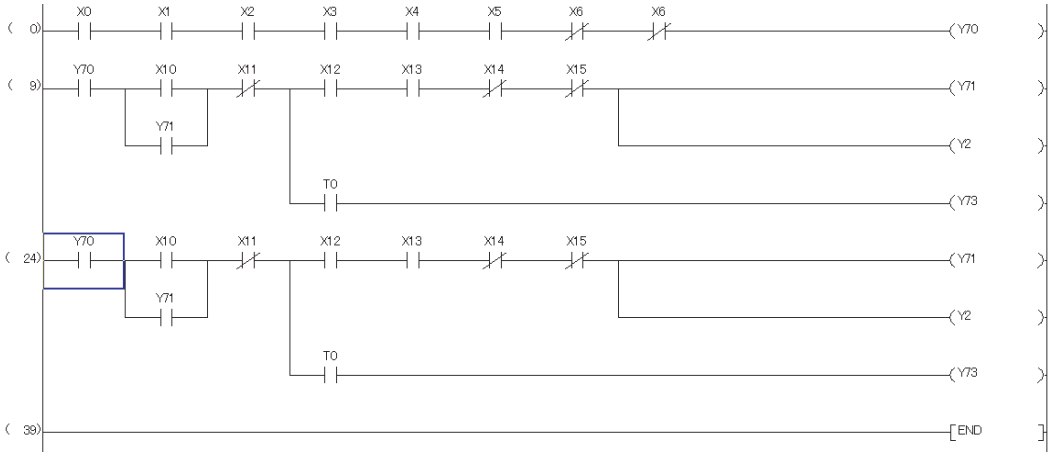
   When [Cut] ( ) is selected, the ladder block in the set range is deleted.

3. **Move the cursor to the position where the cut or copied ladder block is pasted.**



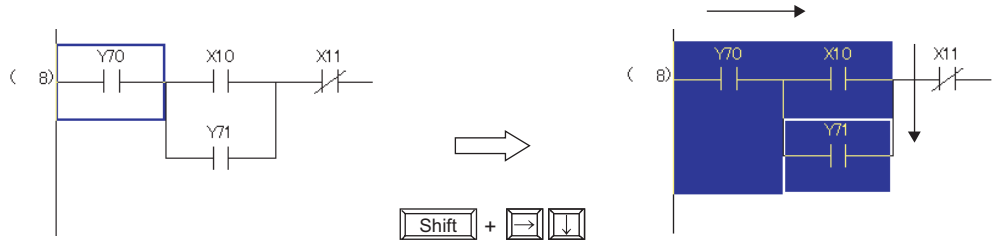
4. **Select [Edit] ⇒ [Paste] ( ).**

The ladder block is pasted.



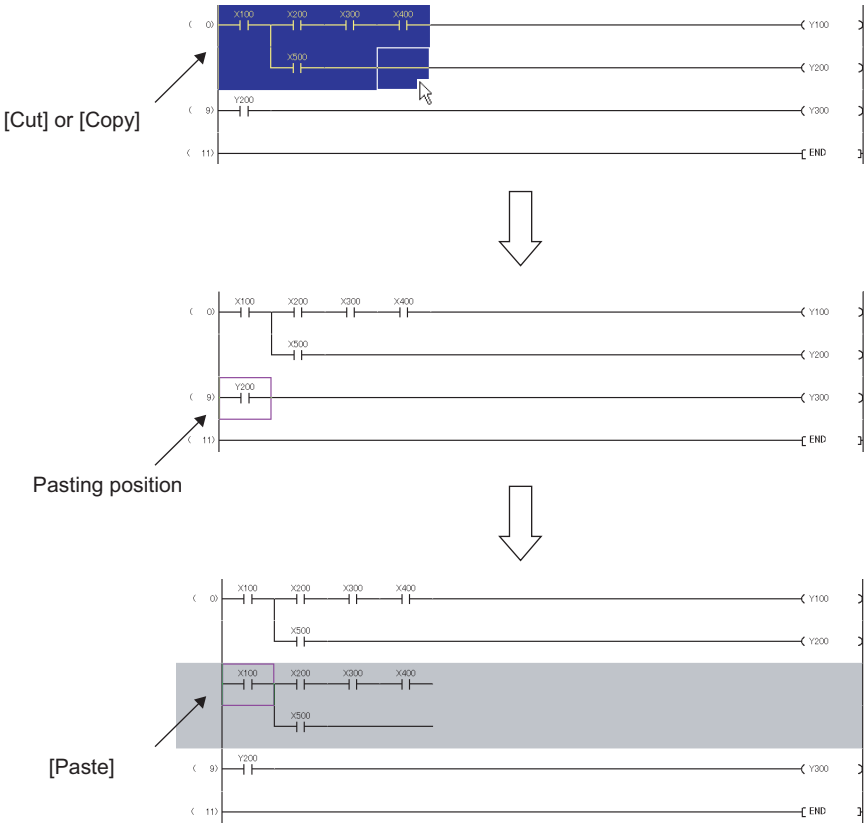
Point

● **The range can be set by pressing the Shift key + ↑ ↓ ← → key.**

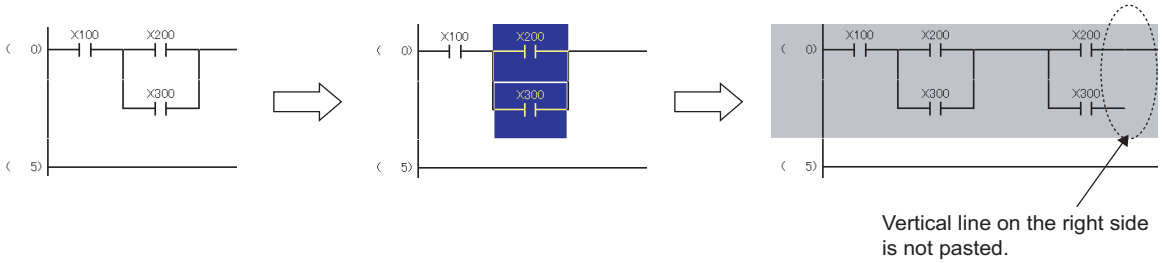


● **Pasting in the 'Insert mode'**

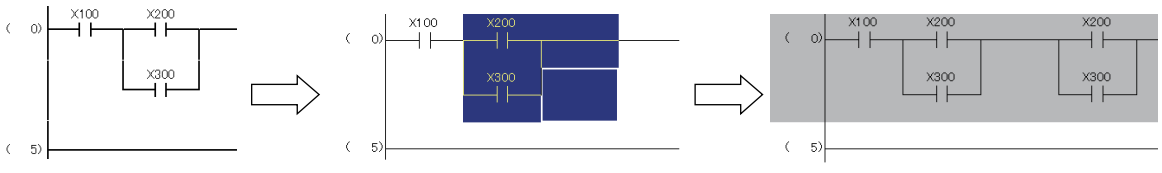
The ladder block is inserted above the cursor position.



● **If the ladders shown below are selected by setting a range, the vertical line on the right side cannot be copied or pasted.**



In such a case, set the range as shown below to copy or paste the ladders.



5.1.10 Canceling the previous operation

QCPU Q

This section explains the method for canceling the previous operation to restore the previous status.

Item	Toolbar	Shortcut key
Undo		Ctrl + Z

Operating procedure

- Select [Edit] ⇒ [Undo] ( ) immediately after editing a ladder.
  The processing status just before the last operation is restored.

■ Operation applicability

The following table shows the operation applicability of the Undo function.

Table 5.1.10-1 Operation applicability of the Undo function

Operation applicability of the Undo function	Reference
Creating and deleting contacts, coils, and application instructions	Section 5.1.2 Section 5.1.5
Inserting and deleting rows	Section 5.1.7
Inserting and deleting columns	Section 5.1.7
Editing and deleting lines	Section 5.1.4 Section 5.1.6
Entering and deleting vertical lines	Section 5.1.4 Section 5.1.6
Entering and deleting horizontal lines	Section 5.1.4 Section 5.1.6
Cutting and pasting by setting ranges	Section 5.1.9

5.1.11 Restoring ladders to the status of after conversion

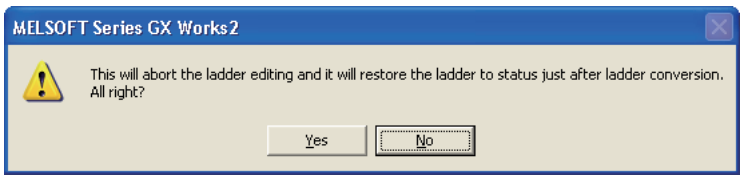
QCPU

This section explains the method for restoring the currently edited ladder to the status of immediately after the ladder conversion.

Operating procedure

1. **Select [Edit] ⇒ [Restore after ladder conversion].**

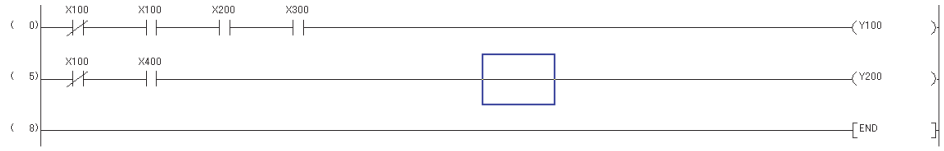
   The confirmation message is displayed.



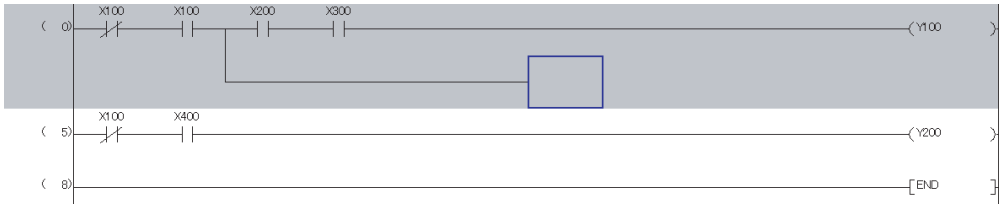
2. **Click the Yes button.**

   The ladder is restored to the status before editing the ladder.

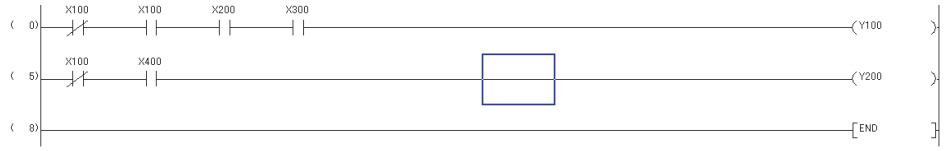
Status after ladder conversion



Edit the ladder.



Execute [Restore after ladder conversion].



Point

- **Converted ladder cannot be restored to the status before conversion.**

5.1.12 Precautions on editing ladders

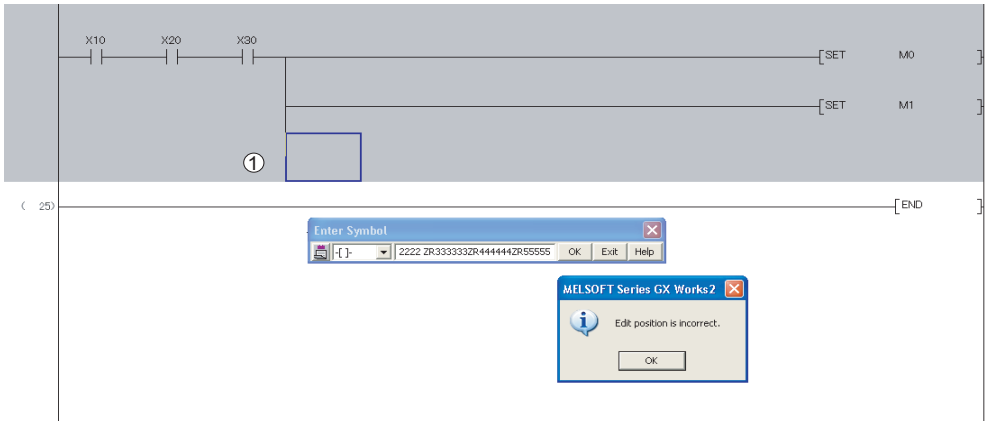
QCPU
Q

The following explains the precautions on editing ladders.

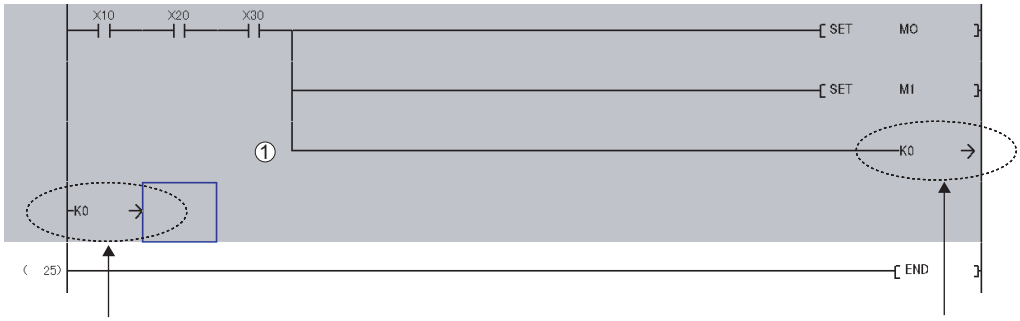
1) For a ladder with a ladder block consisting of two or more rows, if one instruction cannot be fitted in a single row, create wrapping symbols and create the instruction in the next row as shown below.

Example)
To enter the following instruction:
ECALL "abcdefghijklmnopqrstuvw" P1000 ZR111111 ZR222222 ZR333333 ZR444444 ZR555555

An instruction that does not fit in a row cannot be entered in the row ①.
If attempted, the error message "Edit position is incorrect" is displayed.



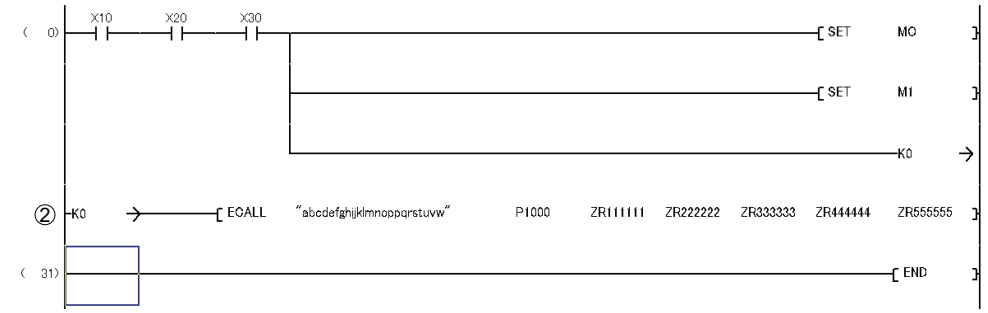
Wrapping the row ① by creating the wrapping symbols.



Create a wrapping destination symbol (>-).

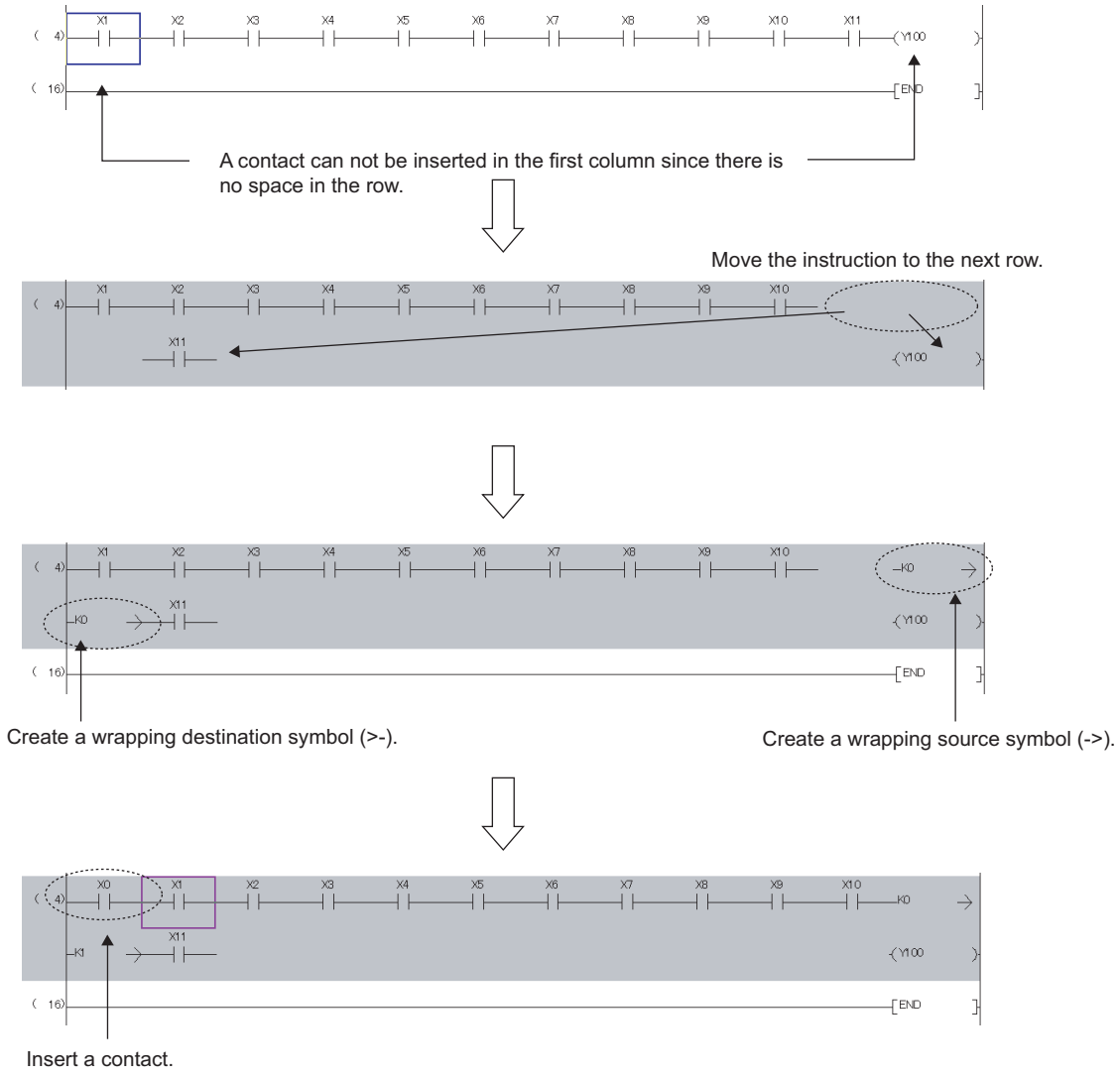
Create a wrapping source symbol (->).

Enter the instruction in the row ②.



2) If wrapping occurs due to the insertion of a contact in the first column, a contact cannot be inserted. In this case, move the instruction to the next row and insert the contact in the first column after connecting the contact with the wrapping symbols.

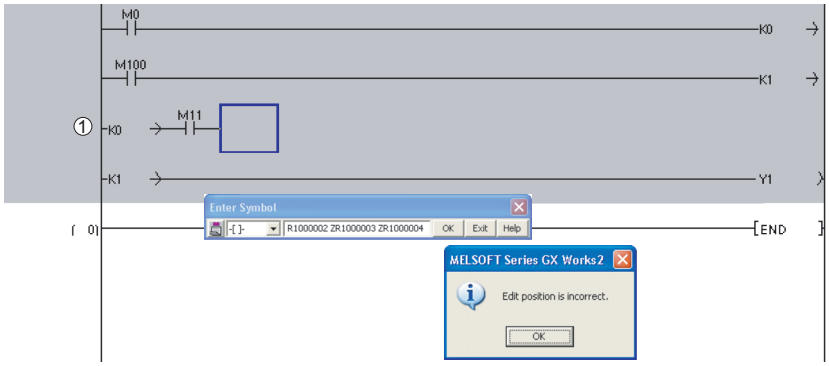
Example)



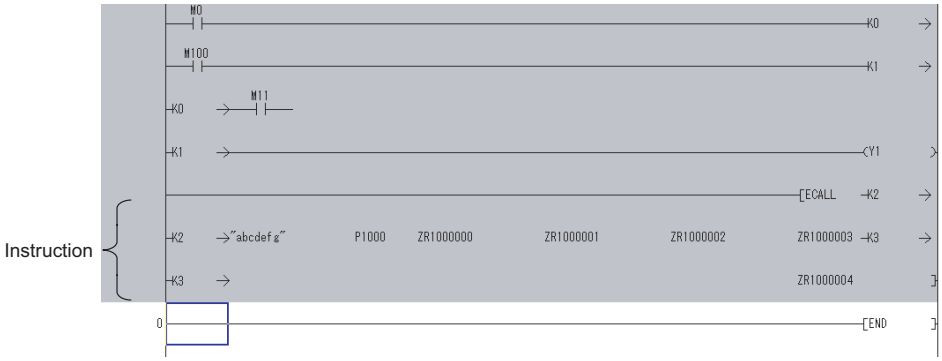
3) When there are two or more wrapping rows, an instruction that causes more wrapping can not be created.
In this case, insert a new row below the existing rows and enter the instruction in that row. Then, adjust the wrapping symbol numbers.

Example)
To enter the following instruction:
ECALL "abcdefg" P1000 ZR1000000 ZR1000001 ZR1000002 ZR1000003 ZR1000004

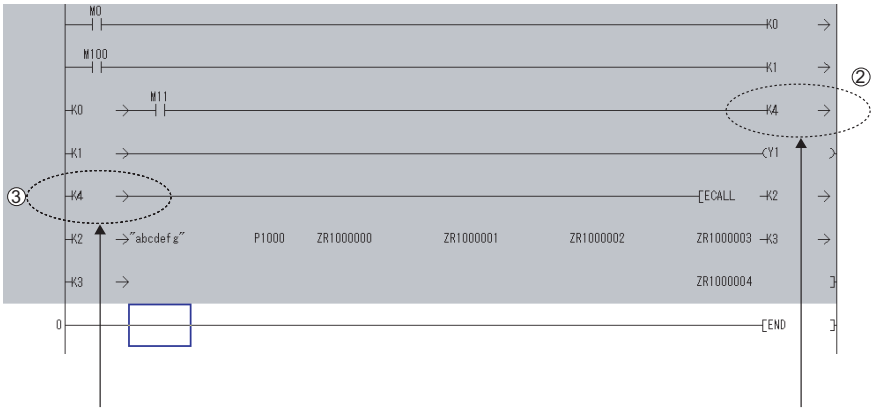
An instruction that does not fit in a row cannot be created in the row ①.
If attempted, the error message is displayed.



In this case, insert a new row and enter the instruction.



Create the wrapping source symbol (->) in the row ②, and create the wrapping destination symbol (>-) in the row ③.

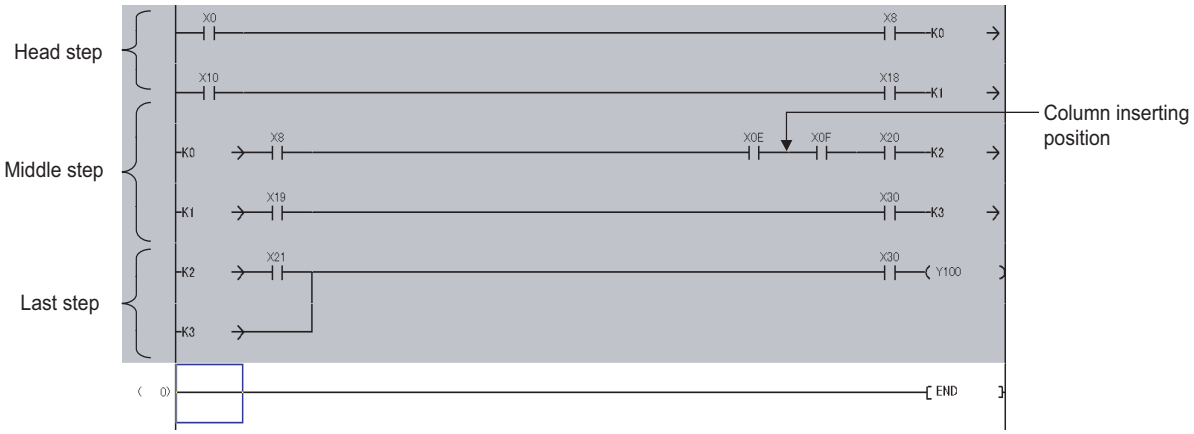


Create a wrapping destination symbol (->).

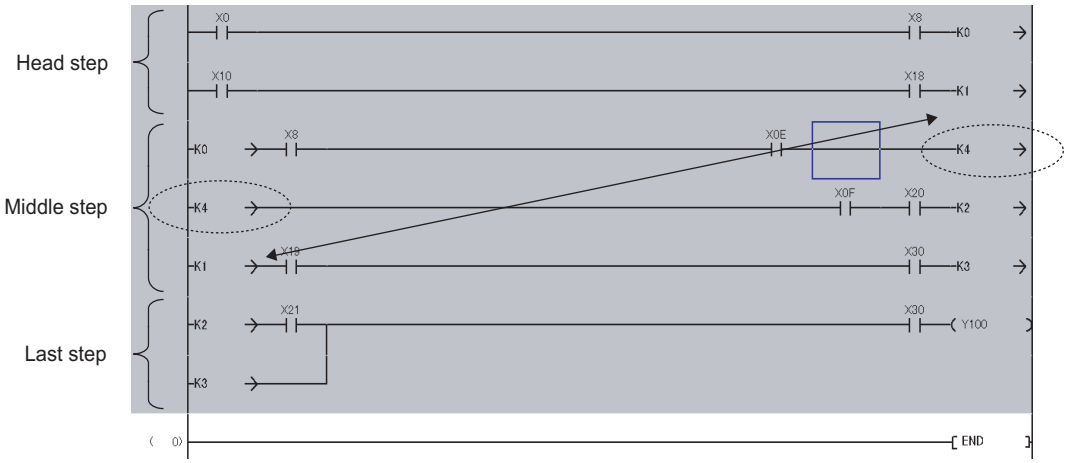
Create a wrapping source symbol (->).

4) If the ladder is edited (such as insertion or deletion of columns) in the middle step of a wrapped ladder, the ladder may not be wrapped correctly, which causes the conversion impossible.
If this happens, make corrections so that the wrapping source symbol (->) number and the wrapping destination symbol (>-) number match correctly.

Example)
A column is inserted in front of [X0F]

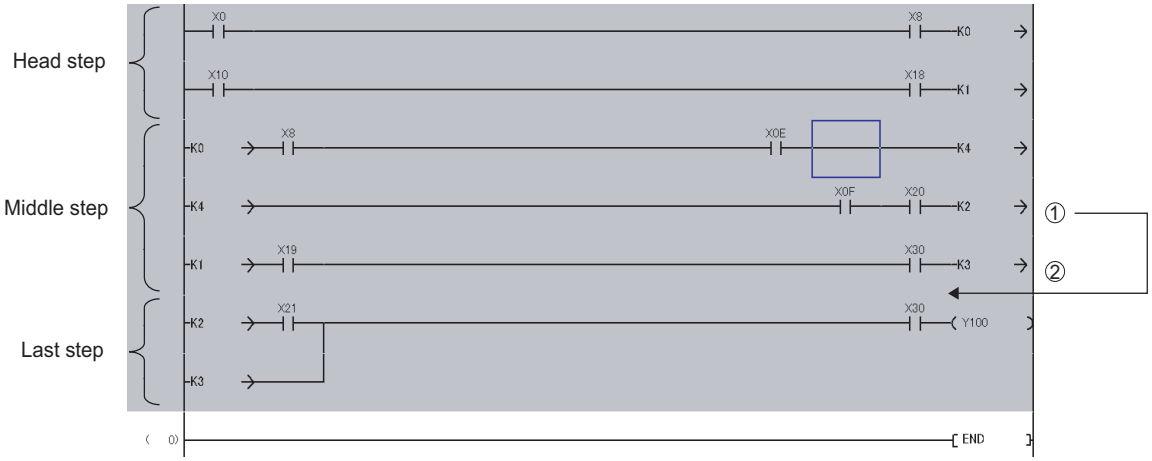


Wrapping source symbol (->) K4 and wrapping destination symbol (>-) K4 are automatically created.
This causes matching failure between the wrapping source symbol (->) K1 and the wrapping destination symbol (>-) K1.

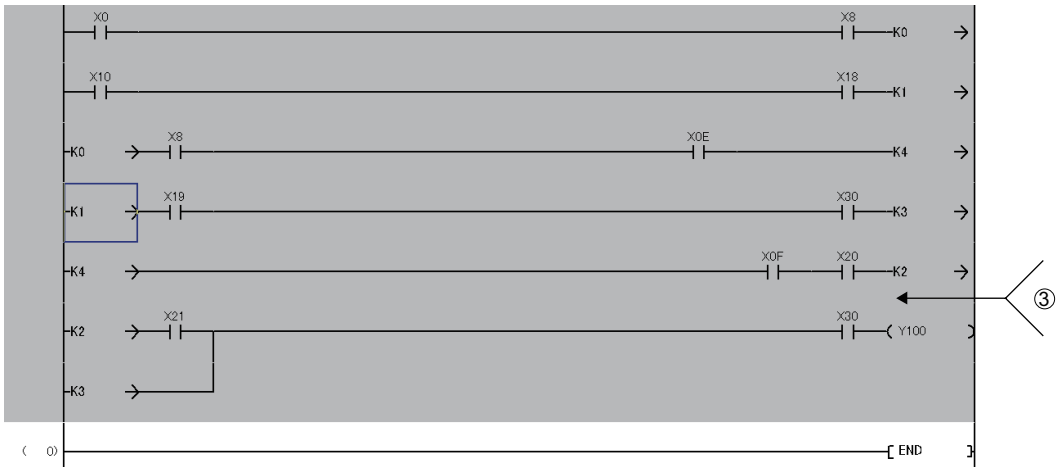


In this case, a correction needs to be made to the ladder so that the wrapping destination symbol (>-) K1 corresponds to the wrapping source symbol (->) K1.

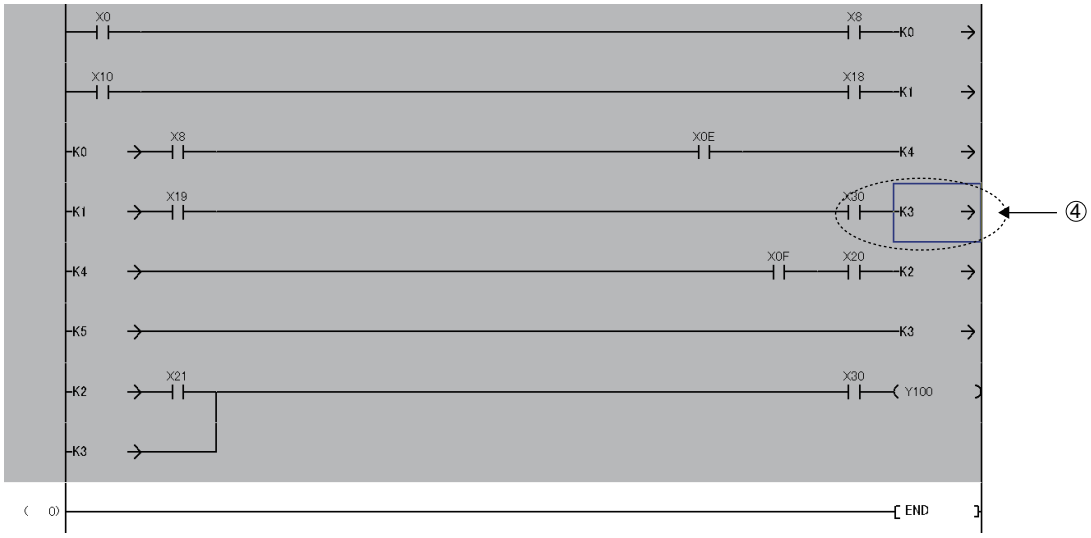
Move row ① below row ②.



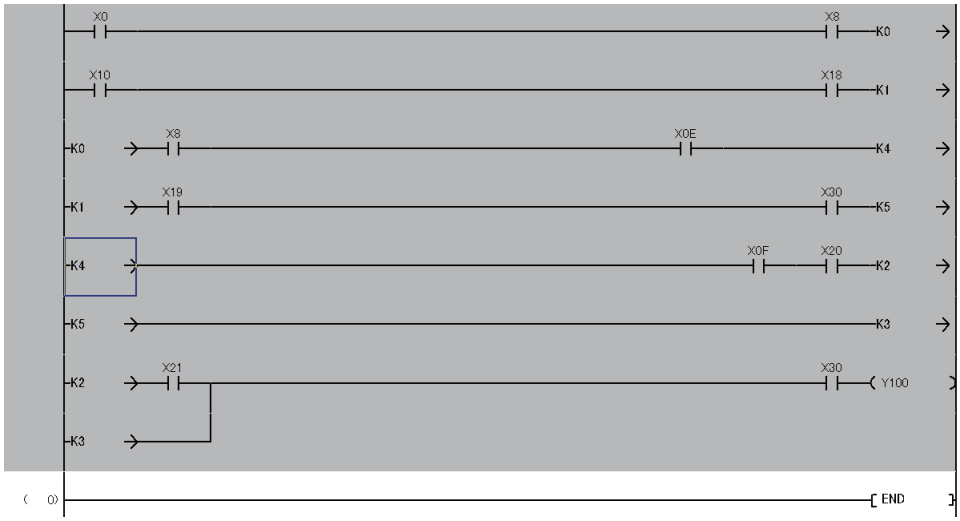
Insert a new row to ③, and create the wrapping source symbol (->) with K5 and wrapping destination symbol (>-) with K3.



Change the wrapping symbol of ④ to K5.

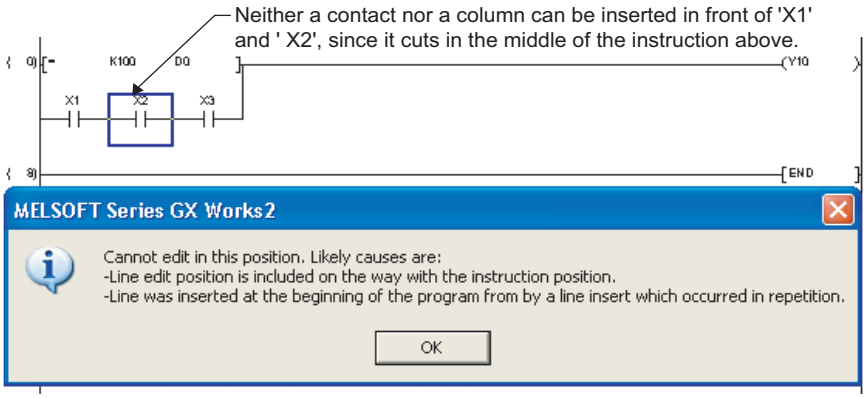


With the corrections above, correspondence between the wrapping source symbols (->) and the wrapping destination symbols (>-) is secured.



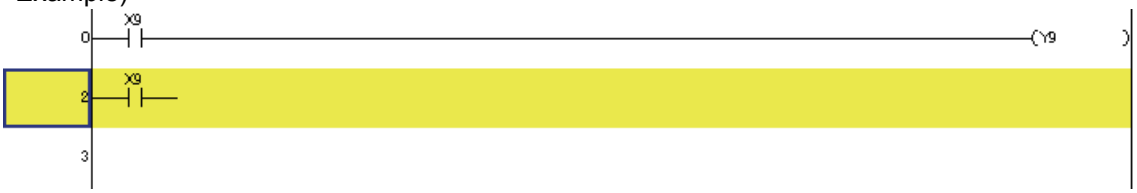
5) A contact or a column cannot be inserted in the middle of an instruction statement.
If attempted, the error message is displayed.

Example)



6) When the ladder block is displayed in yellow, it indicates that the ladder block cannot be displayed properly or an error exists in the program. In this case, perform the program check or compilation to check the error, and correct the program.

Example)



5.2 Editing SFC Programs

This section explains the methods for operating the SFC editor.

5.2.1 List of SFC symbols

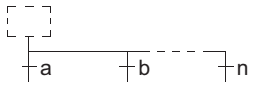
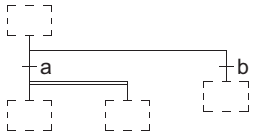
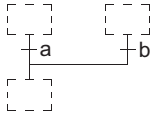
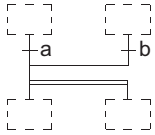
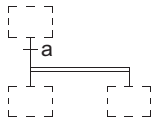
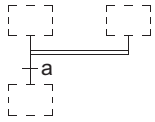
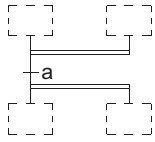
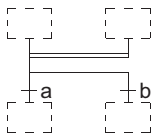
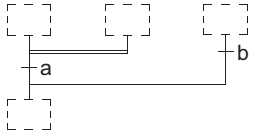
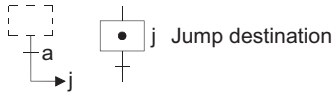
QCPU Q

The following tables show the list of symbols used in SFC programs.

Table 5.2.1-1 List of SFC symbols for Q series (1/2)

Category	Name		Symbol	Number of symbols
SFC step	Initial step	SFC step 0	0	Any one of these steps in a single block
	Dummy initial step		0	
	Coil saving initial step		SC 0	
	Action saving - with no transition check initial step		SE 0	
	Action saving - with transition check initial step		ST 0	
	Reset initial step		R 0 S0	
	Initial step	Initial step other than SFC step 0	1	Up to the total of 31 steps in a single block
	Dummy initial step		1	
	Coil saving initial step		SC 1	
	Action saving - with no transition check initial step		SE 1	
	Action saving - with transition check initial step		ST 1	
	Reset initial step		R 1 S0	
	Step	Other than initial step	2	Including initial steps, up to 512 steps in a single block
	Dummy step		2	
	Coil saving initial step		SC 2	
	Action saving - with no transition check initial step		SE 2	
	Action saving - with transition check initial step		ST 2	
	Reset step		R 2 S0	
	Block start step - with END check		2 B1	
	Block start step - with no END check		2 B1	
	End step			Multiple steps can be applied in a single block

Table 5.2.1-2 List of SFC symbols for Q series(2/2)

Category	Name	Symbol	Number of symbols
Transition	Series transition		
	Selection divergence		
	Selection divergence - simultaneous divergence		
	Selection convergence		
	Selection convergence - simultaneous divergence		
	Simultaneous divergence		
	Simultaneous convergence		
	Simultaneous convergence - simultaneous divergence		
	Simultaneous convergence - selection divergence		
	Simultaneous convergence - selection convergence		
	Jump		

5.2.2 Creating SFC diagrams

QCPU
Q

This section explains the method for creating SFC diagrams.
SFC symbols are entered by using the Enter SFC Symbol screen.

SFC symbols also can be entered by using the toolbar and shortcut keys. The following table shows the toolbar icons and the corresponding shortcut keys.

Item		Toolbar	Shortcut key
SFC Symbol	Step		F5
	Block START Step - with END check		F6
	Block START Step - with no END check		Shift + F6
	Jump		F8
	END Step		F7
	Dummy Step		Shift + F5
	Transition		F5
	Selection Divergence		F6
	Simultaneous Divergence		F7
	Selection Convergence		F8
	Simultaneous Convergence		F9
	Vertical Line		Shift + F9
SFC Step Attribute	Normal		Ctrl + 1
	Coil Saving		Ctrl + 2
	Action Saving - with no transition check		Ctrl + 3
	Action Saving - with transition check		Ctrl + 4
	Reset		Ctrl + 5
Edit Line	Vertical Line		Alt + F5
	Selection Divergence		Alt + F7
	Simultaneous Divergence		Alt + F8
	Selection Convergence		Alt + F9
	Simultaneous Convergence		Alt + F10
Delete Line			Ctrl + F9
Documentation	SFC Step/Edit Step Comment		
SFC Step No. Sort			
Monitor	SFC All Block Batch Monitor		
	SFC Auto Scroll Monitor		
View	Zoom		

■ Entering SFC steps (□)/(▣)/(⊠)

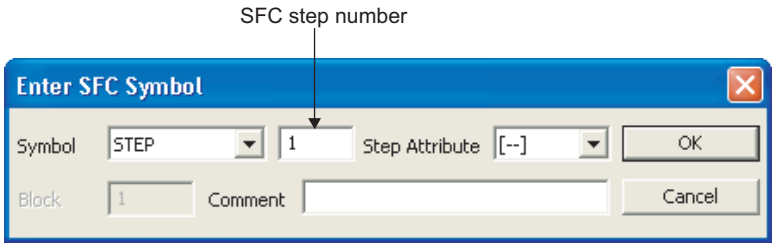
The following explains the method for entering a SFC step.

Operating procedure

1. **Move the cursor to the position where a SFC step is entered.**

2. **Select [Edit] ⇒ [SFC Symbol] ⇒ [Step]/[Dummy Step].**

   The Enter SFC Symbol screen is displayed.



3. **Set the items on the screen.**

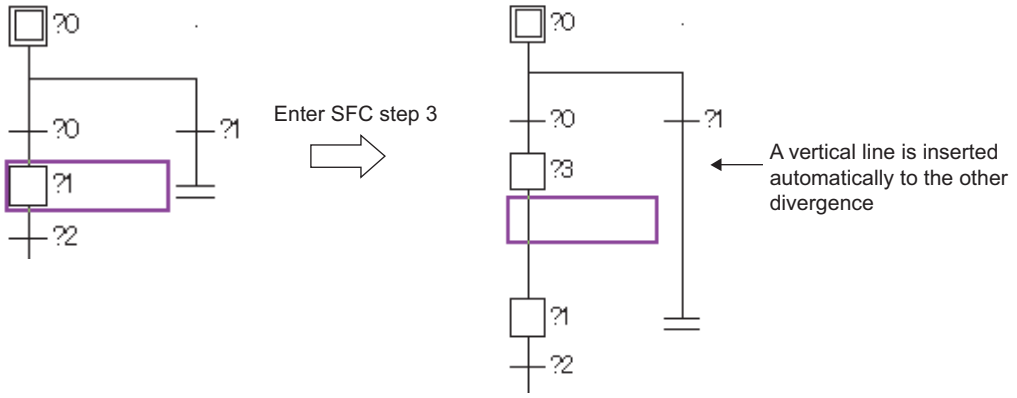
Item	Description
Symbol	Select "STEP" or "DUMMY". Dummy steps are changed to the SFC step display automatically when the operation output program is created.
SFC step number	Enter a SFC step number.
Step Attribute	Select the SFC step attribute. This setting can be set when "STEP" is selected for "Symbol".
Block/Reset	Enter a reset destination step number when the reset step "R" is selected for "Step Attribute".
Comment	Enter SFC step comments. Up to 32 characters can be entered. The created comments can be displayed by selecting [View] ⇒ [SFC Step/Display Step Comment].

4. **Click the OK button.**

   The entered SFC step symbol is displayed.

   <Overwrite mode>

<Insert mode>



Point

● **Changing the SFC step attributes**
The SFC step attributes of created SFC steps can be changed by selecting [View] ⇒ [SFC Step Attribute] ⇒ [(SFC step attribute)]. (☞ Section 5.2.6)

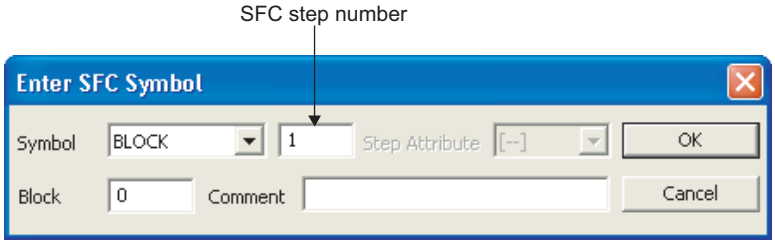
■ Entering block start steps ( )/( )

The following explains the method for entering a block start step.

Operating procedure

1. **Move the cursor to the position where a block start step is entered.**

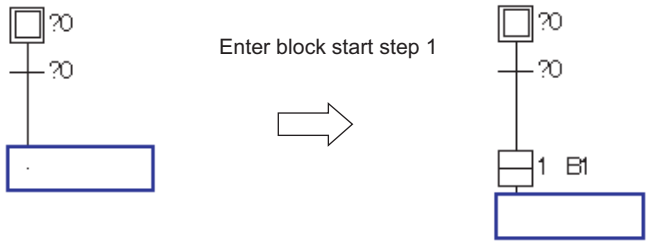
2. **Select [Edit] ⇒ [SFC Symbol] ⇒ [Block START Step - with END check]/[Block START Step - with no END check].**
   The Enter SFC Symbol screen is displayed.



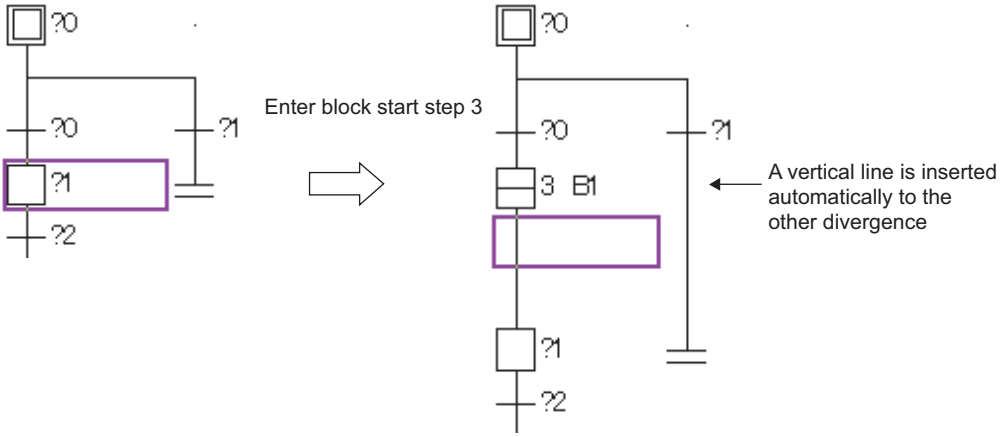
3. **Set the items on the screen.**

Item	Description
Symbol	Select "BLOCK" or "BLOCK-S".
SFC step number	Enter a SFC step number.
Step Attribute	(This setting is not required.)
Block	Enter a start destination block number.
Comment	Enter SFC step comments. Up to 32 characters can be entered.

4. **Click the OK button.**
   The entered block start step symbol is displayed.
   <Overwrite mode>



<Insert mode>


?0
?0
?1
?1
?2
Enter block start step 3
?0
?0
?1
3 B1
A vertical line is inserted automatically to the other divergence
?1
?2

■ Entering series transitions (┼)

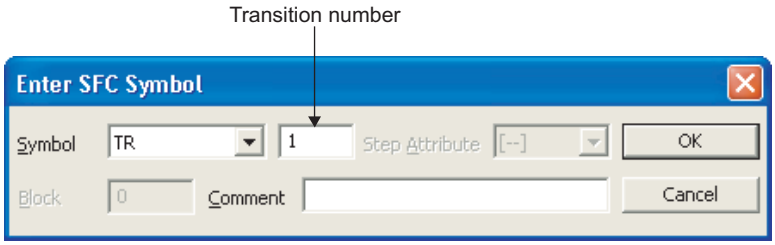
The following explains the method for entering a series transition.

Operating procedure

1. **Move the cursor to the position where a series transition is entered.**

2. **Select [Edit] ⇒ [SFC Symbol] ⇒ [Transition].**

   The Enter SFC Symbol screen is displayed.



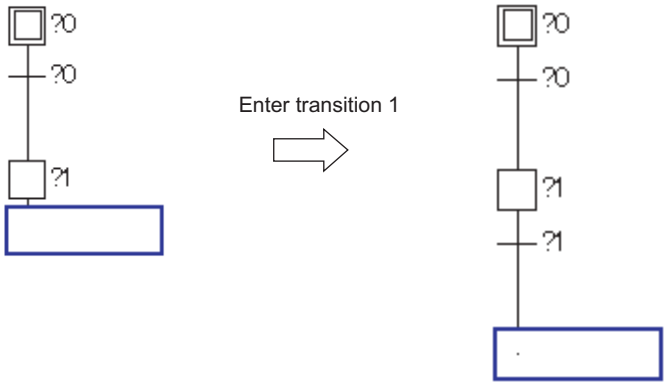
3. **Set the items on the screen.**

Item	Description
Symbol	Select "TR".
Transition number	Enter a transition number.
Step Attribute	(This setting is not required.)
Block	(This setting is not required.)
Comment	Enter transition comments. Up to 32 characters can be entered.

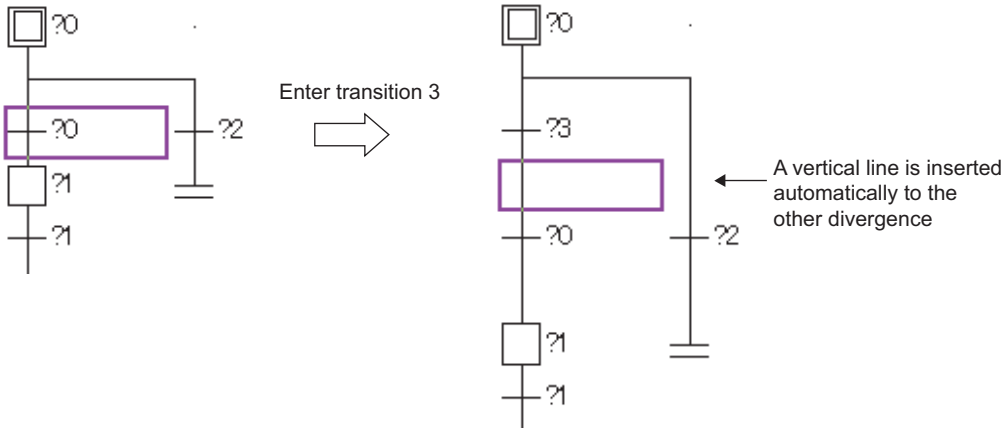
4. **Click the** OK **button.**

   The entered series transition symbol is displayed.

   <Overwrite mode>



<Insert mode>


?0
?0
?2
?1
?1
Enter transition 3
?0
?3
?0
?2
?1
?1
A vertical line is inserted automatically to the other divergence

■ Entering selection divergences (——┐)

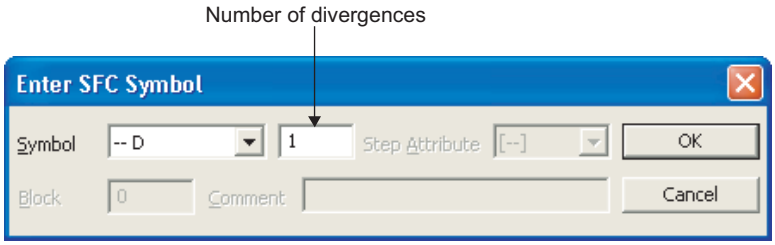
The following explains the method for entering a selection divergence.

Operating procedure

1. **Move the cursor to the position where a selection divergence is entered.**

2. **Select [Edit] ⇒ [SFC Symbol] ⇒ [Selection Divergence].**

   The Enter SFC Symbol screen is displayed.



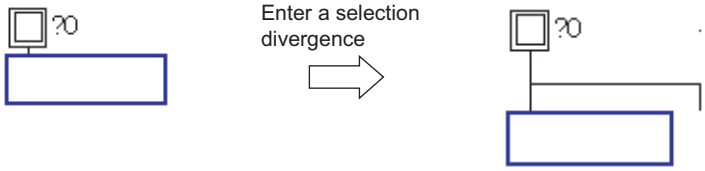
3. **Set the items on the screen.**

Item	Description
Symbol	Select "--D".
Number of divergences	Enter a number of columns of divergence line.
Step Attribute	(This setting is not required.)
Block	(This setting is not required.)
Comment	(This setting is not required.)

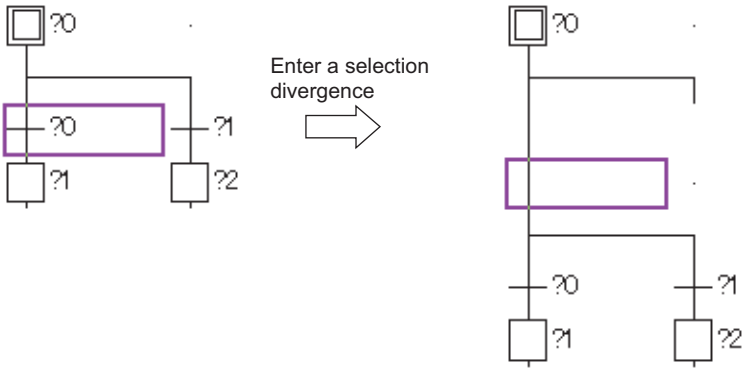
4. **Click the OK button.**

   The entered selection divergence symbol is displayed.

   <Overwrite mode>



   <Insert mode>



■ Entering simultaneous divergences (⊨═══⊨)

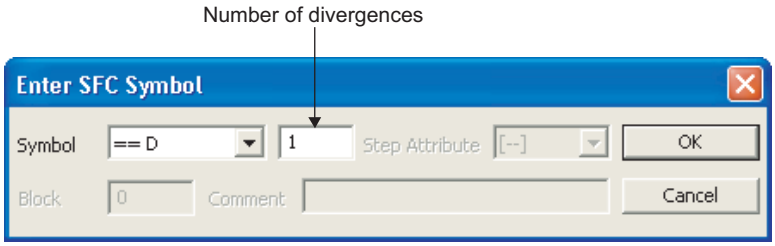
The following explains the method for entering a simultaneous divergence.

Operating procedure

1. **Move the cursor to the position where a simultaneous divergence is entered.**

2. **Select [Edit] ⇒ [SFC Symbol] ⇒ [Simultaneous Divergence].**

   The Enter SFC Symbol screen is displayed.



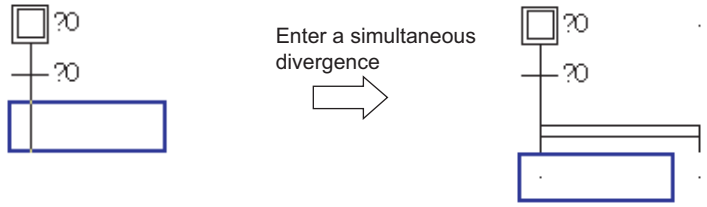
3. **Set the items on the screen.**

Item	Description
Symbol	Select "==D".
Number of divergences	Enter a number of columns of divergence line.
Step Attribute	(This setting is not required.)
Block	(This setting is not required.)
Comment	(This setting is not required.)

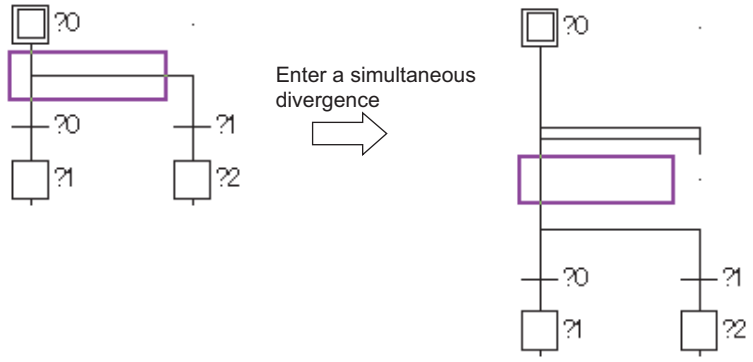
4. **Click the OK button.**

   The entered simultaneous divergence symbol is displayed.

   <Overwrite mode>



   <Insert mode>



■ Entering selection convergences (⊢——⊣)

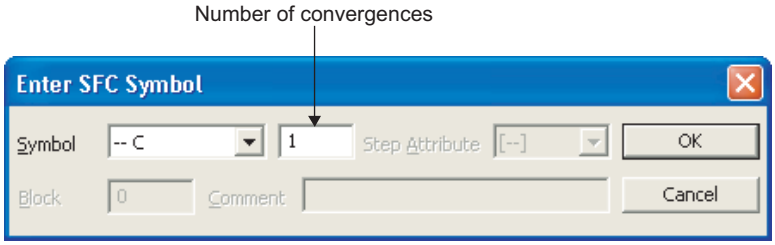
The following explains the method for entering a selection convergence.

Operating procedure

1. **Move the cursor to the position where a selection convergence is entered.**

2. **Select [Edit] ⇒ [SFC Symbol] ⇒ [Selection Convergence].**

   The Enter SFC Symbol screen is displayed.



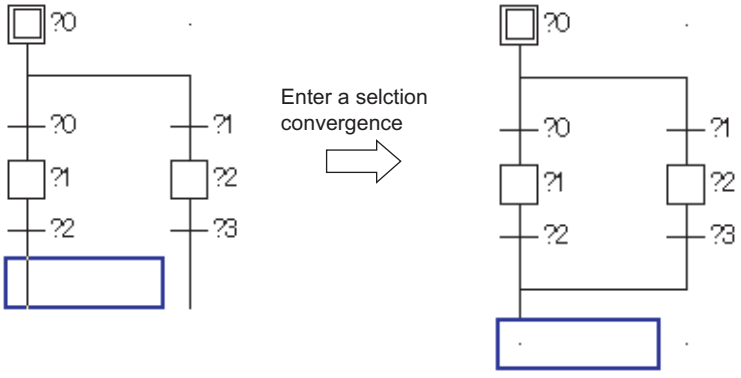
3. **Set the items on the screen.**

Item	Description
Symbol	Select "--C".
Number of convergences	Enter a number of columns of convergence line.
Step Attribute	(This setting is not required.)
Block	(This setting is not required.)
Comment	(This setting is not required.)

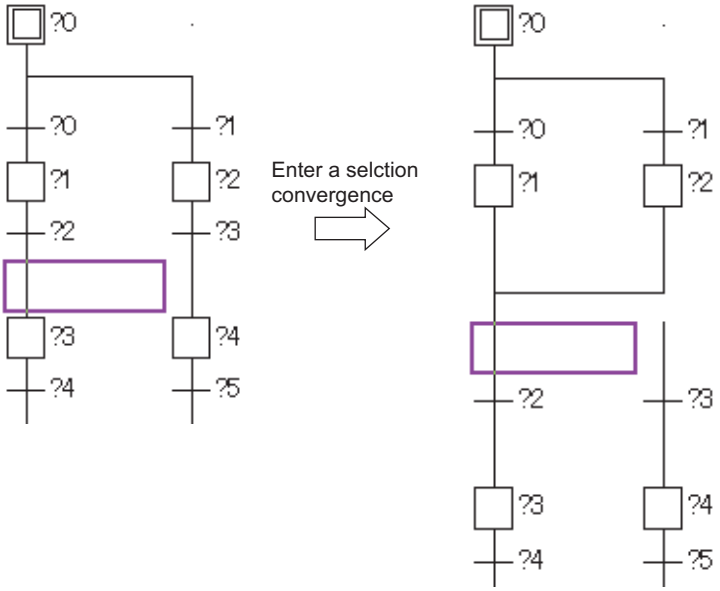
4. **Click the** OK **button.**

   The entered selection convergence symbol is displayed.

   <Overwrite mode>



<Insert mode>



■ Entering simultaneous convergences (═══)

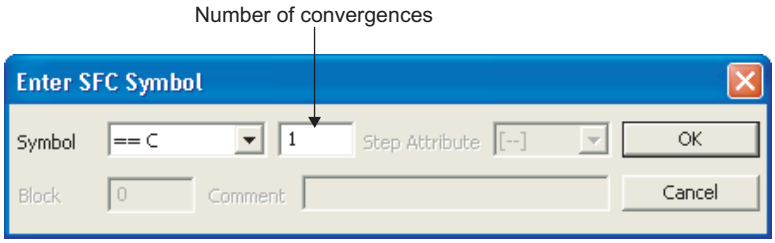
The following explains the method for entering a simultaneous convergence.

Operating procedure

1. **Move the cursor to the position where a simultaneous convergence is entered.**

2. **Select [Edit] ⇒ [SFC Symbol] ⇒ [Simultaneous Convergence].**

   The Enter SFC Symbol screen is displayed.



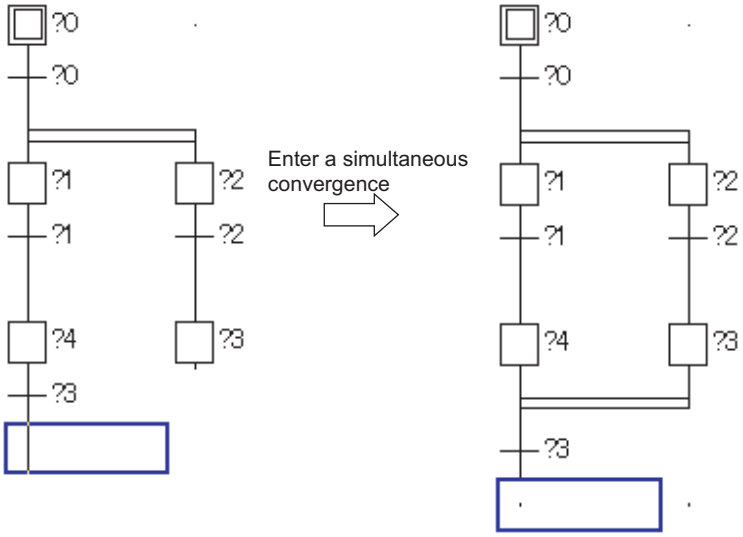
3. **Set the items on the screen.**

Item	Description
Symbol	Select "==C".
Number of convergences	Enter a number of columns of convergence line.
Step Attribute	(This setting is not required.)
Block	(This setting is not required.)
Comment	(This setting is not required.)

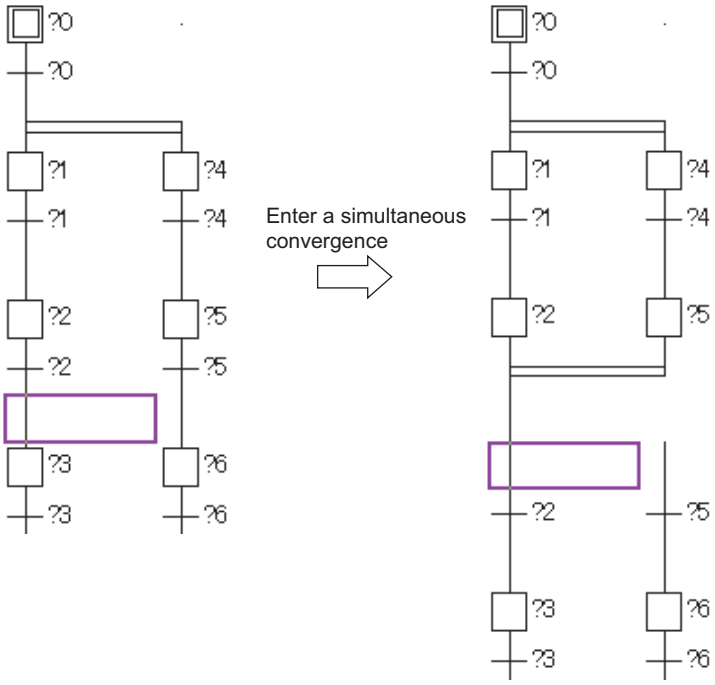
4. **Click the** OK **button.**

   The entered simultaneous convergence symbol is displayed.

   <Overwrite mode>



<Insert mode>

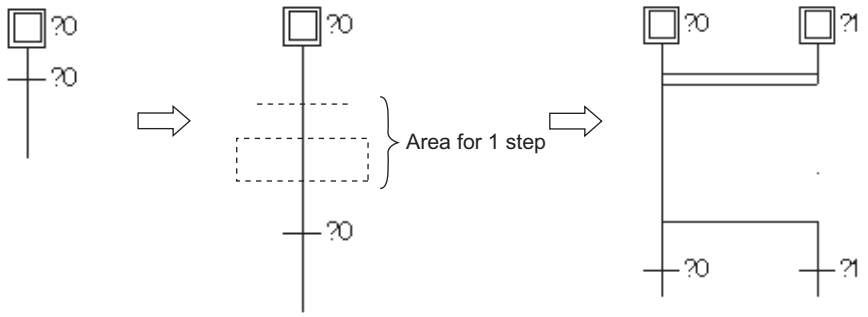

?0
?0
?1
?4
?1
?4
?2
?5
?2
?5
?3
?6
?3
?6
Enter a simultaneous convergence
?0
?0
?1
?4
?1
?4
?2
?5
?2
?5
?3
?6
?3
?6

Point

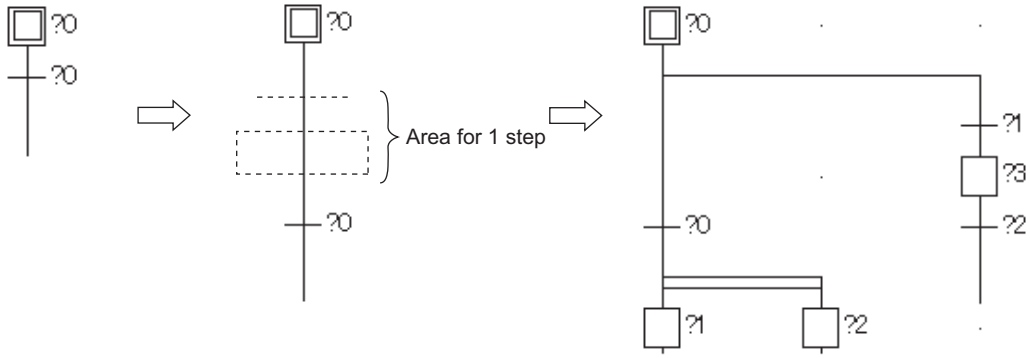
● **Entering method when a divergence and a convergence overlap in a single transition**

Reserve the area for one step using " | " (vertical line), then enter a divergence or convergence symbol. A vertical line can be inserted by selecting [Edit] ⇒ [Insert Row]. (☞ Inserting/deleting rows and columns)

Exmple1)



Exmple2)



● **Number of divergences/convergences when entering divergence/convergence lines**

To create a divergence/convergence line at the left of the cursor position, enter '-n' for the number of divergences/convergences.

● **Inserting divergences/convergences**

Inserting divergences/convergences may cause the SFC diagram to become a program that cannot be converted. Edit the SFC diagram to be normal and convert the program.

■ Entering jump transitions (↳)

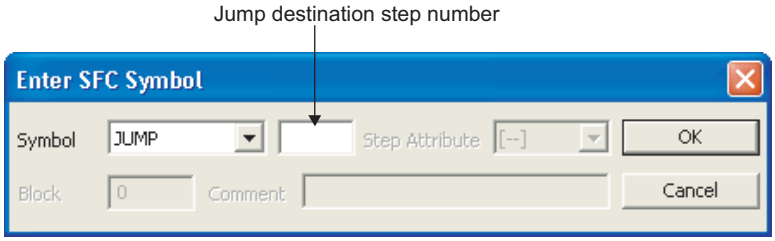
The following explains the method for entering a jump transition.

Operating procedure

1. **Move the cursor to the position where a jump transition is entered.**

2. **Select [Edit] ⇒ [SFC Symbol] ⇒ [Jump].**

   The Enter SFC Symbol screen is displayed.

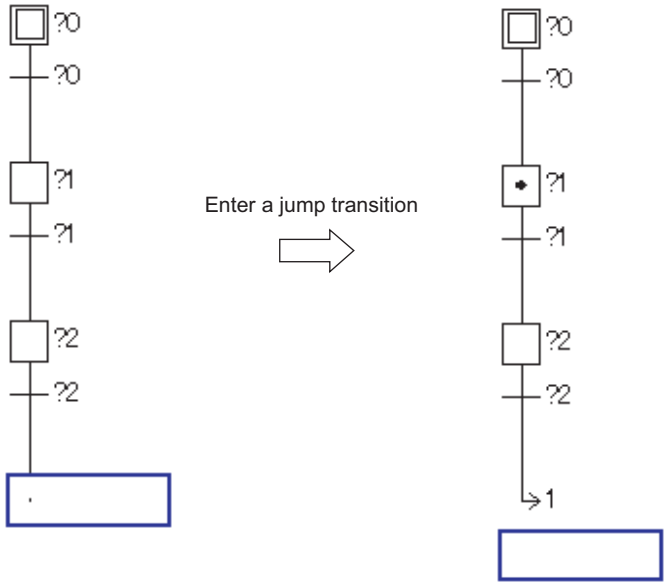


3. **Set the items on the screen.**

Item	Description
Symbol	Select "JUMP".
Jump destination step number	Enter a jump destination step number.
Step Attribute	(This setting is not required.)
Block	(This setting is not required.)
Comment	(This setting is not required.)

4. **Click the OK button.**

   The entered jump transition symbol is displayed.



■ Entering end steps (⊥)

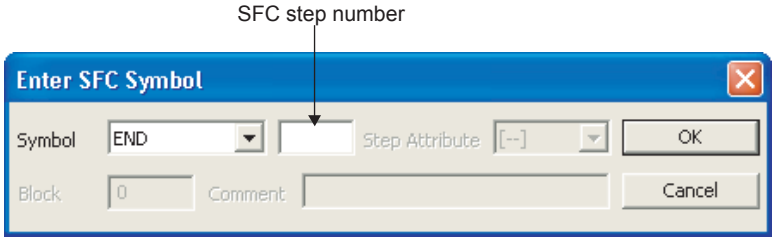
The following explains the method for entering an end step.

Operating procedure

1. **Move the cursor to the position where an end step is entered.**

2. **Select [Edit] ⇒ [SFC Symbol] ⇒ [END Step].**

   The Enter SFC Symbol screen is displayed.

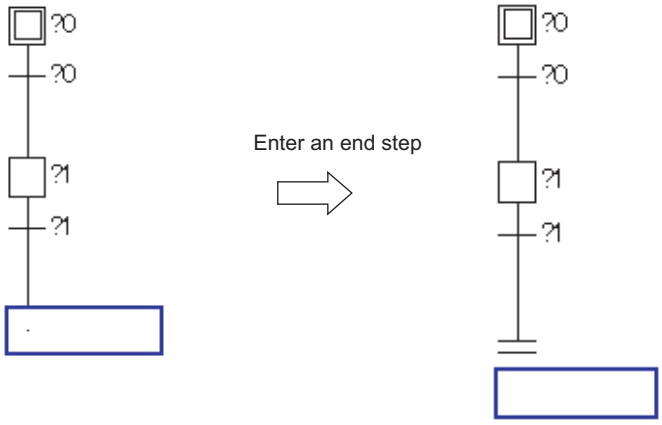


3. **Set the items on the screen.**

Item	Description
Symbol	Select "END".
SFC step number	(This setting is not required.)
Step Attribute	(This setting is not required.)
Block	(This setting is not required.)
Comment	(This setting is not required.)

4. **Click the OK button.**

   The entered end step symbol is displayed.



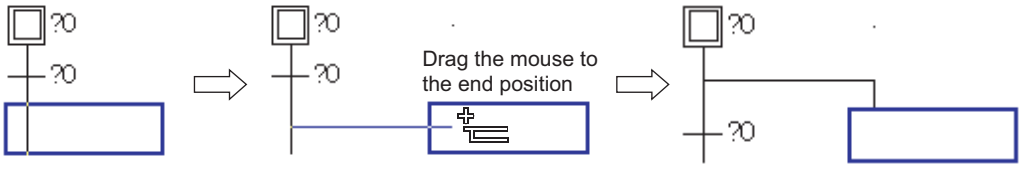
■ Drawing lines

The following explains the method for drawing a divergence line and a convergence line by dragging the mouse.

Operating procedure

1. **Select [Edit] ⇒ [Edit Line] ⇒ [Vertical Line]/[Selection Divergence]/[Simultaneous Divergence]/[Selection Convergence]/[Simultaneous Convergence].**

2. **Drag the cursor from the start position for entering lines to the end position.**



Point

- **Overwriting lines**
  Even when lines are overwritten to the created SFC steps/transitions, SFC steps/transitions and sequence programs in the operation outputs/transition conditions are not deleted.

■ Inserting/deleting rows and columns

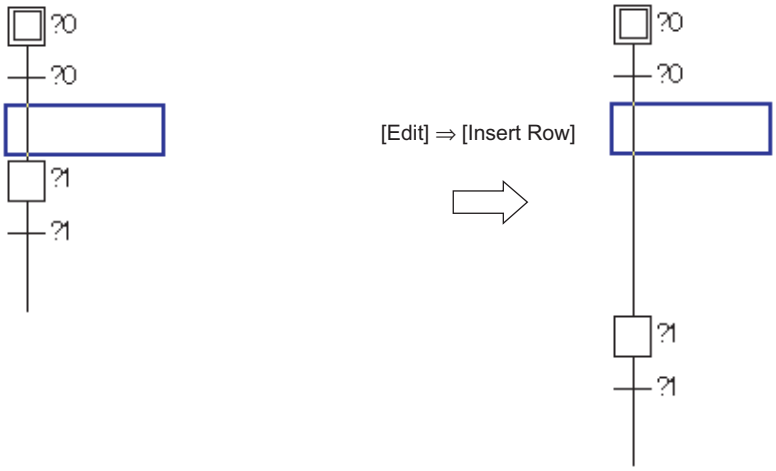
The following explains the method for inserting/deleting a row and a column.

Operating procedure

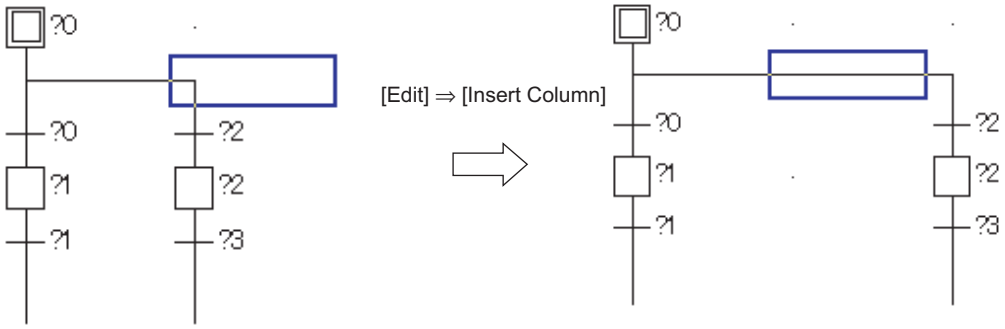
1. **Move the cursor to the position where a row or column is inserted/deleted.**

2. **Execute each operation as shown below.**

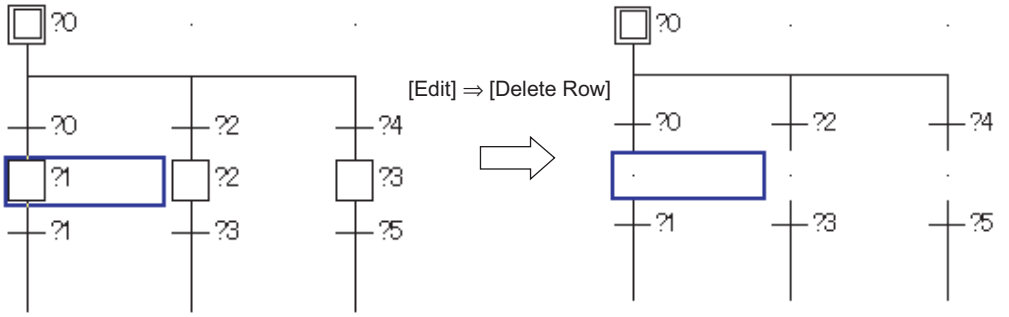
<Inserting a row>



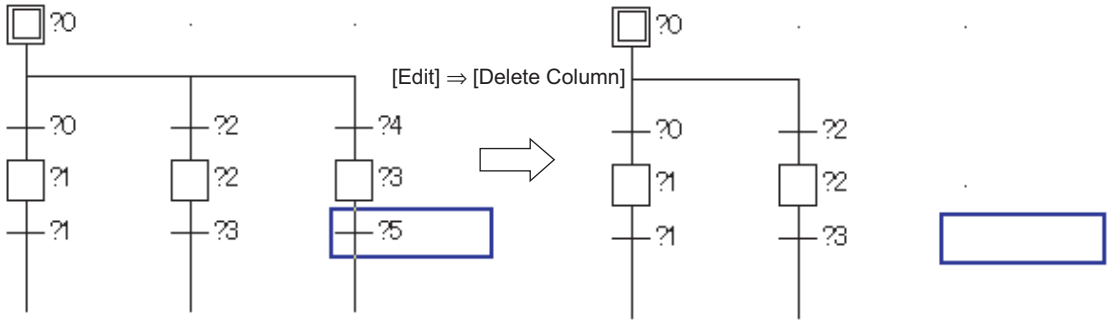
<Inserting a column>



<Deleting a row>



<Deleting a column>



5.2.3 Deleting SFC diagrams

QCPU Q

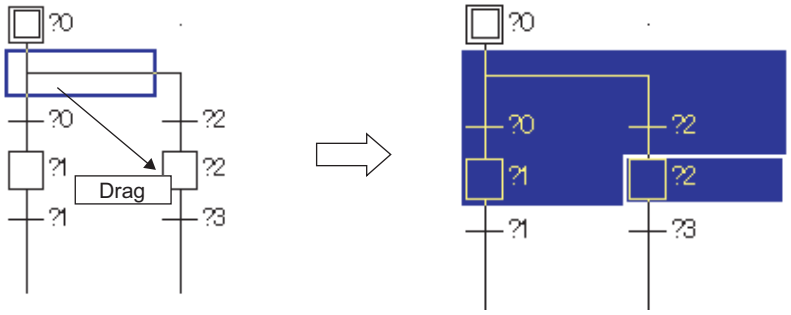
This section explains the methods for deleting entered SFC symbols.

■ Deleting SFC symbols by setting a range

The following explains the method for deleting SFC symbols by setting a range.

Operating procedure

1. **Specify the range to be deleted by dragging the cursor.**



2. **Select [Edit] ⇒ [Delete].**

Point

- **Selecting a range**
  The range can be selected by pressing the Shift key + ↑ ↓ ← → key.
- **Deleting symbols**
  Symbols can be deleted by pressing the Delete key, or by selecting [Edit] ⇒ [Cut].
- **Canceling the previous operation**
  After deleting symbols, the editing status before the deletion is restored by selecting [Edit] ⇒ [Undo].

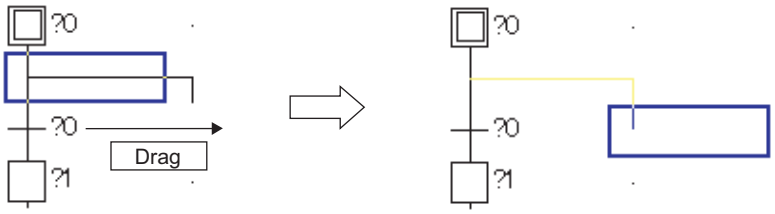
■ Deleting only divergence/convergence/vertical lines

The following explains the method for deleting a divergence/convergence/vertical line.

Operating procedure

1. **Select [Edit] ⇒ [Delete Line].**

2. **Specify the range to be deleted by dragging the cursor.**
   After dragging, the lines in the specified range are deleted.



5.2.4 Changing SFC step attributes

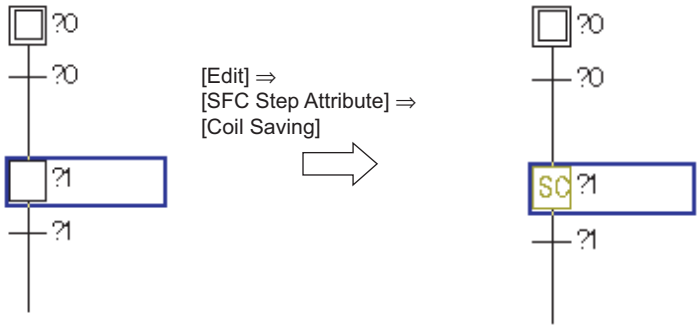
QCPU Q

This section explains the method for changing the SFC step attribute.

Operating procedure

1. **Move the cursor to the SFC step whose attribute is to be changed.**

2. **Select [Edit] ⇒ [SFC Step Attribute] ⇒ [Normal]/[Coil Saving]/[Action Saving - with no transition check]/[Action Saving - with transition check]/[Reset].**



Point

- **Operation output sequence program after the SFC step attribute is changed**
  Even when the SFC step attribute is changed, the operation output sequence program already created remains as it is.

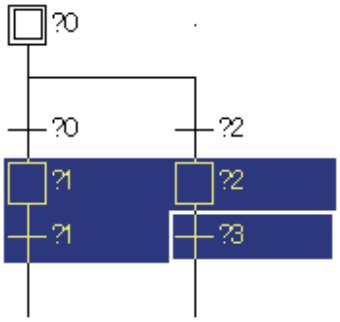
5.2.5 Cutting, copying, and pasting SFC diagrams

QCPU
Q

This section explains the method for cutting, copying, and pasting the SFC diagram.

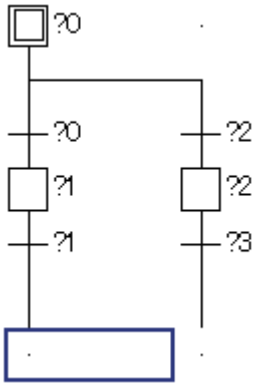
Operating procedure

1. **Specify the range to be cut or copied.**



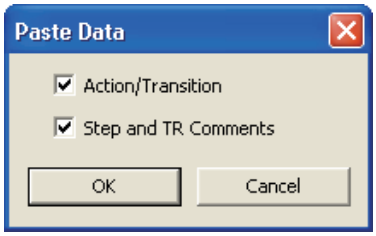
2. **Select [Edit] ⇒ [Cut]/[Copy], and cut or copy the SFC diagram in the specified range.**

3. **Move the cursor to the position where the cut/copied SFC diagram is pasted.**



4. **Select [Edit] ⇒ [Paste].**

The Paste Data screen is displayed.

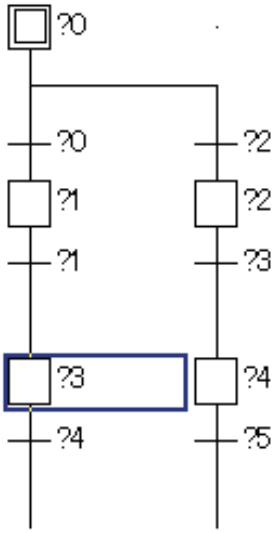


5. Set the items on the screen.

Item	Description
Action/Transition	Check this to paste the cut/copied data including operation output/transition condition sequence programs.
Step and TR Comments	Check this to paste the cut/copied data including SFC step/transition comments.

6. Click the OK button.

The cut/copied SFC diagram is pasted.
Note that the conversion error occurs when the divergence or convergence line is not correct after pasting data. Edit the SFC diagram and convert the program again.



Point

- **Pasting position**
  If the start position of the cut/copied SFC diagram is a SFC step, it cannot be pasted at the position of transition, and if the start position is a transition, it cannot be pasted at the position of SFC step. Change the pasting position one row up or down, and paste the data again.
- **Operation output/transition condition programs to be pasted**
  Paste operation output/transition condition programs within approximate 2K steps.
  For details of maximum number of sequence steps that can be created, refer to the following manual.
  ☞ QCPU (Q Mode)/QnACPU Programming Manual (SFC)

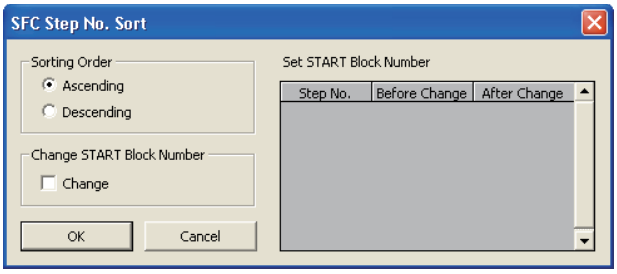
5.2.6 Sorting SFC step/transition numbers of SFC diagram

QCPU
Q

This section explains the method for sorting SFC step/transition numbers of created SFC diagram.

Screen display

Select [Edit] ⇒ [SFC Step No. Sort].



Operating procedure

1. **Set the items on the screen.**

Item	Description
Sorting Order	Select whether to sort SFC step/transition numbers in ascending or descending order.
Change START Block Number	Check this to change the start block number.
Set START Block Number	When the "Change" is selected, set the start destination block number of the block start step that is changed when sorting SFC step/transition numbers.

2. **Click the OK button.**

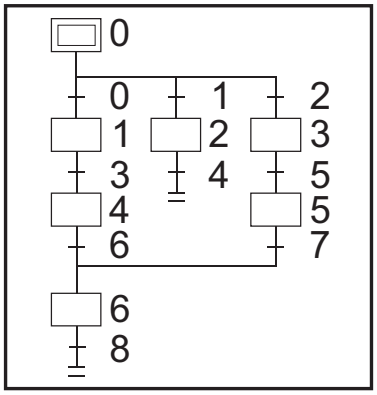
   The sorting of SFC step/transition numbers is executed according to the set contents.

Point

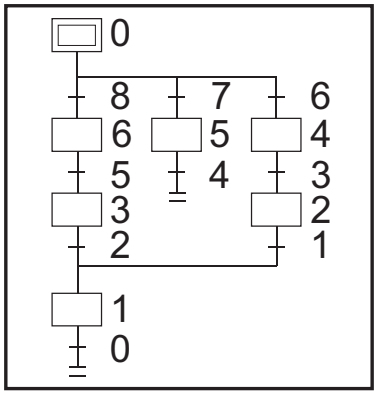
● **Difference of sorting result according to the sorting order**

The following figures show the sorting results in ascending and descending order.

(Ascending order)



(Descending order)



- The "Undo" operation can be performed only once immediately after the sort execution.
- The initial step is always set to '0' for either ascending or descending order.

● **SFC devices at the sorting operation**

SFC devices used for operation outputs/transition conditions (such as BLm\Sn, BLm\TRn) are not sorted. Change them using the device replacing function.

5.2.7 Redisplaying SFC diagrams

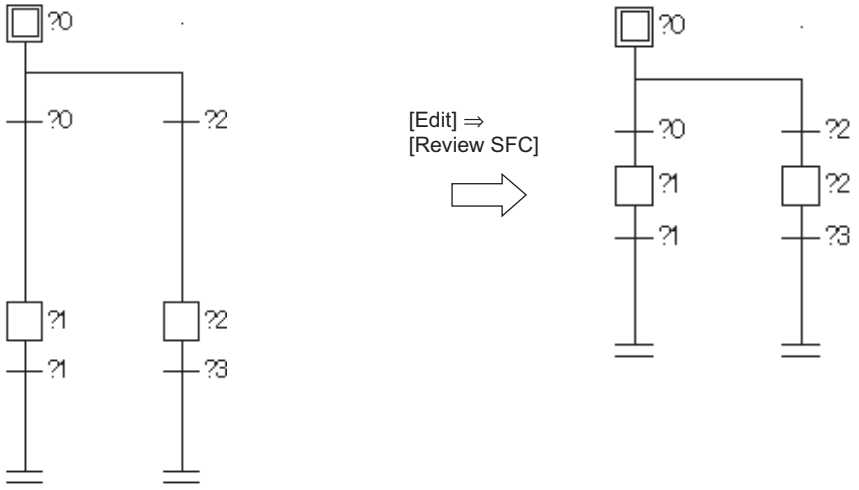
QCPU
Q

This section explains the method for deleting unused vertical/divergence/convergence lines in the converted SFC diagram.
If the unconverted SFC diagram is redisplayed, the unconverted SFC diagram is discarded and the latest converted status is restored.

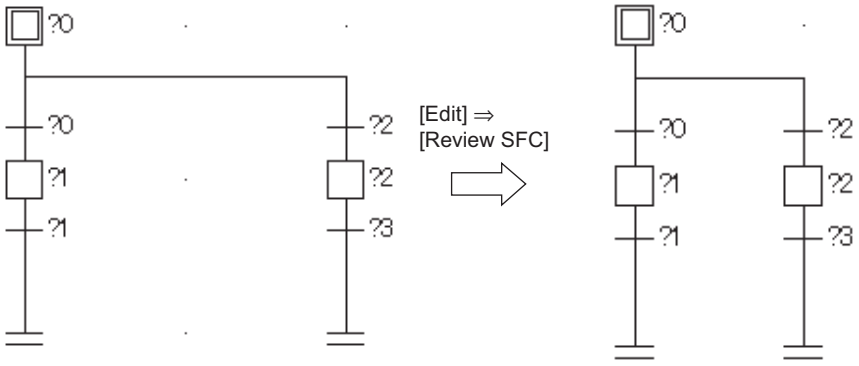
Operating procedure

- Select [Edit] ⇒ [Review SFC].

<Deleting a row section>



<Deleting a column section>



5.2.8 Creating operation outputs and transition conditions

QCPU
Q

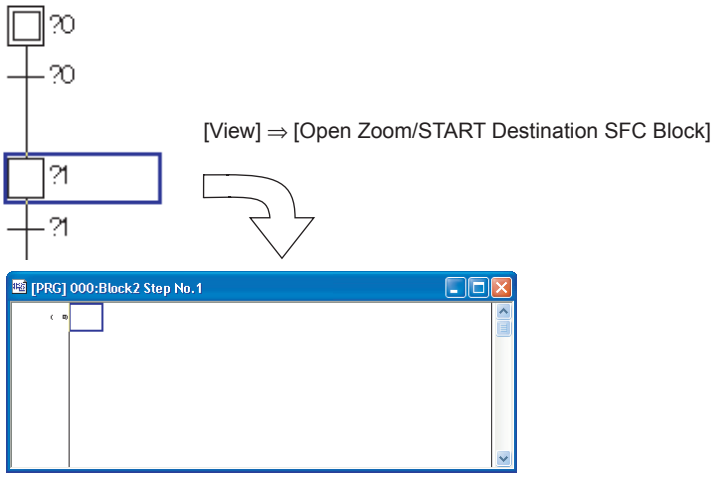
This section explains the method for creating operation output and transition condition programs.

Operating procedure

1. **Move the cursor to the SFC step/transition where the program is created.**

2. **Select [View] ⇒ [Open Zoom/START Destination SFC Block].**

   The editing operations on the Zoom screen are same as those of creating ladder programs. (Section 5.1)



Point

- **Opening the Zoom screen**

  To open the Zoom screen, hold the Ctrl key and double click the SFC step/transition, or press the Ctrl and L keys.

  To return to the SFC diagram, press the Ctrl and R keys.

- **Instructions that can be used in the Zoom screen**

  For details of unavailable instructions for operation outputs/transition conditions, refer to the following manual.
  ☞ QCPU (Q Mode)/QnACPU Programming Manual (SFC)
  Statements and pointers cannot be entered. For transition conditions, notes cannot be entered as well.

- **Entering a dummy coil to transition conditions**

  Only one dummy coil (-[TRAN]) for the coil instruction can be entered.

  To enter a dummy coil, select [Edit] ⇒ [Ladder Symbol] ⇒ [Coil], and clicking the OK button enters a dummy coil automatically.

- **When the cursor is placed at the block start step**

  If [View] ⇒ [Open Zoom/START Destination SFC Block] is selected when the cursor is placed at the block start step, the SFC diagram of the start destination block is displayed.

- **Using function blocks in the Zoom screen**

  Only function blocks created in the ladder language can be used for operation outputs. Function blocks cannot be used for transition conditions.

- **Cutting/copying/pasting data**

  Data can be cut, copied, and pasted between the ladder program and the program in the Zoom screen. However, data containing instructions, statements, and pointers that cannot be used in the Zoom screen cannot be pasted. The ladder containing TRAN can be pasted to transition conditions only.

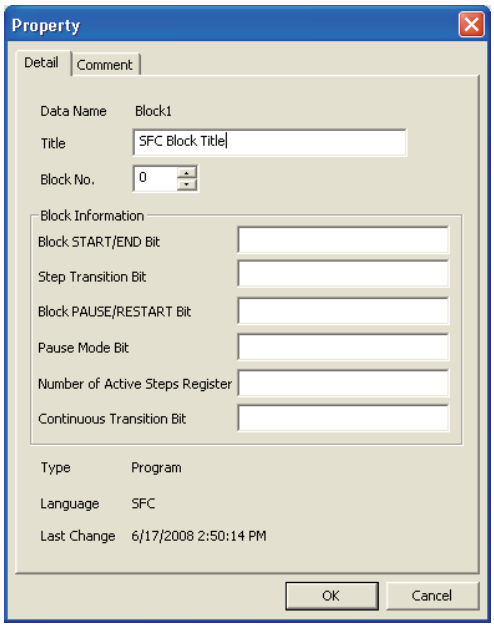
5.2.9 Setting block information

QCPU

This section explains the method for setting block information.
Block information is set on the Property screen of SFC block.
Select the SFC block to be set in the Project window in advance.

Screen display

Select [Project] ⇒ [Object] ⇒ [Property] ⇒ <<Detail>>.



Operating procedure

- Set the items related to the block information on the screen.

Item	Description
Title	Enter the title of the SFC block. (The number of settable characters is 32.)
Block No.	Specify the SFC block number. (0 to 319. 0 to 127 for Q02UCPU.)
Block Information	Enter devices/labels to the required items as block information devices. (The number of settable characters is 32.)

Point

- **Title of SFC block (projects without labels)**
  The set block title is stored as a device comment of device BLm. A block title can be created/changed by entering "BLm" for the device name in the device comment editor. When setting block titles for each program, create comments by program.
  For creating and editing device comments, refer to the following manual.
  ☞ GX Works2 Version1 Operating Manual (Common)
- **Title of SFC block (projects with labels)**
  When the block title is set, the confirmation message asking whether to copy the block title to the device comment of device BLm is displayed. Creating device comment for the device set as BLm in the device comment editor is not applied to the block title.
- **Block information**
  - For details of functions and operations of each item, refer to the following manual.
    ☞ QCPU (Q Mode)/QnACPU Programming Manual (SFC)
  - When the block information is changed in the project with labels, the program becomes uncompiled status.

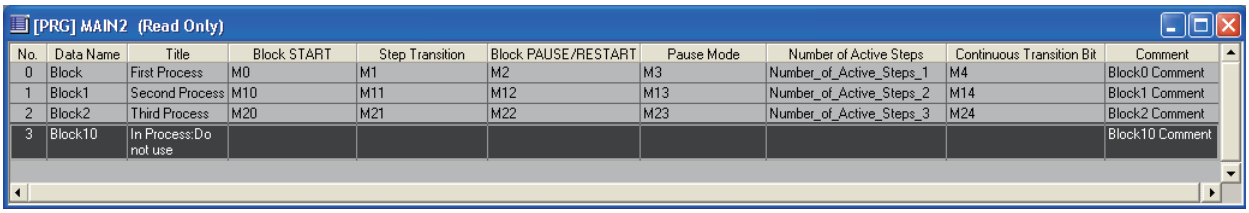
5.2.10 Displaying SFC block list

QCPU

This section explains the method for displaying the list of the SFC program block information including the SFC diagram being edited.
Open the screen of the SFC diagram in advance.

Screen display

Select [View] ⇒ [Open SFC Block List].



Display contents

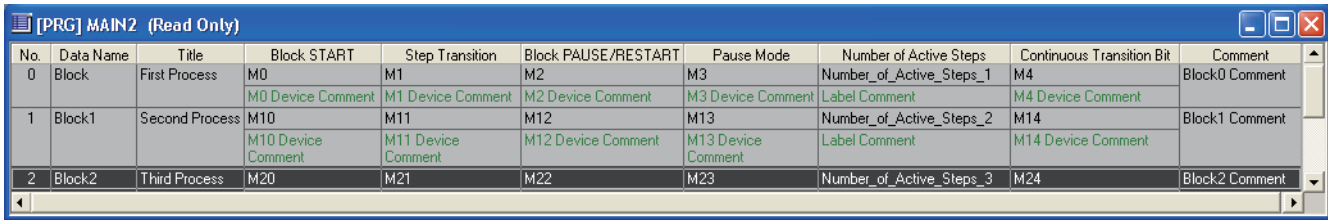
Item	Description
No.	Displays "Block No." set on the Property screen of SFC block.
Data Name	Displays the block name.
Title	Displays "Title" set on the Property screen of SFC block.
Block START	Displays "Block START/END Bit" set on the Property screen of SFC block.
Step Transition	Displays "Step Transition Bit" set on the Property screen of SFC block.
Block PAUSE/RESTART	Displays "Block PAUSE/RESTART Bit" set on the Property screen of SFC block.
Pause Mode	Displays "Pause Mode Bit" set on the Property screen of SFC block.
Number of Active Steps	Displays "Number of Active Steps Register" set on the Property screen of SFC block.
Continuous Transition Bit	Displays "Continuous Transition Bit" set on the Property screen of SFC block.
Comment	Displays "Comment" set on the Property screen of SFC block.

■ Displaying comments on SFC block list

The following explains the method for displaying device/label comments on the SFC block list.

Operating procedure

Select [View] ⇒ [Display SFC Block List Comment].



Point

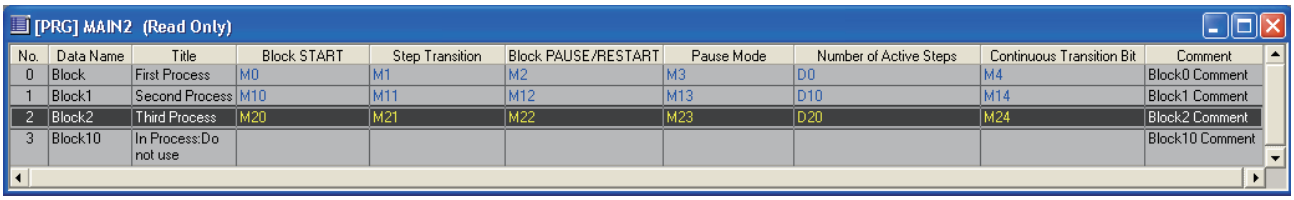
● **Displaying comments on the SFC block list**
Comments also can be displayed on the SFC block list by the following operation.
Select [Tools] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC" ⇒ "Comment".

■ Displaying devices on SFC block list

The following explains the method for displaying devices assigned to labels on the SFC block list.
This function is available after the compcompilation of the SFC program.

Operating procedure

Select [View] ⇒ [Address Display].



No.	Data Name	Title	Block START	Step Transition	Block PAUSE/RESTART	Pause Mode	Number of Active Steps	Continuous Transition Bit	Comment
0	Block	First Process	M0	M1	M2	M3	D0	M4	Block0 Comment
1	Block1	Second Process	M10	M11	M12	M13	D10	M14	Block1 Comment
2	Block2	Third Process	M20	M21	M22	M23	D20	M24	Block2 Comment
3	Block10	In Process:Do not use							Block10 Comment

Point

● **When SFC program becomes uncompiled status**
When the SFC program becomes uncompiled status, the device display is disabled.

● **Displayed comments**
When [Display SFC Block List Comment] is selected, displayed comments are changed from label comments to device comments.

■ Displaying SFC diagram from SFC block list

The following explains the method for displaying the SFC diagram of the block at the cursor position on the SFC block list.

Operating procedure

1. **Move the cursor to the block to be displayed.**

2. **Select [View] ⇒ [Open SFC], or double click the block to be displayed.**

■ Displaying Local Label Setting screen from SFC block list

The following explains the method for displaying the Local Label Setting screen of the block at the cursor position on the SFC block list.

Operating procedure

1. **Move the cursor to the block to be displayed.**

2. **Select [View] ⇒ [Open Header].**

5.2.11 Setting parameters for SFC programs

QCPU

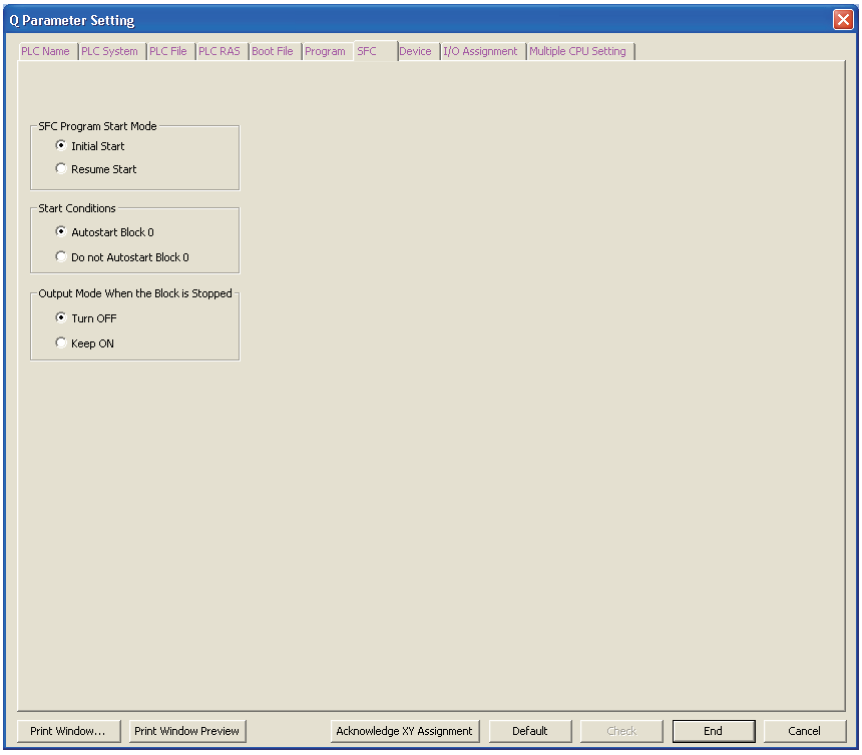
This section explains the method for setting parameters for SFC programs among the parameter settings for operating the programmable controller CPU.

■ SFC settings in PLC parameter

The following explains the method for setting parameters for SFC programs in PLC parameter.

Screen display

Select Project window ⇒ "Parameter" ⇒ "PLC Parameter" ⇒ <<SFC>>.



Operating procedure

- Set the items on the screen.

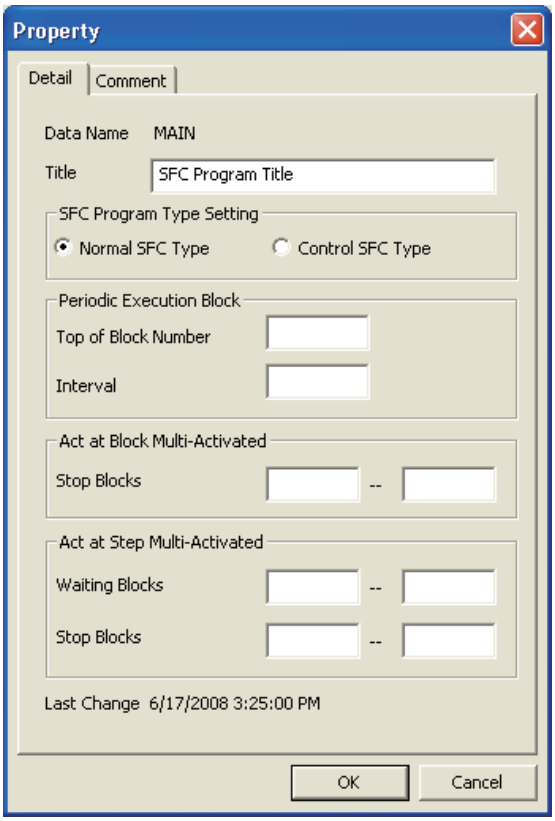
Item	Description
SFC Program Start Mode	Select to initial start or resume start the SFC program.
Start Conditions	Select whether to autostart block 0 at the initial start of the SFC program.
Output Mode When the Block is Stopped	Select to stop the program by turning OFF the coil outputs that are turned ON by the OUT instruction, or to stop the program while they are remained ON, when the stop operation is requested to each block.

■ Setting the property of SFC programs

The following explains the method for setting the property of SFC programs.

Screen display

Select [Project] ⇒ [Object] ⇒ [Property] ⇒ <<Detail>>.



Operating procedure

- Set the items on the screen.

Item	Description
Title	Enter the title of the SFC program. (The number of settable characters is 32.)
SFC Program Type Setting	Select the "Normal SFC type" or "Control SFC type". "Control SFC type" can be selected for High Performance model QCPU.
Periodic Execution Block	All blocks following the set block number become periodic execution blocks. To process all blocks in every scan, leave this field blank. The execution interval is entered within the range of 1 to 65535ms in unit of 1ms.
Act at Block Multi-Activated	When the blocks in the specified range is active, and the start operation is requested from another block, an error occurs and the operation of the programmable controller CPU stops. The operating mode at the multiple activation for blocks out of the specified range becomes 'standby'. To set the operating mode to 'standby' for all blocks, leave the start and end fields blank.
Act at Step Multi-Activated	When the multiple activation of SFC steps occurs, the SFC steps in the range specified for the "Waiting Blocks" are set in standby status until the corresponding SFC steps become inactive. When the multiple activation of SFC steps occurs, the SFC steps in the range specified for the "Stop Blocks" become error and the operation of the programmable controller CPU stops. When the multiple activation of SFC steps occurs, the SFC steps out of the specified range are forcibly transited.

Point

- **Applicable range for the set data**
  The data set in the property of SFC program are commonly applied to all blocks in SFC programs. Specific data cannot be set for each block.

- **Control SFC type program**
  An SFC diagram can be created for the block 0 only in the control SFC type program.
  If a block start step is entered to the block 0, an error occurs and the programmable controller CPU stops when the program is executed.

MEMO

6 SEARCH AND REPLACE

This chapter explains basic operations of search, replace and batch-replace functions.

6.1 Searching for and Replacing Data in Ladder Programs

QCPU
Q

This section explains the method for searching for and replacing the specified device, instruction, and step number.
The search/replace function is applicable only to the converted data.

6.1.1 Searching for, replacing, and batch replacing devices

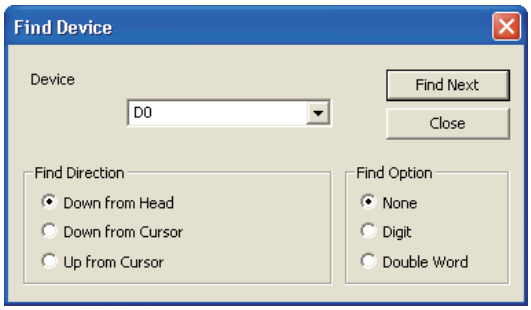
This section explains the method for searching for, replacing, and batch replacing devices in the program.

■ Searching for devices

The following explains the method for searching for devices.

Screen display

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



Operating procedure

1. Set the items on the screen.

Item		Description
Device		Enter a device to be searched for. Click ▼ to select from the list of ten devices entered previously.
Find Direction	Down from Head	Select this to execute a search in the downward direction from the start of the program regardless of the current cursor position.
	Down from Cursor	Select this to execute a search in the downward direction from the cursor position to END.
	Up from Cursor	Select this to execute a search in the upward direction from the cursor position to step 0.
Find Option	None	Select this to execute a search for the entered device only.
	Digit	Select this to execute a search for the entered device and digit specification for bit devices that include the entered device.
	Double Word	Select this to execute a search for the entered device and the double-word format (double word/real number/indirect specification) word devices that include the entered device.

2. Click the Find Next button.

The cursor moves to the searched device.

■ Examples of device search

The following tables show examples of specification for device search operations.

Table 6.1.1-1 Example of the device search (Find option: None)

Device specification	Search result
M0	M0, K4M0, M0Z0, K4M0Z0
K4M0	K4M0, K4M0Z0
D0	D0, D0Z0, D0.1*1
D0.1	D0.1
J1\B0	J1\B0, J1\B0Z0, J1Z0\B0, J1Z0\B0Z0, J1\K4B0, J1\K4B0Z0, J1Z0\K4B0, J1Z0\K4B0Z0

Table 6.1.1-2 Example of the device search (Find option: Digit)

Device specification	Search result
X0 to X3	K1X0
X0 to X0F	K4X0
X0 to X1F	K8X0

Table 6.1.1-3 Example of the device search (Find option: Double word)

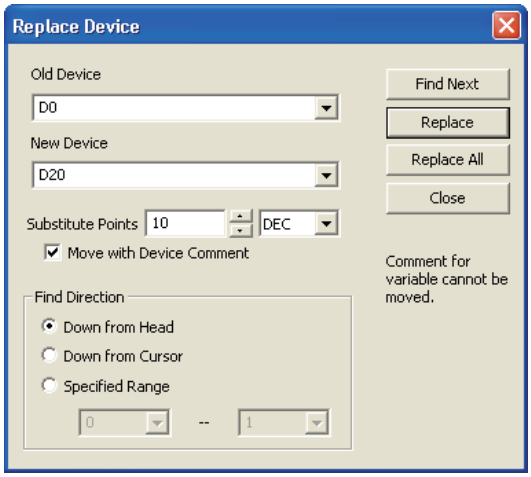
Device specification	Search result
D0 to D1	DMOV K1 D0, EMOV E1 D0, MOV K1 @D0
D0 to D9	BMOV K1 D0 D100 10

■ Replacing devices

The following explains the method for searching for devices and replacing them with the specified device.

Screen display

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



Operating procedure

1. Set the items on the screen.

Item		Description
Old Device		Enter a device to be replaced. Click ▼ to select from the list of ten devices entered previously.
New Device		Enter a replacing device. Click ▼ to select from the list of ten devices entered previously.
Substitute Points		Enter a number of points to be replaced, counted from the device specified for the "Old Device". Click ▼ to select either decimal or hexadecimal for the value to be entered. Example) When X50 for "Old Device", X100 for "New Device", 3 for "Substitute Points", and "DEC" for entered value are set, the devices are replaced as shown below: X50→X100, X51→X101, X52→X102
Move with Device Comment		Check this to move the device comments of the "Old Device" to the "New Device".
Find Direction	Down from Head	Select this to execute a search in the downward direction from the start of the program regardless of the current cursor position.
	Down from Cursor	Select this to execute a search in the downward direction from the cursor position.
	Specified Range	Select this to execute a search in the range set by the entered step numbers.

2. Click the [Find Next] button.

The cursor moves to the searched old device.

3. Click the [Find Next] or [Replace all] button.

The old devices are replaced with the new devices, and the search for the old devices continues.

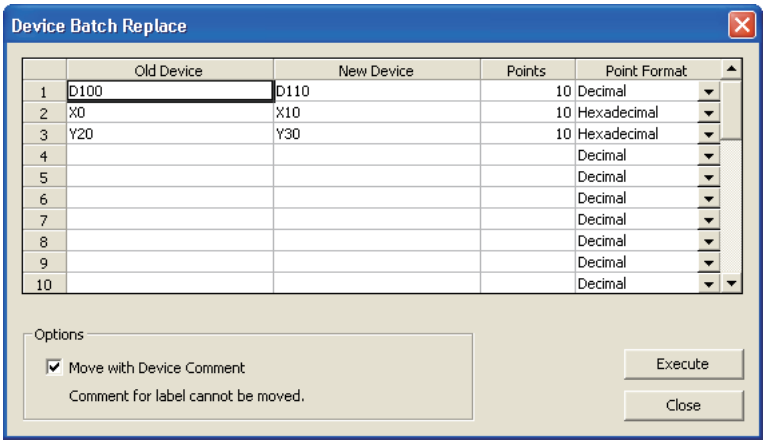
If the [Replace all] button is clicked, all searched old devices are batch replaced with the new devices.

■ Batch replacing devices

The following explains the method for batch replacing devices with the specified device.

Screen display

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



Operating procedure

1. **Set the items on the screen.**

Item	Description
Old Device	Enter a device to be replaced.
New Device	Enter a replacing device.
Points	Points: Enter a number of points to be replaced, counted from the device specified for the "Old Device". Point format: Click ▼ to select either decimal or hexadecimal for the value entered for the "Points". Example) When X0 for "Old Device", X1 for "New Device", 5 for "Points", and "Decimal" for "Point Format" are set, the devices are replaced as shown below: X0→X1, X1→X2, X2→X3, X3→X4, X4→X5
Point Format	
Move with Device Comment Comment for label cannot be moved.	Check this to move the device comments of the "Old Device" to the "New Device".

2. **Click the Execute button.**

The old devices are batch replaced with the new devices.

■ Devices that can be replaced or batch replaced

The following table shows the devices that can be replaced or batch replaced.

Table 6.1.1-4 Devices that can be replaced or batch replaced

		New device			
		Bit device (M0, J1\B0)	Digit specification for bit devices (K4M0, J1\K4B)	Word device (D0, J1\W0)	Bit specification for word devices (D0.1, J1\W0.1)
Earlier device	Bit device (M0, J1\B0)	○	×	×	○
	Digit specification for bit devices (K4M0, J1\K4B)	×	×	×	×
	Word device (D0, J1\W0)	×	×	○	×
	Bit specification for word devices (D0.1, J1\W0.1)	○	×	×	○

6.1.2 Searching for and replacing instructions

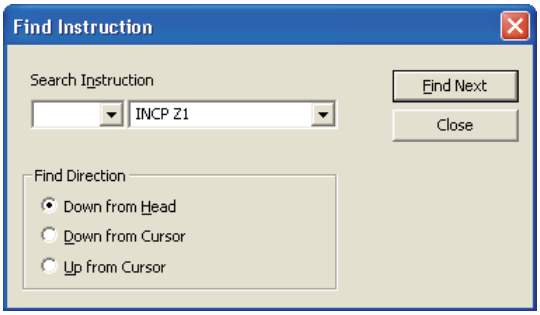
This section explains the method for searching for and replacing instructions.

■ Searching for instructions

The following explains the method for searching for instructions.

Screen display

Select [Find/Replace] ⇒ [Find Instruction] ( ).



Operating procedure

1. **Set the items on the screen.**

Item		Description
Search Instruction		Set a ladder symbol to be searched for. Click to select a ladder symbol from the list.
		Enter an instruction or device to be searched for. Click to select from the list of ten devices or instructions entered previously.
Find Direction	Down from Head	Select this to execute a search in the downward direction from the start of the program regardless of the current cursor position.
	Down from Cursor	Select this to execute a search in the downward direction from the cursor position.
	UP from Cursor	Select this to execute a search in the upward direction from the cursor position.

2. **Click the Find Next button.**

The cursor moves to the searched instruction.

■ Examples of instruction search

The following table shows the examples of instruction search.

Table 6.1.2-1 Example of instruction search

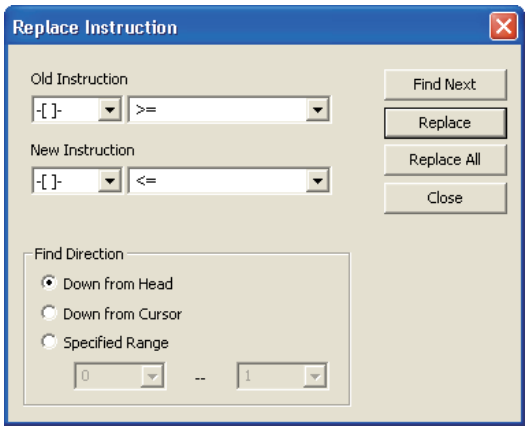
Instruction specification	Search result
MOV	MOV, MOVP
MOVP	MOVP
MOV D0 K4Y0	MOV D0 K4Y0, MOVP D0Z1 K4Y0, MOV D0 K4Y0Z1, MOVP D0Z1 K4Y0Z1
MOVP D0 J1\W0	MOVP D0 J1\W0, MOVP D0Z1 J1\W0, MOVP D0 J1Z1\W0Z1, MOVP D0Z1 J1Z1\W0Z1

■ Replacing instructions

The following explains the method for searching for instructions and replacing them with the specified instruction.

Screen display

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



Operating procedure

1. Set the items on the screen.

Item		Description
Old Instruction		Set a ladder symbol to be replaced. Click ▼ to select a ladder symbol from the list.
		Enter a device and instruction or instruction only to be replaced. Click ▼ to select from the list of ten devices and/or instructions entered previously.
New Instruction		Set a new ladder symbol. Click ▼ to select a ladder symbol from the list.
		Enter a new device and instruction or instruction only. Click ▼ to select from the list of ten devices and/or instructions entered previously.
Find Direction	Down from Head	Select this to execute a search in the downward direction from the start of the program regardless of the current cursor position.
	Down from Cursor	Select this to execute a search in the downward direction from the cursor position.
	Specified Range	Select this to execute a search in the range set by the entered step numbers.

2. Click the Find Next button.

The cursor moves to the searched old instruction.

3. Click the Find Next or Replace all button.

The old instructions are replaced with the new instructions, and the search for the old instructions continues.

If the Replace all button is clicked, all searched old instructions are batch replaced with the new instructions.

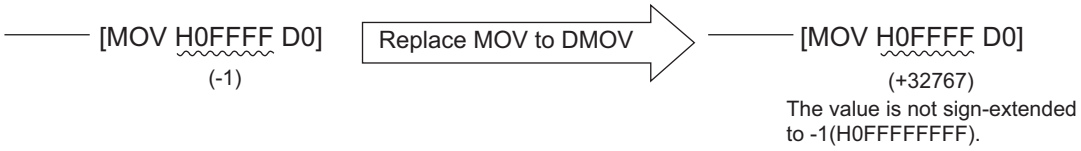
■ Precautions on replacing instructions

The following explains the precautions on replacing instructions.

● Replacing a 16-bit (word) instruction with a 32-bit (double word) instruction

When a 16-bit (word) instruction is replaced with a 32-bit (double word) instruction, and if a constant is set for the device, the constant value is not sign-extended to a value in 32 bits.

Example)



When a 32-bit instruction is replaced with a 16-bit instruction, and if a constant is set for the device, upper 16 bits are discarded.

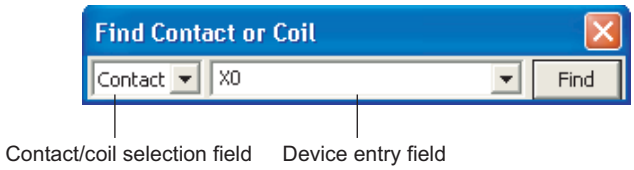
Example)

6.1.3 Searching for contacts and coils

This section explains the method for searching for contacts and coils that correspond to the device at the cursor position.

Screen display

Select [Find/Replace] ⇒ [Find Contact or Coil] ( ).



Operating procedure

1. Set the items on the screen.

Item	Description
Contact/coil selection field	Select "Contact" or "Coil".
Device entry field	Enter the device to be searched. Specify a bit device, bit specification for word devices or label.

2. Click the [Find] button.

The contacts or coils that use the specified device are searched from the start of the program in the order of step number.

Point

● **Devices to be searched**
Only devices in the currently opened program can be searched.

6.1.4 Jumping to the specified step number

This section explains the method for moving to the specified step number.

Screen display

Select [Find/Replace] ⇒ [Jump].

Operating procedure

1. **Enter the jump destination step number.**

Item	Description
Step No.	Enter a program step number for the jump destination. Click ▼ to select from the list of ten step numbers entered previously.

2. **Click the OK button.**

The cursor moves to the specified step number.

Point

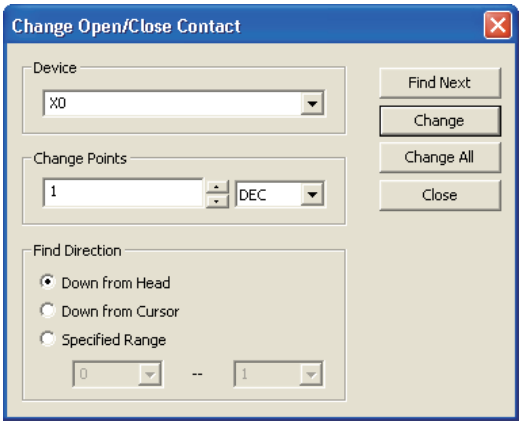
● **Jump function**
On the programming screen, pressing a numeric key on the keyboard enables to display the Jump screen.

6.1.5 Changing contacts between open contact and close contact

This section explains the method for searching for devices and changing their contact types from open contact to close contact, and conversely, from close contact to open contact.

Screen display

Select [Find/Replace] ⇒ [Change Open/Close Contact].



Operating procedure

1. Set the items on the screen.

Item		Description
Device		Enter a device to be changed. Click ▼ to select from the list of ten devices entered previously.
Change Points		Enter a number of points to be changed, counted from the device entered in the "Device" field. Click ▼ to select either decimal or hexadecimal for the value to be entered. Example) When X100 for "Device", 3 for "Change Points" and "DEC for entered value are set, the contact type is replaced between open contact and close contact at X100, X101 and X102.
Find Direction	Down from Head	Select this to execute a search in the downward direction from the start of the program regardless of the current cursor position.
	Down from Cursor	Select this to execute a search in the downward direction from the cursor position.
	Specified Range	Select this to execute a search in the range set by the entered step numbers.

2. Click the [Find Next] button.

The cursor moves to the searched device.

3. Click the [Find Next] or [Replace all] button to change the contact type.

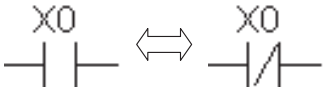
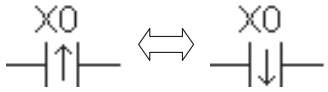
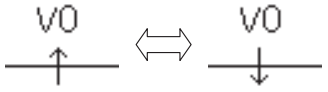
The contact types are changed from open to close contact and from close to open contact, and the search for the next target devices continues.

If the [Replace all] button is clicked, contact types of all searched devices are batch changed from open to close contact and from close to open contact.

Point

● **Operation applicability of the changing open/close contact function**
The following table shows the contacts whose contact types can be changed.

Table 6.1.5-1 Contacts whose contact types can be changed

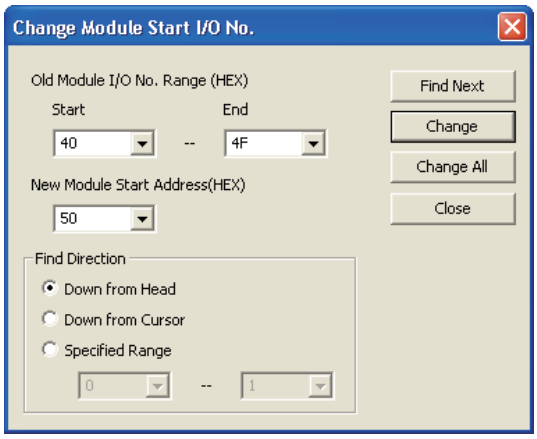
Replace Example		
		

6.1.6 Changing the module start I/O numbers

This section explains the method for changing the start I/O number of the FROM(P), TO(P), DFRO(P), DTO(P), RFRP, and RTOP instructions.

Screen display

Select [Find/Replace] ⇒ [Change Module Start I/O No.].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Old Module I/O No. Range (HEX)	Start	Enter a module start I/O number in the range to be changed. Click ▼ to select from the list of ten module I/O numbers entered previously.
	End	Enter a last module I/O number in the range to be changed. Click ▼ to select from the list of ten module I/O numbers entered previously.
New Module Start Address (HEX)		Enter a replaced module I/O number that corresponds to the module I/O number entered for the "Start". Click ▼ to select from the list of ten module I/O numbers entered previously.
Find Direction	Down from Head	Select this to execute a search in the downward direction from the start of the program regardless of the current cursor position.
	Down from Cursor	Select this to execute a search in the downward direction from the cursor position.
	Specified Range	Select this to execute a search in the range set by the entered step numbers.

2. **Click the [Find Next] button.**

   The cursor moves to the searched old module I/O number.

3. **Click the [Find Next] or [Replace all] button change the I/O number.**

   The old module I/O numbers are replaced with the new module I/O numbers, and the search for the old module I/O numbers continues.

   If the [Replace all] button is clicked, all searched old module I/O numbers are batch replaced with the new module I/O numbers.

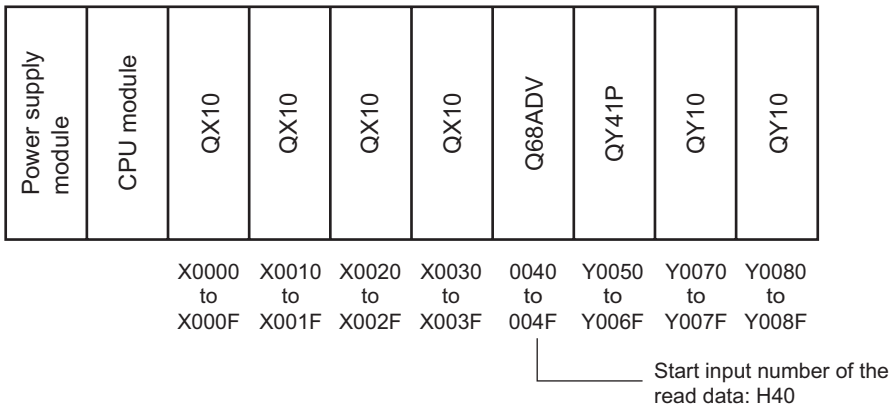
4. **Click the [Close] button to end the batch-replace function.**

■ Precautions on replacing module start I/O numbers (QCPU)

The following explains the precautions on replacing module start I/O numbers.

● Specification of the module I/O number

• When specifying a module I/O number, specify the actual module I/O number.
Example)



● Replacing module I/O numbers of intelligent function module devices

Use the device replacing function to replace the module I/O numbers of intelligent function module devices. (☞ Section 6.1.1)

6.2 Searching for and Replacing Data in SFC Programs

QCPU
Q

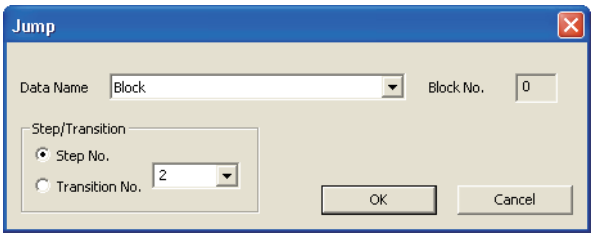
This section explains the method for jumping to the specified SFC step number or block number using the SFC diagram or SFC block list of the SFC program.
The operations of device search/replace, instruction search/replace, and open/close contact change functions are same as the search/replace function of ladder program. (☞ Section 6.1)

6.2.1 Jumping to specified SFC step number/transition number on SFC diagram

This section explains the method for jumping to the SFC step number/transition number in the specified block when the cursor is placed on the SFC diagram.

Screen display

Select [Find/Replace] ⇒ [Jump].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Data Name		Select the block data name.
Block No.		Displays the block number corresponds to the "Data Name".
Step/Transition		Set the jump destination of the SFC step number/transition number.
	Step No.	Select this to jump to the specified SFC step number.
	Transition No.	Select this to jump to the specified transition number.

2. **Click the OK button.**

The cursor jumps to the SFC step number/transition number of the specified block.

6.2.2 Jumping to specified SFC step number/block number on SFC diagram

This section explains the method for jumping to the SFC step number/block number when the cursor is placed on the SFC diagram.

Operating procedure

1. **Press the numeric key when the cursor is placed on the SFC diagram.**

2. **Set the items on the screen.**

Item	Description
Entry field	Displays the number that is entered on the SFC diagram. Enter an SFC step number or block number of the jump destination.
Step No.	Select this to jump to the specified SFC step number.
Block No.	Select this to jump to the specified block number.

3. **Click the OK button.**

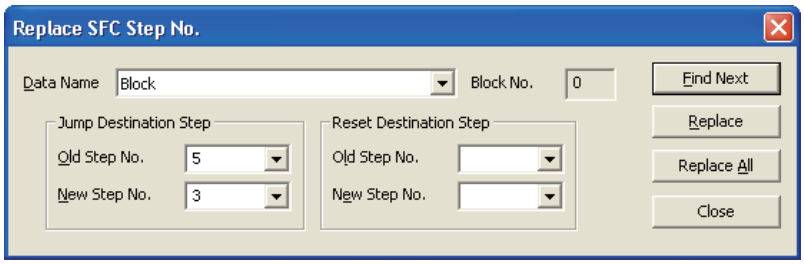
When the "Step No." is selected, the cursor moves to the specified SFC step number in the block being edited.
When the "Block No." is selected, the SFC diagram of the specified block number is displayed.

6.2.3 Replacing SFC step number on SFC diagram

This section explains the method for replacing a jump destination step number or reset destination step number in each block.

Screen display

Select [Find/Replace] ⇒ [Replace SFC Step No.].



Operating procedure

1. Set the items on the screen.

Item		Description
Data Name		Select the block data name.
Block No.		Displays the block number corresponds to the "Data Name".
Jump Destination Step		Enter old and new SFC step numbers when replacing the jump destination SFC step number.
	Old Step No.	Enter an old SFC step number.
	New Step No.	Enter a new SFC step number.
Reset Destination Step		Enter old and new SFC step numbers when replacing the reset destination SFC step number.
	Old Step No.	Enter an old SFC step number.
	New Step No.	Enter a new SFC step number.

2. Click the Find Next button.

The cursor moves to the searched SFC step number.

3. Click the Replace or Replace All button.

When the Replace button is selected, the old step number at the cursor position is replaced with the new step number. When the cursor is not at the old step number, it moves to the next searched step number.

When the Replace All button is selected, all old step numbers in the specified block are replaced with the new step number.

Point

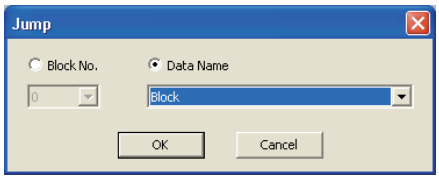
● **Conversion/compilation status after replacing step numbers**
After replacing step numbers, the program becomes unconverted/uncompiled status. Convert or compile the program.

6.2.4 Searching for blocks on SFC block list

This section explains the method for searching for a block or block title on the SFC block list.

Screen display

Select [Find/Replace] ⇒ [Jump].



Operating procedure

1. **Set the items on the screen.**

Item	Description
Block No.	Select this to jump to the specified block number. When the "Data Name" is selected, the block number corresponds to the "Data Name" is displayed.
Data Name	Select this to jump to the specified data name. When the "Block No." is selected, the data name corresponds to the "Block No." is displayed.

2. **Click the** OK **button.**

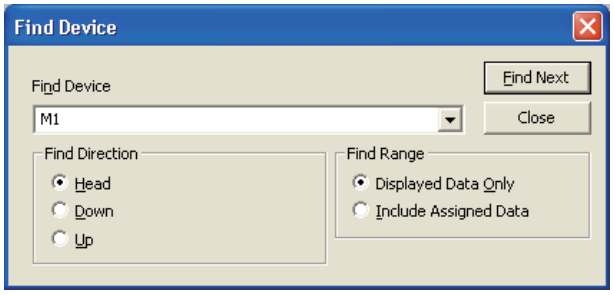
   The cursor moves to the specified block.

6.2.5 Searching for devices on SFC block list

This section explains the method for searching for devices on the SFC block list.

Screen display

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



Operating procedure

1. Set the items on the screen.

Item		Description
Find Device		Enter a device to be searched for. Click to select from the list of ten devices entered previously.
Find Direction	Head	Select this to search for devices in the downward direction from the start of the program regardless of the current cursor position.
	Down	Select this to search for devices in the downward direction from the cursor position.
	Up	Select this to search for devices in the upward direction from the cursor position.
Find Range	Displayed Data Only	Select this to search for devices only within the data that are being displayed.
	Include Assigned Data	Select this to search for devices including those assigned to labels.

2. Click the Find Next button.

The cursor moves to the searched device.

7 EDITING TEXTS

This chapter explains basic operation for editing device comments, statements, and notes.

7.1 Editing Device Comments

For the method for editing device comments and the related functions, refer to the following manual.
☞ GX Works2 Version1 Operating Manual (Common)

7.2 Editing Statements and Notes

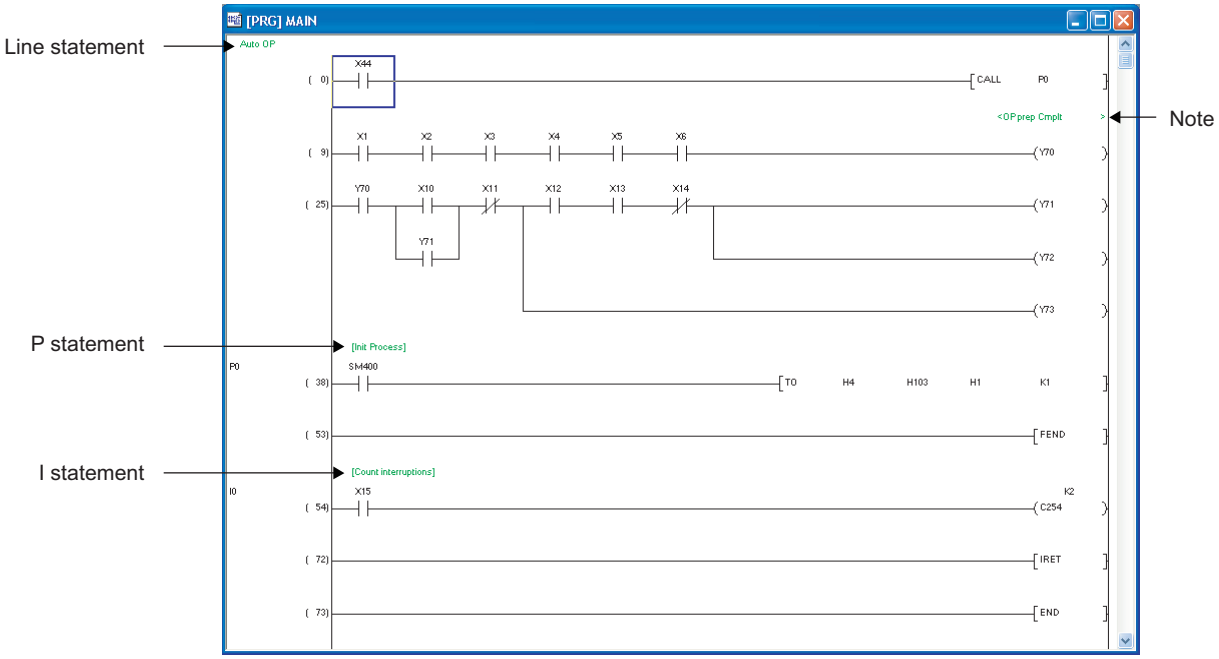
QCPU
Q

This section explains the method for editing statements and notes, and the related functions.

7.2.1 Statements and notes

The following explains the overview of statements and notes, and the precautions on editing.

Screen display



■ What is a statement?

A statement is a comment that is appended to a ladder block.
Appending statements makes the processing flow easy to understand.
Statements include line statements, P statements and I statements.

- Line statement: A comment appended to a ladder block as a whole.
- P statement : A comment appended to a pointer number.
- I statement : A comment appended to an interrupt pointer number.

■ What is a note?

A note is a comment that is appended to a coil and application instruction.
Appending notes makes the details of coils and application instructions easy to understand.

■ Number of characters that can be entered

The following table shows the number of characters that can be entered for a statement or note.

Table 7.2.1-1 Number of characters that can be entered for a statement or note

Name	Number of characters
Line statement	64 characters
P statement	64 characters
I statement	
Note	32 characters

■ Types of statement and note

'PLC' and 'Peripheral' are the types of statement and note.

Name		Applicable model	Function
PLC	Line statement P statement I statement	QCPU (Q mode)	• Statements and notes can be stored in the programmable controller CPU. • PLC statement uses the following number of steps. $2 + \frac{\text{Number of characters}}{2}$ steps (Decimal fraction is rounded up)
	Note		
Peripheral	Line statement P statement I statement	QCPU (Q mode)	• Statements and notes cannot be stored in the programmable controller CPU. (Only the position information can be stored.) Statements and notes must be saved in a peripheral equipment. • One statement or note line uses one step. • A * symbol is prefixed to the entered text automatically.
	Note		

7.2.2 Entering statements

This section explains the method for entering line statements, P statements, and I statements.

■ Entering line statements

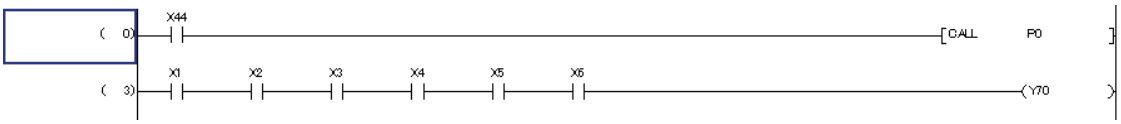
The following explains the method for entering a line statement.

Item	Toolbar
Statement	

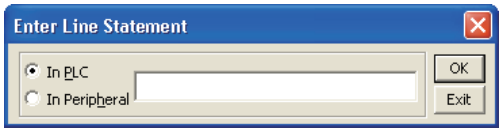
Operating procedure

1. **Select [Edit] ⇒ [Documentation] ⇒ [Statement] ( ).**
   The statement entry mode is established.

2. **Move the cursor to the left end of the ladder block where a line statement is entered.**

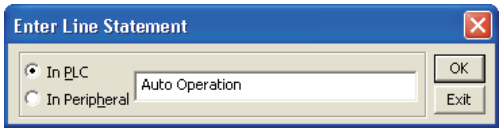


3. **Press the Enter key.**
   The Enter Line Statement screen is displayed.

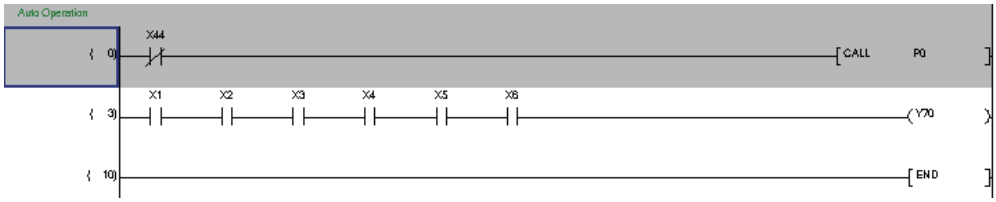


4. **Select the statement type ("In PLC" or "In Peripheral").**

5. **Enter a line statement.**



6. **Click the OK button.**
   The entered line statement is displayed on the editing screen.
   When "In Peripheral" is selected, '*' is automatically prefixed to the line statement.



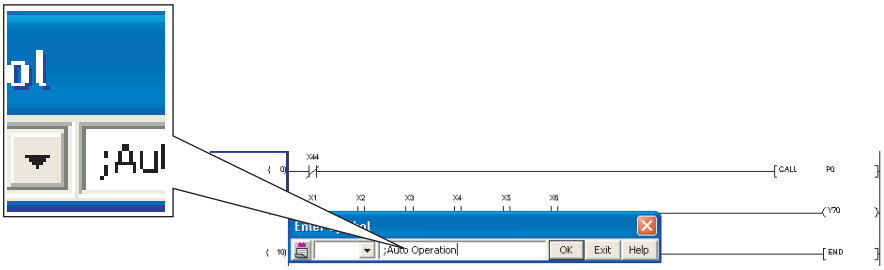
7. **To disable the line statement entry mode, select [Edit] ⇒ [Documentation] ⇒ [Statement] ( ) again.**
   The statement entry mode is disabled.

Point

● **Line statements can be entered on the Enter Symbol screen.**

Move the cursor to the left end of the ladder block where a line statement is entered and press the Enter key. The Enter Symbol screen is displayed. Enter a line statement as shown below.

First, enter ';' for 'PLC' and ';*' for 'Peripheral', and then enter a line statement.



● **Displaying statements on the editing screen.**

Display/hide of statements can be switched by selecting [View] ⇒ [Statement]. (☞ Section 2.2.4)

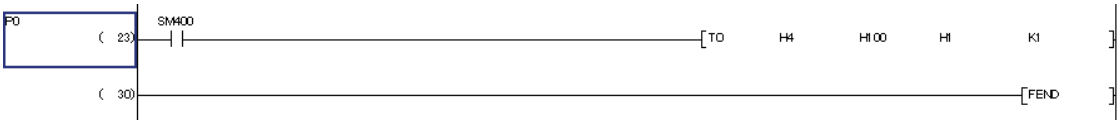
■ Entering P statements and I statements

The following explains the method for entering a P statement or I statement.

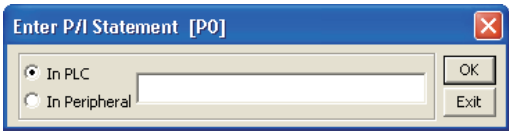
Operating procedure

1. **Select [Edit] ⇒ [Documentation] ⇒ [Statement]) ( ).**
   The statement entry mode is established.

2. **Move the cursor to the pointer number or interrupt pointer number where a P statement or I statement is entered.**

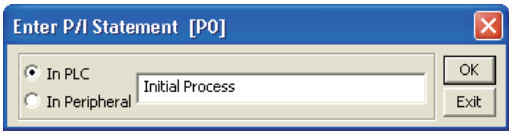


3. **Press the Enter key.**
   The Enter P/I Statement screen is displayed.

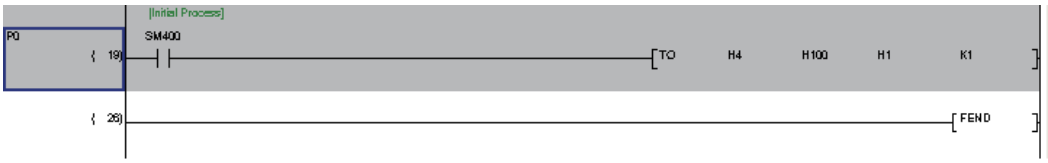


4. **Select the statement type ("In PLC" or "In Peripheral").**

5. **Enter a P or I statement.**



6. **Click the OK button.**
   The entered P or I statement is displayed on the editing screen.
   P and I statements are enclosed by brackets [ ].

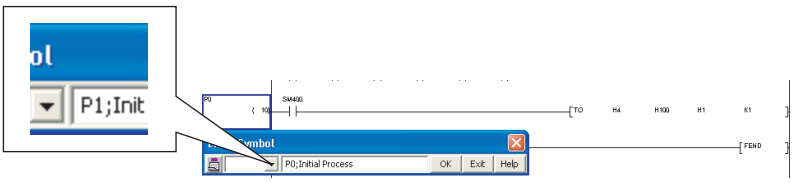


7. **To disable the P statement/I statement entry mode, select [Edit] ⇒ [Documentation] ⇒ [Statement] ( ) again.**
   The statement entry mode is disabled.

Point

● **P or I statements can be entered on the Enter Symbol screen.**
Move the cursor to the pointer number or interrupt pointer number where a P or I statement is entered and press the [Enter] key.
The Enter Symbol screen is displayed. Enter a line statement as shown below.

Following the already entered pointer number or interrupt pointer number, enter ';' for 'PLC' and ';*' for 'Peripheral', and then enter a P or I statement.



● **Displaying statements on the editing screen.**
Display/hide of statements can be switched by selecting [View] ⇒ [Statement]. (☞ Section 2.2.4)

7.2.3 Modifying and deleting statements

This section explains the method for modifying and deleting statements.

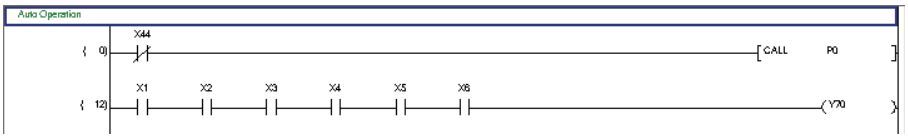
■ Modifying statements

The following explains the method for modifying a statement.

Operating procedure

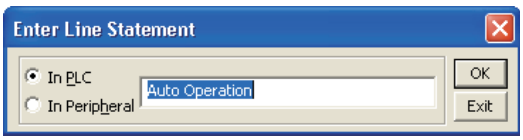
1. **Select [Edit] ⇒ [Documentation] ⇒ [Statement]) ( ).**
   The statement entry mode is established.

2. **Move the cursor to the statement to be modified.**

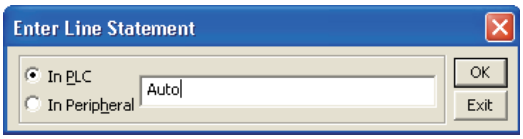


3. **Press the Enter key.**
   For line statements, the Enter Line Statement screen is displayed.

   For P and I statements, the Enter P/I Statement screen is displayed.



4. **Change the type and/or modify the statement.**



5. **Click the OK button.**
   The modified statement is displayed on the editing screen.

6. **To disable the statement entry mode, select [Edit] ⇒ [Documentation] ⇒ [Statement] ( ) again.**
   The statement entry mode is disabled.

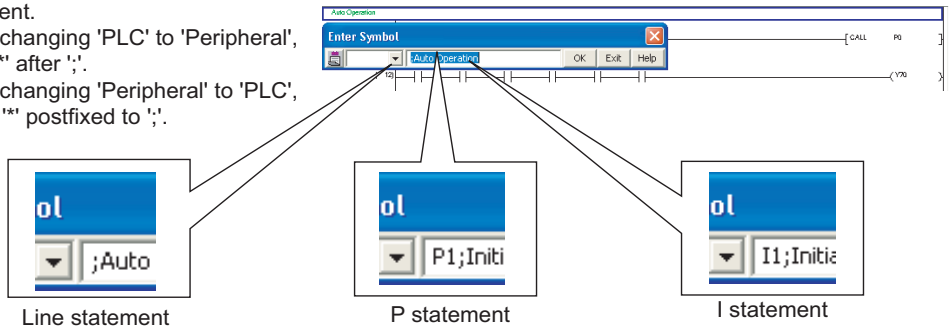
Point

● **Statements can be modified on the Enter Symbol screen.**

Move the cursor to the statement to be modified and press the Enter key.
The Enter Symbol screen is displayed. Modify the statement as shown below.

Do not delete ';', pointer number or interrupt pointer number when modifying a statement.

- When changing 'PLC' to 'Peripheral', enter '*' after ';'.
- When changing 'Peripheral' to 'PLC', delete '*' postfixed to ';'.



Line statement　P statement　I statement

● **Displaying statements on the editing screen.**

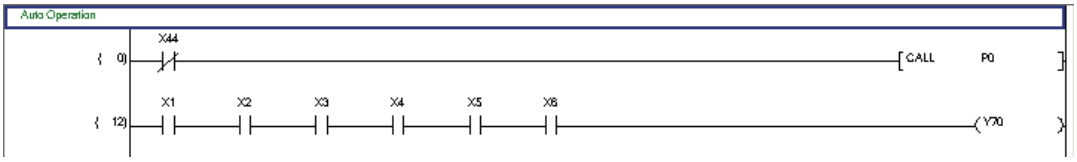
Display/hide of statements can be switched by selecting [View] ⇒ [Statement]. (☞ Section 2.2.4)

■ Deleting statements

The following explains the method for deleting a line statement, P statement or I statement.

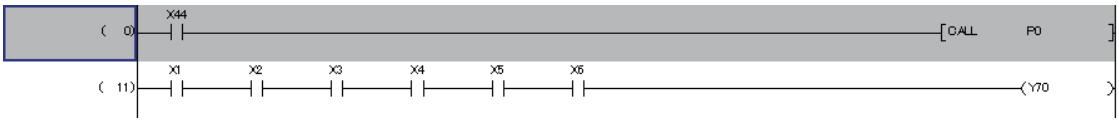
Operating procedure

1. **Move the cursor to the statement to be deleted.**



2. **Press the Delete key.**

   The statement is deleted.



Point

● **Displaying statements on the editing screen**
Display/hide of statements can be switched by selecting [View] ⇒ [Statement]. (☞ Section 2.2.4)

7.2.4 Entering notes

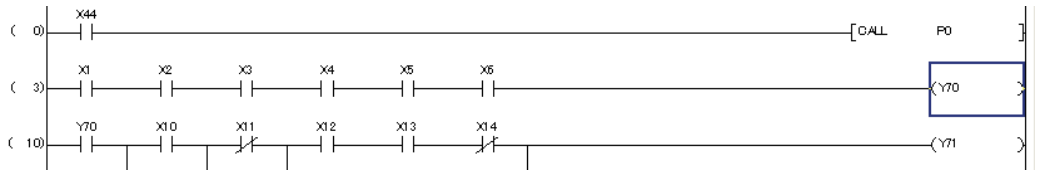
This section explains the method for entering notes in a program.

Item	Toolbar
Note	

Operating procedure

1. **Select [Edit] ⇒ [Documentation] ⇒ [Note] ( ).**
   The note entry mode is established.

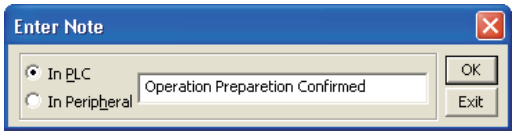
2. **Move the cursor to the coil or application instruction to which a note is appended.**



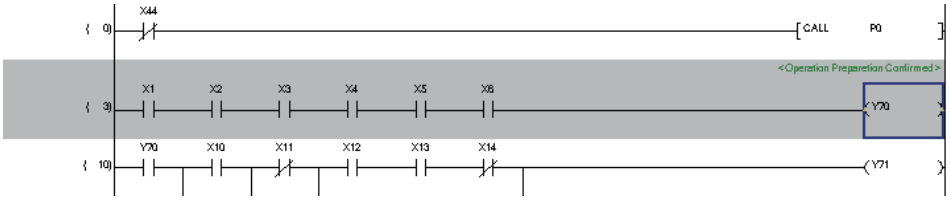
3. **Press the Enter key.**
   The Enter Note screen is displayed.

4. **Select the note type ("In PLC" or "In Peripheral").**

5. **Enter a note.**



6. **Click the OK button.**
   The entered note is displayed on the editing screen.
   When "In Peripheral" is selected, '*' is automatically prefixed to the note.



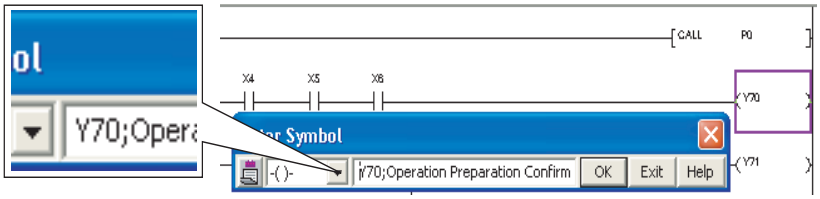
7. **To disable the note entry mode, select [Edit] ⇒ [Documentation] ⇒ [Note] ( ) again.**
   The note entry mode is disabled.

Point

● **Notes can be entered on the Enter Symbol screen.**

Move the cursor to the coil or application instruction to which a note is appended and press the Enter key.
The Enter Symbol screen is displayed. Enter a note as shown below.

Following the already entered device/instruction, enter ';' for, 'PLC' and ';*' for 'Peripheral' first, and then enter a note.



● **Displaying notes on the editing screen.**

Display/hide of notes can be switched by selecting [View] ⇒ [Note]. (☞ Section 2.2.4)

7.2.5 Modifying and deleting notes

This section explains the method for modifying and deleting notes.

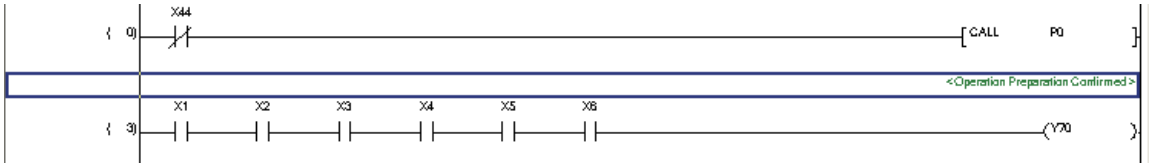
■ Modifying notes

The following explains the method for modifying a note.

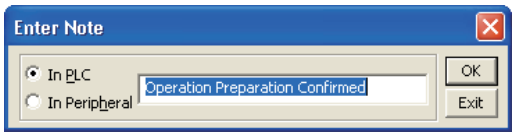
Operating procedure

1. **Select [Edit] ⇒ [Documentation] ⇒ [Note] ( ).**
   The note entry mode is established.

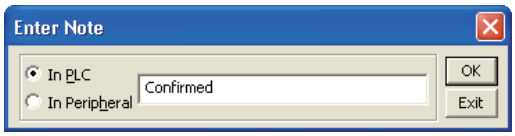
2. **Move the cursor to the note to be modified.**



3. **Press the Enter key.**
   The Enter Note screen is displayed.



4. **Change the type and/or modify the note.**



5. **Click the OK button.**
   The modified note is displayed on the editing screen.

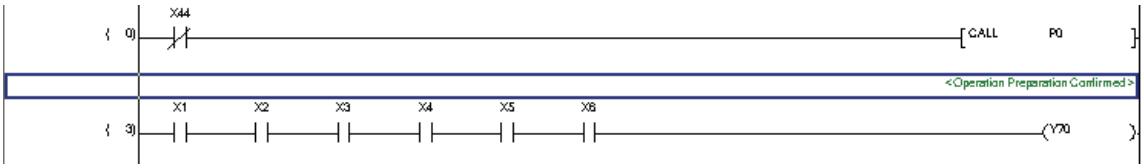
6. **To disable the note entry mode, select [Edit] ⇒ [Documentation] ⇒ [Note] ( ) again.**
   The note entry mode is disabled.

■ Deleting notes

The following explains the method for deleting a note.

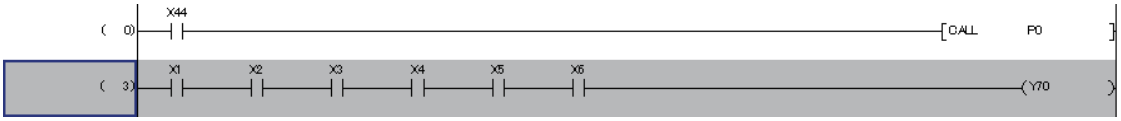
Operating procedure

1. Move the cursor to the note to be deleted.



2. Press the [Delete] key.

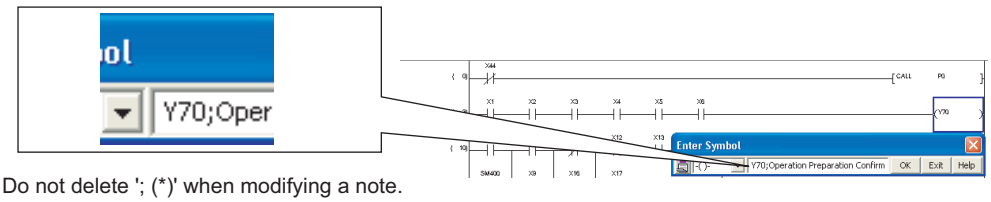
The note is deleted.



Point

● **Notes can be modified or deleted on the Enter Symbol screen.**

Move the cursor to the coil or application instruction whose note is deleted or modified and press the [Enter] key.
The Enter Symbol screen is displayed. Modify or delete the note as shown below.



Do not delete '; (*)' when modifying a note.
Delete '; (*)' as well when deleting a note.

- When changing 'PLC' to 'Peripheral', enter '*' after ';'.
- When changing 'Peripheral' to 'PLC', delete '*' postfixed to ';'.

● **Displaying notes on the editing screen.**

Display/hide of notes can be switched by selecting [View] ⇒ [Note]. (☞ Section 2.2.4)

7.3 Batch Editing Statements and Notes

QCPU
Q

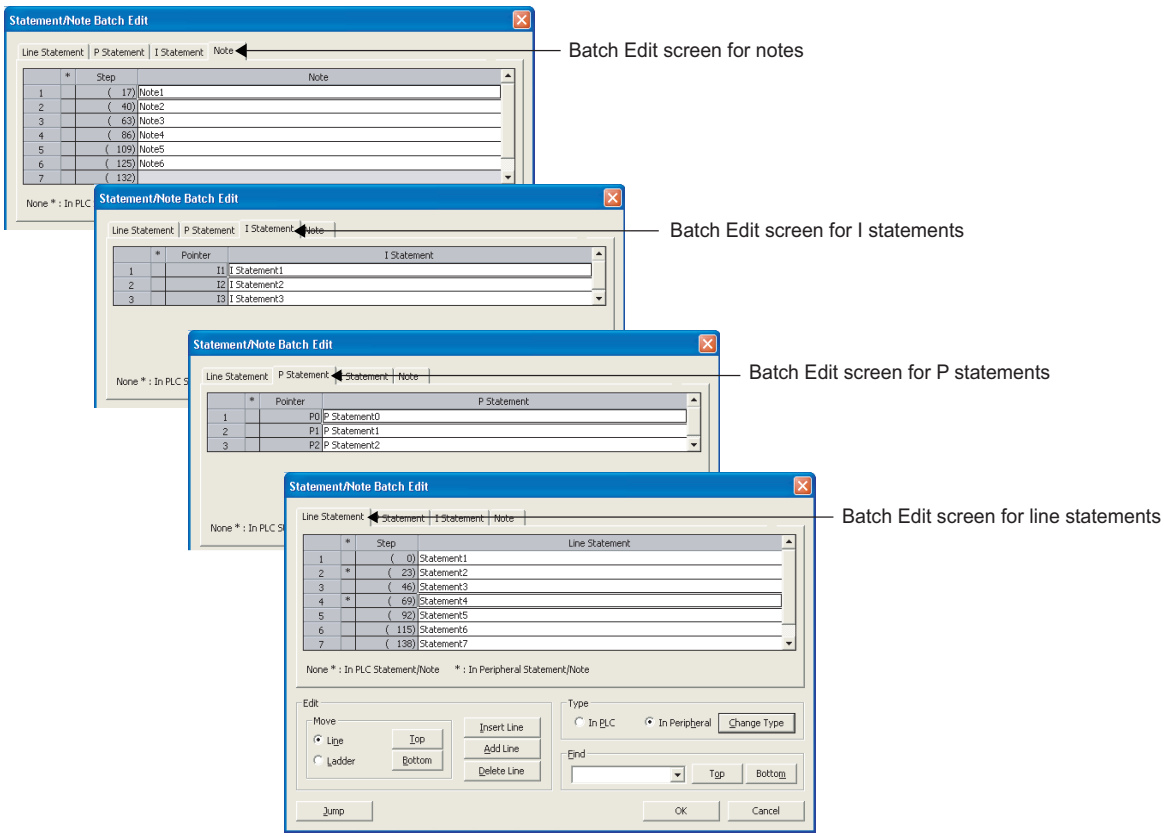
This section explains the method for batch editing statements and notes.
Note that the setting function related to the PLC and Peripheral types described in this section cannot be used.
(For PLC and Peripheral types, refer to the following. (☞ Section 7.2.1)

Restrictions

Batch editing of statements and notes cannot be performed when function blocks are used in a program.

Screen display

Select [Edit] ⇒ [Documentation] ⇒ [Statement/Note Batch Edit].



Display contents

Item		Description
Tab	Line Statement	Displays the batch-edit screen for line statements.
	P Statement	Displays the batch-edit screen for P statements.
	I Statement	Displays the batch-edit screen for I statements.
	Note	Displays the batch-edit screen for notes.
Step	Line Statement	Displays the start step numbers of all ladder blocks in the program.
	Note	Displays the step numbers of all coils and application instructions in the program.
Pointer	P Statement	Displays all pointer numbers in the program.
	I Statement	Displays all interrupt pointer numbers in the program.

Screen button

- Change type

  Changes the type between 'PLC' and 'Peripheral'.

- Insert line

  Inserts a line above the selected line statement.

- Add line

  Inserts a line below the selected line statement.

- Delete Line

  Deletes a line statement.

- Top

  "Edit" : Moves the statement upward.
  "Find" : Executes search in the upward direction from the selected statement or note.

- Bottom

  "Edit" : Moves the statement downward.
  "Find" : Executes a search in the downward direction from the selected statement or note.

- Jump

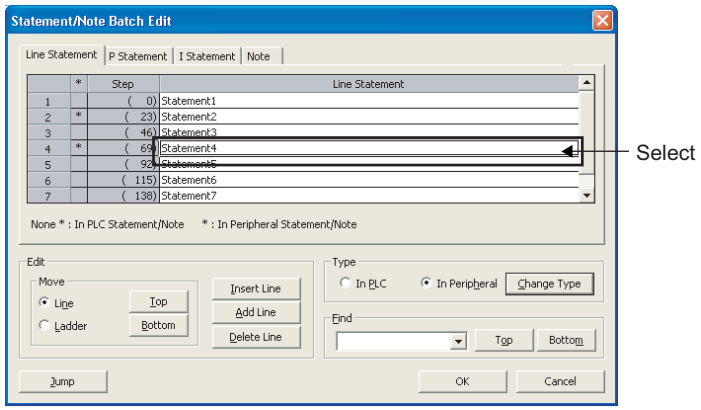
  Moves the cursor to the selected statement or note on the editing screen.

■ Modifying statements and notes

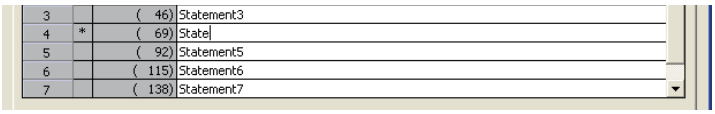
The following explains the method for modifying a statement or note.

Operating procedure

1. **Select a statement or note to be modified.**



2. **Modify the statement or note.**



■ Changing the type of statements and notes

The following explains the method for changing the 'PLC' or 'Peripheral' type of a statement or note.

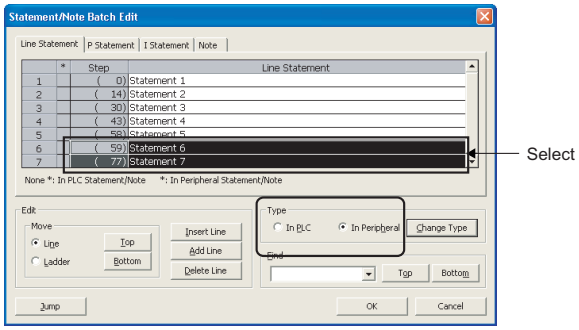
Operating procedure

1. **Select a range in which the type is changed.**

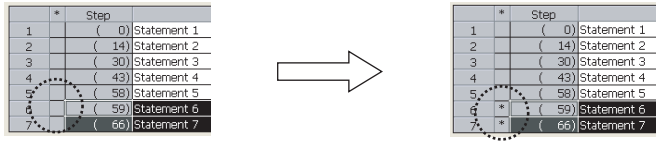
2. **Select the statement/note type ("In PLC" or "In Peripheral").**

3. **Click the** Change type **button.**

   The type is changed.
   A * symbol is appended to a statement or note set as 'Peripheral'.



Change from 'PLC' to 'Peripheral'



■ Inserting lines within line statements

The following explains the method for inserting a line within line statements.

Operating procedure

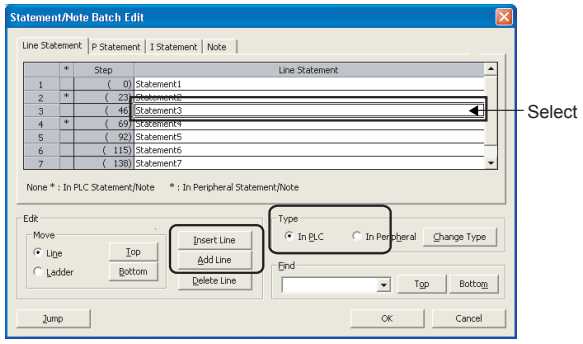
1. **Select a statement for which a line is to be inserted.**

2. **Select the statement type ("In PLC" or "In Peripheral").**

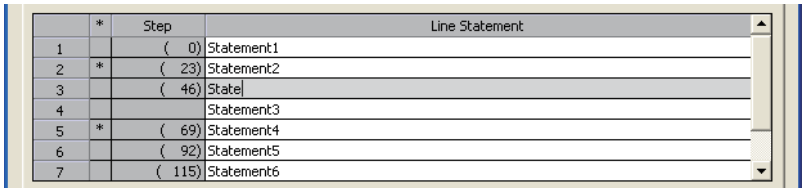
3. **Click the** Insert line **or** Add line **button.**

   Insert line : Inserts a blank line above the cursor position.

   Add line : Inserts a blank line below the cursor position.



4. **Select the inserted line and enter a statement.**

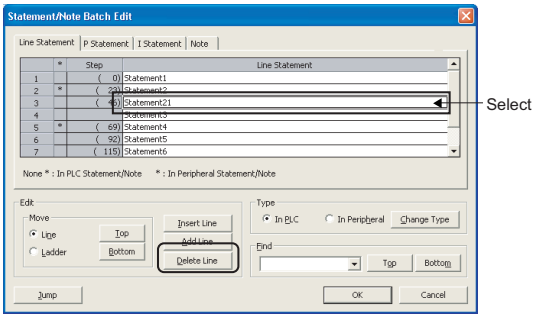


■ Deleting lines of line statements

The following explains the method for deleting a line of line statements.

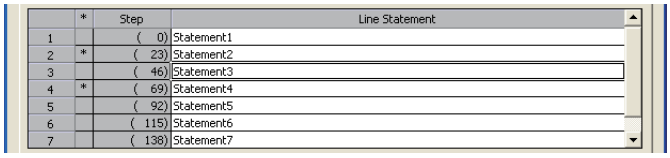
Operating procedure

1. **Select the line statement to be deleted.**



2. **Click the** Delete Line **button.**

   The selected line statement is deleted.



■ Moving statements or notes

The following explains the method for moving a statement or note.

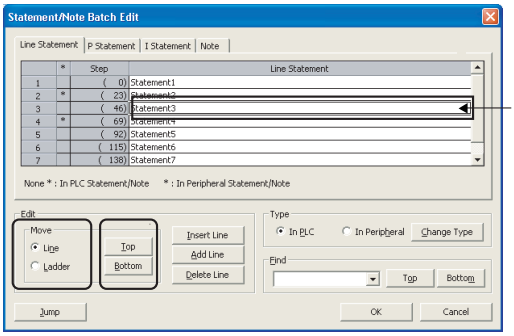
Operating procedure

1. **Select a statement or note to be moved.**

2. **To move a line statement, select the type ("Line" or "Ladder").**

   "Line" : Moves the selected line statement in unit of line.

   "Ladder" : Moves the selected line statement in unit of ladder block.



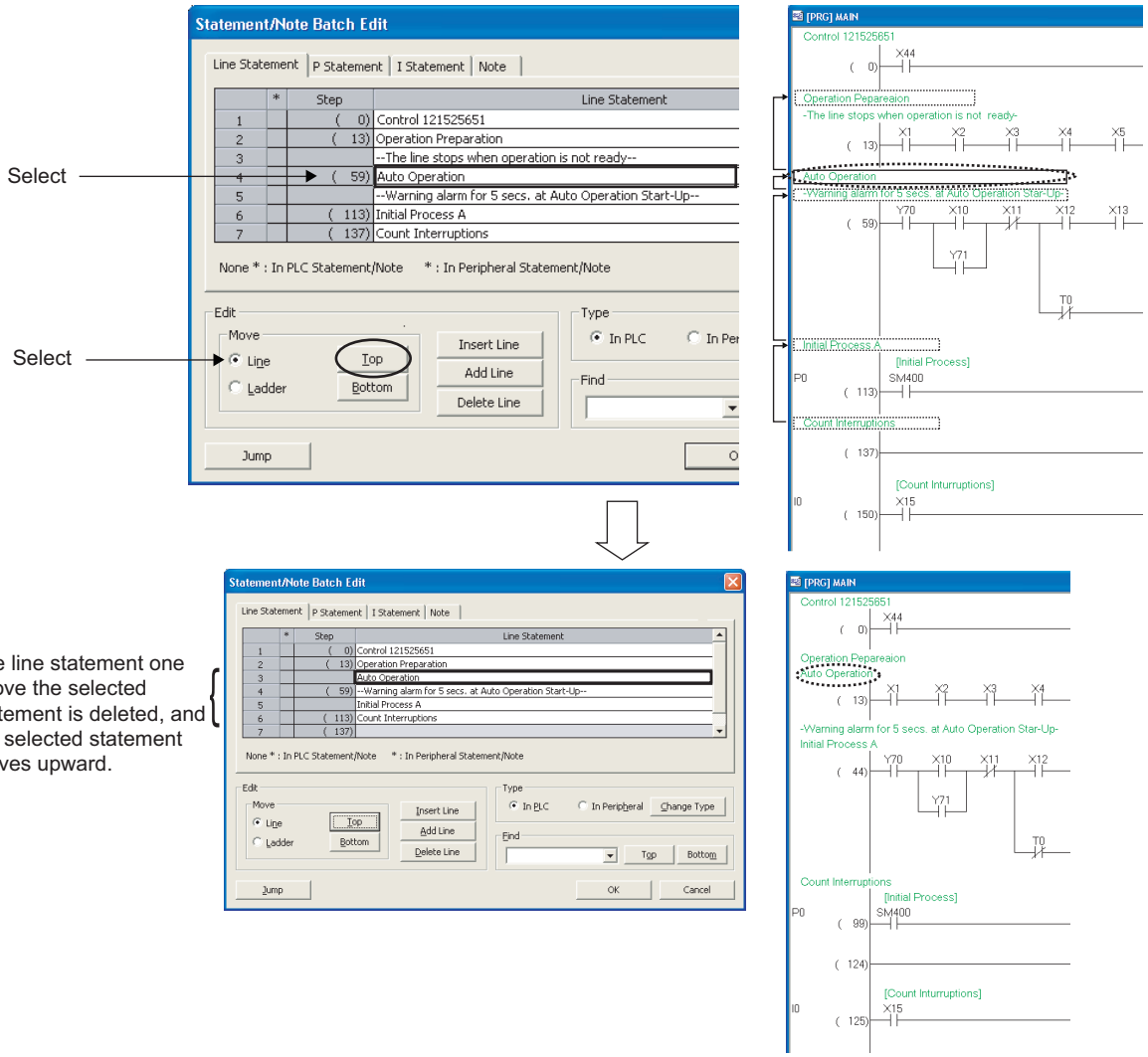
3. **Click the Top or Bottom button.**

   Top : Moves the selected statement or note upward.

   Bottom : Moves the selected statement or note downward.

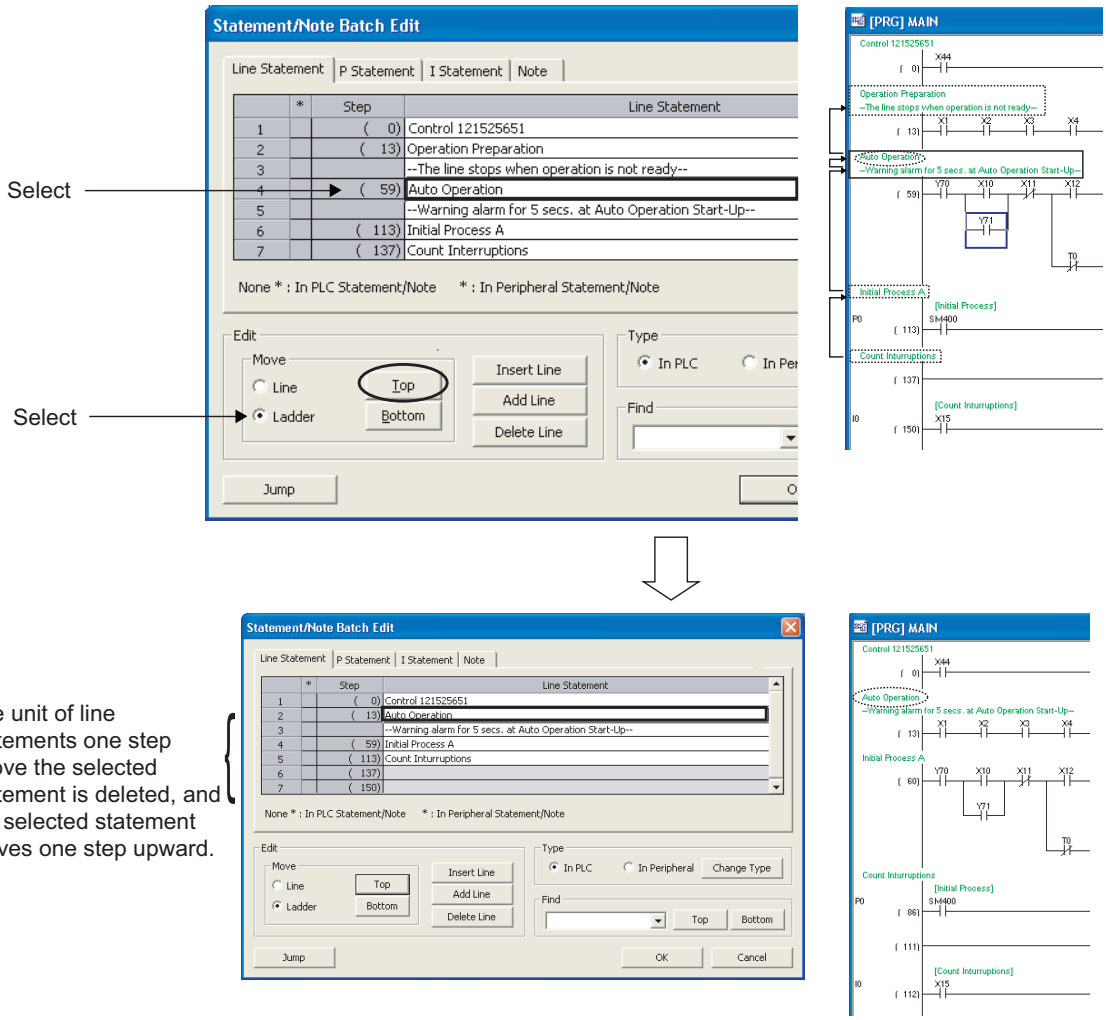
Editing examples)

Moving Step 59 upward in unit of line



The line statement one above the selected statement is deleted, and the selected statement moves upward.

Moving Step 59 upward in unit of ladder block



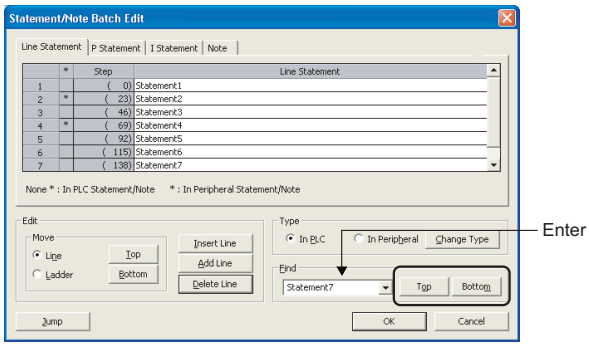
The unit of line statements one step above the selected statement is deleted, and the selected statement moves one step upward.

■ Searching for statements and notes

The following explains the method for searching for a statement or note.

Operating procedure

1. **Enter a statement or note to be searched for in the "Find" field.**

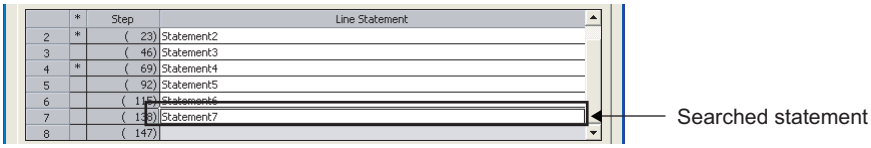


2. **Click the Top or Bottom button.**

   Top : Starts searching in the upward direction from the selected position.

   Bottom : Starts searching in the downward direction from the selected position.

3. **The cursor moves to the searched statement or note.**

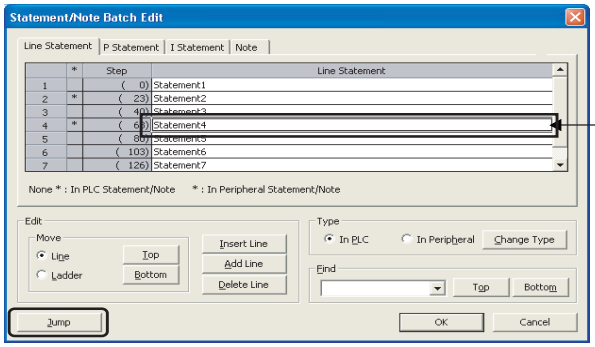


■ Jumping to specified statement and note

The following explains the method for jumping to a specified statement or note.

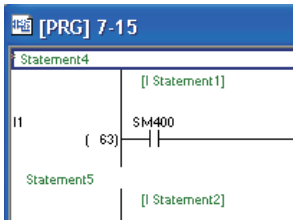
Operating procedure

1. **Select a statement or note for the jump target.**



2. **Click the Jump button.**

   The cursor jumps to the selected statement or note on the editing screen.



7.4 Changing the Type (PLC/Peripheral) of Statement/Note

QCPU Q

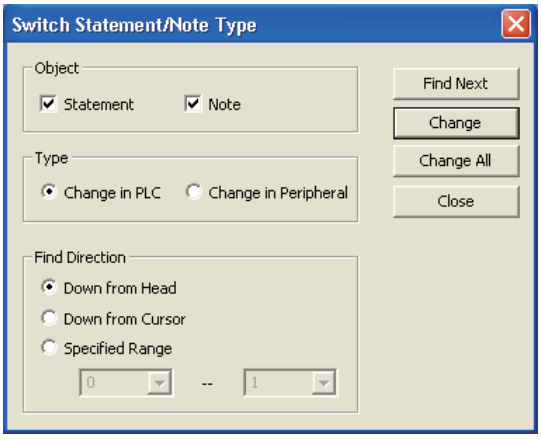
This section explains the method for changing the type of statement or note to PLC or Peripheral.

Restrictions

This operation is applicable only to the converted data.

Screen display

Select [Find/Replace] ⇒ [Switch Statement/Note Type].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Object		Check this to select the target whose type is changed. Multiple objects can be selected.
Type	Change in PLC	Select this to change 'Peripheral' to 'PLC'.
	Change in Peripheral	Select this to change 'PLC' to 'Peripheral'.
Find Direction	Down from Head	Select this to execute a search in the downward direction from the start of the program regardless of the current cursor position.
	Down from Cursor	Select this to execute a search in the downward direction from the cursor position.
	Specified Range	Select this to execute a search in the range set by the entered step numbers.

2. **Click the** Find Next **button.**

   The cursor moves to the searched statement or note.

3. **Click the** Change **or** Change All **button to change the type.**

   The type is changed, and the search for the next statements or notes continues.

   If the Change All button is clicked, the types are batch replaced for all searched statements or notes.

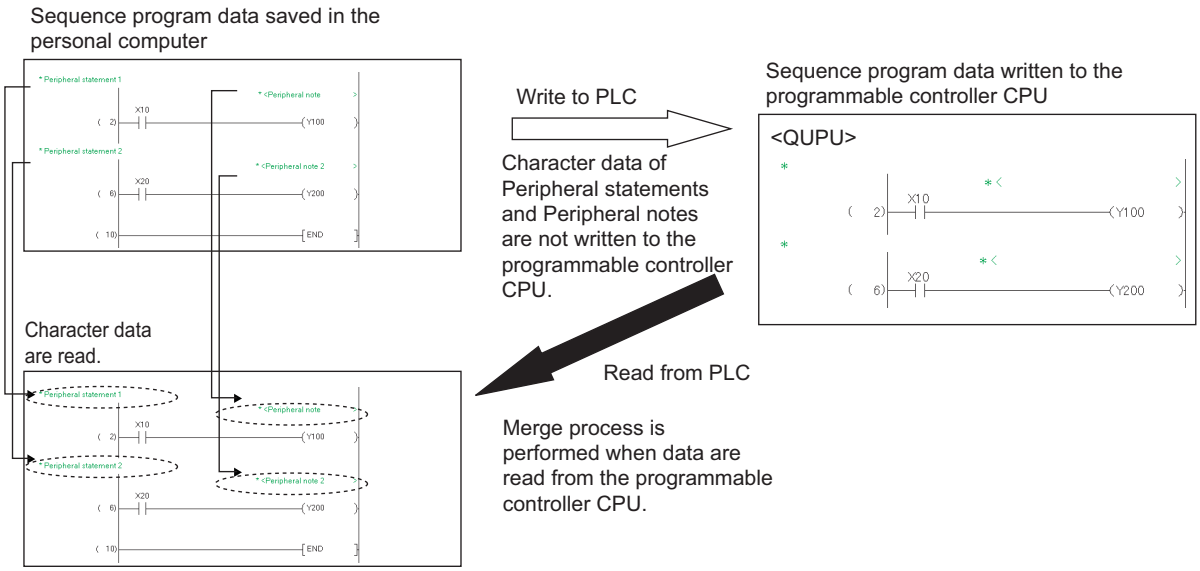
7.5 Merge Process when Reading Programs from Programmable Controller CPU

QCPU

This section explains the merge process when reading sequence programs contain Peripheral statements/notes created in the project without labels from the programmable controller CPU.

7.5.1 Merge process

The character data of Peripheral statements/notes are not written to the programmable controller CPU when sequence programs are written to the programmable controller CPU.
By executing the merge process when reading sequence programs from the programmable controller CPU, the character data of Peripheral statements/notes saved in the personal computer are merged with the sequence programs stored in the programmable controller CPU and displayed in the ladder.



The following table shows the different process status with the execution of the merge process when reading programs from the programmable controller CPU.

Table 7.5.1-1 Merge process status of Peripheral statement/note

Setting	CPU type	Type	Process status
Not executing the merge process	QCPU	Peripheral statement	Character data are not read.
		Peripheral note	
Executing the merge process	QCPU	Peripheral statement	Character data are read.
		Peripheral note	

7.5.2 Performing merge process

This section explains the method for performing the merge process when reading sequence programs from the programmable controller CPU.

Operating procedure

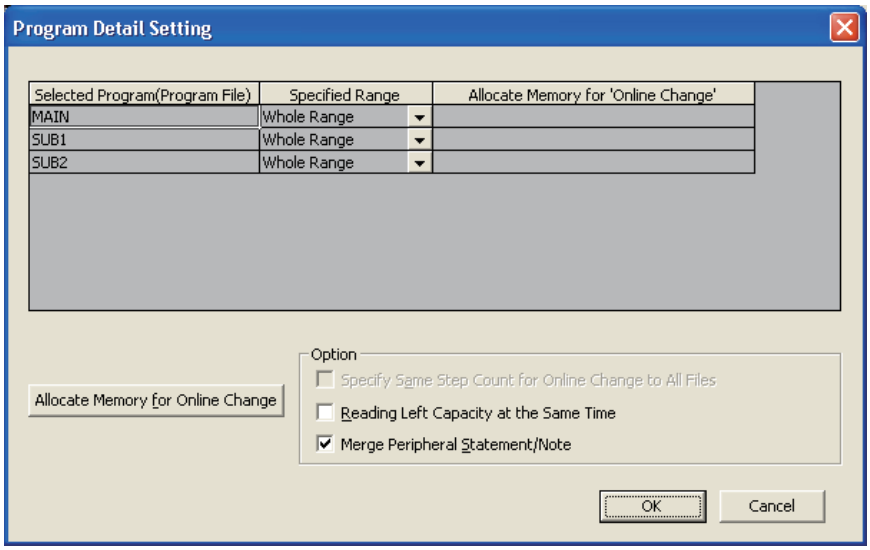
1. **Open the sequence program (project) saved in the personal computer.**

   Open the sequence program (project) which is the same data as the sequence program (project) to be read from the programmable controller CPU.
   For the method for opening a project, refer to the following manual.
   ☞ GX Works2 Version1 Operating Manual (Common)

2. **Select [Online] ⇒ [Read from PLC] ( ).**

   The Online Data Operation screen is displayed.
   The Read from PLC function (☞ Section 9.1)

3. **Check the "Merge Peripheral Statement/Note" item under "Option" on the Program Detail Setting screen, and execute the Read from PLC function.**



4. **Confirm if the statements and/or notes of the read sequence program are entered at the correct positions.**

Point

● **When a statement or note is not entered at the correct position**
Correct the statement and note positions by the statement/note batch editing function if the statement or note is not entered at the correct position after performing the merge process. (☞ Section 7.3)

7.6 Editing SFC Comments

QCPU Q

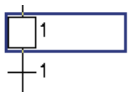
This section explains the method for creating and editing SFC comments.
SFC comment is a generic term for 'SFC step comments' that are appended to SFC steps, and 'transition comments' that are appended to transitions in the created SFC diagrams.
The following shows the example of entering 'Step comment' at 'Block: 0, SFC step: 1'.

Operating procedure

1. **Select [Edit] ⇒ [Documentation] ⇒ [SFC Step/Edit Step Comment].**

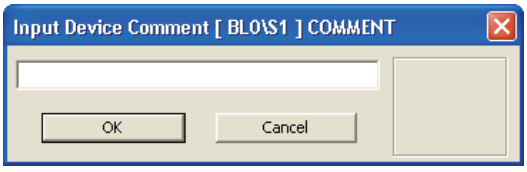
   The editing screen changes to the SFC comment editing mode.

2. **Move the cursor to the position where the SFC comment is entered.**



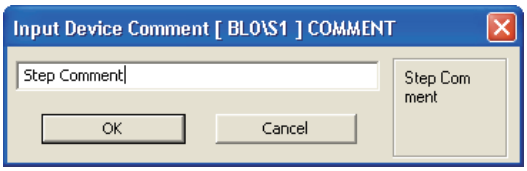
3. **Press the Enter button.**

   The Input Device Comment screen is displayed.



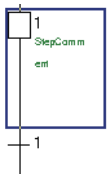
4. **Enter the SFC comment.**

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



5. **Click the OK button.**

   The entered SFC step comment is displayed as shown on the right.



Point

- **Disabling the SFC comment editing mode**
  To disable the SFC comment editing mode, select [Edit] ⇒ [Documentation] ⇒ [SFC Step/Edit Step Comment] again and uncheck the item.
- **Creating SFC comments**
  SFC comments can be created on the Enter SFC Symbol screen when entering SFC symbols, or by using the device comment editor. When creating SFC comments in the device comment editor, specify the device name as shown below.
  - For QCPU (Q mode)
    SFC step comment : BLm\Sn
    Transition comment: BLm\TRn
    (m: block number, n: SFC step/transition number)
- **Saving SFC comments**
  The created SFC comments are saved in the device comment data.
  To recover SFC comments when reading SFC programs from the programmable controller CPU, write/read device comments to/from the programmable controller CPU.

MEMO

8 CONVERTING PROGRAMS

This chapter explains the method for converting created programs.

8.1 Converting Ladder Blocks

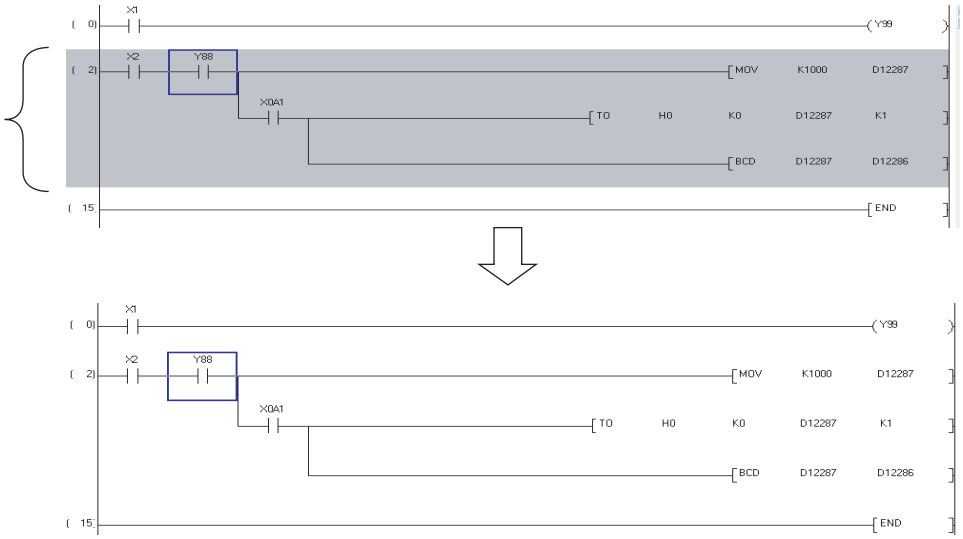
QCPU
Q

This section explains the method for converting a created ladder block.
The ladder conversion confirms edited contents of the ladder block.

Operating procedure

- Select [Convert/Compile] ⇒ [Ladder Conversion].
  The unconverted ladder block is converted.

Unconverted ladder block is displayed in gray.



Point

● **For a project using labels**
Perform the compilation after converting ladder blocks. (☞ Section 8.4, 8.5)

8.2 Converting SFC Diagrams

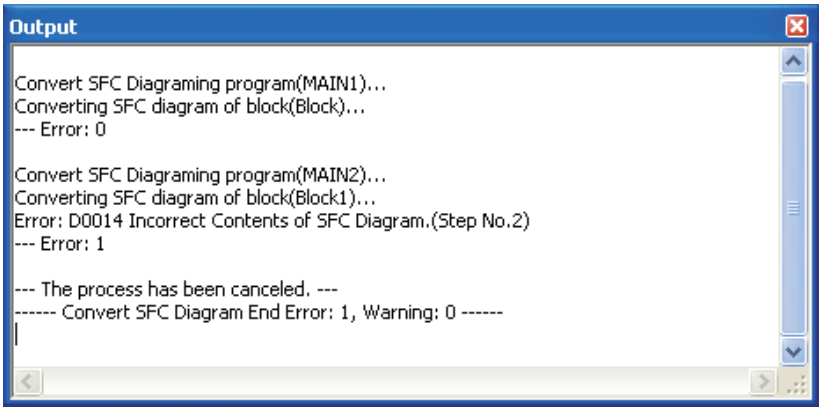
QCPU Q

This section explains the method for converting SFC diagrams created in the project without labels.
For projects with labels, SFC diagrams are converted by the compilation.
(☞ Section 8.4, 8.5)

Operating procedure

- Select [Convert/Compile] ⇒ [Change SFC All].

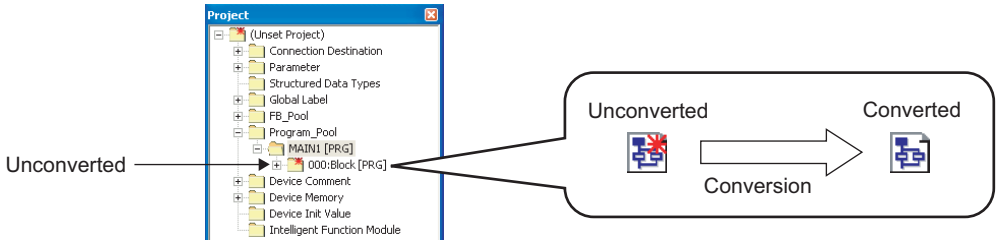
  The conversion result of the SFC diagrams is displayed in the Output window.
  By double clicking the result, the corresponding error location in the program is displayed.



Point

● **Checking the conversion status**

The conversion status can be checked in the Project window. A symbol ( ) is appended to programs in unconverted status.



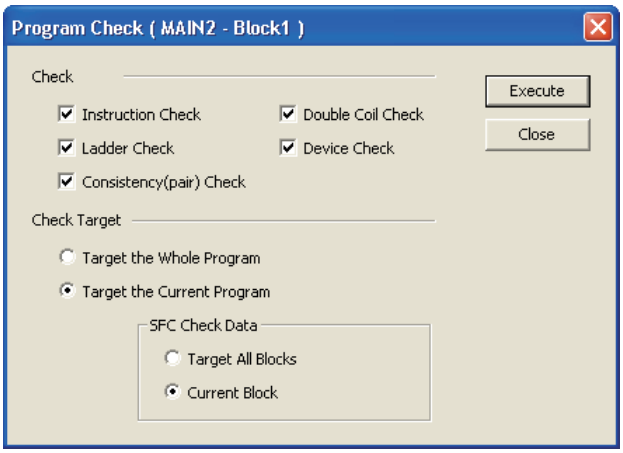
8.3 Checking Programs

QCPU

This section explains the method for checking errors, such as duplicated coils or device range, in the programs created in the project without labels.
The check result is displayed on the Output widow.
For projects with labels, programs are checked by the compilation.
(☞ Section 8.4, 8.5)

Screen display

Select [Tools] ⇒ [Program Check].



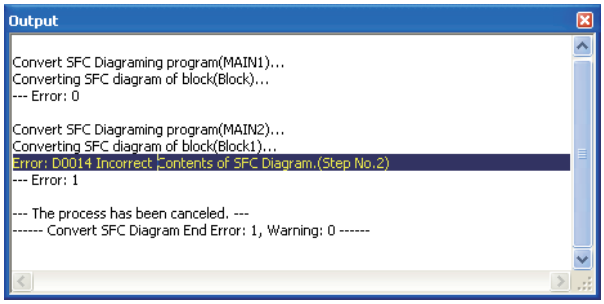
Operating procedure

1. Set the items on the screen.

item			Description
Check			Select the item(s) for checking the program. **Check item** / **Description** Instruction Check: Checks if the instruction can be used for the CPU type of the project being edited. Ladder Check: Checks if the ladder is created properly. Consistency (pair) Check: Checks the program consistency for such case as no pointer at the jump destination or no RET instruction in the subroutine program. Double Coil Check: Checks the duplicated coils. Device Check: Checks if the device being used is within the range set in the parameter.
Check Target			–
	Target the Whole Program		Select this to check all programs in the project.
	Target the Current Program		Select this to check only the program being displayed.
	SFC Check Data		–
		Target All Blocks	Select this to check the SFC block list that includes the SFC blocks being displayed.
		Current Block	Select this to check only SFC blocks being displayed.

2. **Click the Execute button.**

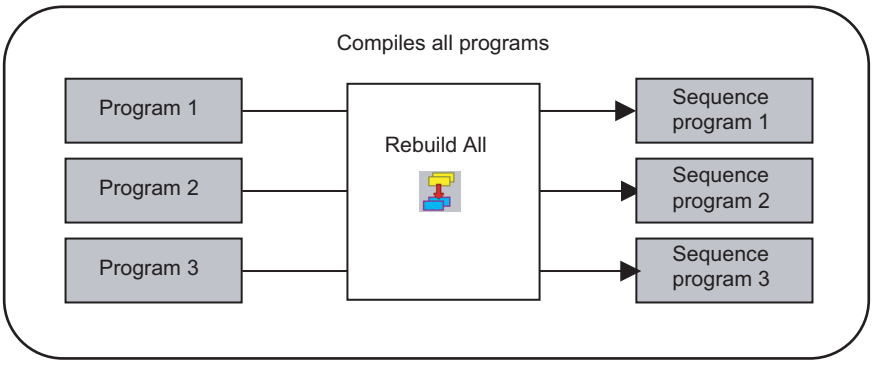
The program is checked and the result is displayed in the Output window.
By double clicking the result, the corresponding error location in the program is displayed.



8.4 Compiling All Programs

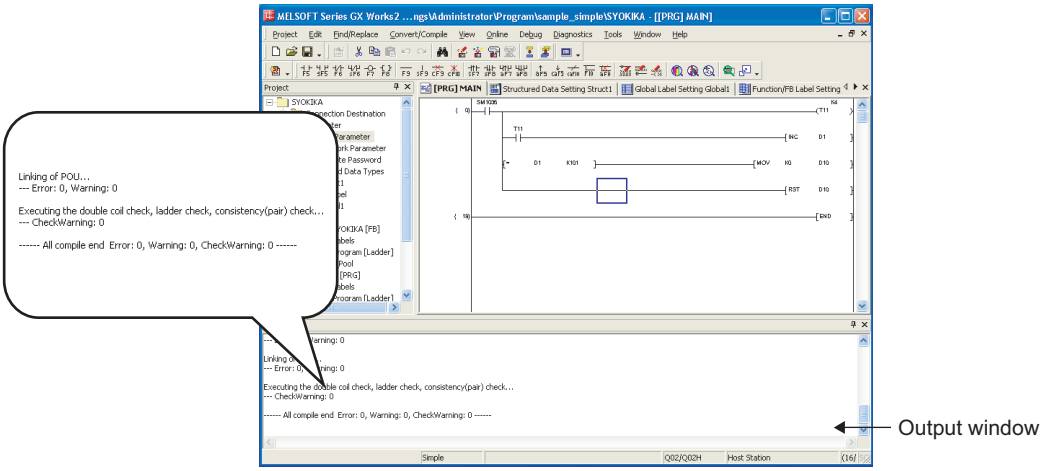
QCPU
Q

This section explains the method for batch compiling all programs in the project.
Programs are compiled to sequence programs that can be executed on the programmable controller CPU.



Operating procedure

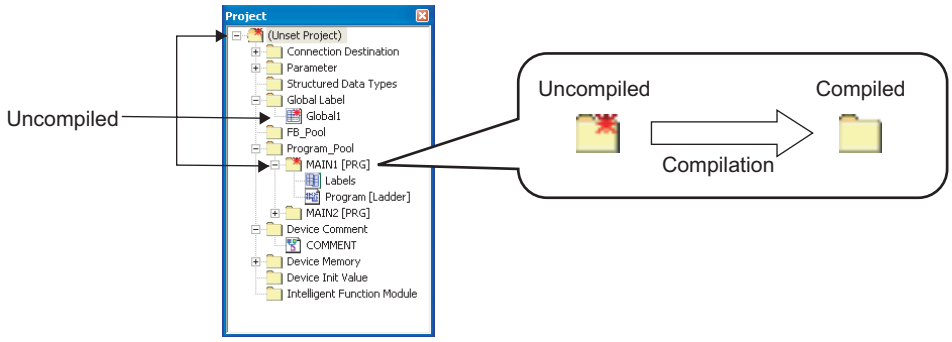
- Select [Convert/Compile] ⇒ [Rebuild All] ( ).
  All programs are compiled and the result is displayed in the Output window.



Point

- **Checking the compilation status**

  The compilation status can be checked in the Project window. A symbol ( ) is appended to programs in uncompiled status.



- **Checking errors and warnings when compiling programs**

  For checking errors and warnings when compiling programs, refer to the following section.

  (☞ Section 8.8)

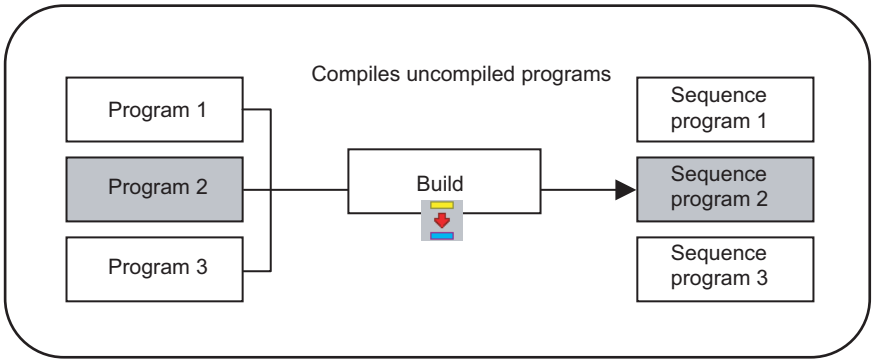
- **Label assignment when compiling all programs**

  When all programs are compiled, devices are reassigned to labels in all programs.

8.5 Compiling Only Modified Programs

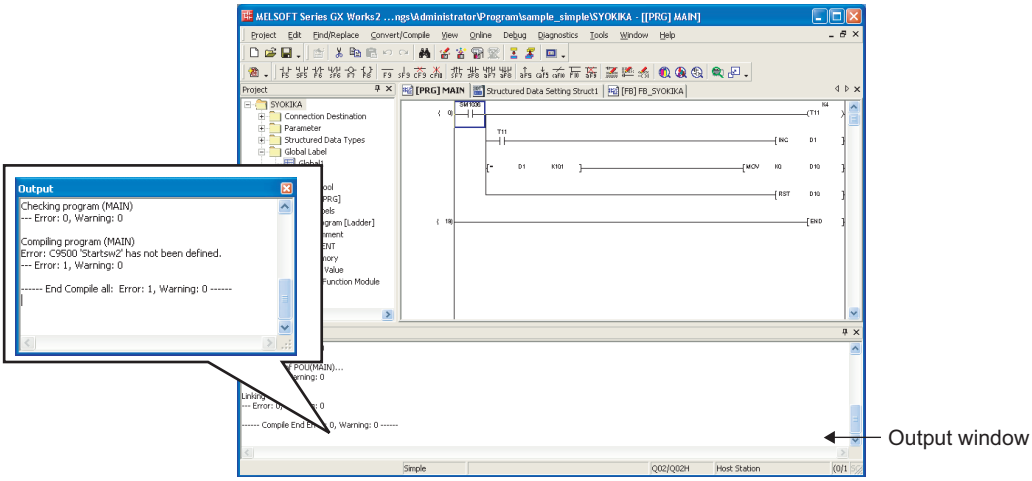
QCPU
Q

This section explains the method for batch compiling the uncompiled programs in the project.
Programs are compiled to sequence programs that can be executed on the programmable controller CPU.
Since this process compiles only uncompiled programs, the compiling time can be reduced.



Operating procedure

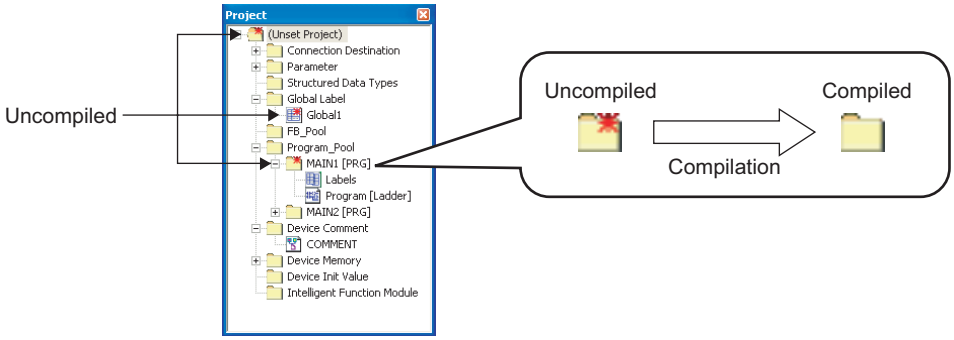
- Select [Convert/Compile] ⇒ [Build] ( ).
  Programs are compiled and the result is displayed in the Output window.



Point

- **Checking the compilation status**

  The compilation status can be checked in the Project window. A symbol ( ) is appended to programs in uncompiled status.



- **Checking errors and warnings when compiling programs**

  For checking errors and warnings when compiling programs, refer to the following section.

  (☞ Section 8.8)

- **Label assignment when compiling programs**

  When programs are compiled, devices are reassigned to labels in uncompiled programs only.

8.6 Precautions on Compilation

QCPU
Q

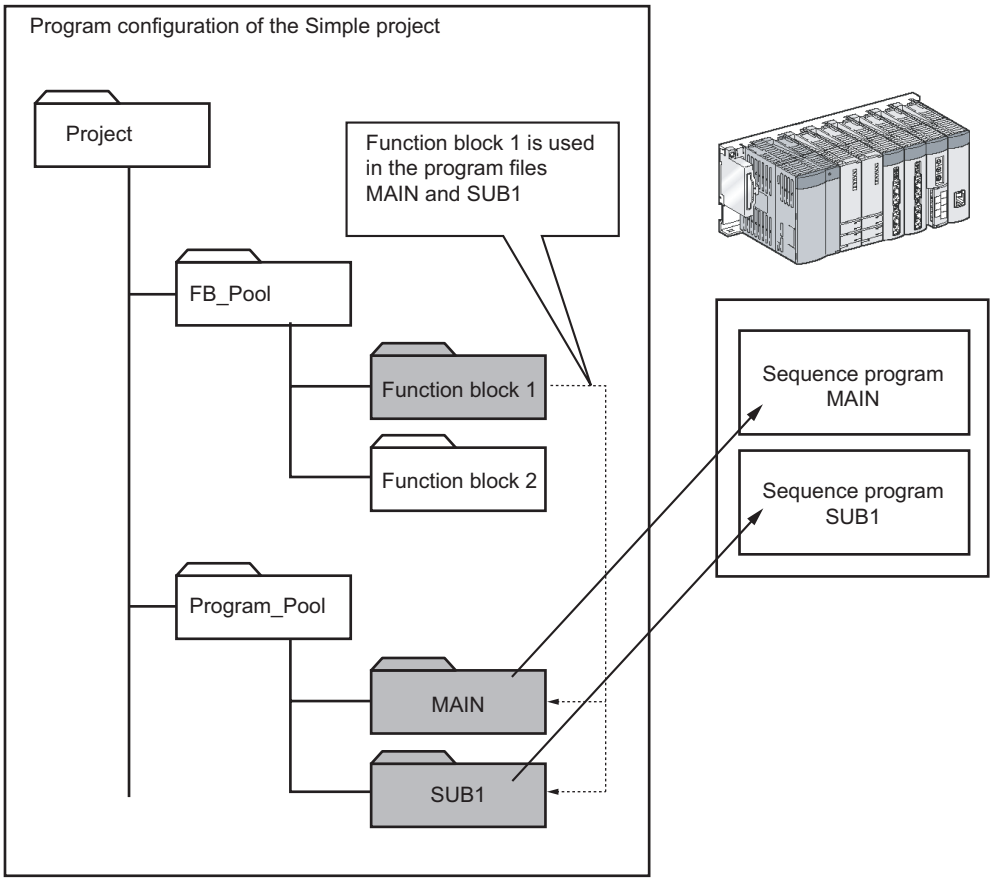
● Assigning devices automatically

When a program is compiled or all programs are compiled, the assignment of devices to labels is changed.
Therefore, the programmable controller CPU must be reset after writing programs to it.

● Modification of global labels and function blocks

If global labels and/or function blocks are modified, multiple programs become the compile targets. Write all program files of the compile targets to the programmable controller CPU to apply the modifications.

Example) Compiling programs after modifying Function block 1 in the following program configuration.
Function block 1 is compiled and the program files MAIN and SUB1 are modified.



8.7 Executing Online Change Simultaneously with Ladder Conversion/Compilation

For the operation for executing the Online change simultaneously with the ladder conversion/compilation, refer to the following manual.

☞ GX Works2 Version1 Operating Manual (Common)

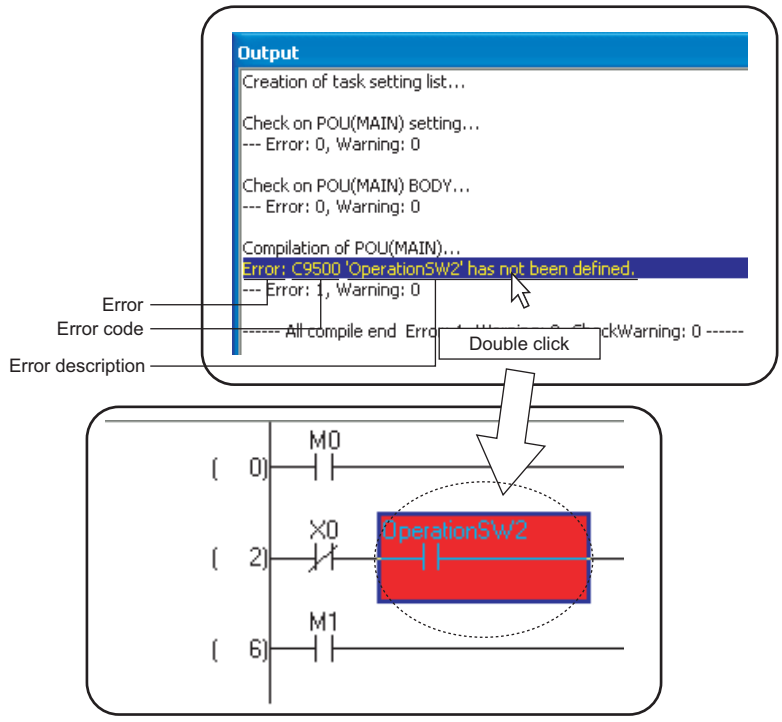
8.8 Checking for Errors and Warnings when Compiling Programs

QCPU
Q

This section explains the method for checking errors/warnings when compiling programs.
When all or uncompiled programs are compiled, the target programs and label settings are checked and the results are displayed on the Output window.
The following explains the checking method and the corrective action to be taken on occurrence of errors and warnings.

Operating procedure

1. **Double click the error/warning message displayed in the Output window.**
   The corresponding error location in the program is displayed.



2. **Check the corresponding error location and correct the program as instructed by the error/warning message.**

8.9 Changing Operating Conditions of Compilation

QCPU
Q

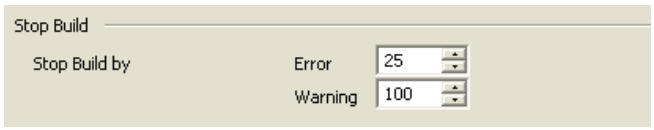
This section explains the method for changing the operating conditions of compilation.

8.9.1 Changing the number of errors and warnings that stops compilation

This section explains the method for changing the number of errors and warnings that stops compilation.
If the number of errors and warnings that occurred during compilation reaches the specified value, the compilation is aborted.

Screen display

Select [Tools] ⇒ [Options] ⇒ "Compile" ⇒ "Output Result".



Operating procedure

- Set the items on the screen.

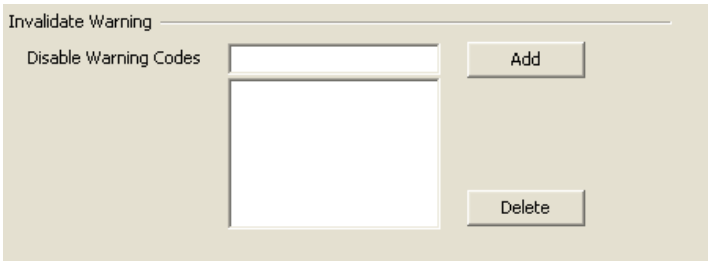
Item	Description
Error	Set the number of errors that stops compilation (1 to 9999).
Warning	Set the number of warnings that stops compilation (1 to 9999).

8.9.2 Hiding warning messages

This section explains the method for hiding messages displayed in the Output window when compiling programs.
The registered warnings are not displayed in the Output window.

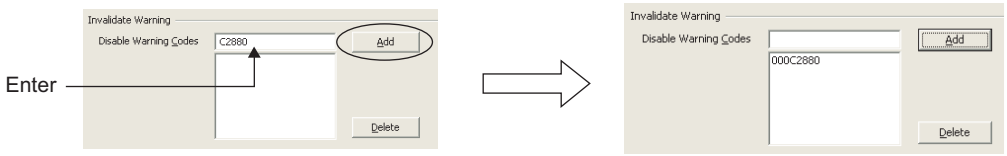
Screen display

Select [Tools] ⇒ [Options] ⇒ "Compile" ⇒ "Output Result".

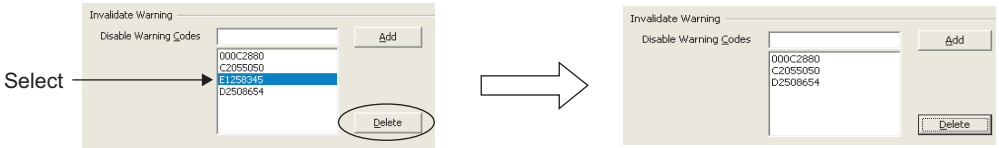


Operating procedure

- To register the warnings, enter the warning code and click the Add button.
  The registered warnings are not displayed in the Output window.



- To cancel the registration, select the warning code and click the Delete button.
  The unregistered warnings are displayed in the Output window.



Point

- **Warning codes**
  Warning codes and their contents can be checked in the Output window when compiling programs.
  (☞ Section 8.8)
- **Copying warning codes**
  Warning codes displayed in the Output window can be copied (Ctrl + C) and pasted (Ctrl + V) to the "Disable Warning Codes" entry field.
- **Maximum number of warnings to be invalidated**
  The maximum number of warnings to be invalidated is 100.

MEMO

9 WRITING/READING DATA TO/ FROM PROGRAMMABLE CONTROLLER CPU

This chapter explains the method for writing/reading sequence programs to/from the programmable controller CPU or memory card.

For the overview of the data write/read operation, refer to the following manual.
☞ GX Works2 Version1 Operating Manual (Common)

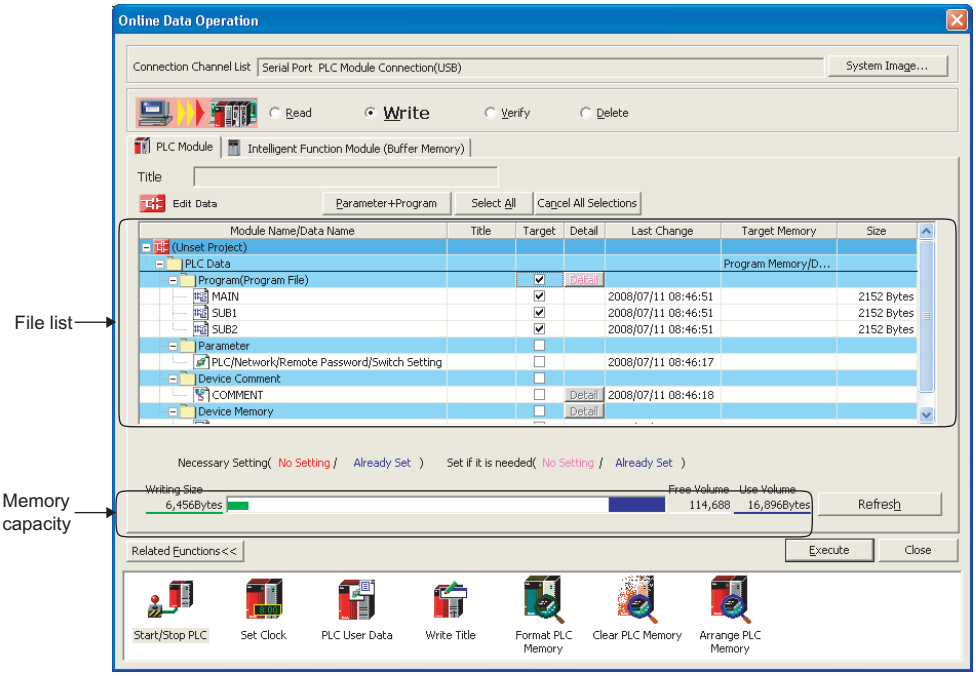
9.1 Writing/Reading Data to/from Programmable Controller CPU

QCPU

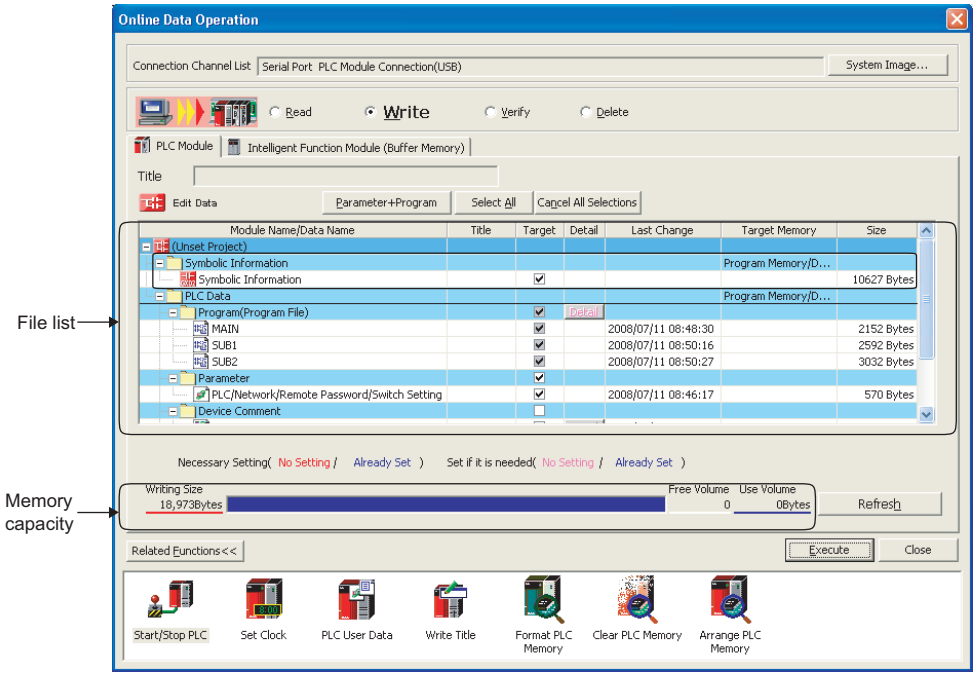
This section explains the method for writing the Simple project data to the programmable controller CPU or memory card, and the method for reading the data from the programmable controller CPU or memory card to the project.

Screen display

Select [Online] ⇒ [Write to PLC] ( )/[Read from PLC] ( ).
<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 manual.
☞ GX Works2 Version1 Operating Manual (Common)

2. Click the Execute 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

- System Image...

  Displays the illustration of the connection channel list.

- Parameter + Program

  Selects the parameters and all programs displayed in the list.

- Select All

  Selects all data displayed in the list.

- Cancel All Selections

  Cancels the selection status of all data displayed in the list.

- Related Functions>> / Related Functions<<

  Switches display/hide of the Related functions button.
  For details of the related functions, refer to the following manual.
  ☞ GX Works2 Version1 Operating Manual (Common)

- Get Project Name of Source Information (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.

- Refresh

  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.

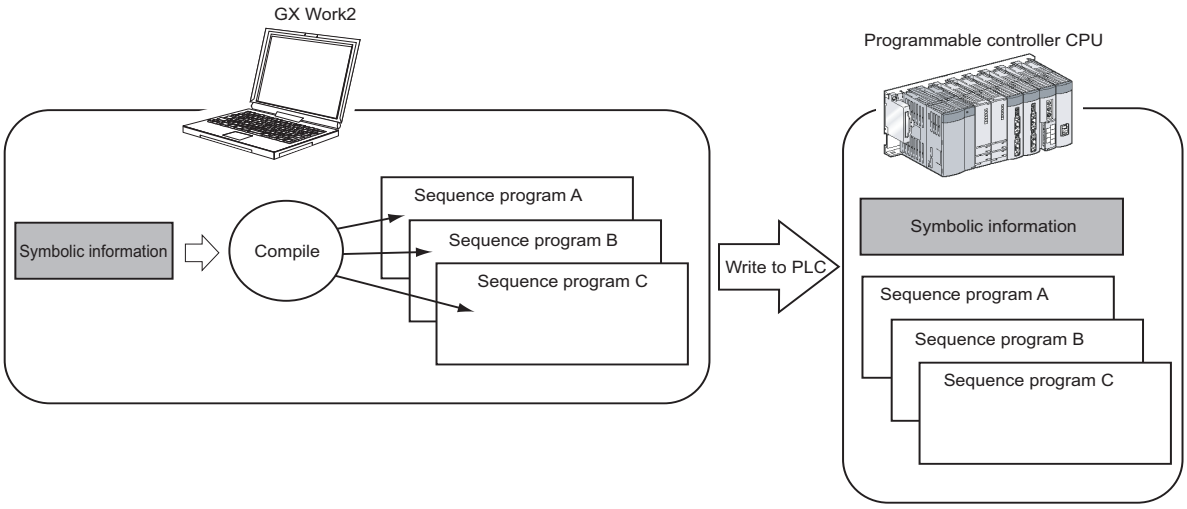
■ Symbolic information

The 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.

The following table shows the program data included in the symbolic information.

Table 9.1-1Data included in the symbolic information

Item	Included data
Symbolic information	Structures
	Global labels
	Local labels
	Programs
	Function blocks



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 manual.
  (☞ GX Works2 Version1 Operating Manual (Common))

10 MONITORING

This chapter explains the method for monitoring the program execution status of the programmable controller CPU using the program editor.
For the overview of monitoring, refer to the following manual.
☞ GX Works2 Version1 Operating Manual (Common)

10.1 Starting and Stopping Monitoring of Programs

QCPU
Q

This section explains the method for monitoring a program.
Open the program editor to be monitored in advance.

■ Starting monitoring of programs

The following explains the method for starting monitoring of the program.

Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ( ).
  The monitoring starts.

■ Stopping monitoring of programs

The following explains the method for stopping monitoring of the program.

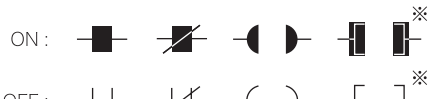
Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [Stop Monitoring] ( ).
  The monitoring stops.

Point

● **Changing current values**
During monitoring, bit devices can be forced ON/OFF and the current values of devices, buffer memories, and labels can be changed.
For forcing bit devices ON/OFF and changing current values, refer to the following manual.
☞ GX Works2 Version1 Operating Manual (Common)

● **ON/OFF status display**
During monitoring, the ON/OFF status of bit device is displayed as shown on the right.
*1 Only comparison instructions that are equivalent to contacts, and SET, RST, PLS, PLF, SFT, SFTP, MC, FF, DELTA, and DELTAP instructions that are equivalent to coils are supported.



10.2 Starting and Stopping Monitoring of Function Blocks

QCPU Q

This section explains the method for monitoring function block programs.
Open the function block program to be monitored in advance.

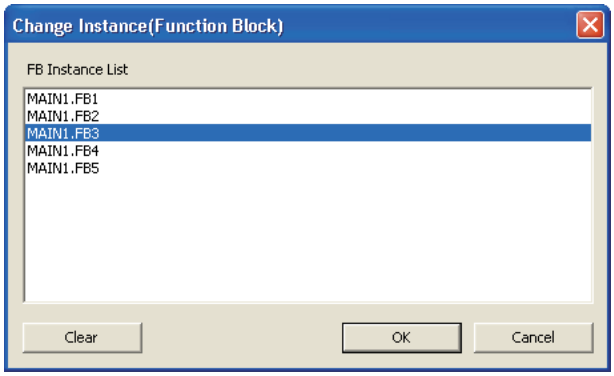
■ Starting monitoring of function blocks

The following explains the method for starting monitoring of the function block.

Operating procedure

1. **Select [Online] ⇒ [Monitor] ⇒ [Change Instance (Function Block)].**

   The Change Instance (Function Block) screen is displayed.



2. **Select the FB instance to be monitored.**

3. **Click the OK button.**

4. **Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ( ).**

   The monitoring starts.
   The display and executable operations during monitoring are the same as those of the program monitoring. (☞ Section 10.1)

Screen button

- Clear

  Cancels the selected status of the FB instance and stops monitoring.

■ Stopping monitoring of function blocks

The following explains the method for stopping monitoring of the function block.

Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [Stop Monitoring] ( ).

  The monitoring stops.

10.3 Changing Operating Conditions of Monitoring

QCPU
Q

This section explains the method for changing the operating conditions of monitoring.

10.3.1 Changing current value display format (decimal/ hexadecimal) of word type variable

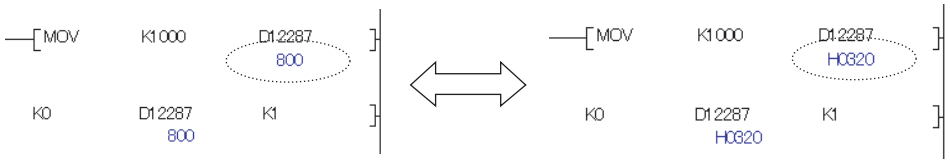
This section explains the method for changing the current value display format of word type variable displayed during monitoring.

■ Changing display format during monitoring

The following explains the method for changing the current value display format of word type variable during monitoring.

Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [Change Value Format (Decimal)] / [Change Value Format (Hexadecimal)].

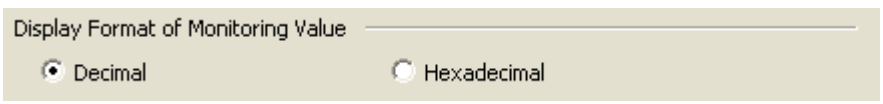


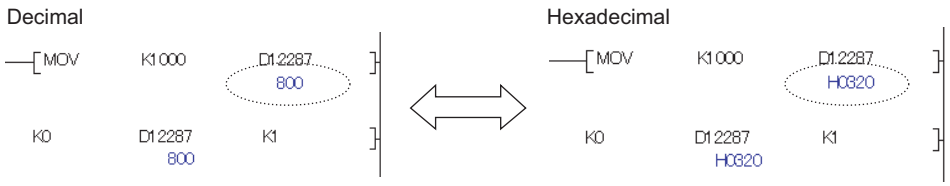
■ Changing display format before starting monitoring

The following explains the method for changing the current value display format by setting the option. The monitoring starts with the set display format.

Operating procedure

- Select [Tools] ⇒ [Options] ⇒ "Monitor" ⇒ "Ladder" ⇒ "Display Format of Monitoring Value" ⇒ "Decimal"/"Hexadecimal".



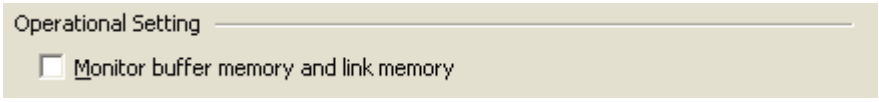


10.3.2 Monitoring buffer memory and link memory

Select whether to monitor the buffer memory and link memory at monitoring.
The scan time of the programmable controller CPU can be reduced by not monitoring the buffer memory and link memory.

Screen display

Select [Tools] ⇒ [Options] ⇒ "Monitor" ⇒ "Ladder" ⇒ "Operation Setting", and check or uncheck the "Monitor buffer memory and link memory" item.

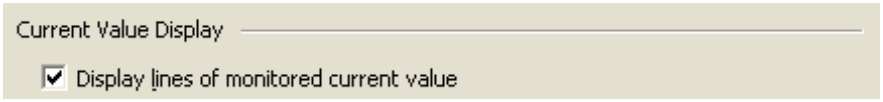


10.3.3 Displaying/hiding current values

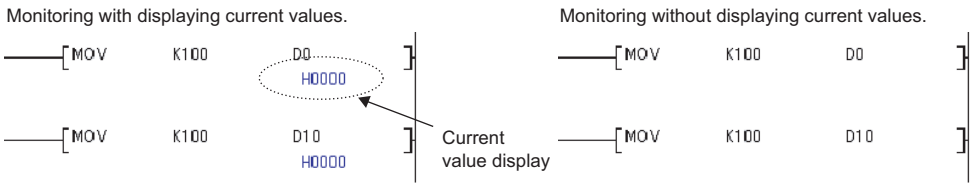
This section explains the method for displaying/hiding current values of word type variable.

Screen display

Select [Tools] ⇒ [Options] ⇒ "Monitor" ⇒ "Ladder" ⇒ "Current Value Display", and check or uncheck the "Display lines of monitored current value" item.



Example)



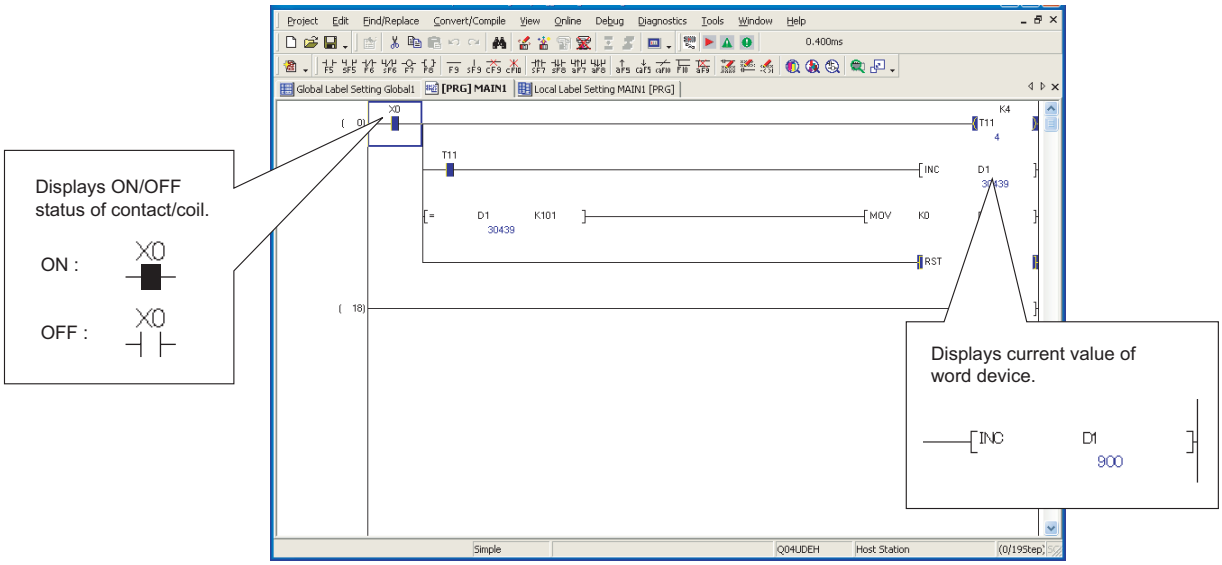
10.4 Monitoring Ladder Programs

QCPU
Q

This section explains the method for monitoring a ladder program.
Open the program editor to be monitored in advance.

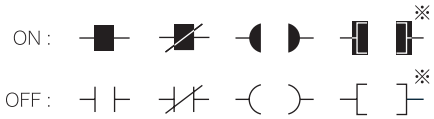
Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ( ).
  The monitoring starts.



Point

● **ON/OFF status display**
During monitoring, the ON/OFF status of bit device is displayed as shown on the right.



*1: Only comparison instructions that are equivalent to contacts, and SET, RST, PLS, PLF, SFT, SFTP, MC, FF, DELTA, and DELTAP instructions that are equivalent to coils are supported.

10.5 Monitoring SFC Programs

QCPU Q

This section explains the method for monitoring SFC diagrams and SFC block list of SFC program.
Open the program editor to be monitored in advance.
The monitoring of the Zoom screen is same as monitoring of ladder programs. (☞ Section 10.4)

10.5.1 Monitoring SFC diagrams

This section explains the method for monitoring active steps, inactive steps, and steps being on hold in the SFC diagram.

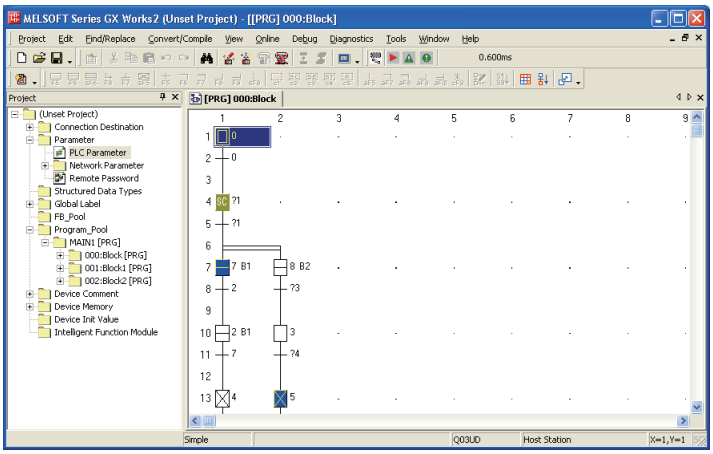
■ Starting monitoring of the SFC diagram

The following explains the method for starting monitoring of the SFC diagram.

Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ( ).

  The monitoring starts.



Display contents

	Description
(Blue)	Active step
(White)	Inactive step
SC (Yellow)	A step specified as a hold step and being on hold.

Point

● **Editing SFC programs**
The SFC diagrams cannot be edited during monitoring.

■ Displaying start destination blocks

The following explains the method for displaying a start destination block when there is a block start step in the SFC diagram being monitored.

Operating procedure

- Move the cursor to the block start step, and select [View] ⇒ [Open Zoom/START Destination SFC Block].
  The start destination block is displayed.

Point

● **Another method for displaying start destination blocks**
A start destination block can be displayed by double clicking the block start step while pressing the Ctrl key.

■ Auto scroll monitoring

The following explains the method for scrolling the screen to display active steps automatically when they are out of the screen during monitoring.

Operating procedure

1. **Select [Online] ⇒ [Monitor] ⇒ [SFC Auto Scroll Monitor] ( ).**

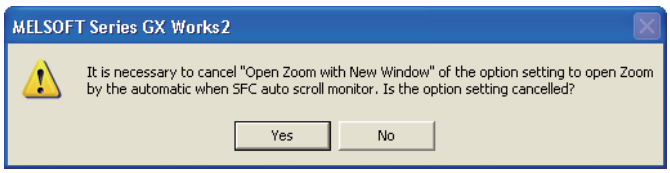
2. **Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ( ).**
   While the auto scroll monitor function is activated, active steps are scrolled on to the screen automatically when they are out of the screen.

Point

● **Starting method for the auto scroll monitor function**
The auto scroll monitor function also can be started by selecting [Online] ⇒ [Monitor] ⇒ [SFC Auto Scroll Monitor] during monitoring.

● **When multiple steps are active in series**
For multiple active steps in series caused by the action saving steps, active steps close to initial steps are displayed when the auto scroll monitor function is activated.

● **Operations when setting options**
When the "Open Zoom in new window" item is checked under [Tools] ⇒ [Options] ⇒ "Program Editor" ⇒ "SFC" ⇒ "Zoom", and the auto scroll monitor function is executed, the following message is displayed. If "Yes" is selected, the SFC diagram and the Zoom screen are synchronized, and the operation output/transition condition programs that correspond to the active steps are monitored automatically. If "No" is selected, only the SFC diagram is monitored.
Note that the program cannot be edited on the Zoom screen that is displayed when the auto scroll monitor function is activated.



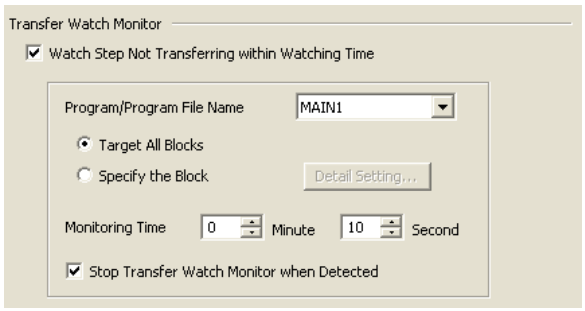
10.5.2 Monitoring transitions

This section explains the method for monitoring SFC steps that do not transfer after passing the specified time using the transition monitoring function.

Operating procedure

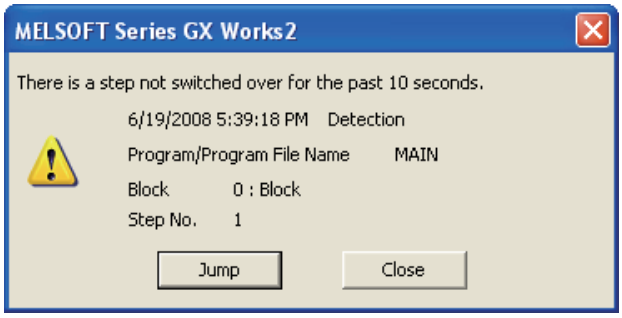
1. **Select [Tools] ⇒ [Options] ⇒ "Monitor" ⇒ "SFC", and set the items in the "Transfer Watch Monitor".**

   For details of the setting items, refer to Section 11.2.



2. **Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ( ).**

   While the transition monitoring function is activated, the following warning message is displayed when a SFC step that does not transfer after passing the specified time is detected.
   Note that the display of the warning message may be delayed from the specified time depending on the operating system of the personal computer.



- The corresponding SFC step in the SFC diagram is displayed by clicking the Jump button.
- When the "Stop transition monitoring at detection" item is checked in the "Transition Monitoring" setting, the transition monitoring function is stopped by the detection of an error step, but the normal monitoring continues operating.

10.5.3 Monitoring operation outputs and transition conditions

This section explains the method for monitoring operation outputs/transition conditions of SFC steps/transitions on the Zoom screen.

Operating procedure

1. **Select [View] ⇒ [Open Zoom/START Destination SFC Block].**

   The Zoom screen is displayed.

2. **Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ( ).**

The monitoring starts.
For details of the monitoring, refer to Section 10.4.

10.5.4 Batch monitoring all blocks, monitoring active steps

This section explains the method for monitoring the active/inactive status of all blocks and step active/inactive status of the specified block in the list display during the execution of the SFC program.

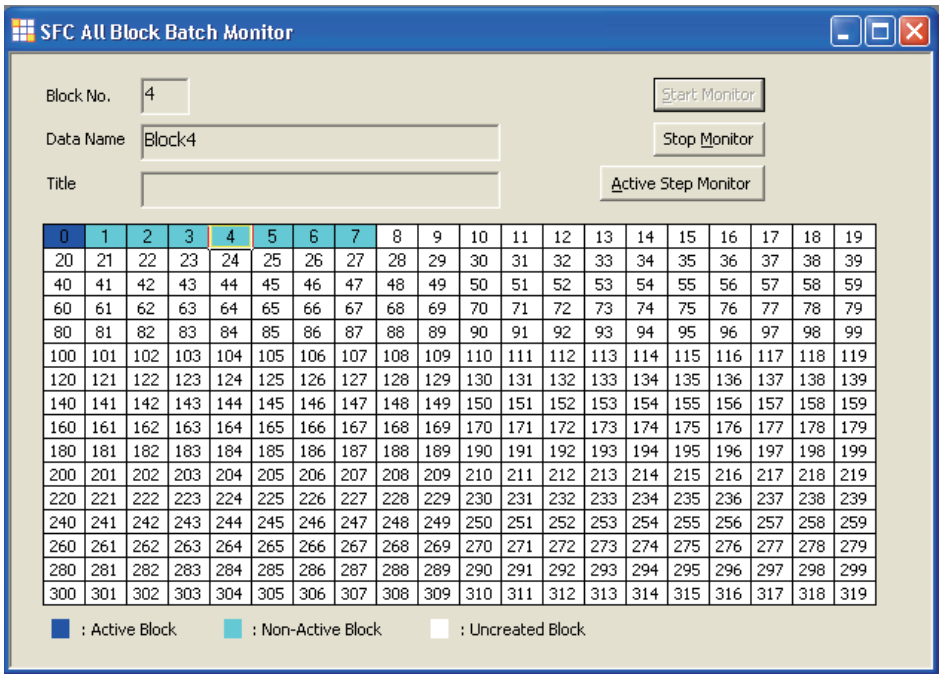
■ Batch monitoring all blocks

The following explains the method for monitoring the active/inactive status of all blocks in the list display.

Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [SFC All Block Batch Monitor] ( ).

The SFC All Block Batch Monitor screen is displayed.



Display contents

Item	Description
Block No.	Displays the block number at the cursor position.
Data Name	Displays the data name of the block.
Title	Displays the title of the block.

Screen button

- Active Step Monitor

Monitors the SFC step active/inactive status of the specified block.

☞ **Monitoring SFC step active/inactive status of the specified block**

■ Monitoring SFC step active/inactive status of the specified block

The following explains the method for monitoring the SFC step active/inactive status in the list display.

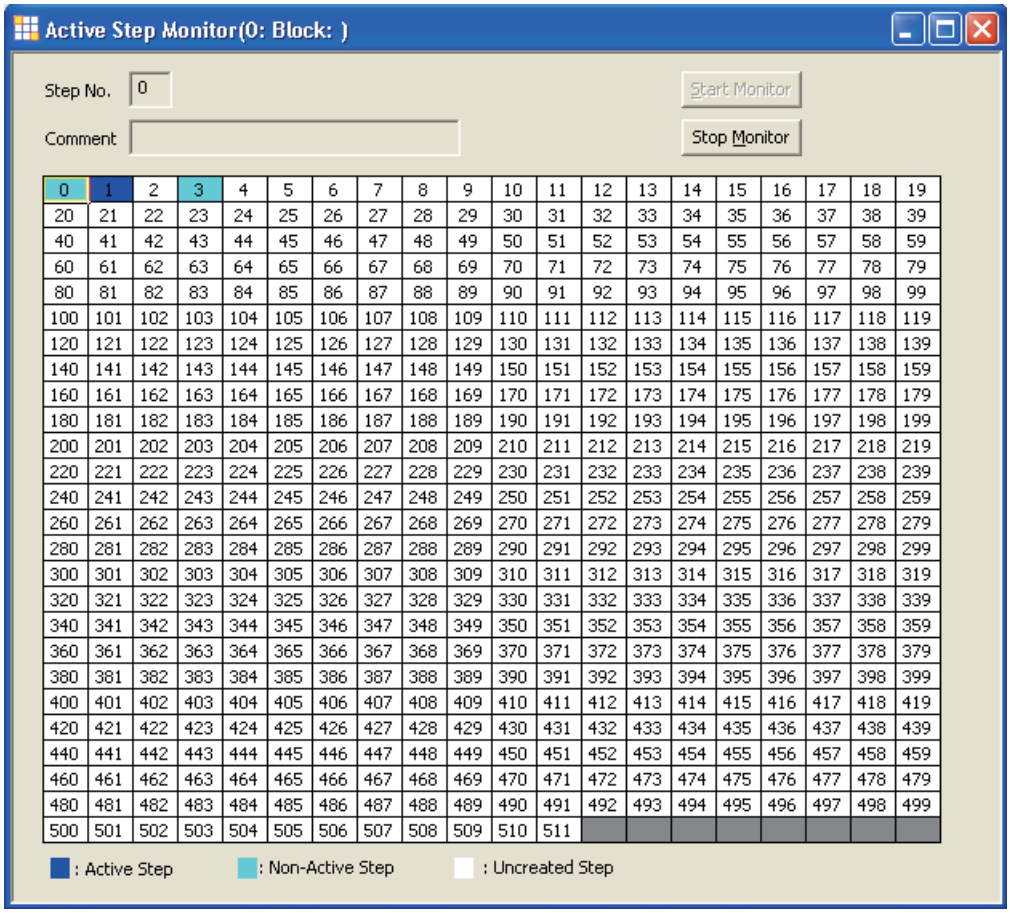
Operating procedure

- Place the cursor at the block to be monitored on the SFC All Block Batch Monitor screen, and click the [Active Step Monitor] button.

  The Active Step Monitor screen is displayed.

  If the program is monitored with the programmable controller CPU that is never set to RUN after its reset, all SFC steps are displayed as uncreated steps.

  If the program is monitored with the programmable controller CPU set to STOP, the status at the STOP setting is displayed as the monitoring result.



0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
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80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
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120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139
140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199
200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219
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460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479
480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499
500	501	502	503	504	505	506	507	508	509	510	511								

10.5.5 Monitoring SFC block list

This section explains the method for monitoring a SFC block list.

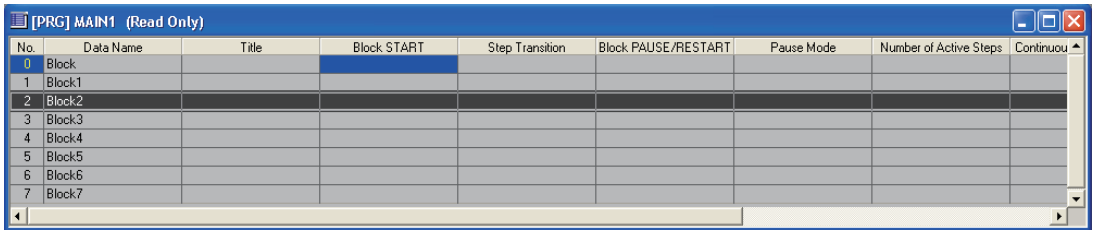
Operating procedure

1. **Select [View] ⇒ [Open SFC Block List].**

   The SFC block list is displayed.

2. **Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ( ).**

   The columns of the active block are displayed in blue.
   When the block information is set, the ON/OFF status of the block information device/label can be checked on the SFC block list.
   When the block information is not set, the program is not monitored.
   By double clicking the block column during monitoring, the SFC diagram of the specified block is displayed.



11 SETTING OPTIONS

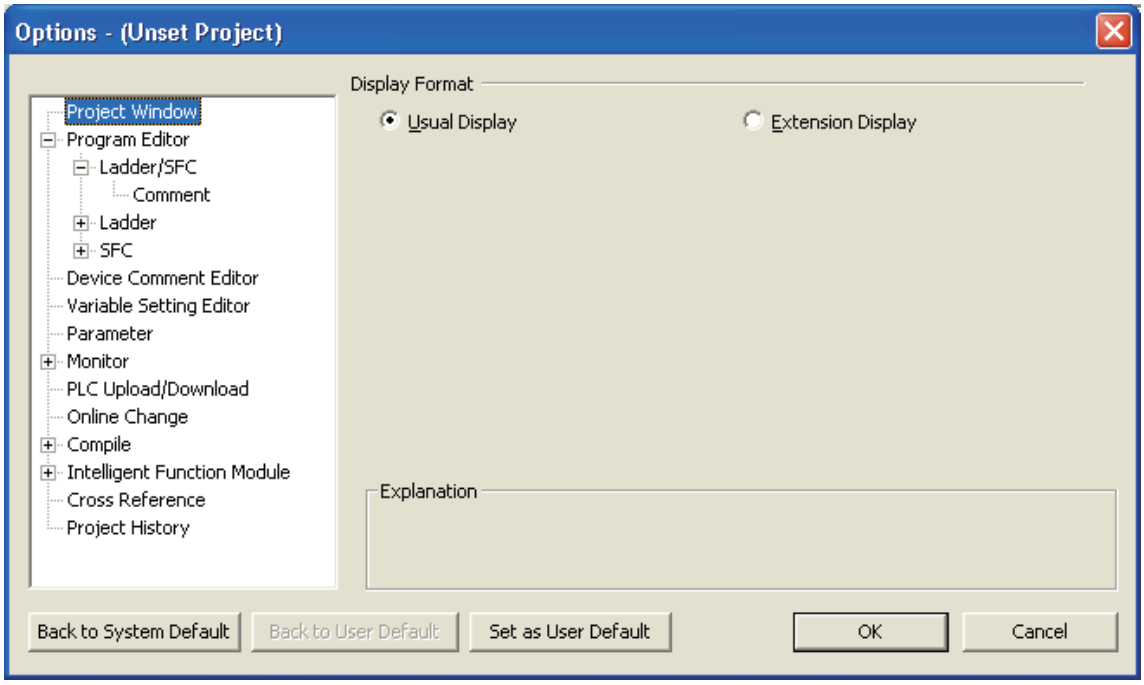
This chapter explains the functions of options for setting screen display format or detailed operations of each function.

11.1 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.

  Details of the setting items ☞ Section 11.2

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.

11.2 Option Setting List

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The following table shows the option setting items.

Table 11.2-1Option setting items (1/2)

Tree item			Item	Description	Reference
Project Window			☞ GX Works2 Version1 Operating Manual (Common)		
Program Editor	Structured Ladder/ST	Tool Hint	☞ GX Works2 Version 1 Operating Manual (Structured Project)		
	Structured Ladder	Label			
		FB/FUN			
		Guided			
	ST				
	Ladder/SFC	Comment	☞ GX Works2 Version1 Operating Manual (Common)		
	Ladder	Device	Check double coil	Select whether to check duplicated coils when entering instruction. Unconverted ladder is not the object for duplicated coil check.	Section 5.1.2
			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.	Section 2.2.4
			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.	Section 2.2.5
		Ladder Diagram	Display Connection of Ladder Diagram	Set the number of contacts to be displayed.	Section 2.2.6
			Display Instruction Help at symbol error occurrence	Select whether to automatically display Instruction Help when symbol errors occur.	Section 5.1.1
	SFC	Comment	Block List	Display device comment on SFC block list.	Section 5.2.10
			Step/Transition	Display step/transition comment on SFC editor.	Section 2.3.3
		SFC Diagram	SFC Edit Area	Set SFC edit area when create SFC. Please change by "Row of SFC" after creating a SFC.	Section 2.3.4
		Zoom	Setting of Zoom Display	Set whether to open window to each zoom or fix window and change display when open a zoom window.	Section 5.2.8
Device Comment Editor			☞ GX Works2 Version1 Operating Manual (Common)		
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.	Section 4.5.2
			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.	Section 4.5.1
Parameter			☞ GX Works2 Version1 Operating Manual (Common)		

Table 11.2-1Option setting items (2/2)

Option tree item			Item	Description	Reference
Monitor	Structured Ladder/ST		☞ GX Works2 Version 1 Operating Manual (Structured Project)		
	Ladder		Display Format of Monitoring Value	Select the display format of the monitored value in decimal or hexadecimal.	Section 10.3.1
			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.	Section 10.3.2
			Display lines of monitored current value	Select whether to display rows of the current value monitor during Ladder-monitoring.	Section 10.3.3
	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.	Section 10.5.2
			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			☞ GX Works2 Version1 Operating Manual (Common)		
Online Change			☞ GX Works2 Version1 Operating Manual (Common)		
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.	–
			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.	Section 8.9.1
			Disable Warning Codes	Register warning codes to invalidate. The registered warning code shall not be displayed in output window.	Section 8.9.2
	Structured Ladder/ST		☞ GX Works2 Version 1 Operating Manual (Structured Project)		
Intelligent Function Module			☞ GX Works2 Version1 Operating Manual (Common)		
Cross Reference		Display Format	Displays detail information on each data in selection of extension display.		(Common)
Project History		Operation Setting	Select whether to register the history after saving a project.		

APPENDIX

Appendix 1 List of Toolbars and Shortcut Keys

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This section shows the list of toolbars and shortcut keys that can be used in Simple project.

For (Common) indicated in the Reference column, refer to the following manual.
☞ GX Works2 Version1 Operating Manual (Common)

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.	(Common)
	Ctrl + O	Open	Opens an existing project.	
	Ctrl + S	Save	Saves the project.	

■ "New Object" toolbar icon

The following table shows the "New Object" toolbar icon.

Table App.1.1-2 "New Object" toolbar

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	New	Adds data to a project.	(Common)

■ "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 shortcut keys

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	Property	Displays properties of the selected data.	(Common)
	Ctrl + X	Cut	Cuts the selected data.	Section 5.1.9
	Ctrl + C	Copy	Copies the selected data.	
	Ctrl + V	Paste	Pastes the cut/copied data at the cursor position.	
	Ctrl + Z	Undo	Cancels the previous operation.	Section 5.1.10
	Ctrl + Shift + F	Find	Searches for a character string.	(Common)
	–	Write to PLC	Writes data to the programmable controller CPU.	Chapter 9
	–	Read from PLC	Reads data from the programmable controller CPU.	
	F3	Start Monitoring	Starts monitoring the window being operated.	Section 10.1
	Alt + F3	Stop Monitoring	Stops monitoring the window being operated.	
	Ctrl + Shift + B	Build	Compiles uncompiled programs.	Section 8.5
	–	Rebuild All	Compiles all programs.	Section 8.4
	–	Start/Stop Simulation	Starts/stops simulation.	(Common)

■ 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

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	Alt + 7	–	Switches the display of the project data list and the uppermost work window.	–
–	Ctrl + F4	–	Closes the window displayed in the uppermost position.	–
–	Ctrl + F6	–	Moves to the next uppermost window.	–
–	Alt + F4	Quit	Closes the project being edited and exits GX Works2.	(Common)
–	Ctrl + Shift + C	Copy	Copies data in the project.	
–	Ctrl + Shift + V	Paste	Pastes the copied data to a folder.	
–	F2	Rename	Changes the name of the selected data or library in the Project window.	
–	Ctrl + Shift + E	Add New Module	Adds the intelligent function module data to the project being edited.	
–	Ctrl + Shift + H	Replace	Replaces the character string.	
–	Ctrl + E	Cross Reference	Creates the cross reference information.	
–	Ctrl + D	Device List	Displays the device usage list.	
–	Alt + Ctrl + ↓	Down	Searches for a device or instruction in the downward direction.	
–	Alt + Ctrl + ↑	Up	Searches for a device or instruction in the upward direction.	
–	Ctrl + Shift + F4	Online Program Change	Compiles the program and executes online program change.	
–	Shift + F3	Start Watching	Starts monitoring devices/labels registered to the Watch window.	
–	Shift + Alt + F3	Stop Watching	Stops monitoring devices/labels registered to the Watch window.	

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
	Shift + Insert	New Declaration (Before)	Adds a line above the cursor position.	Section 4.5.2
	–	New Declaration (After)	Adds a line below the cursor position.	
	Ctrl + Delete	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
–	Ctrl + +	Expand Declaration	Displays the comment and remarks of the selected line in multiple lines.	Section 4.5.2
–	Ctrl + –	Collapse Declaration	Displays only the first line of the comment and remarks of the selected line.	
–	Ctrl + A	Select All	Selects all lines.	
–	Tab	–	Moves the cursor one cell to the right.	–
–	Shift + Tab	–	Moves the cursor one cell to the left.	–
–	Back Space	–	Changes the mode to the text entry mode if the cell is text entry enabled.	–
–	Shift + Space / Shift + Home / Shift + End	–	Selects cells in one line.	–
–	Select the button and press the Enter / Space / F2 key	–	The related setting screen is displayed.	–
–	Ctrl + Enter	–	Allows a line feed while entering a text in the "Comment" and "Remark" items.	Section 4.2, 4.3, 4.4, 4.6.1

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.	(Common)
	–	Display Mode/Octal	Changes display format to octal.	
	–	Display Mode/Decimal	Changes display format to decimal.	
	–	Display Mode/ Hexadecimal	Changes display format to hexadecimal.	
	–	Display Mode/Float	Changes display format to real numbers.	
	–	Display Mode/ASCII	Changes display format to ASCII.	
	–	Register/16-bit	Displays data in units of words.	
	–	Register/32-bit	Displays data in units of double words.	
	–	Register/64-bit	Displays data in units of 64 bits.	
	–	Upload Device Memory from PLC	Reads data in device memory from a programmable controller CPU.	
	–	Download Device Memory to PLC	Writes data in device memory to a programmable controller CPU.	
	–	Import from Excel File	Reads data from an Excel file.	
	–	Export to Excel File	Writes data to an Excel file.	
	Ctrl + I	Insert Device	Enters a device.	

■ 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	Insert Row	Inserts a row at the cursor position.	(Common)
–	Ctrl + G	Find Device	Searches for a device.	

Appendix 1.4 Toolbar icons for executing sampling trace

The following table shows the toolbar icons used for executing sampling trace.

Table Appendix.1.4-1 "Sampling trace" toolbar icons

Toolbar icon	Shortcut key	Corresponding menu		Description	Reference
	–	Trace Setting		Displays the Trace Setting screen.	(Common)
		Trace Start/Stop		Starts or stops sampling trace. To start sampling trace, the trace ready signal (SM800) must be ON.	
	–	Display Trace Status		Displays the Trace Data Storage Status screen.	
Completion	–	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	(Common)
	–	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 Sampling Trace screen between the timing chart (graph) and the detailed data (value).	

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
	F5	Open Contact	Inserts an open contact at the cursor position.	Section 5.1.2
	Shift + F5	Open Branch	Inserts an open branch at the cursor position.	
	F6	Close Contact	Inserts a close contact at the cursor position.	
	Shift + F6	Close Branch	Inserts a close branch at the cursor position.	
	F7	Coil	Inserts a coil at the cursor position.	
	F8	Application Instruction	Inserts an application instruction at the cursor position.	
	F9	Horizontal Line	Inserts a horizontal line at the cursor position.	Section 5.1.4
	Shift + F9	Vertical Line	Inserts a vertical line at the cursor position.	
	Ctrl + F9	Delete Horizontal Line	Deletes the horizontal line at the cursor position.	Section 5.1.6
	Ctrl + F10	Delete Vertical Line	Deletes the vertical line at the cursor position.	
	Shift + F7	Rising Pulse	Inserts a rising pulse at the cursor position.	Section 5.1.2
	Shift + F8	Falling Pulse	Inserts a falling pulse at the cursor position.	
	Alt + F7	Rising Pulse Branch	Inserts a rising pulse branch at the cursor position.	
	Alt + F8	Falling Pulse Branch	Inserts a falling pulse branch at the cursor position.	
	Alt + F5	Operation Result Rising Pulse	Inserts an operation result rising pulse at the cursor position.	
	Alt + Ctrl + F5	Operation Result Falling Pulse	Inserts an operation result falling pulse at the cursor position.	
	Alt + Ctrl + F10	Invert Operation Results	Inserts an operation result inversion at the cursor position.	
	F10	Edit Line	Inputs a line at the cursor position.	Section 5.1.4
	Alt + F9	Delete Line	Deletes the line at the cursor position.	
	–	Device Comment	Edits device comments.	Section 7.1
	–	Statement	Edits the ladder statement at the cursor position.	Section 7.2
	–	Note	Edits the note at the cursor position.	
	Ctrl + F	Find Device	Searches for a device.	Section 6.1.1
	–	Find Instruction	Searches for an instruction.	Section 6.1.2
		Address Display	Displays a device actually assigned with compilation.	Section 2.2.7

Table App.1.5-1 "Ladder" toolbar icons and shortcut keys (2/2)

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	Zoom	Changes the display magnification ratio of the ladder.	Section 2.2.2
–	Shift + Insert	Insert Row	Inserts a row at the cursor position.	Section 5.1.7
–	Shift + Delete	Delete Row	Deletes the row at the cursor position.	
–	Ctrl + Insert	Insert Column	Inserts a column at the cursor position.	
–	Ctrl + Delete	Delete Column	Deletes the column at the cursor position.	
–	F4	Ladder Conversion	Converts the program being edited.	Section 8.1
–	Ctrl + ↑ / ↓ / → / ←	–	Moves the cursor on the editing screen while the Enter Symbol screen is displayed.	Section 5.1.2
–	Ctrl + G	Jump	Displays the specified row.	Section 6.1.4
–	Ctrl + F5	Comment	Displays device comments.	Section 2.2.4
–	Ctrl + F7	Statement	Displays statements.	
–	Ctrl + F8	Note	Displays notes.	
	Ctrl + R	Back to SFC Block	Opens the SFC diagram corresponds to the program on the Zoom screen.	Section 5.2.8

■ "SFC" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys available in the SFC editor.

Table App.1.5-2 "SFC" toolbar icons and shortcut keys (1/2)

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	Shift + Insert	Insert Row	Inserts a row at the cursor position.	Section 5.2.2
–	Shift + Delete	Delete Row	Deletes a row at the cursor position.	
–	Ctrl + Insert	Insert Column	Inserts a column at the cursor position.	
–	Ctrl + Delete	Delete Column	Deletes a column at the cursor position.	
	F5	Step	Inserts at the cursor position.	
	F6	Block START Step - with END check	Inserts at the cursor position.	
	Shift + F6	Block START Step - with no END check	Inserts at the cursor position.	
	F8	Jump	Inserts at the cursor position.	
	F7	END Step	Inserts at the cursor position.	
	Shift + F5	Dummy Step	Inserts at the cursor position.	
	F5	Transition	Inserts at the cursor position.	
	F6	Selection Divergence	Inserts a selection divergence.	
	F7	Simultaneous Divergence	Inserts a simultaneous divergence.	
	F8	Selection Convergence	Inserts a selection convergence.	
	F9	Simultaneous Convergence	Inserts a simultaneous convergence.	
	Shift + F9	Vertical Line	Inserts a vertical line.	
	Ctrl + 1	Normal	Sets the step attribute to Normal.	Section 5.2.4
	Ctrl + 2	Coil Saving	Sets the step attribute to Stored Coil.	
	Ctrl + 3	Action Saving - with no transition check	Sets the step attribute to Stored Operation (SE).	
	Ctrl + 4	Action Saving - with transition check	Sets the step attribute to Stored Operation (ST).	
	Ctrl + 5	Reset	Resets the step attribute.	
	Alt + F5	Vertical Line (Draw Line)	Inserts at the cursor position.	Section 5.2.2
	Alt + F7	Selection Divergence (Draw Line)	Inserts at the cursor position.	
	Alt + F8	Simultaneous Divergence (Draw Line)	Inserts at the cursor position.	
	Alt + F9	Selection Convergence (Draw Line)	Inserts at the cursor position.	
	Alt + F10	Simultaneous Convergence (Draw Line)	Inserts at the cursor position.	
	Ctrl + F9	Delete Line	Deletes a line at the cursor position.	Section 5.2.3
	Alt + S	SFC Step/Edit Step Comment	Edits the SFC step/transition comments.	Section 7.6

Table App.1.5-2 "SFC" toolbar icons and shortcut keys (2/2)

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	SFC Step No. Sort	Sorts the SFC block step numbers.	Section 5.2.6
	–	SFC All Block Batch Monitor	Batch monitors all blocks in the SFC program.	Section 10.5.4
	–	SFC Auto Scroll Monitor	Scrolls the screen to display active steps automatically when they are out of the screen during monitoring.	Section 10.5.1
	–	Zoom	Changes the display magnification ratio of the ladder.	Section 2.3.2
–	Alt + Ctrl + F4	Build All SFC Program	Converts all SFC programs in the project.	Section 8.2
–	Ctrl + F5	SFC Step/ Transition Comment	Displays the SFC step/transition comments.	Section 2.3.3
–	Ctrl + L / Ctrl + double click	Open Step/Transition	Displays the Zoom screen or the start destination block.	Section 5.2.8
–	Space	–	Displays the start destination block.	
–	Ctrl + R	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.1.5-3 SFC block list shortcut keys

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	Ctrl + G	Jump	Jumps to the specified block number/data name.	Section 6.2.1
–	Numeric key	–	Jumps to the selected block number.	
–	Alt + Ctrl + F4	Build All SFC Program	Converts all SFC programs in the project.	Section 8.2
–	Ctrl + F5	SFC Block List Comment	Displays comments of the SFC block list.	Section 5.2.10

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
–	Ctrl + A	–	Selects all data on the Positioning Data and Block Start Data screens.	-

MEMO

MELSOFT

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GX Works2 Version1
Operating Manual
(Simple Project)

MODEL	GXW2-VER1-O-SP-E
MODEL CODE	13JU64
SH(NA)-080780ENG-A(0807)KWIX	

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