# MITSUBISHI ELECTRIC

MELSOFT

Engineering Software

GX Works2 Version 1
Operating Manual
(Intelligent Function Module)

-SW1DNC-GXW2-E
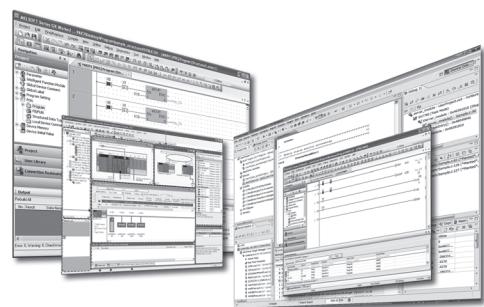
● SAFETY PRECAUTIONS ●

(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 "⚠WARNING" and "⚠CAUTION".

⚠ WARNING	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]

⚠WARNING

● 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, forced input output operation, operating status change such as RUN-STOP switching, and remote control operation) must 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 Version 1 Operating Manual (Common) before use.

● The positioning test functions of OPR, JOG, inching or positioning data for QD75/LD75 positioning module must be executed with the programmable controller set to STOP after the manual has been carefully read and the safety has been ensured. Specially when executing the function on the network system, ensure the safety thoroughly since the machinery whose operation cannot be checked by an operator may be activated. The operation failure may cause the injury or machine damage.

● The online operations performed on the intelligent function module such as data writing to flash ROM must be executed after the operations of the external devices have been carefully considered and the safety has been ensured.

● CONDITIONS OF USE FOR THE PRODUCT ●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;

i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and

ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.

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("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in;

• Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.

• Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.

• Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

REVISIONS

Print date	Manual number*1	Revision
Jan. 2010	SH(NA)-080921ENG-A	First edition
Apr. 2010	SH(NA)-080921ENG-B	**Model Addition** Q50UDEH, Q100UDEH, LJ72GF15-T2 **Addition** Section 1.3, Section 2.1.3, Section 2.1.4, Section 2.1.9, Section 3.1 to Section 3.6, Section 3.8.4, Section 3.8.5, Appendix 2, Appendix 3 **Correction** SAFETY PRECAUTIONS, MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.4, Section 2.1, Section 2.1.1, Section 2.1.6, Section 2.4.1, Section 3.5.5, Appendix 1 **Modification** Section 1.3 → Section 1.4, Section 2.1.3 to Section 2.1.6 → Section 2.1.5 to Section 2.1.8, Section 3.1 → Section 3.7 **Deletion** Section 2.5 to Section 2.10
Sept. 2010	SH(NA)-080921ENG-C	**Addition** Section 3.1.3 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 1.4.2, Section 2.1.7, Section 2.4.1, Section 2.4.2, Section 3.1.2, Section 3.5.1, Section 3.5.2, Section 3.5.3, Section 3.5.5, Section 3.7.1, Appendix 2 **Modification** Section 3.1.1 → Section 3.1.2, Section 3.1.2 → Section 3.1.1
Jan. 2011	SH(NA)-080921ENG-D	**Addition** Section 3.5.1, Section 4.6.6, Section 4.6.7 **Correction** Purpose of this manual, Section 1.3, Section 1.4.1, Section 1.4.6, Section 2.1.2, Section 2.1.4, Section 2.1.7, Section 2.4, Section 3.6.1, Section 4.1, Section 4.5.1, Section 4.6.1, Section 4.6.2, Section 4.7.2, Appendix 1.1, Appendix 1.2, Appendix 2 **Modification** Section 3.5.1 to Section 3.5.6 → Section 3.5.2 to Section 3.5.7
Mar. 2011	SH(NA)-080921ENG-E	**Addition** Section 1.4.12 **Correction** Purpose of this manual, Section 1.3, Section 2.1.7
Jul. 2011	SH(NA)-080921ENG-F	**Model Addition** L02-P, L26-PBT **Addition** Section 3.3.2 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.2, Section 1.3, Section 1.4.4, Section 2.1.2, Section 2.1.7, Section 2.1.9, Section 3.5.6, Section 3.6.1, Section 4.2, Appendix 1.1
Sept. 2011	SH(NA)-080921ENG-G	**Addition** Section 3.5.7 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.2, Section 1.3, Section 1.4.4, Section 1.4.6, Section 2.1.1, Section 2.1.7, Section 3.3.2, Section 3.5.8, Section 4.7.2, Appendix 3 **Modification** Section 3.5.7 → Section 3.5.8
Nov. 2011	SH(NA)-080921ENG-H	**Addition** Section 3.3.3 **Correction** MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 1.4.4, Section 2.1.1, Section 2.1.4, Section 2.1.7

Print date	Manual number[*1]	Revision
Jan. 2012	SH(NA)-080921ENG-I	**Addition** Section 3.5.8 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 1.4.6, Section 2.1.4, Section 2.1.7, Section 3.1.1, Section 3.5.9 **Modification** Section 3.5.8 → Section 3.5.9
May 2012	SH(NA)-080921ENG-J	**Model Addition** Q02PH, Q06PH, Q12PH, Q12PRH, Q25PH, Q25PRH **Addition** Section 3.1.4 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.2, Section 1.3, Section 1.4.2, Section 2.1.1, Section 2.1.7, Section 3.1.1, Appendix 1.1
Sept. 2012	SH(NA)-080921ENG-K	**Addition** Section 1.4.13 **Correction** Section 1.3, Section 2.1.1 Section 2.1.7 Section 2.4.1
Feb. 2013	SH(NA)-080921ENG-L	**Model Addition** Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV, L02S, L06, L26 **Addition** Section 1.4.13, Section 3.8 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 1.4.1, Section 1.4.2, Section 1.4.3, Section 1.4.4, Section 1.4.5, Section 1.4.6, Section 1.4.7, Section 1.4.8, Section 1.4.9, Section 1.4.10, Section 1.4.11, Section 1.4.12, Section 1.4.14, Section 2.1.7, Section 2.4.1, Section 3.1.4, Section 3.5, Section 3.5.2, Section 3.5.9, Section 4.2, Section 4.7.2 **Modification** Section 1.4.13 → Section 1.4.14
May 2013	SH(NA)-080921ENG-M	**Model Addition** L02S-P, L06-P, L26-P, FX3S **Addition** Section 3.8.6, Section 4.1.1 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 1.4.1, Section 1.4.9, Section 2.1.7, Section 3.1.4, Section 3.5.3, Section 3.5.4, Section 3.5.6, Section 3.8.1, Section 3.8.2, Chapter 4, Section 4.1.2, Section 4.2, Section 4.3, Section 4.5.2, Section 4.6.3, Section 4.7, Section 4.7.2, Section 4.8, Section 4.8.1, Section 4.9
Sept. 2013	SH(NA)-080921ENG-N	**Correction** MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 2.4.1, Section 3.8.3
Dec. 2013	SH(NA)-080921ENG-O	**Correction** Section 1.1, Section 1.3, Section 1.4.1, Section 1.4.2, Section 1.4.3, Section 1.4.4, Section 1.4.5, Section 1.4.6, Section 1.4.7, Section 1.4.8, Section 1.4.9, Section 1.4.10, Section 1.4.11, Section 1.4.12, Section 1.4.13, Section 1.4.14, Section 2.1, Section 2.1.1, Section 2.1.6, Section 2.1.7, Section 3.8.1, Section, Section 4.1, Section 4.1.1, Section 4.1.2, Section 4.3, Section 4.5.2, Section 4.6.3, Section 4.7, Section 4.7.2, Section 4.8.1, Section 4.9

Print date	Manual number[*1]	Revision
Mar. 2014	SH(NA)-080921ENG-P	**Addition** 　Section 1.4.8, Section 1.4.15, Section 3.9 **Correction** 　Section 1.2, Section 2.1, Section 4.5, Section 4.8.1 **Modification** 　Section 1.4.8 to Section 1.4.13 → Section 1.4.9 to Section 1.4.14, 　Section 1.4.14 → Section 1.4.16
Jun. 2014	SH(NA)-080921ENG-Q	**Addition** 　Section 1.4.17 **Correction** 　Section 1.3, Section 1.4.1, Section 2.1.7, Section 4.1, Section 4.7, Section 4.7.2
Sept. 2014	SH(NA)-080921ENG-R	**Correction** 　Section 3.5.1, Section 3.5.9, Appendix 2, Appendix 3
Dec. 2014	SH(NA)-080921ENG-S	**Addition** 　Section 4.5.3 **Correction** 　Section 4.1.2, Section 4.5.3, Section 4.8.1, Section 4.8.2 **Modification** 　Section 4.5.3 to Section 4.5.4 → Section 4.5.4 to Section 4.5.5
Jun. 2015	SH(NA)-080921ENG-T	**Addition** 　Section 3.1.5, Section 3.1.6, Section 3.2.2 **Correction** 　Section 1.3, Section 1.4.2, Section 1.4.3, Section 2.1.2, Section 2.1.7, Section 2.4.1
Dec. 2015	SH(NA)-080921ENG-U	**Correction** 　GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 2.1.7
Jun. 2016	SH(NA)-080921ENG-V	**Correction** 　GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 2.1.7

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

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INTRODUCTION

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

CONTENTS

1 OVERVIEW

2 COMMON OPERATIONS FOR INTELLIGENT FUNCTION MODULES

3 OPERATING INTELLIGENT FUNCTION MODULES

4   PREDEFINED PROTOCOL SUPPORT FUNCTION

APPENDIX

INDEX

■ MANUALS

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

● **Related manuals**

The manuals related to this product are shown below.
Refer to the following tables when ordering required manuals.

1) Operation of GX Works2

Manual name	Manual number (Model code)
GX Works2 Version 1 Operating Manual (Common) Explains the system configuration of GX Works2 and the functions common to Simple project and Structured project such as parameter setting, operation method for the online function. (Sold separately)	SH-080779ENG (13JU63)
GX Works2 Version 1 Operating Manual (Simple Project) Explains methods for such as creating and monitoring programs in Simple project of GX Works2. (Sold separately)	SH-080780ENG (13JU64)
GX Works2 Version 1 Operating Manual (Simple Project, Function Block) Explains methods for such as creating function blocks, pasting function blocks to sequence programs, and operating FB library in Simple project of GX Works2.　(Sold separately)	SH-080984ENG (13JU72)
GX Works2 Version 1 Operating Manual (Structured Project) Explains methods for 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 methods for 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 methods for 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)
MELSEC-Q/L/F 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)
MELSEC-Q/L Structured Programming Manual (Common Instructions) Explains the specifications and functions of common instructions such as sequence instructions, basic instructions, and application instructions, that can be used in structured programs.　(Sold separately)	SH-080783ENG (13JW07)
MELSEC-Q/L 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)
MELSEC-Q/L Structured Programming Manual (Special Instructions) Explains the specifications and functions of special instructions such as module dedicated instruction, PID control instruction, and built-in I/O function dedicated instruction, that can be used in structured programs.　(Sold separately)	SH-080785ENG (13JW09)
FXCPU Structured Programming Manual [Device & Common] Explains the devices and parameters provided in GX Works2 for structured programming. (Sold separately)	JY997D26001 (09R925)
FXCPU Structured Programming Manual [Basic & Applied Instruction] Explains the sequence instructions provided in GX Works2 for structured programming. (Sold separately)	JY997D34701 (09R926)
FXCPU Structured Programming Manual [Application Functions] Explains the application functions provided in GX Works2 for structured programming. (Sold separately)	JY997D34801 (09R927)

3) Operation of iQ Works

Manual name	Manual number (Model code)
Let's start iQ Works Version 2 Explains fundamental methods for such as managing the system using MELSOFT Navigator and using system labels for users inexperienced with GX Works2. (Sold separately)	SH-081261ENG (13JZ79)

4) iQ Sensor Solution

Manual name	Manual number (Model code)
iQ Sensor Solution Reference Manual Explains the operation methods for online functions. (Sold separately)	SH-081133ENG (13JV28)

5) User's manual of each intelligent function module

Point

The Operating Manuals are included on the CD-ROM of the software package in a PDF file format. 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 operation related to the intelligent function modules using the functions supported by GX Works2.
Manuals for reference are listed in the following table according to their purpose.
For information such as the content and number of each manual, refer to the list of 'Related manuals'.

1) Installation of GX Works2 and USB driver

Purpose	GX Works2 Installation Instructions	GX Works2 Version 1 Operating Manual
		Common
Learning the operating environment and installation method	Details	
Learning a USB driver installation method		Details

2) Operation of GX Works2

Purpose	GX Works2 Beginner's Manual		GX Works2 Version 1 Operating Manual				
	Simple Project	**Structured Project**	**Common**	**Simple Project**		**Structured Project**	**Intelligent Function Module**
					Function Block		
Learning all functions of GX Works2			Outline				
Learning the project types and available languages in GX Works2			Outline				
Learning the basic operations and operating procedures when creating a simple project for the first time	Details						
Learning the basic operations and operating procedures when creating a structured project for the first time		Details					
Learning the operations of available functions regardless of project type.			Details				
Learning the functions and operation methods for programming			Outline	Details		Details	
Learning the operations and operating procedures when creating function blocks (FB) in Simple project.					Details		
Learning data setting methods for intelligent function module							Details

3) Operations in each programming language
For details of instructions used in each programming language, refer to the section 4 and the section 5 on the following pages.

Purpose		GX Works2 Beginner's Manual		GX Works2 Version 1 Operating Manual	
		Simple Project	Structured Project	Simple Project	Structured Project
Simple Project	Ladder Diagram	Outline		Details	
	Sequential Function Chart	Outline *1		Details	
	Structured Text		Outline		Details
Structured Project	Ladder Diagram	Outline		Details	
	Sequential Function Chart	Outline *1		Details	
	Structured Ladder /FBD		Outline		Details
	Structured Text		Outline		Details

*1 :   MELSAP3 and FX series SFC only

4) Details of instructions in each programming language (for QCPU (Q mode)/LCPU)

Purpose		MELSEC-Q/L/F Structured Programming Manual	MELSEC-Q/L Structured Programming Manual			MELSEC- Q/L Programming Manual	MELSEC-Q/L/QnA Programming Manual		Manual for module to be used
		Fundamentals	Common Instructions	Special Instructions	Application Functions	Common Instruction	PID Control Instructions	SFC	–
All languages	Learning details of programmable controller CPU error codes, special relays, and special registers					Details			
Using Ladder Diagram	Learning the types and details of common instructions					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		
Using Sequential Function Chart	Learning details of specifications, functions, and instructions of SFC (MELSAP3)							Details	
Using Structured Ladder/ FBD or Structured Text	Learning the fundamentals for creating a structured program	Details							
	Learning the types and details of common instructions		Details						
	Learning the types and details of instructions for intelligent function modules			Outline					Details
	Learning the types and details of instructions for network modules			Outline					Details
	Learning the types and details of instructions for the PID control function			Outline			Details		
	Learning the types and details of application functions				Details				

5) Details of instructions in each programming language (for FXCPU)

Purpose		MELSEC-Q/L/F Structured Programming Manual	FXCPU Structured Programming Manual			FXCPU Programming Manual		
		Fundamentals	Device & Common	Basic & Applied Instruction	Application Functions	FX0,FX0S, FX0N,FX1, FXU,FX2C	FX1S,FX1N, FX2N,FX1NC, FX2NC	FX3S,FX3G, FX3U,FX3GC, FX3UC
Using Ladder Diagram	Learning the types and details of basic/ application instructions, descriptions of devices and parameters					Details	Details	Details
Using Sequential Function Chart	Learning details of specifications, functions, and instructions of SFC					Details	Details	Details
Using Structured Ladder/ FBD or Structured Text	Learning the fundamentals for creating a structured program	Details						
	Learning the descriptions of devices, parameters, and error codes		Details					
	Learning the types and details of sequence instructions			Details				
	Learning the types and details of application instructions				Details			

● **How to read this manual**

Screen display

Describes the screen display procedure. Follow the ⇒ and select [(menu)] to open the screen.
*Screen display may differ depending on the CPU type.

Chapter heading

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

Display contents

Describes the display contents on the screen.

Operating procedure

Describes the operating procedure of the function.

Section title

Clarifies the section of currently open page.

2.4 Monitoring Intelligent Function Modules

This section explains a method for monitoring input/output signals and buffer memory of an intelligent function module.
For QD75/LD75 positioning module, this function is used to debug a program such as ladder. For checking an operation of QD75/LD75 positioning module or debugging, use the positioning monitor.
(☞ Section 3.5.1)

2.4.1 Registering and monitoring intelligent function modules

Register and monitor module information of an intelligent function module.

Screen display

Select [View] ⇒[Docking Window] ⇒[Intelligent Function Module Monitor] ⇒[Intelligent Function Module Monitor 1] to [Intelligent Function Module Monitor 10].

Display contents

Item	Description
Item	Display the name of the module information. When "Data Type" is 'Detail Dialog' ( )/'Error Code' or 'Warning Code' ( ), an icon is displayed at the head of each item.
Current value	Display the current value of the module information. Display character strings such as ON/OFF.
Device	Display the device assigned to the module information.
Data Type	Display the data type of the module information. For 'Detail Dialog'/'Error Code'/'Warning Code', details of each item can be confirmed. For details, refer to the Point in this section.

Operating procedure

1. **Register the intelligent function module to be monitored.**

For the registration method, refer to Section 2.4.2.

2. **Select [Online] ⇒[Watch] ⇒[Start Watching].**

The current values of the registered intelligent function module are displayed in the window.

Screen button

Describes the buttons on the screen.

Reference location

☞ leads to the reference location and reference manual.

Screen button

● Change Type
Changes the type of the packet element. (☞ Section 4.7.3)

● Add New
Adds a new packet element. (☞ Section 4.7.1)

● Copy
Copies the packet element at the cursor position.

● Paste
Pastes the copied packet element to the row next to the cursor position.

● Delete
Deletes the packet element at the cursor position.

■ Display examples of element settings

Element type	Display content	Display example
	value (ASCII string) with	"TEXT"(4Byte)

This manual also uses the following columns:

Point

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

Restrictions

This indicates 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.
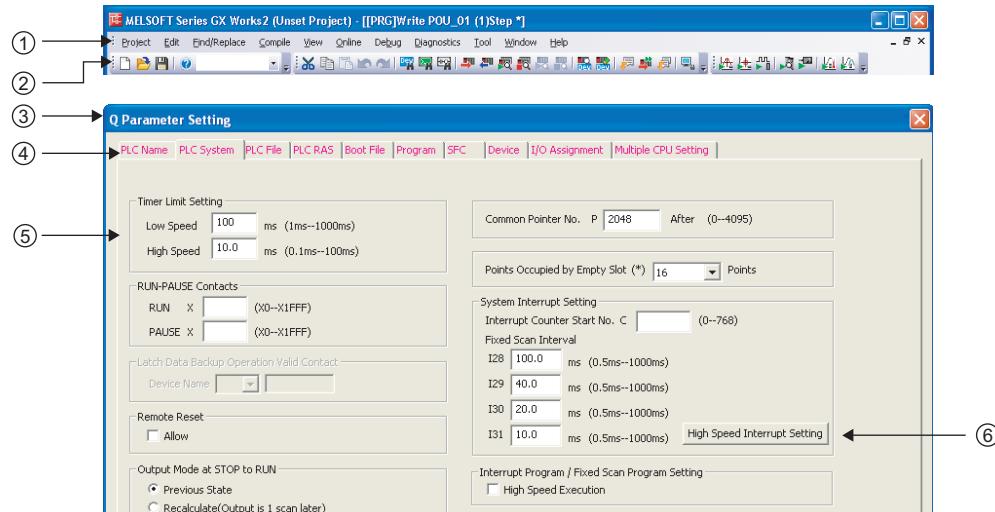
No.	Symbol	Description	Example
①	[　]	Menu name on a menu bar	[Project]
②	📄	Toolbar icon	🔳
③	(Underline)	Screen name	Q Parameter Setting screen
④	<<　>>	Tab name on a screen	<<PLC System>>
⑤	"　"	Item name on a screen	"Timer Limit Setting"
⑥	▭	Button on a screen	High Speed Interrupt Setting button
−	▭	Keyboard key	Ctrl

■ GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL

The following are the generic terms/abbreviations of such as software packages and programmable controller CPUs used in this manual.

Generic term and abbreviation		Description
GX Works2		Generic product name for SWnDNC-GXW2-E (n: version)
Existing application		–
	GX Developer	Generic product name for SWnD5C-GPPW-E, SWnD5C-GPPW-EA, SWnD5C-GPPW-EV, and SWnD5C-GPPW-EVA (n: version)
	GX IEC Developer	Product name for SWnD5C-MEDOC3 (n: version)
	GX Simulator	Generic product name for SWnD5C-LLT-E, SWnD5C-LLT-EA, SWnD5C-LLT-EV, and SWnD5C-LLTEVA (n: version)
	GX Configurator	Generic product name for GX Configurator-AD/DA/SC/CT/TC/TI/FL/PT/AS/QP
MELSOFT Navigator		Product name for the integrated development environment included in SWnDNC-IQWK (MELSOFT iQ Works) (n: version)
iQ Works		Abbreviation for MELSOFT iQ Works
Personal computer		Generic term for personal computer on which Windows® operates
Basic model QCPU		Generic term for Q00J, Q00, and Q01
High Performance model QCPU		Generic term for Q02, Q02H, Q06H, Q12H, and Q25H
Process CPU		Generic term for Q02PH, Q06PH, Q12PH, and Q25PH
Redundant CPU		Generic term for Q12PRH and Q25PRH
Universal model QCPU		Generic term for Q00UJ, Q00U, Q01U, Q02U, Q03UD, Q03UDE, Q03UDV, Q04UDH, Q04UDEH, Q04UDV, Q06UDH, Q06UDEH, Q06UDV, Q10UDH, Q10UDEH, Q13UDH, Q13UDEH, Q13UDV, Q20UDH, Q20UDEH, Q26UDH, Q26UDEH, Q26UDV, Q50UDEH, and Q100UDEH
High-speed Universal model QCPU		Generic term for Q03UDV, Q04UDV, Q06UDV, Q13UDV, and Q26UDV
QCPU (Q mode)		Generic term for Basic model QCPU, High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU
LCPU		Generic term for L02S, L02S-P, L02, L02-P, L06, L06-P, L26, L26-P, L26-BT, and L26-PBT
FXCPU		Generic term for FX0S, FX0, FX0N, FX1, FX1S, FX1N ,FX1NC, FXU, FX2C, FX2N, FX2NC, FX3S, FX3G, FX3GC, FX3U, and FX3UC
CPU module		Generic term for QCPU (Q mode), LCPU, and FXCPU
CC IE Field head module		Generic term for LJ72GF15-T2
SSCNET III/H head module		Generic term for LJ72MS15
Communication head module		Generic term for CC IE Field head module and SSCNET III/H head module
QJ72LP25		Generic term for QJ72LP25-25 and QJ72LP25G
Remote I/O module		Generic term for QJ72LP25 and QJ72BR15
A/D converter module		Generic term for Q64AD, Q68ADV, Q68ADI, Q64AD-GH, Q62AD-DGH, Q68AD-G, Q66AD-DG, Q64ADH, Q64AD2DA, L60AD4, L60AD4-2GH, L60ADVL8, L60ADIL8, and L60AD2DA2
D/A converter module		Generic term for Q62DAN, Q64DAN, Q68DAVN, Q68DAIN, Q62DA, Q64DA, Q68DAV, Q68DAI, Q62DA-FG, Q66DA-G, Q64DAH, Q64AD2DA, Q61LD, Q68CT, L60DA4, L60DAVL8, L60DAIL8, and L60AD2DA2
QD75M/QD75MH		Generic term for QD75M1, QD75M2, QD75M4, QD75MH1, QD75MH2, and QD75MH4
QD75 positioning module		Generic term for QD75P1, QD75P2, QD75P4, QD75P1N, QD75P2N, QD75P4N, QD75D1, QD75D2, QD75D4, QD75D1N, QD75D2N, QD75D4N, QD75M1, QD75M2, QD75M4, QD75MH1, QD75MH2, and QD75MH4

Generic term and abbreviation	Description
LD75 positioning module	Generic term for LD75P1, LD75P2, LD75P4, LD75D1, LD75D2, and LD75D4
QD75/LD75 positioning module	Generic term for QD75 positioning module and LD75 positioning module
Serial communication module	Generic term for QJ71C24, QJ71C24-R2, QJ71C24N, QJ71C24N-R2, QJ71C24N-R4, LJ71C24, and LJ71C24-R2
Simple motion module	Generic term for QD77MS2, QD77MS4, QD77MS16, QD77GF4, QD77GF8, QD77GF16, LD77MS2, LD77MS4, LD77MS16, LD77MH4, and LD77MH16
AnyWireASLINK interface module	Generic term for QJ51AW12AL, LJ51AW12AL, and FX3U-128ASL-M
Q series C24N	Generic term for QJ71C24N, QJ71C24N-R2, and QJ71C24N-R4
L series C24	Generic term for LJ71C24 and LJ71C24-R2
Common instruction	Generic term for sequence instructions, basic instructions, application instructions, data link instructions, multiple CPU dedicated instructions, and multiple CPU high-speed transmission dedicated instructions
Special instruction	Generic term for module dedicated instructions, PID control instructions, socket communication function instructions, built-in I/O function instructions, and data logging function instructions

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1 OVERVIEW

This manual describes operating methods of the intelligent function module, such as setting parameters, writing/reading data, and monitoring.
For the features and functions of GX Works2, refer to the following manual.
☞ **GX Works2 Version 1 Operating Manual (Common)**

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1.1 Overview

This manual describes operations of the intelligent function module with GX Works2.
In GX Works2, the term of special modules for FX series are included in "intelligent function module".
The operations of the intelligent function module with GX Works2 enable to easily set, monitor, and test settings and parameters, such as the intelligent function module parameters (initial setting/auto refresh) for the analog module, the system settings for the serial communication module, and the positioning data and parameters for the positioning module, without regard for the input/output signals and buffer memory.

For the detailed settings of the intelligent function module, refer to the user's manual of the module to be used.

1.2 Features of Operations of Intelligent Function Module

■ Adding intelligent function modules

By adding an intelligent function module to a project, its data such as the intelligent function module parameters (initial setting/auto refresh) can be set, monitored, and tested.
The I/O assignment information of the added intelligent function module is applied to the I/O assignment setting of the PLC parameter. Intelligent function module data can also be added from the I/O assignment setting of the PLC parameter.
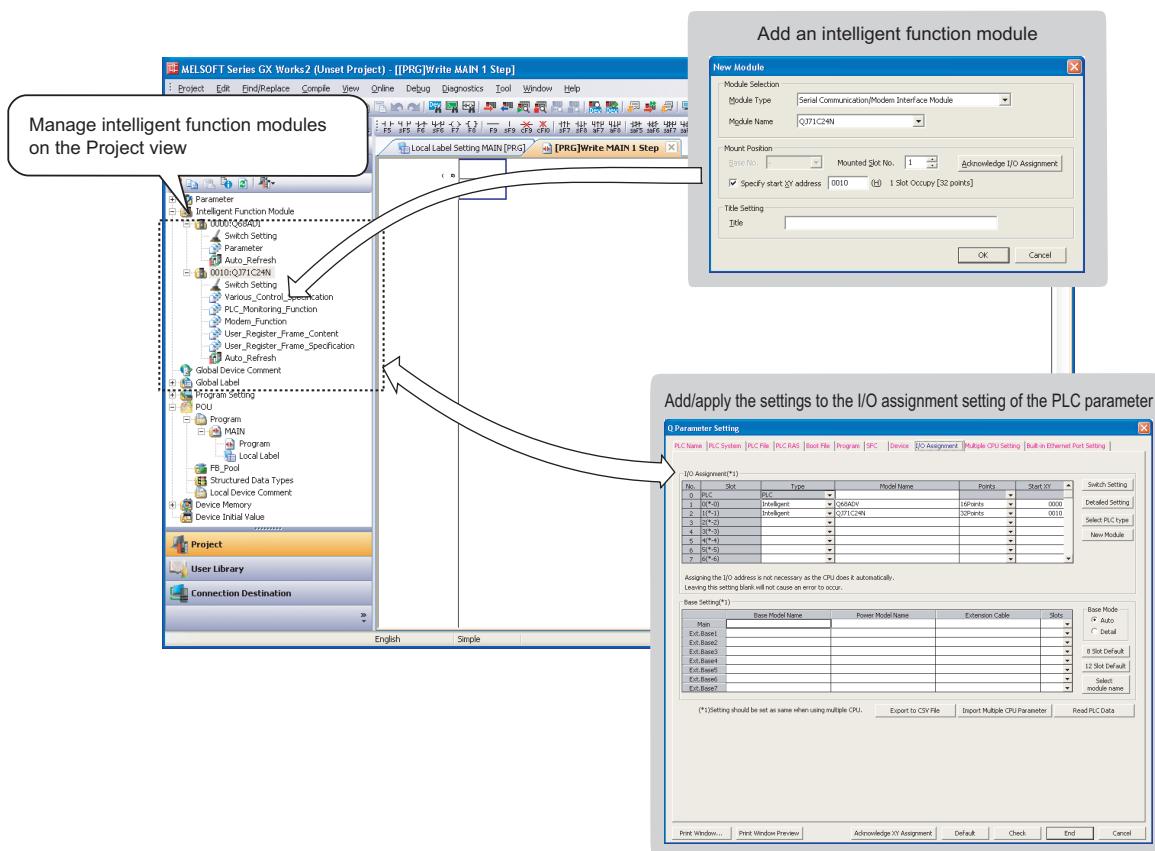
■ Setting data to intelligent function modules

● Intelligent function module parameters (initial setting/auto refresh)

The intelligent function module parameters can be set by opening the data of each intelligent function module on the Project view.

On the intelligent function module parameter list, the number of set parameters (initial setting/auto refresh) can be checked. In addition, the enabled/disabled status of the parameters can be switched. The maximum number of parameters (initial setting/auto refresh) may differ depending on the CPU module to be used. For details of the limit of the number of parameters depending on the CPU module, refer to Section 2.1.7.

<Data setting screen for the intelligent function module>   <Intelligent function module parameter list>
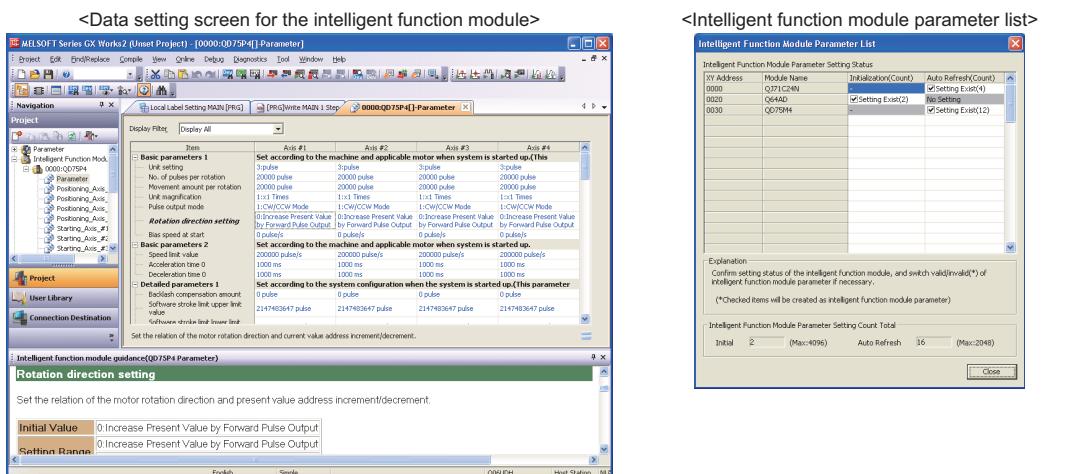
● Switch setting of intelligent function module

The switch setting of the intelligent function module can easily be performed without regard to the order of bits.

The switch setting of the intelligent function module links with the switch setting of the PLC parameter.

<Switch setting of the intelligent function module>   <Switch setting of the PLC parameter>
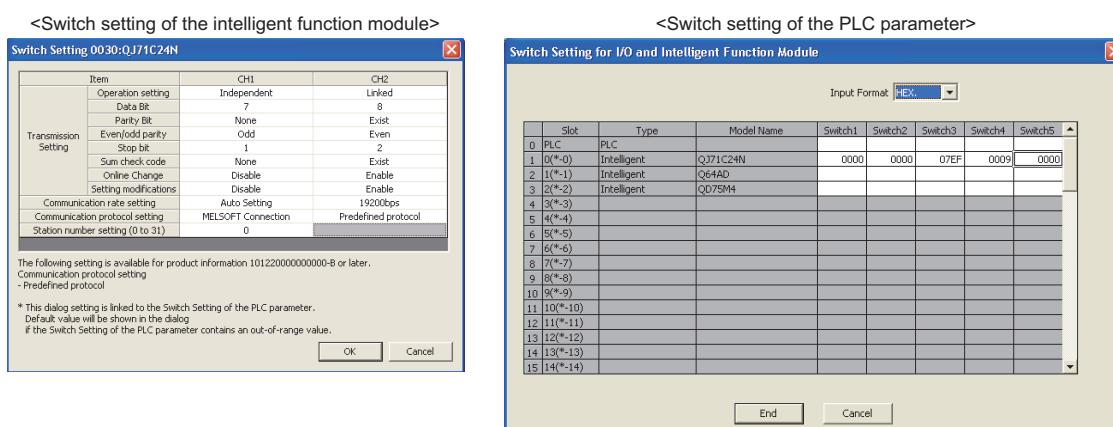
● Writing/reading data to/from intelligent function module

Using the Write to PLC and Read from PLC functions, the intelligent function module parameters can be written/read. Data can also be written/read to/from the buffer memory and flash ROM.

■ Monitoring/testing intelligent function modules

On the Intelligent Function Module Monitor windows, the input/output signals and buffer memory can be monitored on module by module basis.
The input/output signals and buffer memory can be tested by changing their current values on the Intelligent Function Module Monitor window.

<Monitoring of the serial communication module>
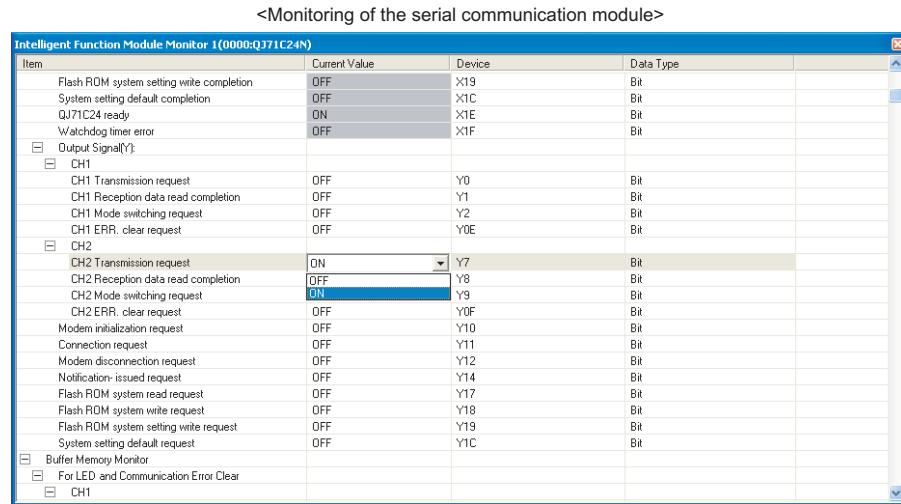
■ Intelligent function module tools

The functions such as the offset/gain setting of the analog module and temperature input module, and the circuit trace of the serial communication module can be performed using the intelligent function module tools.
For details of the intelligent function module tools, refer to Chapter 3.

<Offset/gain setting of the analog module>   <Circuit trace of the serial communication module>

■ Starting setting tool for intelligent function module (for FXCPU only)

The setting, monitoring, and testing of FXCPU can be performed by using FXCPU setting tool for intelligent function module. The set data can be saved in the format of the setting tool, and the saved data can be read as a setting data.

1.3 Intelligent Function Module Data

This section explains intelligent function module data which can be used in GX Works2.
For details of each item, refer to the user's manual of the module to be used.

Intelligent function module parameters are created when the intelligent function data are set. The intelligent function module parameters include the data for initial setting and auto refresh.
Intelligent function module parameters are not supported by FXCPU.
The following table shows the intelligent function module data and the data registered to the intelligent function module parameters as initial setting and auto refresh.
Note that the auto refresh configures the settings to automatically store the error information and status information stored in buffer memory to the specified device in the programmable controller CPU.

● **QCPU (Q mode), Remote I/O module**

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
Analog Module	Q64AD Q68ADV Q68ADI Q64AD-GH Q62AD-DGH Q68AD-G Q66AD-DG Q64ADH	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings and warning output function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	Q62DAN Q64DAN Q68DAVN Q68DAIN Q62DA Q64DA Q68DAV Q68DAI Q62DA-FG Q66DA-G Q64DAH	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings and warning output function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	Q64AD2DA	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter (A/D Conversion)	Set the basic settings, scaling function settings, shift function, input signal error detected function, and logging function.	○	–
		Parameter (D/A Conversion)	Set the basic settings, scaling function settings, and shift function.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	Q61LD	Parameter	Set the basic settings and warning output function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	Q68CT	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings and warning output function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
Temperature Input Module	Q64RD Q64RD-G Q64TD Q64TDV-GH Q68TD-G-H02 Q68TD-G-H01 Q68RD3-G	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings, warning output function settings, and scaling function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○

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Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
Temperature Control Module	Q64TCTT Q64TCTTBW Q64TCRT Q64TCRTBW Q64TCTTN Q64TCTTBWN Q64TCRTN Q64TCRTBWN	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings, control basic parameters, control detailed parameters, warning function settings, and CT settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	Q62HLC	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter (MAIN)	Set the basic setting, control basic parameters, control detailed parameters, warning function settings, and scaling settings.	○	–
		Parameter (Program Control Function)	Set the program control function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
Counter Module	QD62 QD62E QD62D	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings and counter function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	QD63P6	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings and periodic pulse counter function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	QD64D2	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings, coincidence output function, and continuous comparison function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	QD60P8-G	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings and warning output function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	QD65PD2	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
QD75 Type Positioning Module	QD75P1 QD75P2 QD75P4 QD75P1N QD75P2N QD75P4N	Parameter	Set the basic parameters 1, basic parameters 2, detailed parameters 1, detailed parameters 2, OPR basic parameters, and OPR detailed parameters.	–	–
		Positioning Axis #n Data	Set the positioning data including the pattern, control method, acceleration/deceleration time, and address for each axis. (n = number of axes)	–	–
		Starting Axis #n Block Data	Set the execution sequence and execution conditions for the positioning data. (n = number of axes)	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	QD75D1 QD75D2 QD75D4 QD75D1N QD75D2N QD75D4N	Parameter	Set the basic parameters 1, basic parameters 2, detailed parameters 1, detailed parameters 2, OPR basic parameters, and OPR detailed parameters.	–	–
		Positioning Axis #n Data	Set the positioning data including the pattern, control method, acceleration/deceleration time, and address for each axis. (n = number of axes)	–	–
		Starting Axis #n Block Data	Set the execution sequence and execution conditions for the positioning data. (n = number of axes)	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	QD75M1 QD75M2 QD75M4	Parameter	Set the basic parameters 1, basic parameters 2, detailed parameters 1, detailed parameters 2, OPR basic parameters, and OPR detailed parameters.	–	–
		Servo Parameter	Set the servo basic parameters, servo regulation parameters, servo extended parameters, and servo extended parameters 2.	–	–
		Positioning Axis #n Data	Set the positioning data including the pattern, control method, acceleration/deceleration time, and address for each axis. (n = number of axes)	–	–
		Starting Axis #n Block Data	Set the execution sequence and execution conditions for the positioning data. (n = number of axes)	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	QD75MH1 QD75MH2 QD75MH4	Parameter	Set the basic parameters 1, basic parameters 2, detailed parameters 1, detailed parameters 2, OPR basic parameters, and OPR detailed parameters.	–	–
		Servo Parameter	Set the basic setting parameters, gain/filter parameters, extension setting parameters, I/O setting parameters, extension settings, and special settings.	–	–
		Positioning Axis #n Data	Set the positioning data including the pattern, control method, acceleration/deceleration time, and address for each axis. (n = number of axes)	–	–
		Starting Axis #n Block Data	Set the execution sequence and execution conditions for the positioning data. (n = number of axes)	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○
QD70 Type Positioning Module	QD70P4 QD70P8 QD70D4 QD70D8 QD72P3C3 QD73A1	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic parameters and OPR parameters.	○	–
		Positioning Axis #n Data	Set the positioning data including the operation pattern, control method, and acceleration/deceleration time. (n = number of axes)	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
Serial Communication/ Modem Interface Module	QJ71C24N QJ71C24N-R2 QJ71C24N-R4 QJ71C24 QJ71C24-R2	Switch Setting	Set the intelligent function module switches.	–	–
		Various Control Specifications	Make system settings for transmission control, MC protocol, nonprocedural protocol, and bidirectional protocol.	–	–
		PLC Monitoring Function	Make system settings to use the programmable controller CPU monitoring function.	–	–
		Modem Function	Make system settings for data communications using the model function. (Not available for QJ71C24N-R4)	–	–
		User Register Frame Content	Set the content of user frames.	–	–
		User Register Frame Specification	Set the frame numbers for data transmission/reception.	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○
AS-i Master Module	QJ71AS92	Auto Refresh (System Common)	Set the devices for auto refresh.	–	○
		Auto Refresh (System Individual)		–	○
FL-net (OPCN-2) Interface Module	QJ71FL71-F01 QJ71FL71-T-F01 QJ71FL71-B2-F01 QJ71FL71-B5-F01 QJ71FL71 QJ71FL71-T QJ71FL71-B2 QJ71FL71-B5	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
MODBUS Interface Module	QJ71MT91 QJ71MB91	Switch Setting	Set the intelligent function module switches.	–	–
		Basic Parameter (Router Information)	Set the TCP/UDP/IP, GX Works2 connection.	○	–
		Basic Parameter (Preferred Node Specification (MODBUS/TCP settings))	Set the MODBUS/TCP.	○	–
		Automatic Communication Parameter	Set the automatic communication parameter.	○	–
		MODBUS Device Assignment Parameter	Set the MODBUS device assignment parameter.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
Simple Motion Module	QD77MS2 QD77MS4 QD77MS16 QD77GF4 QD77GF8 QD77GF16	Simple Motion Module Setting	Start the simple motion module setting tool.	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○
AnyWire ASLINK Interface Module	QJ51AW12AL	Switch Setting	Set the intelligent function module switches.	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○
		AnyWireASLINK Configuration	Set the equipment configuration of AnyWireASLINK.	–	–

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto refresh
Energy Measuring Module	QE81WH QE81WH4W	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the rate setting, the alarm monitoring function, the data acquisition clock function.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	QE84WH QE83WH4W	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter (Normal operation mode)	Set the rate setting, the alarm monitoring function, the data acquisition clock function.	○	–
		Parameter (Current measuring mode)		○	–
		Auto Refresh (Normal operation mode)	Set the devices for auto refresh.	–	○
		Auto Refresh (Current measuring mode)		–	○
	QE82LG	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the common setting, the leak current (Io) alarm monitoring function, the leak current for resistance (Ior) alarm monitoring function.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○

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● **LCPU, Communication head module**

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto Refresh
Analog Module	L60AD4 L60AD4-2GH L60ADVL8 L60ADIL8 L60DA4 L60DAVL8 L60DAIL8	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings and warning output function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
	L60AD2DA2	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter (A/D Conversion)	Set the basic settings, input signal error detected function, scaling function (A/D conversion), and logging function.	○	–
		Parameter (D/A Conversion)	Set the basic settings, warning output function, and scaling function (D/A conversion).	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
Temperature Input Module	L60RD8	Parameter	Set the basic settings, sensor compensation function, disconnection detection function, scaling function and warning output function.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
Temperature Control Module[1]	L60TCTT4 L60TCTT4BW L60TCRT4 L60TCRT4BW	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings, control basic parameters, control detailed parameters, warning function settings, and CT settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
Counter	LD62 LD62D	Switch Setting	Set the intelligent function module switches.	–	–
		Parameter	Set the basic settings and warning output function settings.	○	–
		Auto Refresh	Set the devices for auto refresh.	–	○
LD75 Type Positioning Module[1]	LD75P1 LD75P2 LD75P4 LD75D1 LD75D2 LD75D4	Parameter	Set the basic parameters 1, basic parameters 2, detailed parameters 1, detailed parameters 2, OPR basic parameters, and OPR detailed parameters.	–	–
		Positioning Axis #n Data	Set the positioning data including the pattern, control method, acceleration/deceleration time, and address for each axis. (n = number of axes)	–	–
		Starting Axis #n Block Data	Set the execution sequence and execution conditions for the positioning data. (n = number of axes)	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○
Serial Communication Module[1]	LJ71C24 LJ71C24-R2	Switch Setting	Set the intelligent function module switches.	–	–
		Various Control Specifications	Make system settings for transmission control, MC protocol, nonprocedural protocol, and bidirectional protocol.	–	–
		PLC Monitoring Function	Make system settings to use the programmable controller CPU monitoring function.	–	–
		Modem Function	Make system settings for data communications using the model function.	–	–
		User Register Frame Content	Set the content of user frames.	–	–
		User Register Frame Specification	Set the frame numbers for data transmission/reception.	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○
Simple Motion[1]	LD77MS2 LD77MS4 LD77MS16 LD77MH4 LD77MH16	Simple Motion Module Setting	Start the simple motion module setting tool.	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○

Module type	Module model	Data	Description	Intelligent function module parameter	
				Initial setting	Auto Refresh
AnyWire ASLINK Interface Module[1]	LJ51AW12AL	Switch Setting	Set the intelligent function module switches.	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○
		AnyWireASLINK Configuration	Set the equipment configuration of AnyWireASLINK.	–	–
Multiple Input Module	L60MD4-G	Parameter	Set the basic settings, input signal error detected function, conversion setting function at disconnection detection, scaling function, and warning output function.	–	–
		Auto Refresh	Set the devices for auto refresh.	–	○

*1 :   Not applicable to SSCNET III/H head module.

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1.4　List of Functions

This section shows the list of functions of GX Works2 related to the intelligent function module.
For (Common) indicated in the Reference column, refer to the following manual.
☞ **GX Works2 Version 1 Operating Manual (Common)**

1.4.1　List of functions common to intelligent function module

The following tables show the functions common to operations of the intelligent function module.

● **QCPU (Q mode), LCPU, Remote I/O module, Communication head module**

Project (common function)			Reference
Intelligent Function Module			–
	New Module	Add new intelligent function module data.	Section 2.1.1
	Delete Module	Delete intelligent function module data.	Section 2.1.5
	Property	Display properties of the intelligent function module data.	Section 2.1.6
	Intelligent Function Module Parameter List	Display a list of set/unset parameters of the intelligent function module.	Section 2.1.7
Print Window		Print the open screen.	(Common)
Print Window Preview		Display the print preview of the open screen.	
Printer Setup		Change the printer settings.	

View (common function)			Reference
Docking Window			–
	Intelligent Function Module Monitor	Display/hide the Intelligent Function Module Monitor window.	Section 2.4
	Module 1 to 10		
	Intelligent Function Module Guidance	Display/hide the Intelligent Function Module Guidance window.	Section 3.5.6
Automatic Adjustment for Height		Automatically adjust the height of intelligent function module data table and auto refresh data table.	Section 2.1.2
Automatic Adjustment for Width		Automatically adjust the width of intelligent function module data table and auto refresh data table.	

Online (common function)			Reference
Read from PLC		Read data from the programmable controller CPU.	(Common)
Write to PLC		Write data to the programmable controller CPU.	
Monitor			–
	Start Monitoring (All Windows)	Start monitoring of all open windows.	(Common)
	Stop Monitoring (All Windows)	Stop monitoring of all open windows.	
	Start Monitoring	Start monitoring of the open window.	
	Stop Monitoring	Stop monitoring of the open window.	
Watch			–
	Start Watching	Start monitoring the current values of registered devices/labels and intelligent function module.	Section 2.4
	Stop Watching	Stop monitoring the current values of registered devices/labels and intelligent function module.	

Tool (common function)		Reference
Check Intelligent Function Module Parameter		–
Check Auto Refresh Duplication	Check the duplication of devices set in the Auto refresh function and displays the result.	Section 2.1.8
Predefined Protocol Support Function		–
Serial Communication Module	Start the predefined protocol support function for the serial communication module.	Chapter 4
Ethernet Module	Start the predefined protocol support function for the Ethernet module.	
Built-in/Adapter Serial	Start the predefined protocol support function of built-in/adapter serial.	
Built-in Ethernet	Start the predefined protocol support function of built-in Ethernet.	

● **FXCPU**

Project (common function)		Reference
Intelligent Function Module		–
New Module	Add new intelligent function module data.	Section 2.1.1
Delete Module	Delete intelligent function module data.	Section 2.1.5
Property	Display properties of the intelligent function module data.	Section 2.1.6

View (common function)		Reference
Docking Window		–
Intelligent Function Module Monitor Module 1 to 10	Display/hide the Intelligent Function Module Monitor window.	Section 2.4

Online (common function)		Reference
Monitor		–
Start Monitoring (All Windows)	Start monitoring of all open windows.	(Common)
Stop Monitoring (All Windows)	Stop monitoring of all open windows.	
Start Monitoring	Start monitoring of the open window.	
Stop Monitoring	Stop monitoring of the open window.	

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1.4.2 List of functions for analog module

The following tables show the functions for analog module.

● **QCPU (Q mode), LCPU, Remote I/O module, Communication head module**

Edit (analog module)		Reference
Channel Copy	Utilize specified channel data to another channel.	Section 2.1.3
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (analog module)			Reference
Intelligent Function Module Tool			–
	Analog Module	–	–
		Offset/Gain Setting	Set an offset/gain of analog module.	Section 3.1.1
		Q61LD Two-Point Calibration Setting	Set a Q61LD two-point calibration.	Section 3.1.2
		Q61LD Default Setting	Configure the Q61LD default setting.	Section 3.1.3
		Create Wave Output Data	Create waveform output data.	Section 3.1.4
		Create Conversion Characteristics Table	Create conversion characteristics table.	Section 3.1.5
		Free Operation Function Setting	Set the operation expression data.	Section 3.1.6
Data Initialization		Initialize the set data of specified channel.	Section 2.1.4

1.4.3 List of functions for temperature input module

The following tables show the functions for temperature input module.

● **QCPU (Q mode), Remote I/O module**

Edit (temperature input module)		Reference
Channel Copy	Utilize specified channel data to another channel.	Section 2.1.3
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (temperature input module)			Reference
Intelligent Function Module Tool			–
	Temperature Input Module	–	–
		Offset/Gain Setting	Set an offset/gain of temperature input module.	Section 3.2.1
Data Initialization		Initialize the set data of specified channel.	Section 2.1.4

● **LCPU**

Edit (temperature input module)		Reference
Channel Copy	Utilize specified channel data to another channel.	Section 2.1.3
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (temperature input module)			Reference
Intelligent Function Module Tool			–
	Temperature Input Module	–	–
		Register 2-point Sensor Compensation Value	Register the 2-point sensor compensation value of the temperature input module.	Section 3.2.2
Data Initialization		Initialize the set data of specified channel.	Section 2.1.4

1.4.4   List of functions for temperature control module

The following tables show the functions for temperature control module.

● **QCPU (Q mode), LCPU, Remote I/O module**

Edit (temperature control module)		Reference
Channel Copy	Utilize specified channel data to another channel.	Section 2.1.3
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2
Setting Item Reduction Mode	Reduce the number of auto refreshes.	Section 3.3.3

Tool (temperature control module)		Reference
Intelligent Function Module Tool		–
Temperature Control Module	–	–
Auto Tuning	Execute the Auto tuning function of temperature control module.	Section 3.3.1
Sensor Correction	Execute the Sensor Correction function of the temperature control module.	Section 3.3.2
Data Initialization	Initialize the set data of specified channel.	Section 2.1.4

1.4.5   List of functions for counter module

The following tables show the functions for counter module.

● **QCPU (Q mode), LCPU, Remote I/O module, Communication head module**

Edit (counter module)		Reference
Channel Copy	Utilize specified channel data to another channel.	Section 2.1.3
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (counter module)		Reference
Intelligent Function Module Tool		–
Counter Module	–	–
Preset	Execute the Preset function of counter module.	Section 3.4.1
Data Initialization	Initialize the set data of specified channel.	Section 2.1.4

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1.4.6   List of functions for QD75/LD75 positioning module

The following tables show the functions for QD75/LD75 positioning module.

● **QCPU (Q mode), LCPU, Remote I/O module**

Project (QD75/LD75 positioning module)		Reference
Intelligent Function Module		–
Save the Positioning Module Data	Save data of the positioning module selected on the Project view to a file.	Section 3.5.7
Read from the Positioning Module Data	Read data from the positioning module and apply it to the positioning module selected on the Project view.	Section 3.5.7
Save GX Configurator-QP Data	Save the positioning module data in GX Configurator-QP format.	Section 3.5.8
Import GX Configurator-QP Data	Read the data created with GX Configurator-QP, and add a new positioning module.	Section 3.5.9

Edit for Parameter (QD75/LD75 positioning module)		Reference
Set Maximum Value	Set the maximum value to the specified parameter item.	Section 3.5.6
Set Minimum Value	Set the minimum value to the specified parameter item.	Section 3.5.6
Set Default Value	Set the default to the specified parameter item.	Section 3.5.6
Computation of Electronic Gear	Calculate the electronic gear from the data set on the parameter screen.	Section 3.5.6
Axis Copy	Utilize the specified axis data to another axis.	Section 2.1.3

Edit for Servo Parameter (QD75/LD75 positioning module)		Reference
Set Maximum Value	Set the maximum value to the specified servo parameter item.	Section 3.5.6
Set Minimum Value	Set the minimum value to the specified servo parameter item.	Section 3.5.6
Set Default Value	Set the default to the specified servo parameter item.	Section 3.5.6
Axis Copy	Utilize the specified axis data to another axis.	Section 2.1.3

Edit for Positioning Data (QD75/LD75 positioning module)		Reference
Select All	Select all items.	Section 3.5.6
Jump	Jump to the specified positioning data number.	Section 3.5.6
Initialization of Row	Initialize the row at the cursor position.	Section 3.5.6
Initialization of Column	Initialize the column at the cursor position.	Section 3.5.6
Insert Row	Add a row above the cursor position.	Section 3.5.6
Delete Row	Delete the row at the cursor position.	Section 3.5.6
Positioning Data Copy	Copy the data in the row at the cursor position.	Section 3.5.6
Positioning Data Paste	Paste the data to the row at the cursor position.	Section 3.5.6
Axis Copy	Utilize specified axis data to another axis.	Section 2.1.3
M Code Comment Edit	Edit the M code comment.	Section 3.5.6
Condition Data Edit	Edit the condition data.	Section 3.5.6

Edit for Block Starting (QD75/LD75 positioning module)		Reference
Select All	Select all items.	Section 3.5.6
Jump	Jump to the specified positioning data number.	
Initialization of Row	Initialize the row at the cursor position.	
Initialization of Column	Initialize the column at the cursor position.	
Insert Row	Add a row above the cursor position.	
Delete Row	Delete the row at the cursor position.	
Axis Copy	Utilize specified axis data to another axis.	Section 2.1.3
Block Start Copy	Utilize specified block start data to another block start data.	Section 3.5.6
Condition Data Edit	Edit the condition data.	

Edit for Auto Refresh (QD75/LD75 positioning module)		Reference
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (QD75/LD75 positioning module)			Reference
Intelligent Function Module Tool			–
	QD75/LD75 Positioning Module	–	–
		Positioning Monitor	Execute the positioning monitoring.	Section 3.5.1
		Positioning Test	Execute the positioning test.	Section 3.5.2
		Wave Trace	Execute the wave trace.	Section 3.5.3
		Location Trace	Execute the location trace.	Section 3.5.4
Data Initialization		Initialize the set data of specified axis.	Section 2.1.4
Request of Parameter Initialization/Flash ROM Write Request		Request a command to write buffer memory data of QD75/LD75 positioning module to the flash ROM.	Section 3.5.5
Offline Simulation		Simulate the waveform and location of set positioning data offline.	Section 3.5.6
Automatic Command Speed Calculation		Calculate the constant speed of traveling time between the start position and the target position.	
Automatic Sub Arc Calculation		Calculate the positioning data of circular interpolation control to form a smooth arc (curve line) from the angle position created by two continuous linear interpolation controls.	

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1.4.7 List of functions for QD70 positioning module

The following tables show the functions for QD70 positioning module.

● **QCPU (Q mode), Remote I/O module**

Edit (QD70 positioning module)		Reference
Initialization of Row	Initialize the row at the cursor position.	Section 3.5.6
Initialization of Column	Initialize the column at the cursor position.	
Axis Copy	Utilize specified axis data to another axis.	Section 2.1.3
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (QD70 positioning module)		Reference
Data Initialization	Initialize the set data of specified axis.	Section 2.1.4

1.4.8 List of functions for FX3U-20SSC-H positioning module

The following table shows the functions for FX3U-20SSC-H positioning module.

● **FXCPU**

Project (FX3U-20SSC-H positioning module)		Reference
Intelligent Function Module		–
Save/Read FX Special Module Data		–
Read new FX Special Module Data	Read a data created with the setting tool for special module (intelligent function module), and add new data.	Section 3.9
Save FX Special Module Data	Save a data of the special module (intelligent function module) selected on the Project view in the format of the setting tool.	
Read from FX Special Module Data	Read a data created with the setting tool for a special module (intelligent function module), and reflect it to the positioning module selected on the Project view.	

1.4.9 List of functions for simple motion module

The following tables show the functions for simple motion module.

● **QCPU (Q mode), LCPU, Remote I/O module**

Edit (simple motion module)		Reference
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (simple motion module)		Reference
Data Initialization	Initialize the auto refresh data of specified axis.	Section 2.1.4

1.4.10 List of functions for serial communication/modem interface module

The following tables show the functions for serial communication/modem interface module.

● **QCPU (Q mode), LCPU, Remote I/O module**

Edit (serial communication/modem interface module)		Reference
Channel Copy	Utilize specified channel data to another channel.	Section 2.1.3
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

View (serial communication/modem interface module)		Reference
String/Hexadecimal Switch Format	Switch between the string display and the hexadecimal display on the User Register Frame Content screen.	Section 2.1.2

Tool (serial communication/modem interface module)			Reference
Intelligent Function Module Tool			–
	Serial Communication Module	–	–
		Circuit Trace	Execute the circuit trace.	Section 3.7.2
Data Initialization			Initialize the set data of specified channel.	Section 2.1.4
Flash ROM Operation			Execute the flash ROM write permission/protection, module initialization, and flash ROM write command of serial communication module.	Section 3.7.4

1.4.11 List of functions for AS-i master module

The following tables show the functions for AS-i master module.

● **QCPU (Q mode), Remote I/O module**

Edit (AS-i master module)		Reference
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (AS-i master module)		Reference
Data Initialization	Initialize the set data of specified channel.	Section 2.1.4

1.4.12 List of functions for FL-net (OPCN-2) interface module

The following tables show the functions for FL-net (OPCN-2) interface module.

● **QCPU (Q mode), Remote I/O module**

Edit (FL-net (OPCN-2) interface module)		Reference
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (FL-net (OPCN-2) interface module)		Reference
Data Initialization	Initialize the set data of specified channel.	Section 2.1.4

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1.4.13 List of functions for MODBUS interface module

The following tables show the functions for MODBUS interface module.

● **QCPU (Q mode), Remote I/O module**

Edit (MODBUS interface module)		Reference
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (MODBUS interface module)		Reference
Data Initialization	Initialize the specified set data.	Section 2.1.4

1.4.14 List of functions for AnyWireASLINK interface module

The following tables show the functions for AnyWireASLINK interface module.

● **QCPU (Q mode), LCPU, Remote I/O module**

Edit (AnyWireASLINK interface module)		Reference
Auto Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (AnyWireASLINK interface module)		Reference
Data Initialization	Initialize the specified set data.	Section 2.1.4

1.4.15 List of functions for FX-ENET series

The following table shows the functions for FX-ENET series.

● **FXCPU**

Project (FX-ENET series)			Reference
Intelligent Function Module			–
	Save/Read FX Special Module Data		–
		Read new FX Special Module Data	Read a data created with the setting tool for special module (intelligent function module), and add new data.	Section 3.9
		Save FX Special Module Data	Save a data of the special module (intelligent function module) selected on the Project view in the format of the setting tool.	
		Read from FX Special Module Data	Read a data created with the setting tool for a special module (intelligent function module), and reflect it to the Ethernet module selected on the Project view.	

1.4.16 List of functions for Energy measuring module

The following tables show the functions for Energy measuring module.

● **QCPU (Q mode), Remote I/O module**

Edit (Energy measuring module)		Reference
Automatic Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (Energy measuring module)		Reference
Data Initialization	Initialize the set data of specified channel.	Section 2.1.4

1.4.17 List of functions for Multiple input module

The following tables show the functions for Multiple input module.

● **LCPU, Communication head module**

Edit (Multiple input module)		Reference
Channel Copy	Utilize specified channel data to another channel.	Section 2.1.3
Automatic Device Assignment	Assign sequential devices to the items selected for auto refresh.	Section 2.1.2

Tool (Multiple input module)		Reference
Data Initialization	Initialize the set data of specified channel.	Section 2.1.4

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MEMO

2 COMMON OPERATIONS FOR INTELLIGENT FUNCTION MODULES

This chapter explains common operations for the intelligent function modules, such as adding a new project, and setting the parameters.

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2.1 Operations of Intelligent Function Module Data

This section explains how to set the intelligent function module data.
Adding an intelligent function module to a project, the data settings (parameter and switch settings)
of the intelligent function module become available.

Restrictions

● **Data operation of intelligent function module when using FXCPU**
 When using FXCPU, intelligent function module data can be operated under the following condition.

Intelligent Function Module		Condition
Type	**Module**	
AnyWireASLINK interface module	FX3U-128ASL-M	• When any of FX3U/FX3UC or FX3G/FX3GC is selected to PLC Type of project
Positioning module	FX3U-20SSC-H	• When any of the PLC type supported by FX Configurator-FP is selected to PLC Type of project • When FX Configurator-FP version 1.70 or later is installed
Ethernet module	FX-ENET series	• When any of the PLC type supported by FX-ENET series setting tool is selected to PLC Type of project • When FX-ENET series setting tool version 1.40 or later is installed

2.1.1   Adding intelligent function module data

Add the intelligent function module data to the project being edited. The installation slot number and start XY address of the added intelligent function module are applied to the I/O assignment setting of the PLC parameter.

Screen display

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

(For QCPU (Q mode)/LCPU, a module can be added by clicking the [New Module] **button on the <<I/O Assignment>> tab of the PLC parameter.)**

< QCPU (Q mode) >

< LCPU >

Occupied I/O points information

Occupied I/O points information

< FXCPU >

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Operating procedure

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

Item	Description
Module Selection	—
Module type	Select the type of the intelligent function module to be added.
Module model	Select the model of the intelligent function module to be added.
Setting Item Reduction Mode for Auto-refresh[*1]	Select this to reduce the number of auto refreshes. (☞ Section 3.3.3)
Mount Position	—
Base No.[*2]	Specify the base number where the intelligent function module is mounted.
Module No.[*3]	Specify the module No. of the intelligent function module.
Mounted Slot No.[*4]	Set the slot number of the intelligent function module.
Specify Start XY Address[*4]	Set the start XY address of the intelligent function module.
Occupied I/O points information[*4]	For QCPU (Q mode), display the number of occupied slots and the number of occupied I/O points of the module selected for "Module Name". For LCPU, display the number of logically-occupied modules and the number of occupied I/O points of the module selected for "Module Name".
Title Setting	—
Title	Set the title. (The number of applicable characters is 32)

*1 : For temperature control modules (except for Q62HLC) only
*2 : For QCPU (Q mode) only
*3 : For FXCPU only
*4 : For QCPU (Q mode) and LCPU only

2. **Click the ⟨ OK ⟩ button.**

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

Screen button
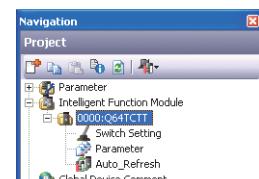
● ⟨Acknowledge I/O Assignment⟩ **(Not supported by FXCPU)**
Displays the Acknowledge I/O Assignment screen. On the Acknowledge I/O Assignment screen, the current I/O assignment settings can be checked. The mounting position for the intelligent function module to be added can also be set. The following explains how to set the mounting position.

Operation

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

2. **Click the ⟨ Setting ⟩ button.**
The selected mounting position is set on the New Module screen.

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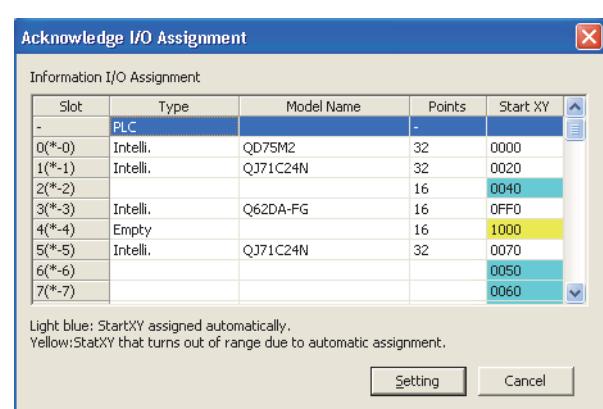
Point

● **Switch setting**
The switch setting of the intelligent function module is applied to "Switch Setting" on the <<I/O Assignment>> tab of the PLC parameter.

● **Changing the positioning data display range**
The display range of the positioning data can be changed by the following setting.
Select [Tool] ⇒ [Options] ⇒ "Intelligent Function Module" ⇒ "QD75/LD75 Type Positioning", and set the setting for "Display Specification of Positioning Data".

If the display range is enlarged by setting "Display Specification of Positioning Data", it takes longer time to display the positioning data editing window.
When positioning data No. 101 and above are not necessary, select "Data No. 1 to 100".

● **Display when mismatches of data assignment exist between PLC parameters and intelligent function module data**
When mismatches of data assignment exist between the I/O assignment setting of the PLC parameter and the intelligent function module data, the icon on the Project view is displayed as shown below.
Even after a module is added by clicking the ⬚ New Module ⬚ button on the <<I/O Assignment>> tab of the PLC parameter, the icon on the Project view is displayed as shown below by clicking the ⬚ Cancel ⬚ button on the <<I/O Assignment>> tab, and the I/O assignment setting becomes incorrect status.

<Normal display>   <Duplicate display>
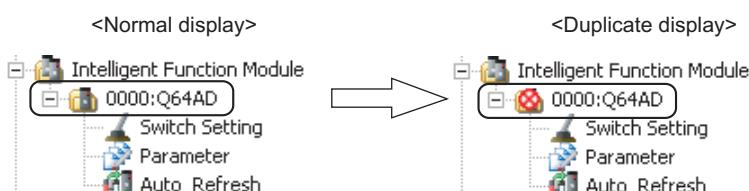
If the added module is not necessary, delete it from the Project view.

● **Opening project data which contain modules not supported by version of GX Works2 being used**
When project data which contain an intelligent function module not supported by version of GX Works2 being used are opened, "Reserved Module" is displayed on the tree of the Project view.
It cannot be edited, displayed, or printed, however, it can be saved in the project. In addition, its intelligent function module parameters can be written to the programmable controller CPU.
(Example of display on the Project view)
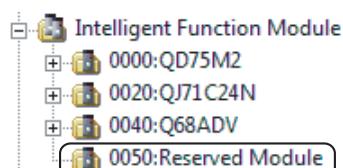
● **Adding modules to project data that contain modules not supported by version of GX Works2 being used**
A module not supported by version of GX Works2 being used is regarded as the one uses single slot, even if it uses multiple slots. Therefore, the setting of I/O assignment may be duplicated when a module is added to project data where unsupported modules exist.
In this case, set the I/O assignment settings on the <<I/O Assignment>> tab of PLC parameter again.

2.1.2   Setting intelligent function module data

Edit the intelligent function module data.

Screen display

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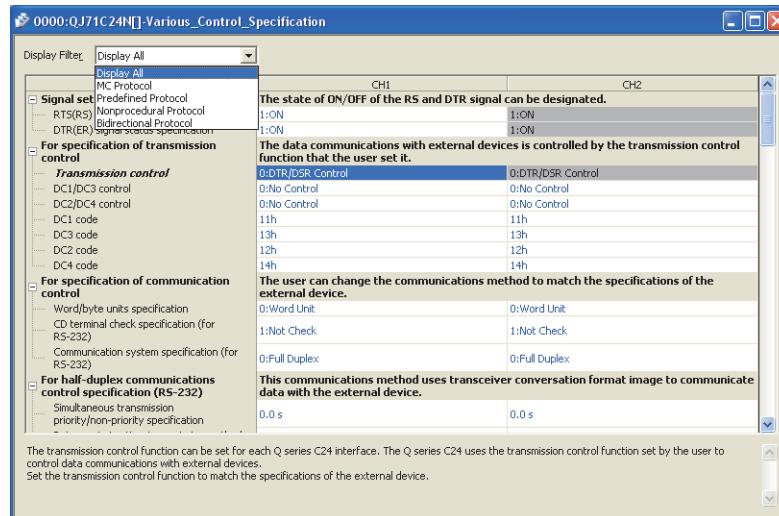
Operating procedure

- **Set the items on the screen.**

  For details of the setting items, refer to the manual of each intelligent function module.

  - Detailed explanation of a setting item is displayed at the bottom of the screen when it is selected. For LD75 positioning module, a detailed explanation is displayed on the Intelligent Function Module Guidance window. (☞ Section 3.5.6)

  - For a multiple-choice item, the available choices can be displayed on a combo box by double-clicking the cell.

  - For a text input item, the cell becomes editable by double-clicking it.

  - "Display Filter" filters the settings so that only those related to the selected item are displayed.

  - For Q64TCTTN/Q64TCTTBWN/Q64TCRTN/Q64TCRTBWN/L60TCTT4/L60TCTT4BW/ L60TCRT4/L60TCRT4BW, "Control Mode" set on the Switch Setting is displayed.

    Click the Clear Value for Gray Cells button to set the unnecessary items for the mode set on the Switch Setting to '0'.

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● **Adjusting height/width of data table when characters are illegible**
Height and width of cells can be adjusted by selecting [View] ⇒ [Automatic Adjustment for Height]/[Automatic Adjustment for Width].
The adjusted height and width are saved to the project.

[View]
⇒ [Automatic Adjustment for Height]

● **Switching display on the setting screen of serial communication module**
The display can be switched to either string or hexadecimal format by selecting [View] ⇒ [String/Hexadecimal Switch Format] on the User Register Frame Content screen.

● **Utilizing data of channel/axis to another channel/axis**
When utilizing the data for a channel/axis, select [Edit] ⇒ [Channel Copy]/[Axis Copy]. (☞ Section 2.1.3)
When copying and pasting the data including channel/axis range, the settings may be changed from the data source one depending on the input status and mask status of the copy destination.

■ Switch setting

Edit the switch setting of the intelligent function module.

Screen display

Select Project view ⇒ "Intelligent Function Module" ⇒ "(module)" ⇒ "Switch Setting".
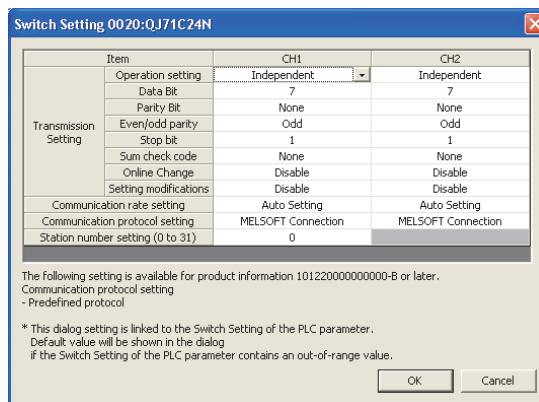
Operating procedure

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

For details of the setting items, refer to the manual of each intelligent function module.

• The available choices can be displayed on a combo box by double-clicking the cell.

2. **Click the** [OK] **button.**

This setting is applied to the switch setting on the <<I/O Assignment>> tab of the PLC parameter. The switch setting set on the <<I/O Assignment>> tab of the PLC parameter is also applied to this setting.

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● **Switch setting data that is not supported by version of GX Works2 being used**
   To set the switch setting data that is not supported by version of GX Works2 being used, set the parameter with the switch setting on the <<I/O assignment>> tab of PLC parameter.

■ **Auto refresh function**

Set the auto refresh function of the intelligent function module.

Screen display

Select Project view ⇒ "Intelligent Function Module" ⇒ "(module)" ⇒ "Auto Refresh".
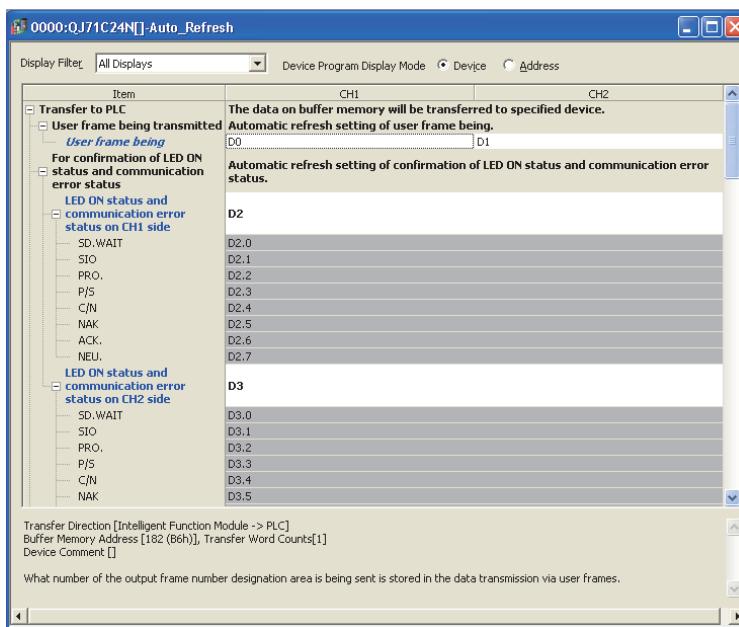
Operating procedure

• **Setting devices.**

For details of the setting items, refer to the manual of each intelligent function module.

• Detailed explanation of a setting item is displayed at the bottom of the screen when it is selected. For LD75 positioning module, a detailed explanation is displayed on the Intelligent Function Module Guidance window. (☞ Section 3.5.6)

• For Structured projects, device format and address format can be switched by selecting "Device Program Display Mode".

• "Display Filter" filters the settings so that only those related to the selected item are displayed.

• For the items of which the offset values of buffer memory and the transfer word counts can be changed, set the items such as auto refresh devices on another screen.

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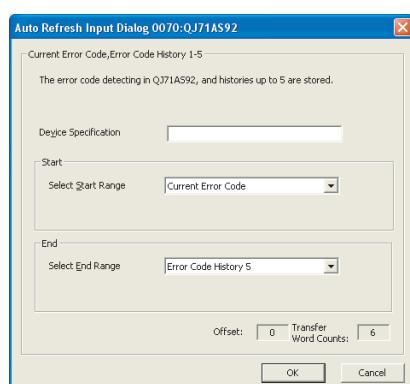
<AS-i master module>   < FL-net (OPCN-2) interface module >
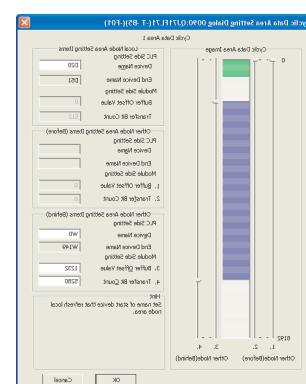
Point

● **Contents displayed on explanation field**
The following shows the contents displayed on the explanation field.

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

● **Items of which offset values of buffer memory and transfer word counts can be changed**
The set value of the items of which the offset values of buffer memory and the transfer word counts can be changed, is displayed as shown below.

Error Code History 5	D5 (0,1)
EC Flags	
Analog Input Data	D100 (20,97)
Command Buffer <Result>	
Extended Command Buffer <Result>	

Device number (offset value, transfer word counts)

● **Assigning sequential devices for auto refresh**
The following screen is displayed by selecting [Edit] ⇒ [Auto Device Assignment] after selecting cells to assign sequential devices. Devices are assigned sequentially from the one specified.

Input Device

[OK] [Cancel]

● **Display of the Project view when the devices set in the auto refresh setting are duplicated in the module**
When the screen is closed while the duplicated devices of the auto refresh setting exist, the icon on the Project view is displayed as shown below. To check the device duplications in multiple intelligent function modules, select [Tool] ⇒ [Check Intelligent Function Module Parameter] ⇒ [Check Auto Refresh Duplication].

<Normal display>

Intelligent Function Module
  0000:Q64AD
    Switch Setting
    Parameter
    Auto_Refresh

<Display when duplication occurs>

Intelligent Function Module
  0000:Q64AD
    Switch Setting
    Parameter
    Auto_Refresh

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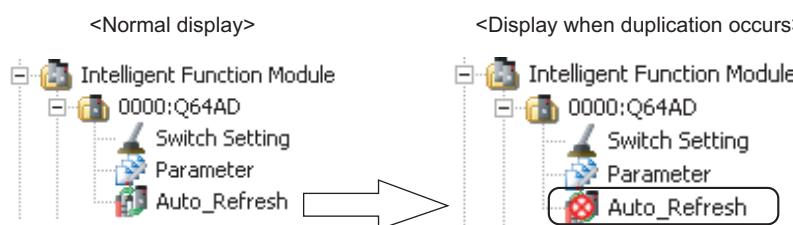
■ Data setting screen of intelligent function modules

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

Color		Setting status
Text	Background	
Blue	White	Default values
Black	White	Values other than default values
White	Red	Items whose values outside the setting range
Red	White	Items for which device is duplicated in auto refresh setting.
Black	Gray	Items for which setting is not required.
Black	Yellow	Items for which setting (partner axis) is not required at the data number specified for axis to be interpolated. (For QD75/LD75 positioning module only)
Green	White	Comments (Positioning module only)
Blue	Gray	Item with the transfer direction of [Intelligent Function Module $\Rightarrow$ PLC]
Green	Gray	Item with the transfer direction of [PLC $\Rightarrow$ Intelligent Function Module]

2.1.3   Channel copy/axis copy

Utilize specified channel/axis data to another channel/axis data when setting intelligent function module data.
The Channel copy function is not supported by the Auto refresh function.

Operating procedure

1. **Select [Edit] $\Rightarrow$ [Channel Copy]/[Axis Copy].**

The Channel Copy screen is displayed.
The image below is a screen when the operation is performed on the data of Q68DAIN.
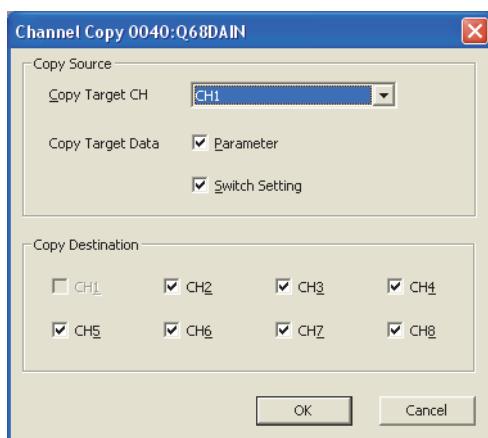
2. **Select the copy target channel/axis and data, and click the [OK] button.**

The channel/axis data are copied.

2.1.4　　Data initialization

Initialize the set data of intelligent function module.
For simple motion module, only the auto refresh data are initialized.

Operating procedure

1. **Select [Tool] ⇒ [Data Initialization].**

The Data Initialization screen is displayed.
The image below is a screen when the operation is performed with the data of Q68DAIN.
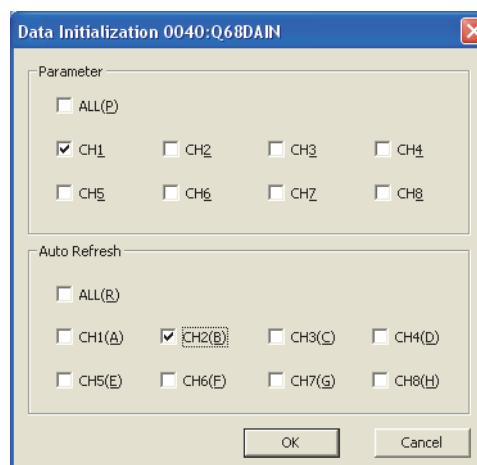
2. **Select the target channel(s) whose data to be initialized, and click the** `OK` **button.**

The data of selected channel(s) are initialized.

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● **Selection items of the Data Initialization screen**
When the auto refresh of temperature control modules is set with the Setting item reduction mode, only "ALL" can be selected from "Auto Refresh". Each channel cannot be selected independently.
For details of the Setting item reduction mode, refer to Section 3.3.3.

2.1.5　　Deleting intelligent function modules

Delete an intelligent function module from the project being edited.

Operating procedure

1. **Select the intelligent function module to be deleted from the Project view.**

2. **Select [Project] ⇒ [Intelligent Function Module] ⇒ [Delete Module].**

The selected intelligent function module is deleted.

2.1.6   Displaying properties of intelligent function modules

Check the setting information of an intelligent function module. This operation can also change the installation slot number, start XY address, module name, and title.

Screen display

Select [Project] ⇒ [Intelligent Function Module] ⇒ [Property].
<QCPU (Q mode)>
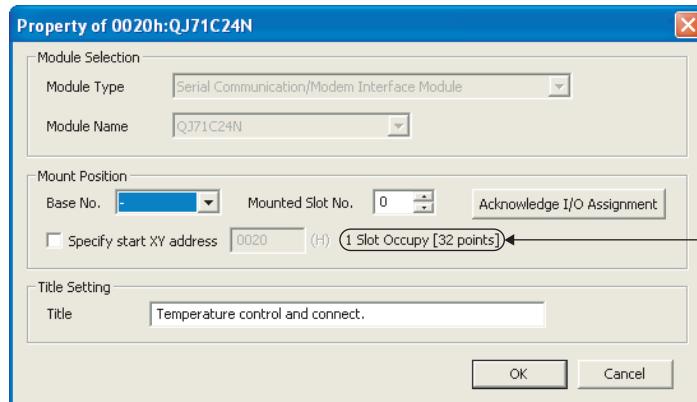
Occupied I/O
points information

Operating procedure

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

Item	Description
Module Selection	—
Module type	Display the type of the intelligent function module.
Module Name	Display the model of the intelligent function module.
Mount Position	—
Base No.[*1]	Display the base number where the intelligent function module is mounted.
Module No.[*2]	Display the module No. of the intelligent function module.
Mounted Slot No.[*3]	Display the current slot number.
Specify start XY address[*3]	Display the current start XY address.
Occupied I/O points information[*3]	For QCPU (Q mode), display the number of occupied slots and the number of occupied I/O points of the module selected for "Module Name". For LCPU, display the number of logically-occupied modules and the number of occupied I/O points of the module selected for "Module Name".
Title Setting	—
Title	Display the current title. (The number of applicable characters is 32)

*1 :   For QCPU (Q mode) only
*2 :   For FXCPU only
*3 :   For QCPU (Q mode) and LCPU only

2. **Click the** [OK] **button.**

Screen button

For the buttons on the screen, refer to Section 2.1.1.

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2.1.7 Checking/changing the applicable number of intelligent function module parameters

Display a list of the intelligent function module parameters (initial setting/auto refresh) set to the current project.
Set for enabling/disabling initial setting and auto refresh as intelligent function module parameters.

■ Enabling/disabling intelligent function module parameters

Set for enabling/disabling initial setting and auto refresh as intelligent function module parameters.
Since a programmable controller CPU limits the number of parameters that can be set for the mounted intelligent function modules, check the applicable number of parameters using this function and switch enabling/disabling for the parameters so that the number of set parameters is within the allowable range.
For the maximum number of the parameter settings, refer to the following section.
☞ ■ Number of parameter settings for intelligent function modules

Screen display

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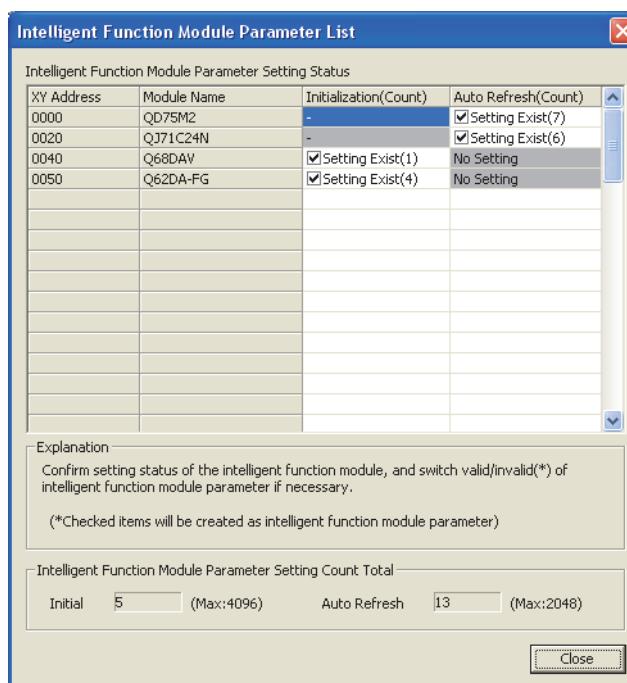
Operating procedure

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

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

2. **Click the** Close **button.**

Point

● **When the initial setting and the number of auto refresh settings cannot be changed**
In case of the following conditions, the number of initial settings and auto refresh settings cannot be changed. Even when "Setting Exist" is selected, the display is masked and the check box is not displayed.

• Reserved module

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

■ Intelligent function module parameters

When the intelligent function module data are set, intelligent function module parameters are created.
The intelligent function module parameters consist of initial setting and auto refresh.
The intelligent function module parameters, when written to a programmable controller CPU, operate as explained below. Write the intelligent function module parameters to the programmable controller CPU using the Write to PLC function. (☞ GX Works2 Version 1 Operating Manual (Common))

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

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

For the intelligent function module type and the availability of initial setting/auto refresh setting, refer to Section 2.1.1.

■ Number of parameter settings for intelligent function modules

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

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

● **Limit for the number of parameter settings of the programmable controller CPUs or MELSECNET/H Remote I/O modules**

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

Application target of intelligent function module		Maximum number of parameter settings	
		Initial setting	Auto refresh
QCPU (Q mode)	Basic model QCPU, High Performance model QCPU, MELSECNET/H Remote I/O module	512	256
	Q00UJ, Q00U, Q01U, Q02U	2048	1024
	Q03UD, Q03UDE, Q03UDV, Q04UDH, Q04UDEH, Q04UDV, Q06UDH, Q06UDEH, Q06UDV, Q10UDH, Q10UDEH, Q13UDH, Q13UDEH, Q13UDV, Q20UDH, Q20UDEH, Q26UDH, Q26UDEH, Q26UDV, Q50UDEH, Q100UDEH	4096	2048
LCPU	L02S, L02S-P, L02, L02-P	2048	1024
	L06, L06-P, L26, L26-P, L26-BT, L26-PBT	4096	2048

● **Limit for the number of parameter settings of the intelligent function modules**

The following table shows the number of the initial setting and the number of columns of auto refresh of the intelligent function modules.

'-' in the Initial setting column indicates that the corresponding module does not have the initial setting.

CPU	Module type	Module model	Initial setting (Fixed)	Auto refresh
QCPU (Q mode)	Analog module	Q64AD	2	13
		Q68ADV	1	25
		Q68ADI	1	25
		Q64AD-GH	5	27
		Q62AD-DGH	9	15
		Q68AD-G	7	36
		Q66AD-DG	11	28
		Q64ADH	12	75
		Q62DAN	1	5
		Q64DAN	1	9
		Q68DAVN	1	17
		Q68DAIN	1	17
		Q62DA	1	5
		Q64DA	1	9
		Q68DAV	1	17
		Q68DAI	1	17
		Q62DA-FG	4	9
		Q66DA-G	5	14
		Q64DAH	4	11
		Q64AD2DA	8	61
		Q61LD	3	14
		Q68CT	14	73
	Temperature input module	Q64RD	5	18
		Q64RD-G	5	18
		Q64TD	6	13
		Q64TDV-GH	6	13
		Q68TD-G-H02	6	24
		Q68TD-G-H01	6	24
		Q68RD3-G	6	24
	Temperature control module	Q64TCTT[1]	21	61
		Q64TCTTBW[1]	21	73
		Q64TCRT[1]	21	61
		Q64TCRTBW[1]	21	73
		Q64TCTTN[1]	54	103
		Q64TCTTBW[1]	55	115
		Q64TCRTN[1]	53	103
		Q64TCRTBW[1]	54	115
		Q62HLC	24	52

CPU	Module type	Module model	Initial setting (Fixed)	Auto refresh
QCPU (Q mode)	Counter module	QD62	8	14
		QD62D	8	14
		QD62E	8	14
		QD63P6	6	48
		QD64D2	6	16
		QD60P8-G	24	8
		QD65PD2	18	62
	QD75 positioning module	QD75P1	–	7
		QD75P2	–	14
		QD75P4	–	28
		QD75P1N	–	7
		QD75P2N	–	14
		QD75P4N	–	28
		QD75D1	–	7
		QD75D2	–	14
		QD75D4	–	28
		QD75D1N	–	7
		QD75D2N	–	14
		QD75D4N	–	28
		QD75M1	–	7
		QD75M2	–	14
		QD75M4	–	28
		QD75MH1	–	7
		QD75MH2	–	14
		QD75MH4	–	28
	QD70 positioning module	QD70P4	12	26
		QD70P8	24	50
		QD70D4	16	26
		QD70D8	32	50
		QD72P3C3	12	18
		QD73A1	4	5

CPU	Module type	Module model	Initial setting (Fixed)	Auto refresh
QCPU (Q mode)	Serial communication/ Modem interface module	QJ71C24N	–	46
		QJ71C24N-R2	–	47
		QJ71C24N-R4	–	46
		QJ71C24	–	46
		QJ71C24-R2	–	47
	AS-i master module	QJ71AS92	–	30
	FL-net (OPCN-2) interface module	QJ71FL71-F01	2	14
		QJ71FL71-T-F01	2	14
		QJ71FL71-B2-F01	2	14
		QJ71FL71-B5-F01	2	14
		QJ71FL71	2	14
		QJ71FL71-T	2	14
		QJ71FL71-B2	2	14
		QJ71FL71-B5	2	14
	MODBUS interface module	QJ71MT91	3	5
		QJ71MB91	3	5
	Simple motion module	QD77MS2	–	124
		QD77MS4	–	224
		QD77MS16	–	981
		QD77GF4	–	28
		QD77GF8	–	56
		QD77GF16	–	112
	AnyWireASLINK interface module	QJ51AW12AL	–	32
	Energy measuring module	QE81WH	4	36
		QE84WH	38	184
		QE81WH4W	4	46
		QE83WH4W	35	178
		QE82LG	5	16

CPU	Module type	Module model	Initial setting (Fixed)	Auto refresh
LCPU	Analog module	L60AD4	12	75
		L60AD4-2GH	11	57
		L60ADVL8	8	37
		L60ADIL8	8	37
		L60DA4	4	11
		L60DAVL8	4	19
		L60DAIL8	4	19
		L60AD2DA2	12	31
	Temperature input module	L60RD8	10	38
	Temperature control module	L60TCTT4[1]	45	103
		L60TCTT4BW[1]	45	115
		L60TCRT4[1]	45	103
		L60TCRT4BW[1]	45	115
	Counter module	LD62	8	14
		LD62D	8	14
	LD75 positioning module	LD75P1	–	7
		LD75P2	–	14
		LD75P4	–	28
		LD75D1	–	7
		LD75D2	–	14
		LD75D4	–	28
	Simple motion module	LD77MS2	–	124
		LD77MS4	–	244
		LD77MS16	–	981
		LD77MH4	–	28
		LD77MH16	–	112
	Serial communication module	LJ71C24	–	50
		LJ71C24-R2	–	51
	AnyWireASLINK interface module	LJ51AW12AL	–	32
	Multiple input module	L60MD4-G	8	23

*1 : For the temperature control modules (except for Q62HLC), the number of auto refreshes can be reduced by switching to the Setting item reduction mode. For details of the Setting item reduction mode, refer to Section 3.3.3.
The following shows the maximum number of auto refreshes after reduction.

CPU	Temperature control module	Auto refresh (maximum number of auto refreshes)
QCPU (Q mode)	Q64TCTT	11
	Q64TCTTBW	12
	Q64TCRT	11
	Q64TCRTBW	12
	Q64TCTTN	35
	Q64TCTTBWN	36
	Q64TCRTN	35
	Q64TCRTBWN	36
LCPU	L60TCTT4	35
	L60TCTT4BW	36
	L60TCRT4	35
	L60TCRT4BW	36

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● **Number of auto refresh settings**

The number of auto refresh settings in which devices are set is counted.
In the following settings, the number of auto refresh settings is 8.

2.1.8 Checking device duplication of auto refresh setting

Check the device duplication of auto refresh settings among intelligent function modules.

Screen display

Select [Tool] ⇒ [Check Intelligent Function Module Parameter] ⇒ [Check Auto Refresh Duplication].
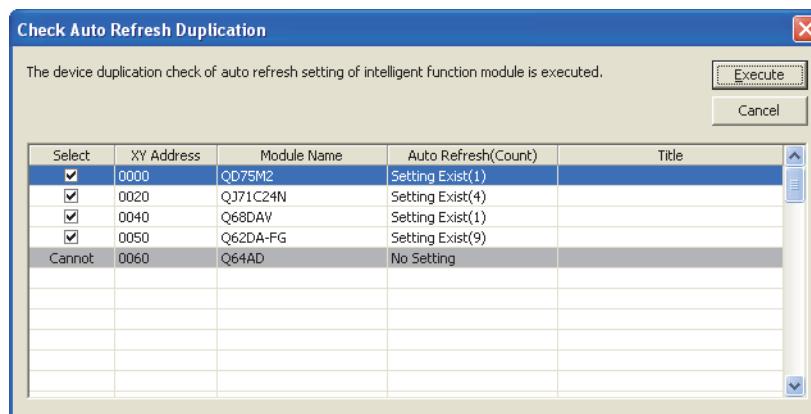
Operating procedure

1. **Select the modules to check the device duplication of auto refresh settings.**

2. **Click the** Execute **button.**

If device duplication is found, the check result is displayed on the Output window.
By double-clicking the result, the corresponding error location in the program is displayed.
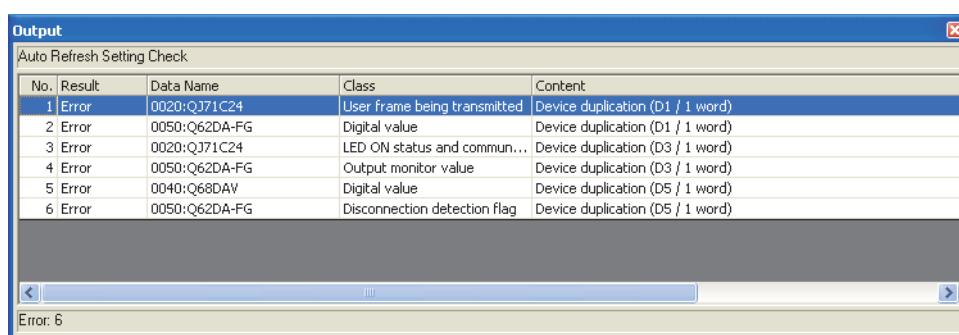
Point

● **When the device duplication of auto refresh settings cannot be checked**
In case of the following conditions, the module is recognized as a module that cannot check the device duplication of auto refresh settings, and "Cannot Select" is displayed.
- No device is set on the Auto Refresh screen.
- The check box is cleared in the intelligent function module parameter list.
- The module start XY address is not set.
- Reserved module
- The access authority for security is in the read-protected mode.

2.1.9 Changing intelligent function module type

The following explains the operating procedure to change intelligent function module type, for instance, from QD75P4 to QD75D4, or from LD75D4 to LD75P4.
The intelligent function module type can be changed by copying and pasting the original data onto the parameter setting screen of the new module data.

The following operating procedure is the instance when changing the type from QD75P4 to QD75D4.

Operating procedure

1. **Add new intelligent function module data. (Section 2.1.1)**
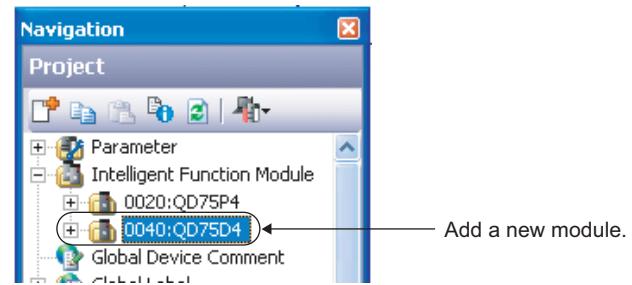
Add a new module.

2. **Display both parameter setting screens of the original module and the new module.**
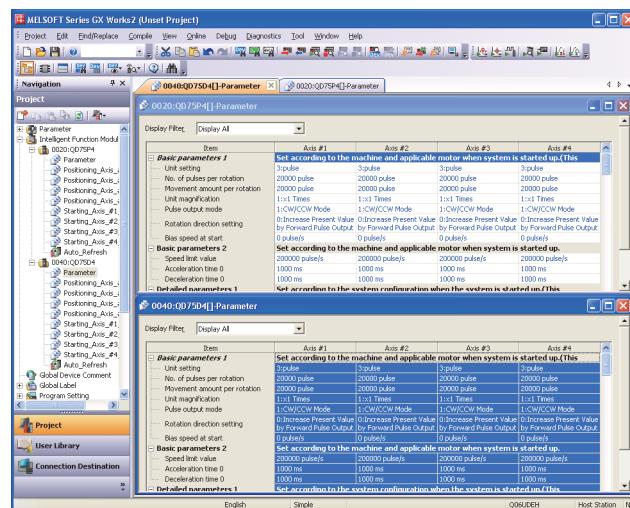
3. **On the parameter setting screen of the original module, right-click the top left cell and select [Copy] from the shortcut menu to copy all data.**
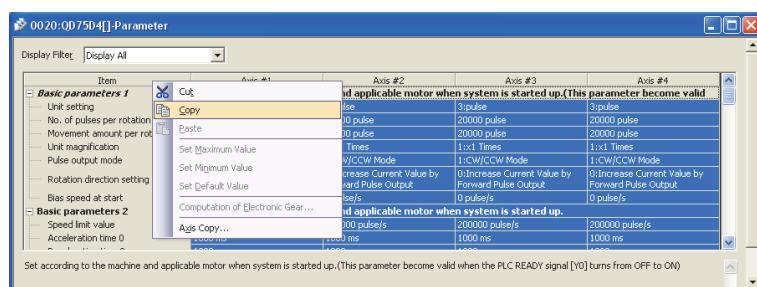
4. **On the parameter setting screen of the new module, right-click the top left cell and select [Paste] from the shortcut menu to paste all data.**
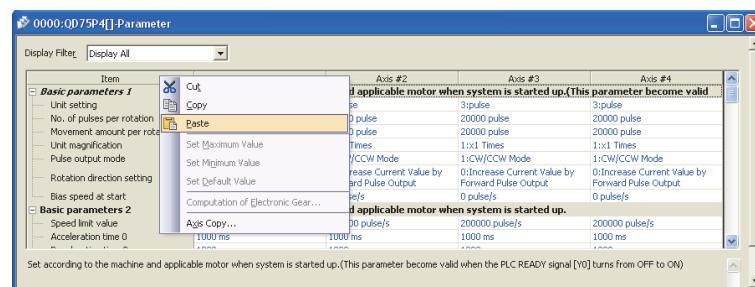
2.2 Utilizing Sample Comments of Intelligent Function Module

Utilize sample comments of intelligent function module devices for device comments.
For details of the operation method, refer to the following manual.
☞ **GX Works2 Version 1 Operating Manual (Common)**

2.3 Writing/Reading Intelligent Function Module Data

Write the set intelligent function module data to the programmable controller CPU, or the buffer memory and flash ROM of the intelligent function module.
For details of the operation method, refer to the following manual.
☞ **GX Works2 Version 1 Operating Manual (Common)**

2.4   Monitoring Intelligent Function Modules

This section explains how to monitor input/output signals and buffer memory of an intelligent function module.
For QD75/LD75 positioning module, this function is used to debug a program such as a ladder program. For checking an operation of QD75/LD75 positioning module or debugging, use the positioning monitoring.
(☞ Section 3.5.1)

2.4.1   Registering and monitoring intelligent function modules

Register and monitor module information of an intelligent function module.

Screen display

Select [View] ⇒ [Docking Window] ⇒ [Intelligent Function Module Monitor], and select from [Module 1] to [Module 10].

Display contents

Item	Description
Item	Display the name of the module information. When "Data Type" is 'Detail Dialog' (🖥)/'Error Code' or 'Warning Code' (📒), an icon is displayed at the head of each item.
Current value	Display the current value of the module information. Display character strings such as ON/OFF.
Device	Display the device assigned to the module information.
Data Type	Display the data type of the module information. For 'Detail Dialog'/'Error Code'/'Warning Code', details of each item can be confirmed. For details, refer to Point in this section.

Operating procedure

1. **Register the intelligent function module to be monitored.**

For the registration method, refer to Section 2.4.2.

2. **Select [Online] ⇒ [Watch] ⇒ [Start Watching].**

The current values of the registered intelligent function module are displayed on the window.

■ Customizing monitoring items

The module information registered to the Intelligent Function Module Monitor window can be customized by cutting/copying/pasting/deleting unnecessary items.
The customized settings are saved along with the project.
Note that the operations to 'undo' the customized items cannot be performed.

Operating procedure

● Select an unnecessary item on the Intelligent Function Module Monitor window, right-click it and select [Cut]/[Copy]/[Paste]/[Delete] from the shortcut menu.
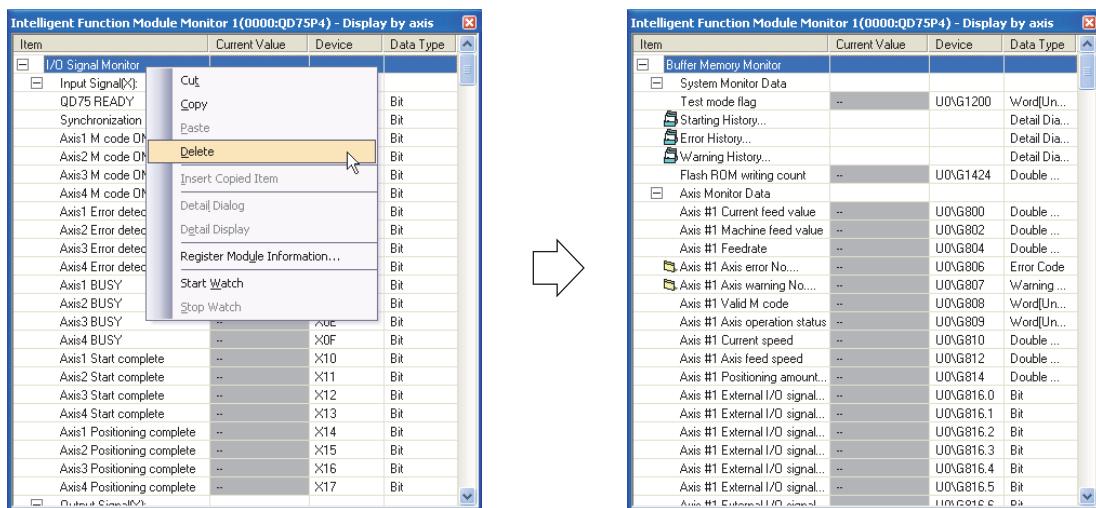
Point

● **Paste**
The cut/copied items can be pasted in the same project in the same window only.
● **Project created in former version**
If a project to which the Intelligent Function Module Monitor is registered in GX Works2 Version 1.07H or earlier is opened in GX Works2 Version 1.50C or later, all registered module information is discarded.
● **Changing current value**
The current value can be changed by directly inputting the desired value in "Current value" area during monitoring.
When the current value to be changed is displayed in character strings such as ON/OFF, available choices are shown in a combo box. The current value cannot be changed is displayed in gray background.
For bit devices, ON/OFF can be switched by force by pressing the [Shift] + [Enter] keys.
To prevent from pressing the [Shift] + [Enter] keys by mistake, changing the current value using the shortcut key can be invalid on the Option screen.
Select "Disable Current Value Changing by Pressing Shift+Enter" in [Tool] ⇒ [Option] ⇒ "Monitor" ⇒ "Common" .
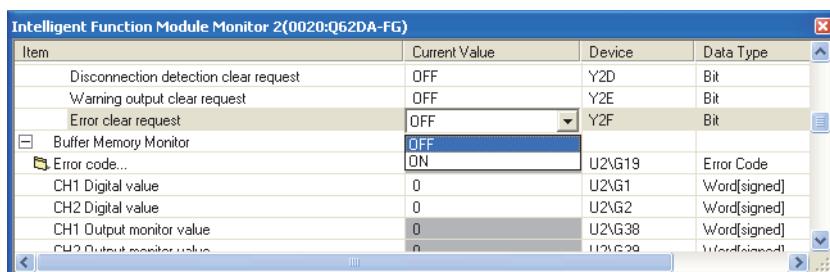
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● **Detailed display of history information**
For the analog module, QD75/LD75 type positioning module, and FL-net (OPCN-2) interface module, details of the history information can be displayed during the monitoring.
To display details of the history information, double-click a row in which 'Detail Dialog' is displayed in the "Data Type" column, or right-click it and select [Detail Dialog] from the shortcut menu.
The following shows the Detail Dialog screen for QD75P4.
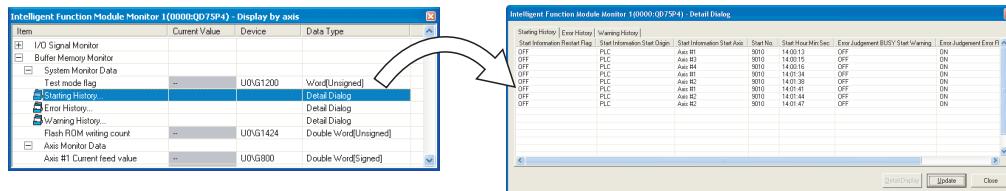
● **Detailed display of error code/warning code**
Details of the error code/warning code can be displayed from the Intelligent Function Module Monitor windows or the screen of error/warning history.
To display details of the error code/warning code, double-click a row in which an error code/warning code is displayed, or right-click it and select [Detail Display] from the shortcut menu.
The following shows the Detail Display screen of error code for QD75P4.
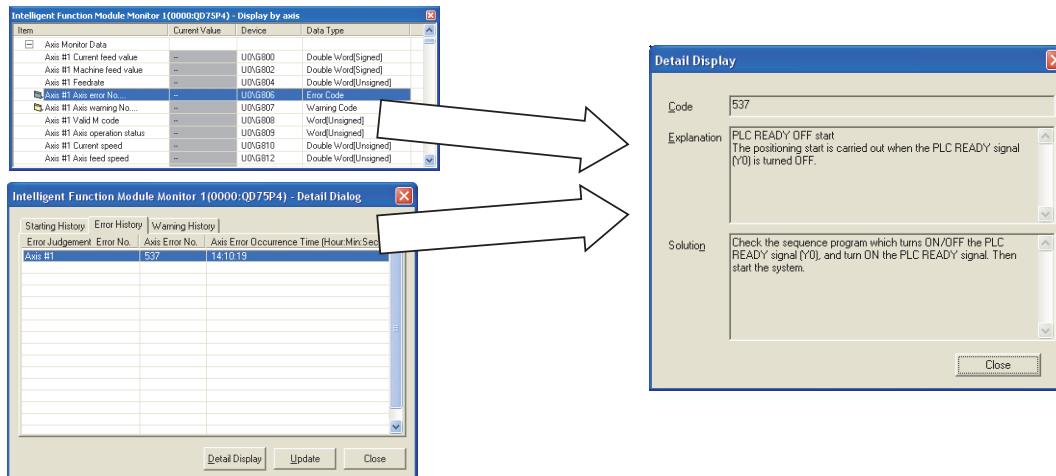
● **Using multiple Intelligent Function Module Monitor windows**
Each axis of positioning module can be monitored by activating multiple Intelligent Function Module Monitor windows and customizing the settings of each window.

For Axis #1   For Axis #2   For Axis #3   For Axis #4
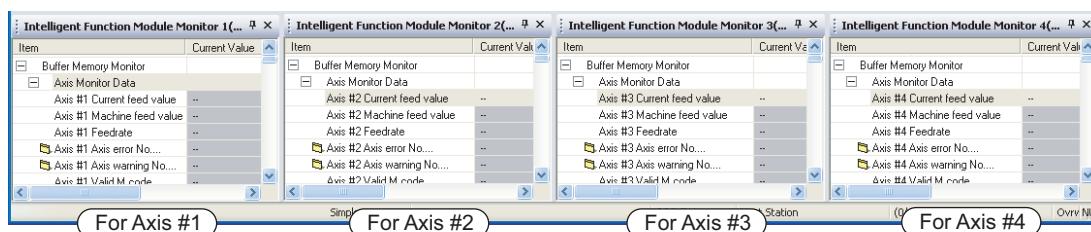
Restrictions

● **Updating values on the Intelligent Function Module Monitor window**
The Intelligent Function Module Monitor updates only values within the range displayed on the window for monitoring acceleration.
When executing operation such as copy and paste on an Excel spreadsheet, "--" or the previously monitored value is displayed for the data outside the range displayed on the window.

● **When the item that shows the current value in a character string displays "--".**
When the monitored value does not match the displayed character string, "--" is displayed as the current value.

2.4.2   Registering intelligent function modules

Register an intelligent function module to the Intelligent Function Module Monitor window.

■ Registering intelligent function modules using shortcut menu from Project view

Register an intelligent function module using the shortcut menu from the Project view.

Operation

1. **Select a module to be registered to the Intelligent Function Module Monitor window from the Project view.**

2. **Right-click and select [Register to Intelligent Function Module Monitor] in the shortcut menu.**
The module is registered to the Intelligent Function Module Monitor window.
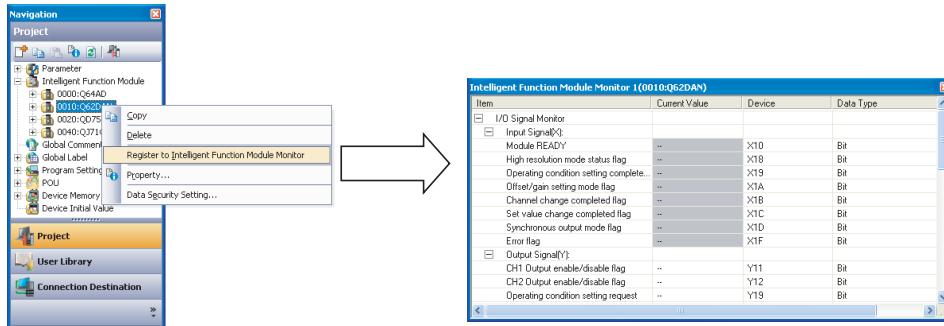
■ Registering intelligent function modules with drag-and-drop operation

Register an intelligent function module with the drag-and-drop operation from the Project view.

Operation

1. **Select a module to be registered from the Project view.**

2. **Drag and drop it to the Intelligent Function Module Monitor window.**
The module is registered.

Drag and drop
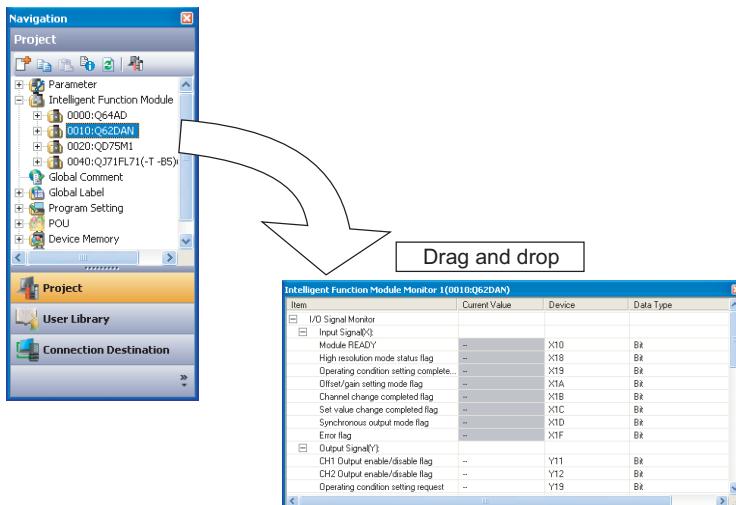
■ Registering intelligent function modules using shortcut menu from Intelligent Function Module Monitor window

Register an intelligent function module using the shortcut menu from the Intelligent Function Module Monitor window.

| Operation |

1. **On the Intelligent Function Module Monitor window on which the registration is to be canceled, right-click and select [Register Module Information] in the shortcut menu.**
The Module Information Selection screen is displayed.
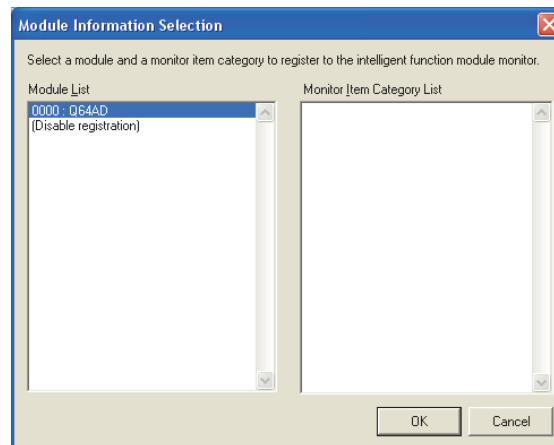
2. **Select a module to be registered from "Module List" and click the ⌐ OK ⌐ button.**
The module is registered to the Intelligent Function Module Monitor window.

When selecting the positioning module, AS-i master module, or FL-net (OPCN-2) interface module in "Module List", select an item displayed on "Monitor Item Category List".

   Example) AS-i master module
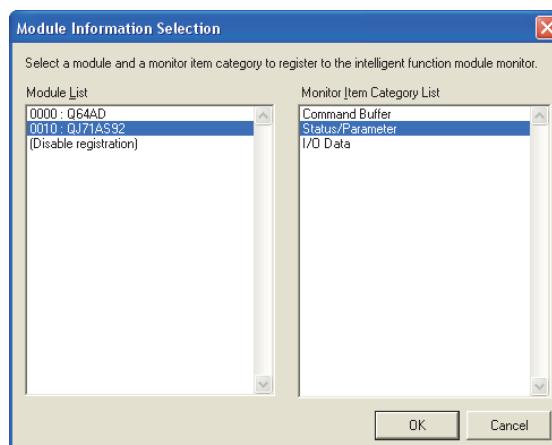
| Point⌐ |

● **Customizing monitoring items**
   The registered intelligent function module information can be customized by right-clicking the desired module information on the Intelligent Function Module Monitor window and selecting [Cut]/[Copy]/[Paste]/[Delete] in the shortcut menu. (⌐ Section 2.4.1)

● **Copying module information**
   Module information can be copied by right-clicking a desired module information and selecting [Copy] from the shortcut menu on the Intelligent Function Module Monitor window, and pasted to such as text files.

2.4.3　Canceling registration of intelligent function modules

Cancel the registration of the module information which is registered to the Intelligent Function Module Monitor.

Operation

1. **On the Intelligent Function Module Monitor window on which the registration is to be canceled, right-click and select [Register Module Information] in the shortcut menu.**
The Module Information Selection screen is displayed.
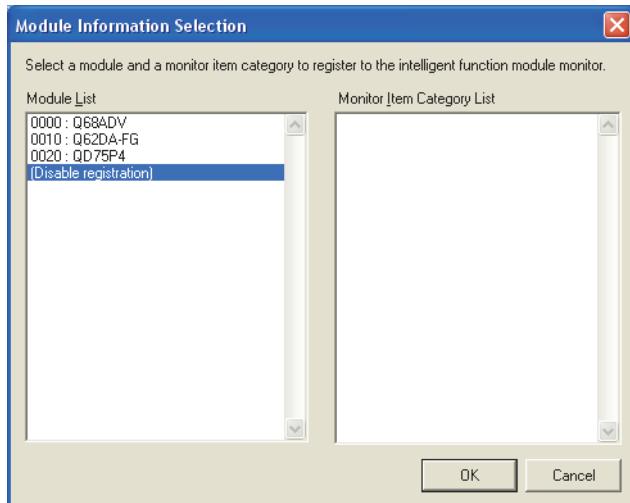
2. **Select "(Disable registration)" and click the   OK   button.**
The registration of the module is canceled.

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3 OPERATING INTELLIGENT FUNCTION MODULES

This chapter explains the operations of such as the intelligent function module tools.

3.1   Analog Module

This section explains the operations of the intelligent function module tools related to the analog module.

3.1.1   Offset and gain settings

Perform the offset/gain settings of the analog module.
For details of offset/gain settings, refer to the user's manual of the module to be used.

<div style="background:#ccc">**Operating procedure**</div>

1. **Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Analog Module] ⇒ [Offset/ Gain Setting] (▨).**

The Module Selection (Offset/Gain Setting) screen is displayed.
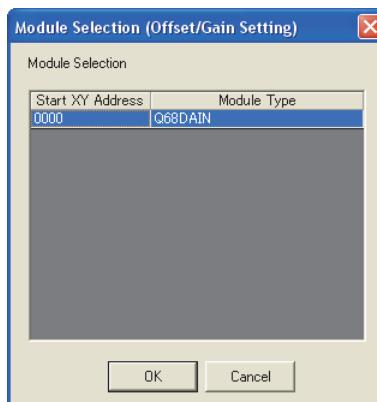
2. **Select a module and click the [OK] button.**

The Offset/Gain Setting screen is displayed.
For details of the operations of offset and gain settings of analog modules, refer to the following sections.
☞ ■ Settings on A/D converter module
☞ ■ Settings on D/A converter module
☞ ■ Settings on Q68CT

<div style="background:#ccc">*Point*</div>

● **Module operation mode**
When the offset/gain settings are performed, the following operation mode transition confirmation message is displayed according to the module's function version.
If the message is not displayed, the module operation mode needs to be set to the offset/gain setting mode by the switch setting of intelligent function module.
For details, refer to the user's manual of the module to be used.

■ Settings on A/D converter module

The following explains the operation of offset/gain settings using Q68AD-G as an example.

Offset/Gain status

Operating procedure

1. **Select the offset/gain setting target channel(s) under "Channel Selection".**

2. **Apply an electric current or voltage to the module.**

3. **Click the** [Offset Setting] **or** [Gain Setting] **button.**

The [Offset Setting] button sets the analog value which is input to the specified channel as an offset value.

The [Gain Setting] button performs the gain setting to the specified channel.
When the settings are completed normally, "Changed" is displayed on the 'Offset/Gain status' fields.
When an error occurs, an error code is displayed at "Error Code".

4. **Click the** [Close] **button.**

The offset values and gain values are registered to the module.

Screen button

● [Detail Display...]

Displays the error description and the corrective action for the displayed error code.

● [Error Clear]

Clears the error.

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■ Settings on D/A converter module

The following explains the operation of offset/gain settings using Q68DAIN as an example.
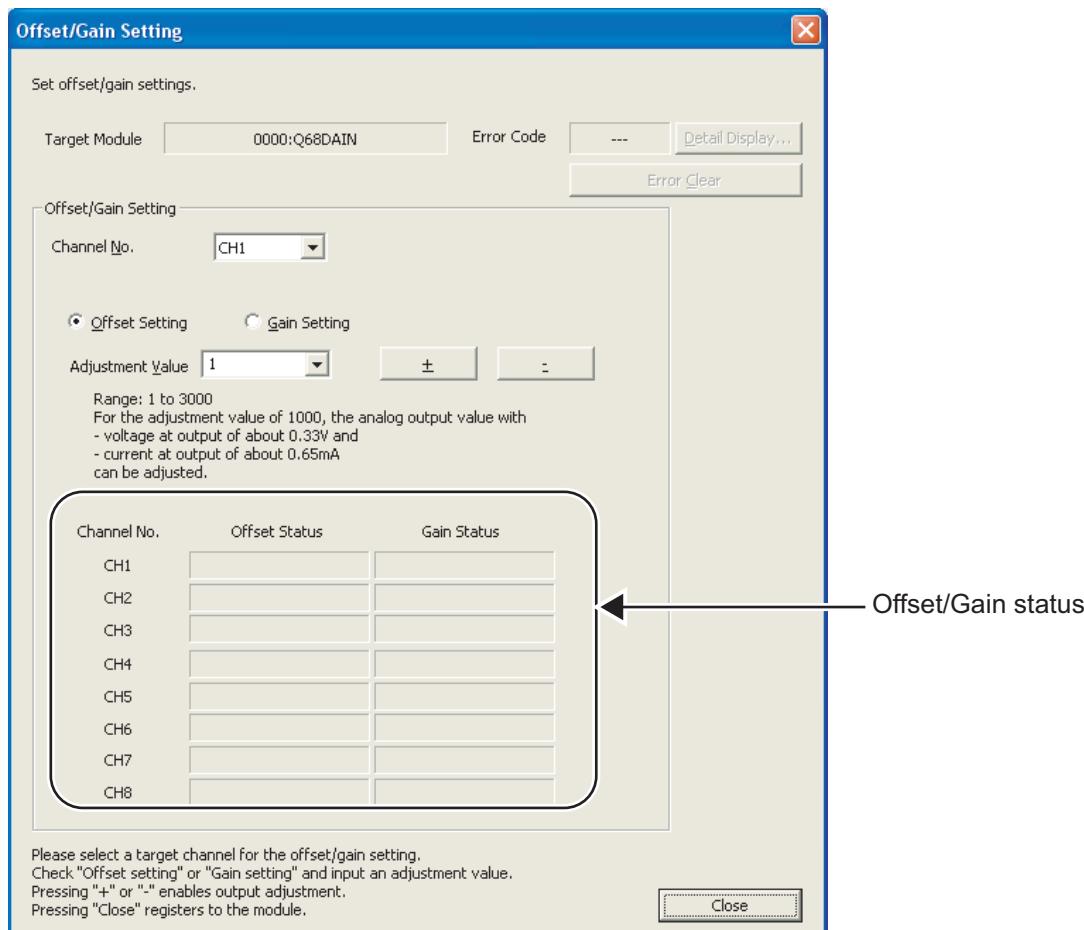
Offset/Gain status

Operating procedure

1. **Select the channel number and select either "Offset Setting" or "Gain Setting".**

2. **Select or enter a value for "Adjustment Value".**

3. **Click the** ± **or** - **button.**

The offset/gain values increase or decrease for the amount set as an adjustment value.
When the settings are completed normally, "Changed" is displayed on the 'Offset/Gain status' fields.
When an error occurs, an error code is displayed at "Error Code".

4. **Click the** Close **button.**

The offset values and gain values are registered to the module.

Screen button

For the screen buttons, refer to ■ Settings on A/D converter module.

■ Settings on Q68CT

The following explains the operation of offset/gain settings using Q68CT.
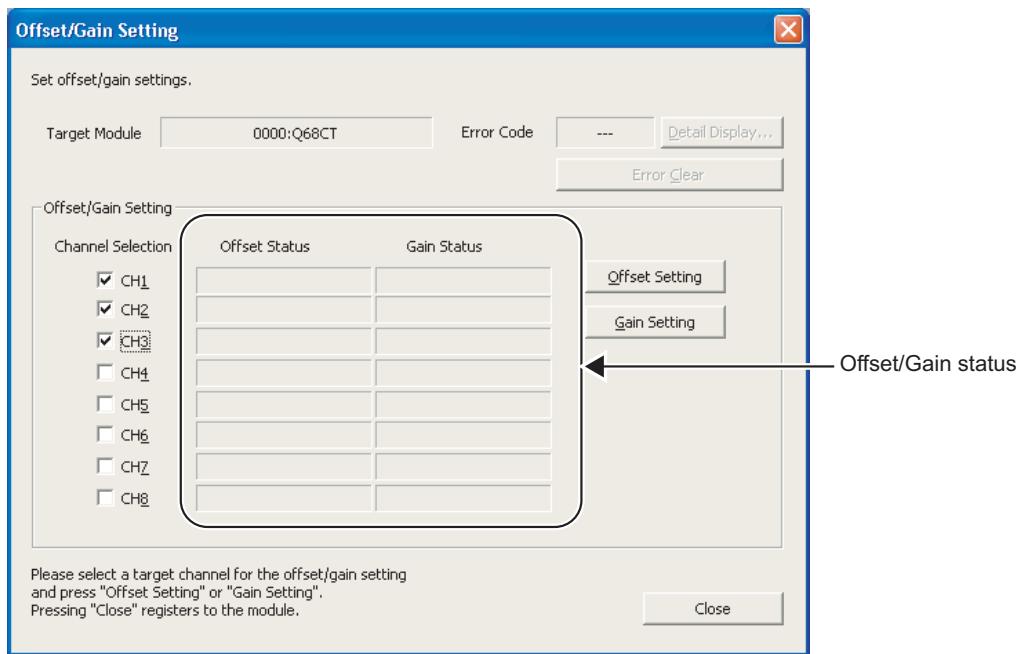
Offset/Gain status

Operating procedure

1. **Select the offset/gain setting target channel(s) under "Channel Selection".**

2. **Apply an electric current or voltage to the module.**

3. **Click the** [Offset Setting] **or** [Gain Setting] **button.**

The following confirmation message is displayed.[*1]

*1 : The message will not be displayed when the module operation mode is already set to the offset/gain setting mode by the switch setting of the intelligent function module.
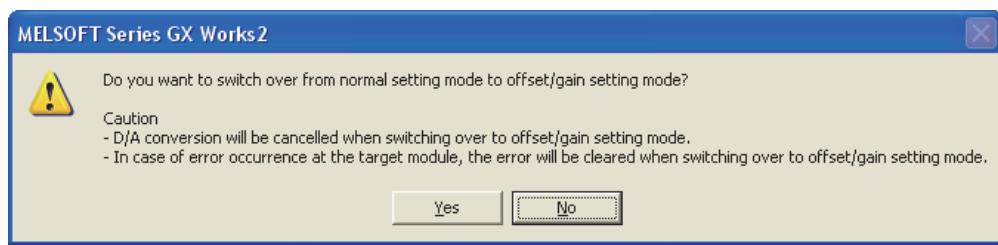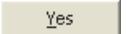
4. **Click the** [Yes] **button.**

The Input Range Setting screen is displayed.
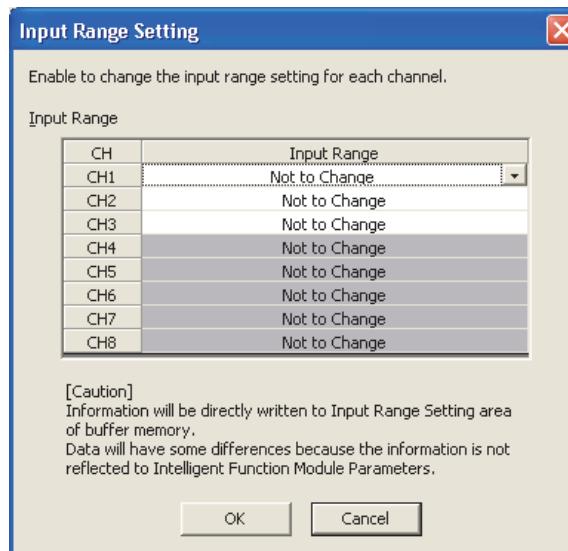
5. **Set "Input Range", and click the** [OK] **button.**

When the settings are completed normally, "Changed" is displayed in the 'Offset/Gain status' fields.

When an error occurs, an error code is displayed at "Error Code".

6. **Click the** [Close] **button.**

The offset values and gain values are registered to the module.

Screen button

For the screen buttons, refer to ■ Settings on A/D converter module.

3.1.2   Q61LD two-point calibration

Perform the two-point calibration to use Q61LD as a measuring device.
For the detailed settings, refer to the user's manual of the module to be used.

Operating procedure

1. **Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Analog Module]
⇒ [Q61LD Two-Point Calibration Setting].**

The Module Selection (Q61LD Two-Point Calibration Setting) screen is displayed.
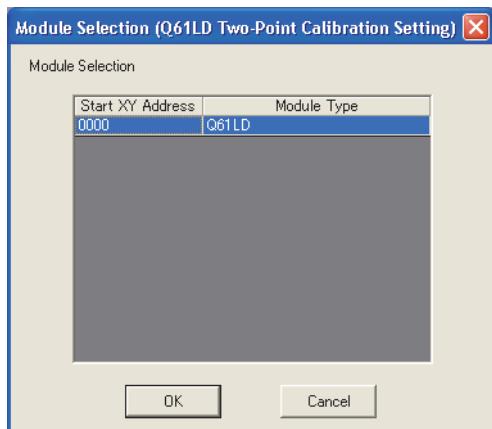
2. **Select a module, and click the [OK] button.**

The Two-Point Calibration Setting screen is displayed.

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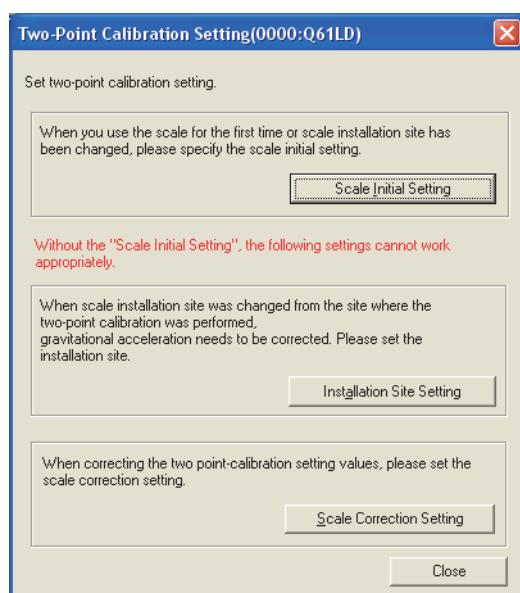
3. **Click the** | Scale Initial Setting | **button.**

The Scale Initial Setting screen is displayed.
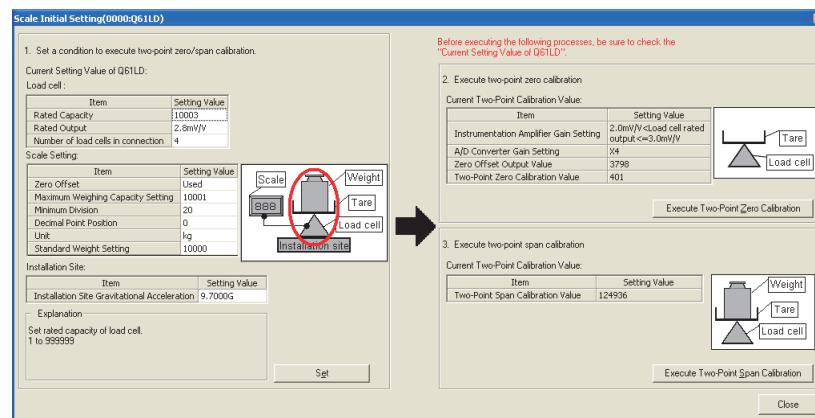
4. **Set the conditions on the left side of the screen, and click the** | Set | **button.**

The settings are written to the module.

5. **Click the** | Execute Two-Point Zero Calibration | **button.**

The two-point zero calibration is performed.

6. **Click the** | Execute Two-Point Span Calibration | **button.**

The two-point span calibration is performed.

Screen button

● | Installation Site Setting |

Opens the screen to set the installation site gravitational acceleration.

● | Scale Correction Setting |

Opens the screen to correct the two-point calibration value of the scale.
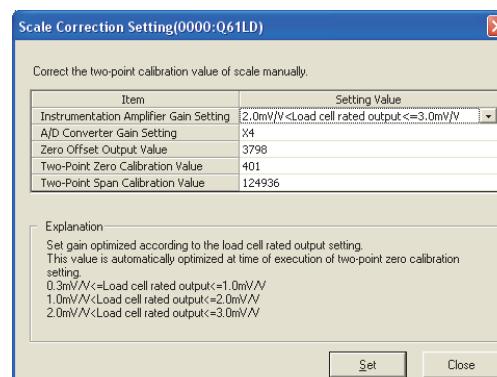
3.1.3 Q61LD default settings

Batch restore the Q61LD parameters to the factory default settings when the setting of module is incorrect, an error occurs, or using in another system.
For details of such as setting items, refer to the user's manual of the module.

Operating procedure

1. **Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Analog Module] ⇒ [Q61LD Default Setting].**

The Module Selection (Q61LD Default Setting) screen is displayed.
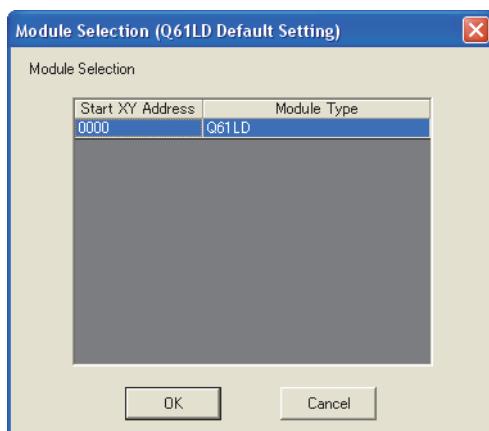
2. **Select a module, and click the** `OK` **button.**

The following message is displayed.
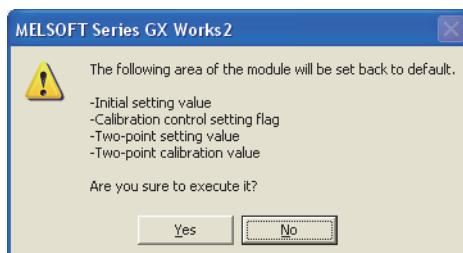
3. **Click the** `Yes` **button.**

The default settings are written to Q61LD.

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3.1.4   Waveform output data creation

Create the waveform output data. Complicated output waveform can be created with simple mouse operations.
Created data can be saved as a CSV file or written to a device memory in a project.
For details of such as functions and setting items, refer to the user's manual of the module.

Screen display

● **Creating waveform output data**
Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Analog Module] ⇒ [Create Wave Output Data].
Select the module type first, then register waveform pattern, set waveform output data, and write/read waveform output data on the following screen.
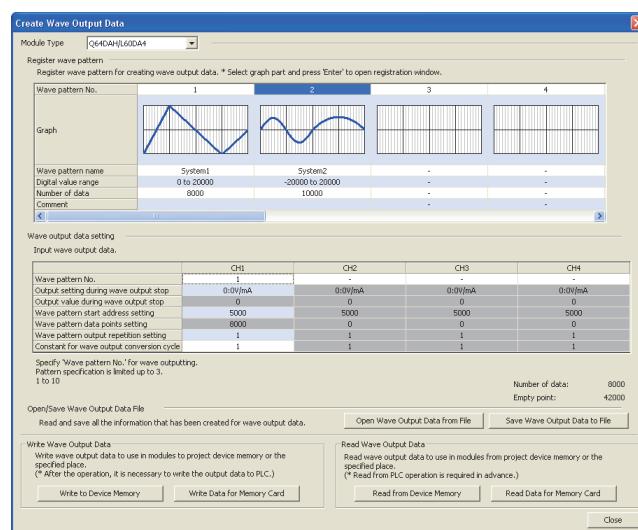
● **Registering waveform pattern**
Double-click on the graph under "Register wave pattern" on the Create Wave Output Data screen, or select the graph and press the ⟦Enter⟧ key.
Set wave pattern information, edit wave graph, and set wave details on the following screen.
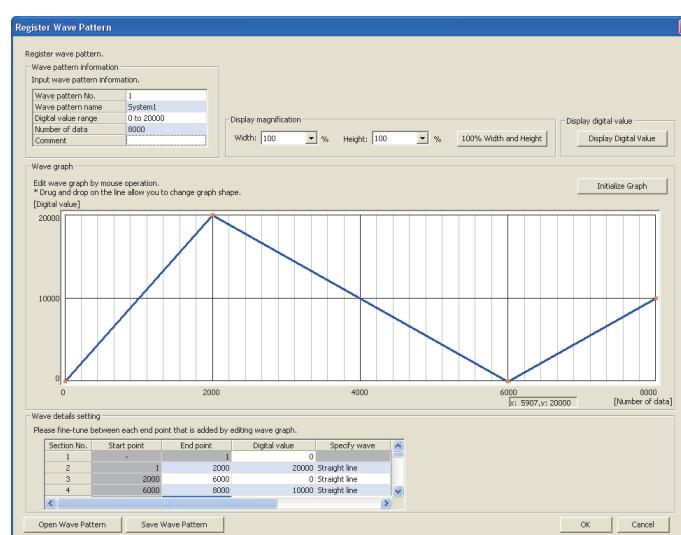
3.1.5 Conversion characteristics table creation

Create the conversion characteristics table to be used in L60AD2DA2.
Writing the conversion characteristic table in the module enables analog input/output using conversion characteristics, without having to create an operation program of the programmable controller CPU.
Created data can be saved as a CSV file or written to a device memory in a project.
For details of such as functions, setting items and operating procedures, refer to the user's manual of the module.

Screen display

● **Creating conversion characteristics table**

Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Analog Module] ⇒ [Create Conversion Characteristics Table].
Write/Read to conversion characteristics table on the following screen.
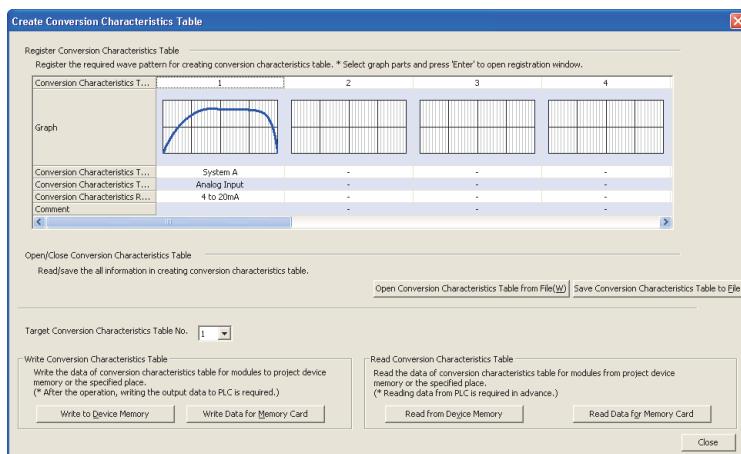
● **Registering conversion characteristics table**

Double-click on the graph under "Register conversion characteristics table" on the <u>Create Conversion Characteristics Table</u> screen, or select the graph and press the ⌷Enter⌷ key.
Set conversion characteristics table information, edit conversion characteristics graph, and set conversion characteristics table details on the following screen.
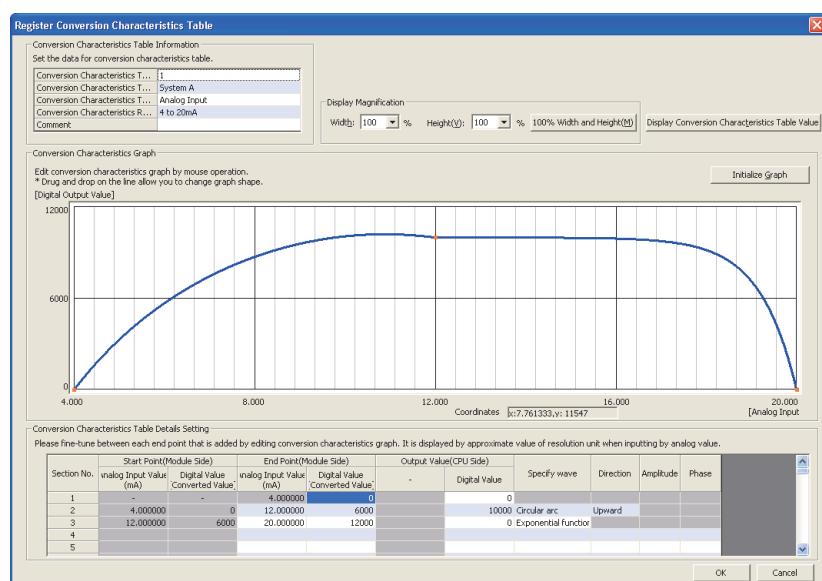
3.1.6 Free operation function setting

Create operation expression to be used in L60AD2DA2.
Maximum 5 operation expressions in the form of the data stored in the buffer memory or the constant can be used.
Created operation expressions can be written to the module and operated inside a module.
The created data can be directly transferred to the module or can be written to the device memory in the project.
For details of such as functions, setting items and operating procedures, refer to the user's manual of the module.

Screen display

● **Setting free operation function**

Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Analog Module] ⇒ [Free Operation Function Setting].
Check the operation expressions, set the number of significant digits after the decimal point of calculation result and write/read the operation expression on the following screen.
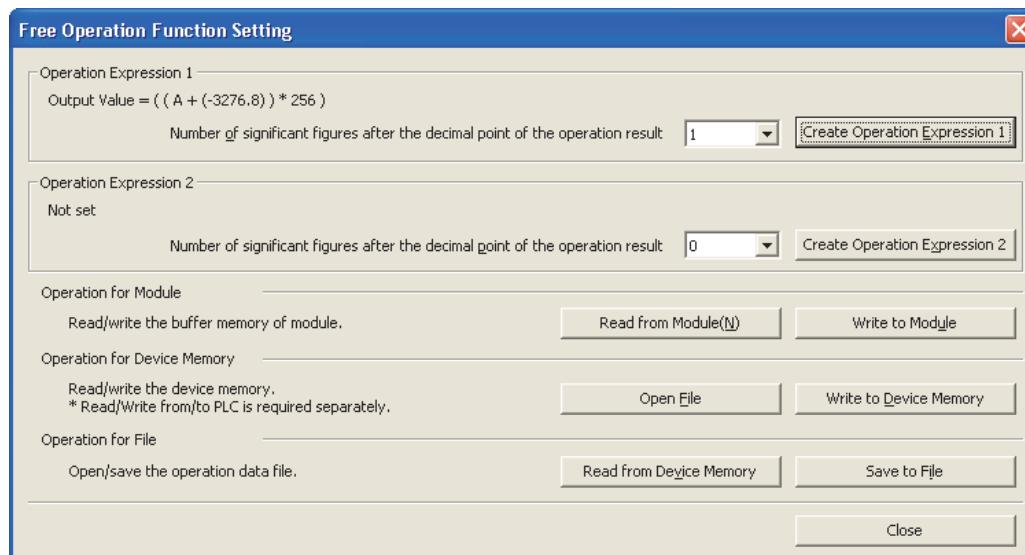
● **Creating operation expression**

Click the Create Operation Expression 1 button or Create Operation Expression 2 button on the Free Operation Function Setting screen.
Create an operation expression on the following screen.

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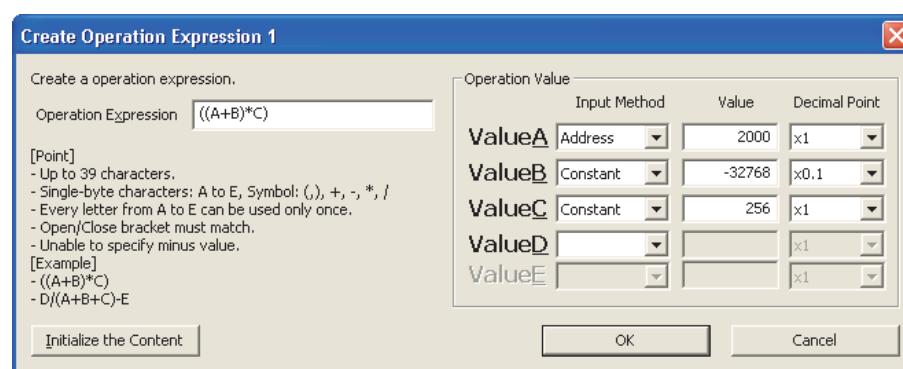
3.2   Temperature Input Module

This section explains the operations of the intelligent function module tools related to the temperature input module.

3.2.1   Offset and gain settings

Perform the offset/gain settings of the temperature input module.
For details of offset/gain settings, refer to the user's manual of the module to be used.

Operating procedure

1. **Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Temperature Input Module] ⇒ [Offset/Gain Setting] ( ).**

The Module Selection (Offset/Gain Setting) screen is displayed.
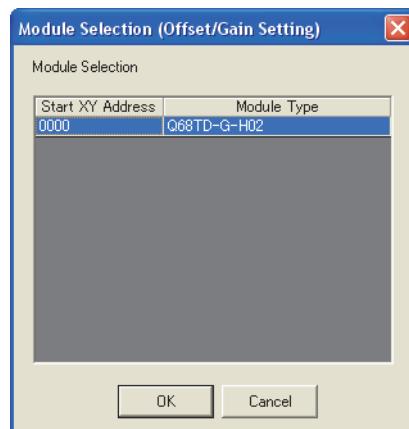
2. **Select a module and click the OK button.**

The Offset/Gain Setting screen is displayed.

The following indicates the operation of offset/gain settings using Q68TD-G-H02 as an example.
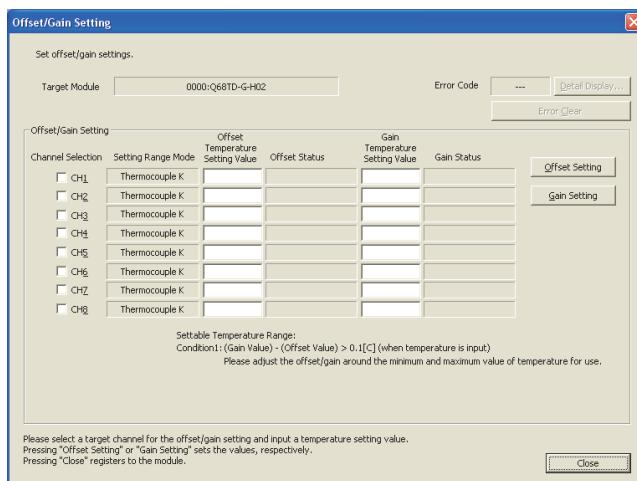
3. **Select the offset/gain setting target channel(s) under "Channel Selection".**

4. **Set an offset value or a gain value on the thermocouple or the standard direct current voltage generator for the channel whose offset/gain setting to be adjusted.**

5. **Enter values to "Offset Temperature Setting Value" or "Gain Temperature Setting Value".**

6. **Click the** `Offset Setting` **or** `Gain Setting` **button.**

The `Offset Setting` button sets the analog value which is input to the specified channel as an offset value.

The `Gain Setting` button performs the gain setting to the specified channel.
When the settings are completed normally, "Changed" is displayed on the "Offset Status" or "Gain Status" fields.
When an error occurs, an error code is displayed at "Error Code".

7. **Click the** `Close` **button.**

The offset values and gain values are registered to the module.

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3.2.2 Register 2-point sensor compensation value

Register the 2-point sensor compensation value of temperature input module.
For details on 2-point sensor compensation value registration, refer to the user's manual for the module.

Operating procedure

1. **Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Temperature Input Module] ⇒ [Register 2-point Sensor Compensation Value].**

The Module Selection (Register 2-point Sensor Compensation Value) screen is displayed.
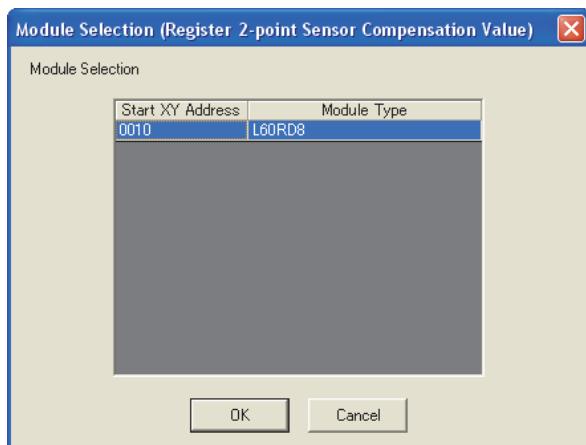
2. **Select a module and click the OK button.**

The Register 2-point Sensor Compensation Value screen is displayed.
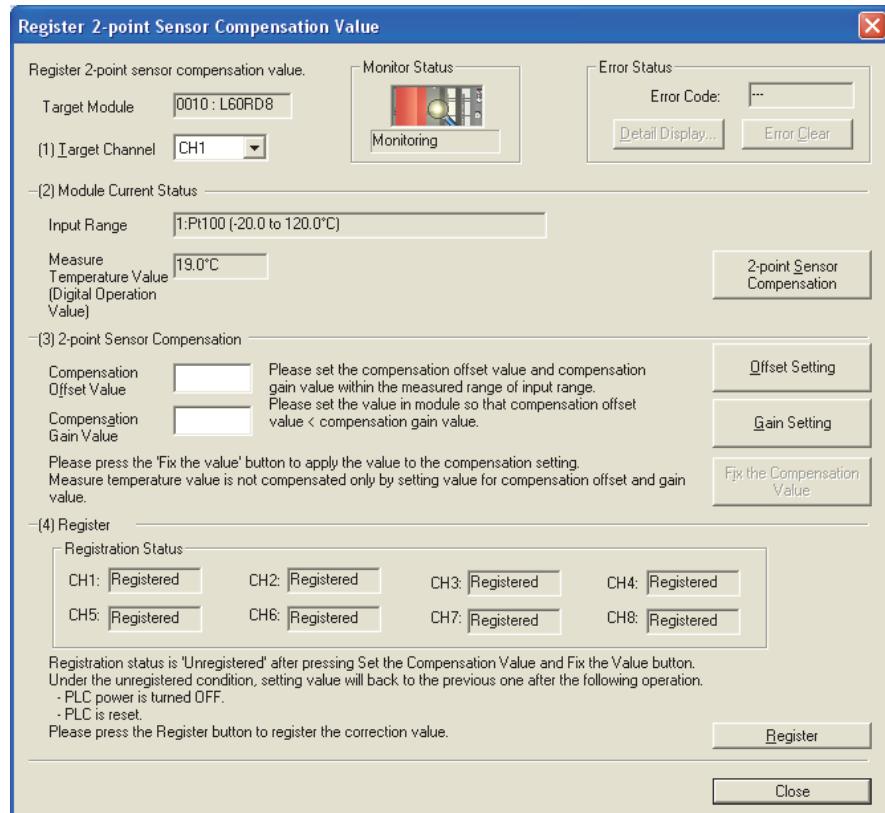
3. **Select the target channel from "(1) Target Channel".**

4. **Set the compensation offset value and the compensation gain value in "(3) 2-point Sensor Compensation".**

For details on setting items, refer to the user's manual for the module.

5. **Click the** [Fix the Compensation Value] **button.**

6. **Click the** [Register] **button.**

The compensation value is registered in the module.

Screen button

For the screen buttons, refer to Section 3.1.1.

● [2-point Sensor Compensation]

The Change Input Range screen is displayed.
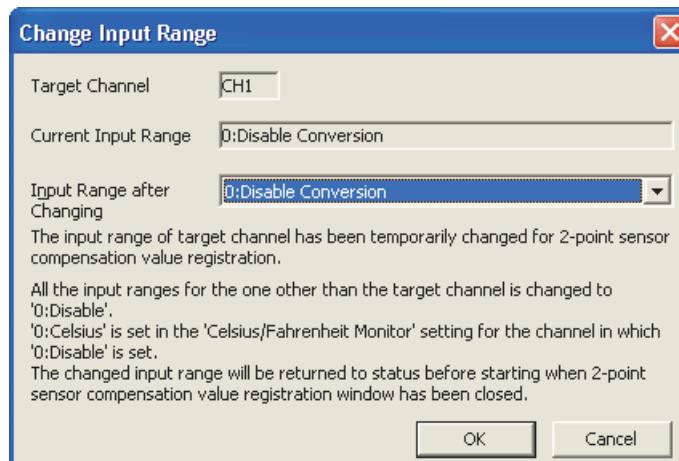
3.3 Temperature Control Module

**This section explains the operations of the intelligent function module tools related to the temperature control module.**

3.3.1 Automatic tuning

Perform the automatic tuning of the temperature control module.
For details of automatic tuning, refer to the user's manual of the module to be used.

Operating procedure

1. **Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Temperature Control Module] ⇒ [Auto Tuning].**

The Module Selection (Auto Tuning) screen is displayed.
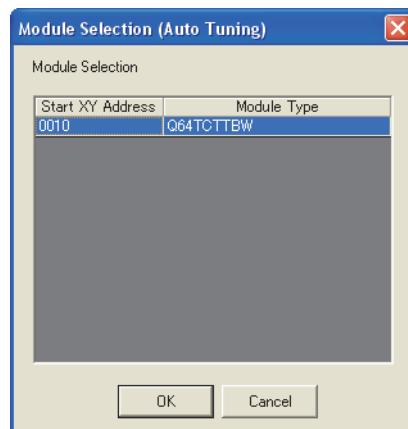
2. **Select a module and click the `OK` button.**

The Auto Tuning screen is displayed.

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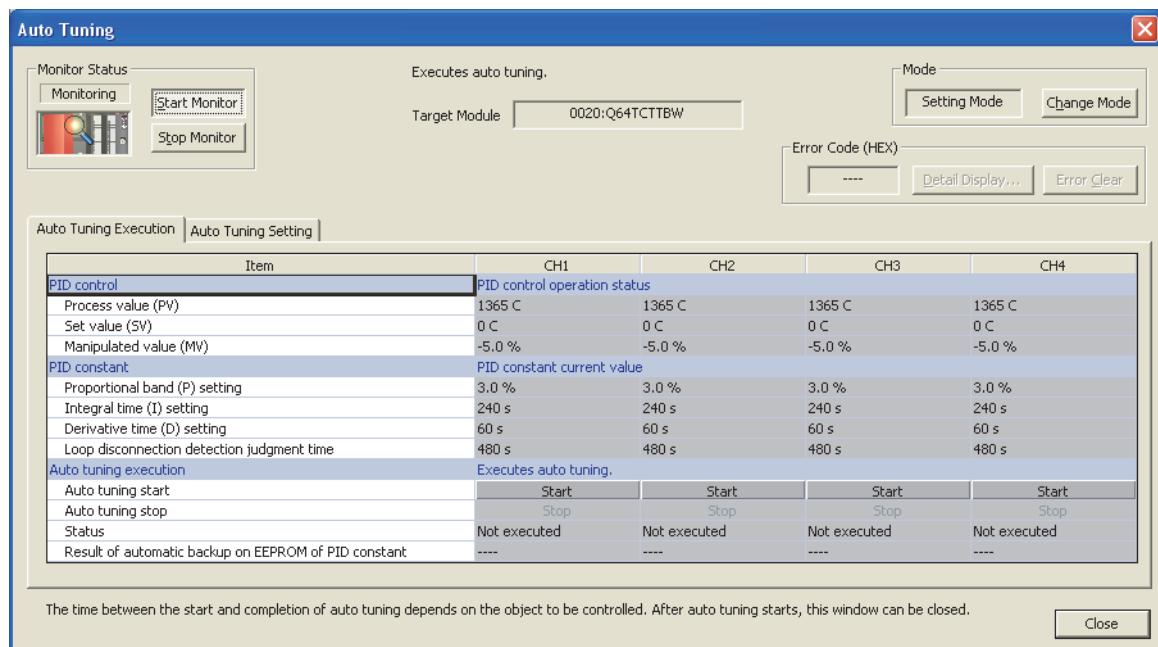
3. **When "Mode" is set to "Setting Mode", click the** `Change Mode` **button.**

The operation mode of the temperature control function is changed to "Operation Mode".

4. **Select the <<Auto Tuning Setting>> Tab.**
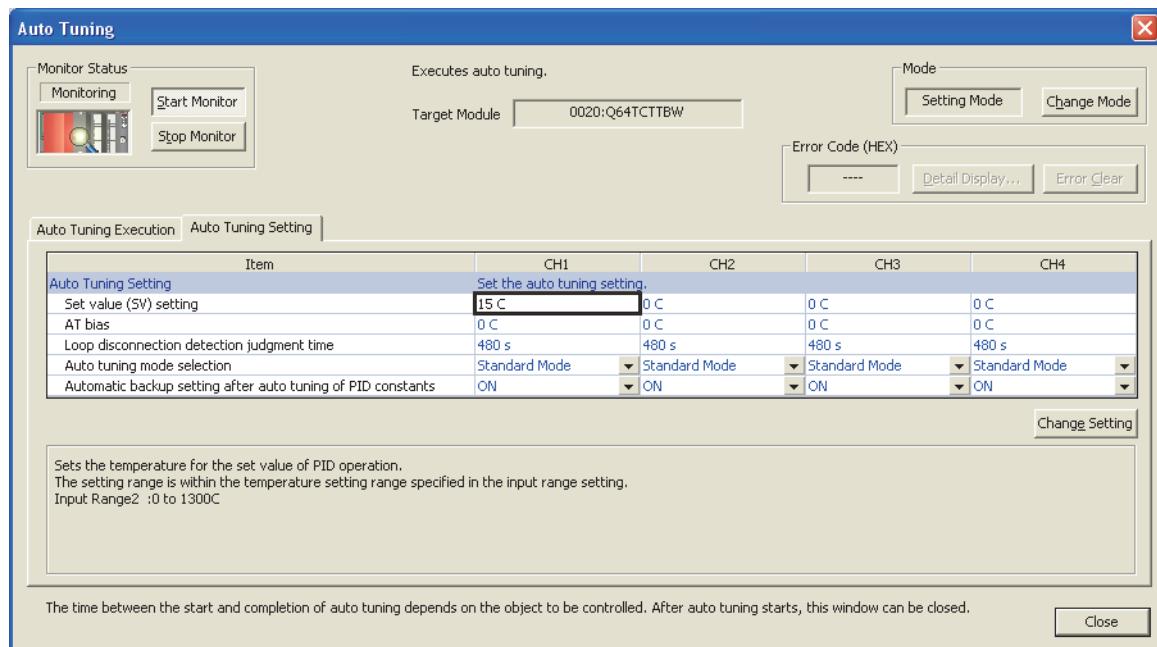
5. **Configure the automatic tuning settings.**

For details of setting items, refer to the user's manual of the module to be used.

6. **Click the** `Change Setting` **button.**

The set values are written to the buffer memory of the module.

7. **Select the <<Auto Tuning Execution>> tab.**

8. **Click the** `Start` **button.**

The automatic tuning is started.

Screen button

For the screen buttons, refer to Section 3.1.1.

3.3.2 Sensor Correction

Perform the sensor correction of temperature control module.
For details of sensor correction, refer to the user's manual of the module to be used.

Operating procedure

1. **Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Temperature Control Module] ⇒ [Sensor Correction].**

The Module Selection (Sensor Correction Function) screen is displayed.
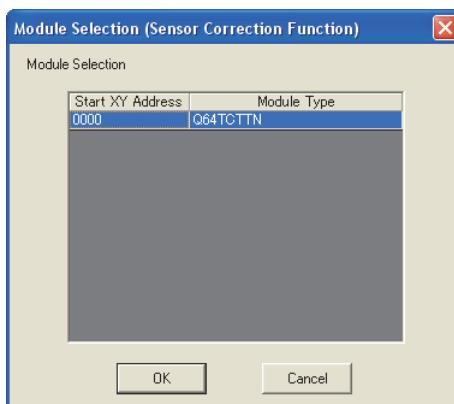
2. **Select a module, and click the [OK] button.**

The Sensor Correction screen is displayed.
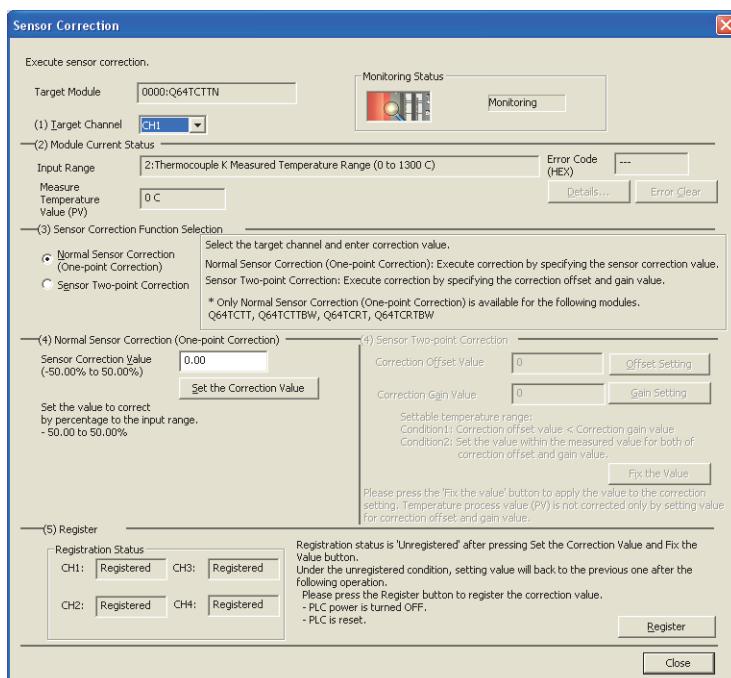
3. **Select the target channel from "(1) Target Channel".**

4. **Select a method for sensor correction from "(3) Sensor Correction Function Selection".**

For details of setting items, refer to the user's manual of the module to be used.

5. **Enter a correction value on "(4) Normal Sensor Correction (One-point Correction)"
or "(4) Sensor Two-point Correction", and click the** | Set the Correction Value | / | Offset Setting | /
| Gain Setting | **button.**

The set values are written to the buffer memory of the module.

6. **For "(4) Sensor Two-point Correction", click the** | Fix the Value | **button.**

7. **Click the** | Register | **button.**

The correction value is registered to the module.

Screen button

For details of screen buttons, refer to Section 3.1.1.

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● **Considerations when initial settings are set on PLC parameter**
When the initial settings are set on the PLC parameter, if the power is turned OFF to ON, or the CPU module is reset and then canceled after the execution of sensor correction on the Sensor Correction screen, the value of "Sensor correction value setting" set on the PLC parameter is given priority at the start of the module.
When using the value set on the Sensor Correction screen after the power is turned OFF to ON, or the CPU module is reset and then canceled, correct the setting value of "Sensor correction value setting" on the PLC parameter, and execute Write to PLC.

3.3.3 Reducing number of auto refreshes

Change the mode of auto refresh of open temperature control module to the Setting item reduction mode.

When changed to the Setting item reduction mode, the parameter items are grouped, and devices are set only on the start item of group. This operation reduces the number of settings of intelligent function module parameters when using multiple temperature control modules.

For the number of auto refreshes after reduction, refer to Section 2.1.7.

Operating procedure

1. **Select [Edit] ⇒ [Setting Item Reduction Mode].**

The following message is displayed.
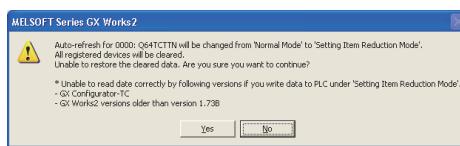
2. **Click the [Yes] button.**

The mode is changed to the Setting item reduction mode, and the parameter items are grouped.
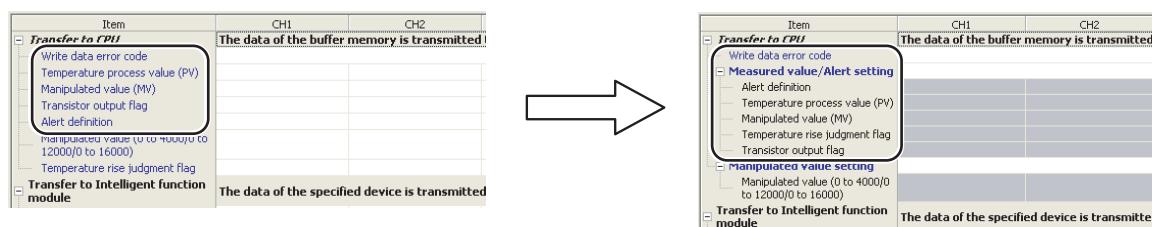
3. **Set a start device on the parameter item.**

The sequential devices are set in the group automatically.

The sequential devices are set in the group.
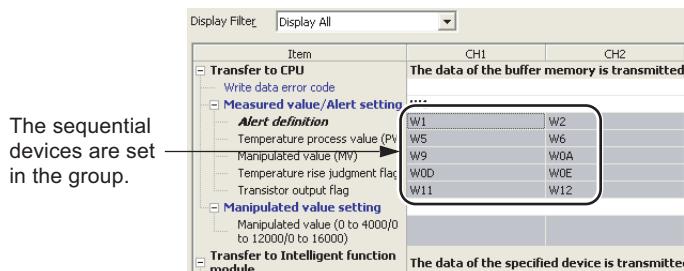
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● **When returning to the normal mode from the Setting item reduction mode**
When returning to the normal mode from the Setting item reduction mode, select [Edit] ⇒ [Setting Item Reduction Mode].

● **Considerations when changing modes**
Changing modes clears all the previous settings.

● **Reading auto refresh that is set with the Setting item reduction mode in GX Configurator-TC**
  • The settings of auto refresh set in group unit cannot be displayed properly when reading in GX Configurator-TC. The device set on the start item of group is displayed.
  • Do not edit the settings of auto refresh being read in GX Configurator-TC.

3.4 Counter Module

This section explains the operations of the intelligent function module tools related to the counter module.

3.4.1 Preset function

Perform the preset function.
For details of preset function, refer to the user's manual of the module to be used.

Operating procedure

1. **Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Counter Module] ⇒ [Preset].**

The Module Selection (Preset) screen is displayed.
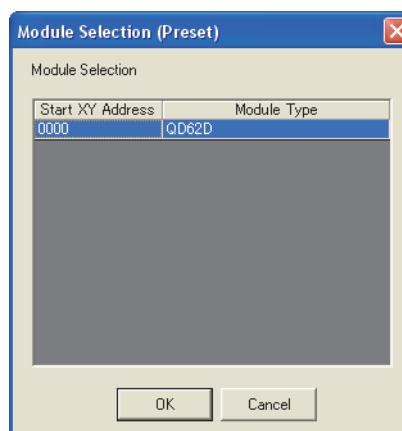
2. **Select a module and click the [OK] button.**

The Preset screen is displayed.
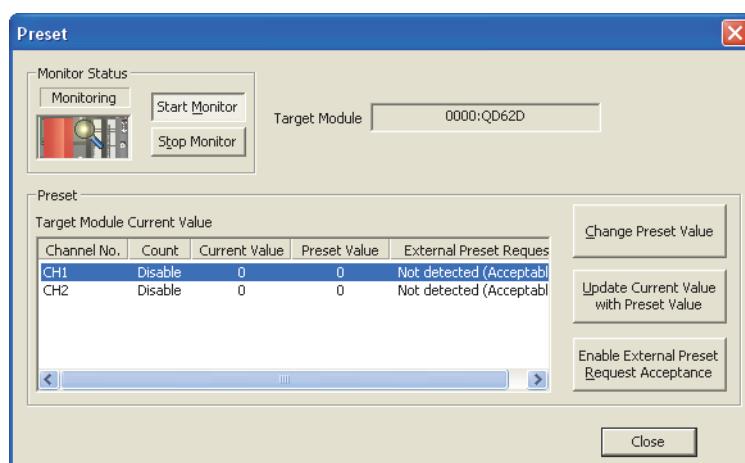
3. **Select a channel number to which the preset is performed.**

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4. **Click the** Change Preset Value **button.**

The Change Preset Value screen is displayed.

Change Preset Value

Changes the preset value of CH1.

New Preset Value: 100

(Setting Range: -2147483648 to 2147483647)

Caution: Changed preset values are reset to the parameter values at
the time of PLC reset or power ON. To hold the preset values, the
values need to be reflected to the parameter.

      Change   Cancel
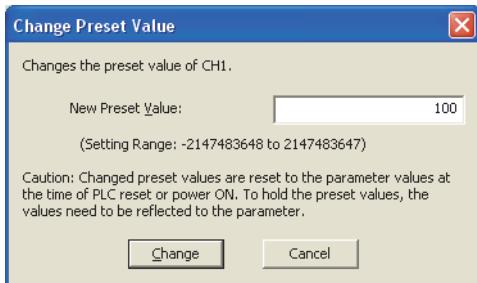
5. **Enter a preset value to "New Preset Value".**

6. **Click the** Change **button.**

The set preset value is written to the buffer memory of the module.

Screen button

- Update Current Value
  with Preset Value

  Click to execute the preset from this screen.
  Updates the current value of the selected channel with the preset value.

- Enable External Preset
  Request Acceptance

  Click to execute the preset by the external control signal.
  Validates the reception of the external preset request of the selected channel.

3.5 QD75/LD75 Positioning Module

This section explains the operations of the intelligent function module tools related to the QD75/LD75 positioning module.

⚠ CAUTION

● **The positioning test functions of OPR, JOG, inching or positioning data for QD75/LD75 positioning module must be executed with the programmable controller set to STOP after the manual has been carefully read and the safety has been ensured. Specially when executing the function on the network system, ensure the safety thoroughly since the machinery whose operation cannot be checked by an operator may be activated. The operation failure may cause the injury or machine damage.**
Ensure the high-speed line condition as much as possible by such as stopping other monitoring functions during execution, and connecting the personal computer and the CPU module directly with USB.
Since the stop request from GX Works2 to the positioning module is delayed depending on the transmission speed, the stop of the motor connected to the positioning module may be delayed.
● **Error occurrence on positioning module with error code 103 at positioning test execution**
Refer to Point in Section 3.5.2.

3.5.1 Positioning monitoring

Execute the positioning monitoring of QD75/LD75 positioning module.
The positioning monitoring is used for checking an operation of QD75/LD75 positioning module or debugging. When debugging a program such as a ladder program, use the Intelligent Function Module Monitor.
(☞ Section 2.4)
For details of the monitoring items, refer to the user's manual of the module to be used.

Operating procedure

1. **Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [QD75/LD75 Positioning Module] ⇒ [Positioning Monitor] (🖼).**

The Module Selection (Positioning Monitor) screen is displayed.
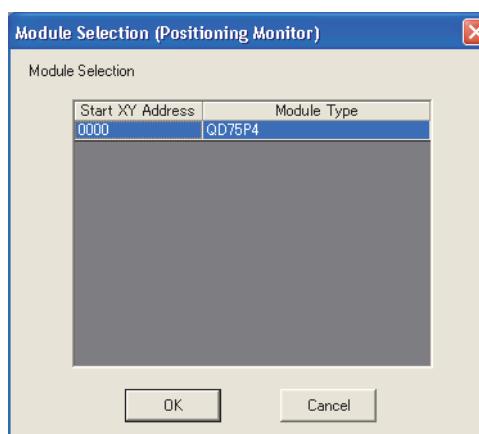
2. **Select a module and click the** ⟦ OK ⟧ **button.**

The monitor screen of positioning module is displayed.

Toolbar →

Display contents

Item		Description
Toolbar		Display tool buttons for executing each function. Check the histories and start/stop monitoring with each tool button. For details of each history, refer to the following sections. ☞ ■ Starting history ☞ ■ Error history ☞ ■ Warning history
Axis Monitor		Display the monitoring result of positioning module.
	Monitor type	Select a monitoring item. The monitoring items are as follows: • Operation monitor • Operation monitor (Axis control) • Operation monitor (Speed-position switching control) • Operation monitor (Position-speed switching control) • Operation monitor (OPR monitor) • Operation monitor (JOG/manual pulse) • Servo monitor (Servo state) • Servo monitor (Torque control/servo load factor) • Servo monitor (Content of servo parameter setting) • Servo monitor (Servo parameter error)
	Font Size	Set a font for the Axis Monitor screen.
Module Information List		QD75 READY (X0), Synchronization flag (X1), M code ON for each axis. The color is turned to green when it is turned ON.

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Screen button

● **Monitor Item Selection**

Displays the Monitor Item Selection screen.
Select axes of monitoring target or monitoring items.
The screen when "Operation monitor" is selected as a monitoring type is as shown below.
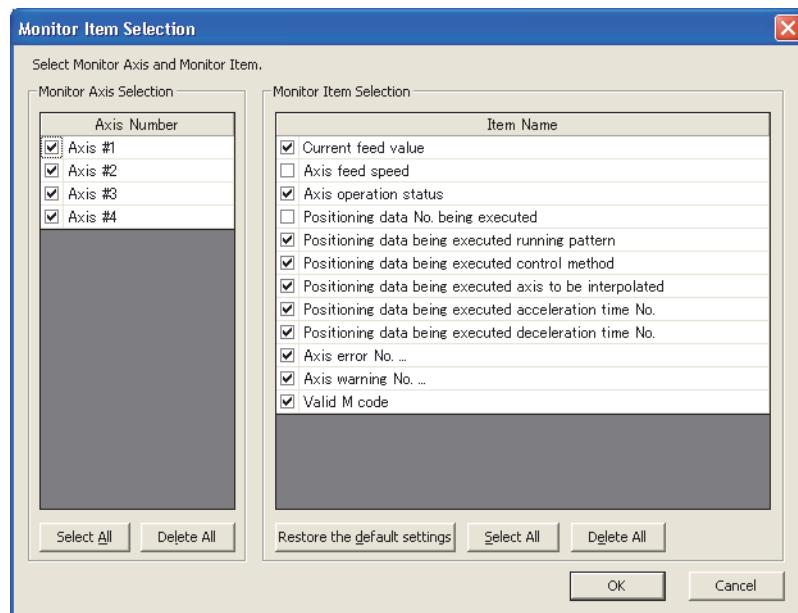
■ Starting history

Monitor the starting history which is stored in a buffer memory of QD75/LD75 positioning module.

Operating procedure

• **Right-click on the Positioning Monitor screen and select [Starting History] (🔍) from the shortcut menu.**
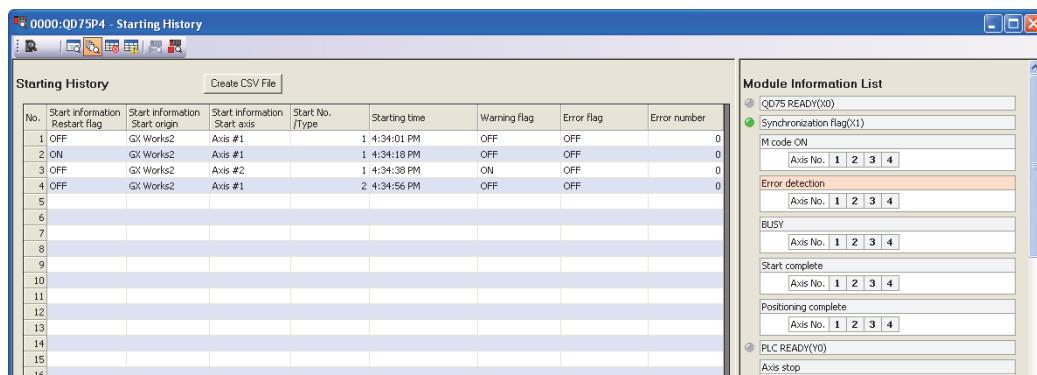
Screen button

● **Create CSV File**

Saves the history being displayed to a file in the CSV file format.

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■ Error history

Monitor the error history which is stored in a buffer memory of QD75/LD75 positioning module.

Operating procedure

- **Right-click on the <u>Positioning Monitor</u> screen and select [Error History] (▣) from the shortcut menu.**
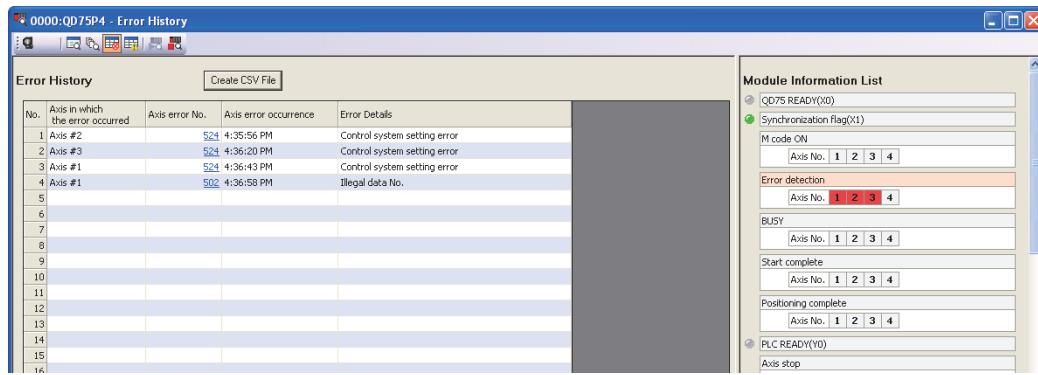
Screen button

For the screen buttons, refer to ■ Starting history.

■ Warning history

Monitor the warning history which is stored in a buffer memory of QD75/LD75 positioning module.

Operating procedure

- **Right-click on the <u>Positioning Monitor</u> screen and select [Warning History] (▣) from the shortcut menu.**

Screen button

For the screen buttons, refer to ■ Starting history.

Point⌁
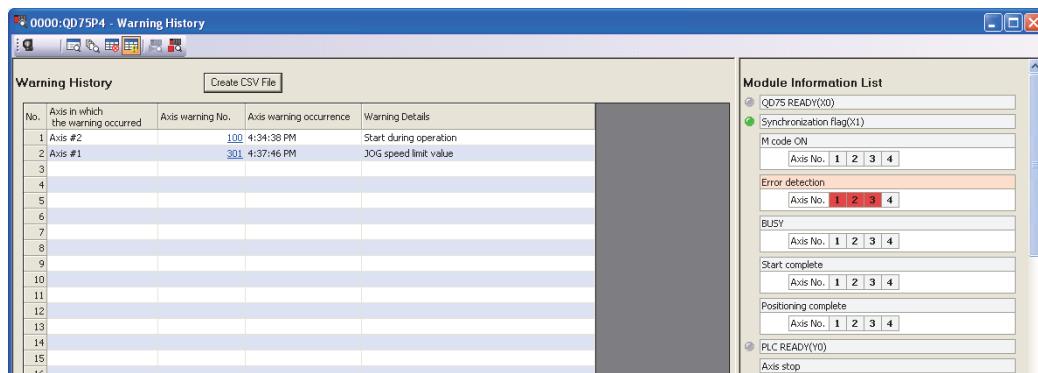
● **Axis error No./Axis warning No.**
  For axis error No. 2000 or higher/error details of axis warning No./warning details, refer to user's manual of positioning module.

3.5.2 Positioning test

Perform the positioning test of QD75/LD75 positioning module.
For details of testing items, refer to the user's manual of the module to be used.

Operating procedure

1. **Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [QD75/LD75 Positioning Module] ⇒ [Positioning Test] (🖥️).**

   The Module Selection (Positioning Test) screen is displayed.
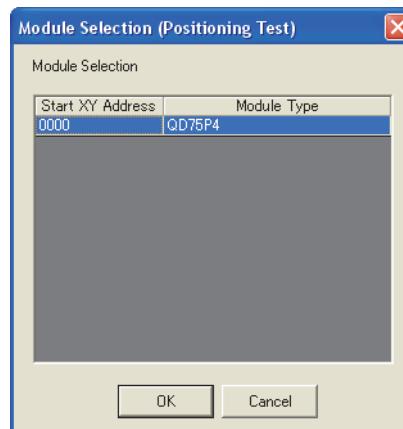
2. **Select a module, and click the** ⟨ OK ⟩ **button.**

The Positioning Test screen is displayed.

Test function selection →
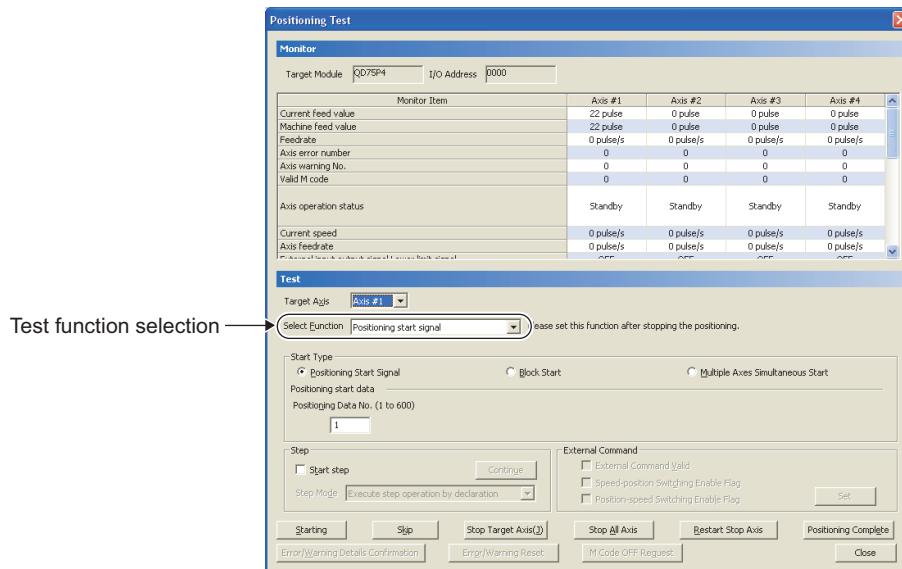
The test function can be switched by selecting an item in "Select Function" under "Test" section.
For details of each test function, refer to the following sections.
☞ ■ Positioning start test
☞ ■ JOG, manual pulse generator, and OPR tests
☞ ■ Speed change test
☞ ■ Current value change test

Screen button

● ⟨ Starting ⟩
Starts the positioning operation.

● ⟨ Skip ⟩
Decelerates and stops the currently-running sequential positioning operation, and starts the operation of the next positioning number by clicking the button during the positioning operation.

● ⟨ Stop Target Axis(J) ⟩
Stops the positioning control of the selected "Target Axis" by clicking the button during the positioning operation.

● ⟨ Stop All Axis ⟩
Stops the positioning control of all the axes by clicking the button during the positioning operation.

● ⟨ Restart Stop Axis ⟩
Restarts the suspended positioning operation by clicking the button when the positioning operation is in a suspended status.

● ⟨ Positioning Complete ⟩
Ends the positioning operation prior to the operation of the next positioning number.

● ⟨ Error/Warning Details Confirmation ⟩
Displays the Error/Warning Details Confirmation screen when an error or warning is occurring to the axis set for "Target Axis". Check the error description and the corrective action.

● Error/Warning Reset

Clears the error or warning of the target axis when an error or warning is occurring to the axis set for "Target Axis".

● M Code OFF Request

Turns the M code status OFF when the axis with M code ON is set for "Target Axis".

● Servo ON/OFF Request

Performs the servo ON/OFF command for QD75M/MH.

Servo ON/OFF Request

Axis Servo OFF Command

☐ Axis #1 servo OFF command

☐ Axis #2 servo OFF command

☐ Axis #3 servo OFF command

☐ Axis #4 servo OFF command

[All Axis Servo ON Request] [All Axis Servo OFF Request] [Close]

Point

● **Testing before installing external devices such as servo amplifiers and motors.**

The following message is displayed after selecting a module. Click the [No] button.

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Are the servo amplifier and motor connected?

Caution
When executing the test without connecting,
OPR requiring speed-position/position-speed switching by external input signal, near-point dog and zero signal cannot be executed.

[Yes] [No]
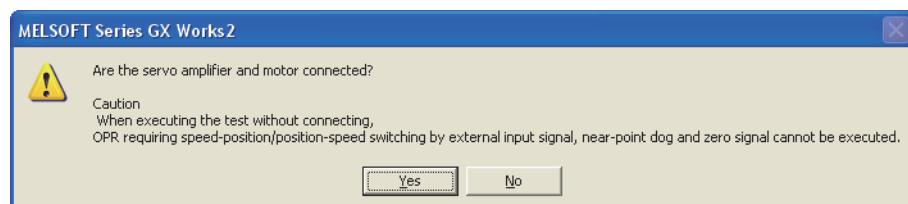
● **Error occurrence on positioning module with error code 103 during positioning test execution**
Take a corrective action such as setting the transmission speed to high speed on the Transfer Setup screen, connecting the personal computer to the communication I/F of CPU module directly, and stopping other functions (such as monitoring function) that use the communication port.

■ **Positioning start test**

Perform the test operation by specifying a positioning data number or a point number of block start data.

Operating procedure

1. **Select "Positioning start signal" for "Select Function" on the <u>Positioning Test</u> screen.**
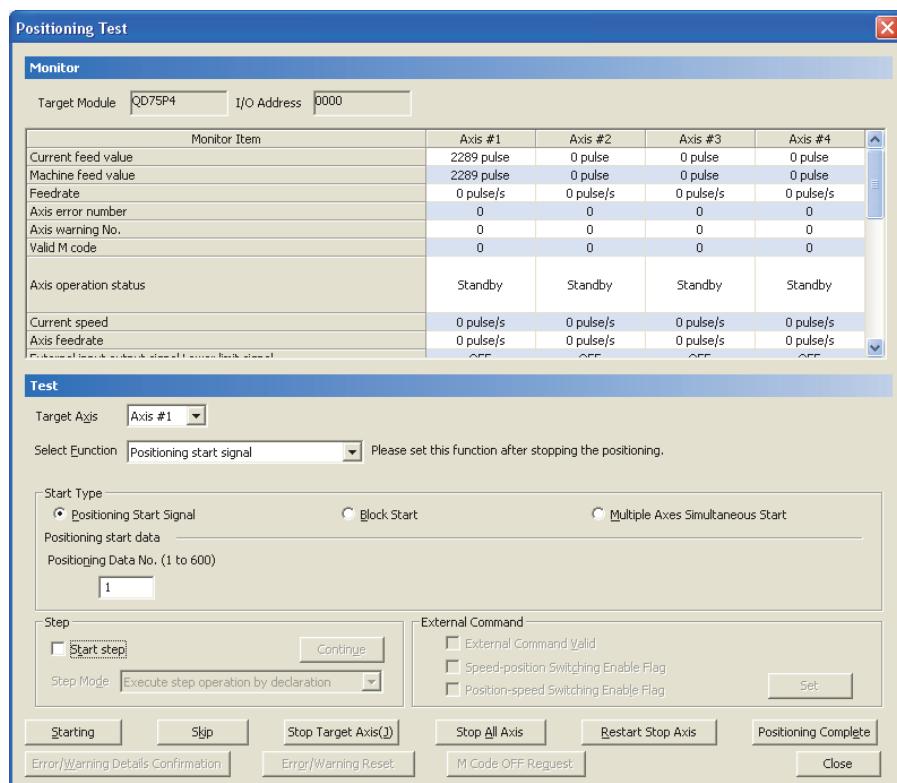
2. **Set the items on the screen.**

Item			Description
Start Type			Select a start type for the test operation.
	Positioning Start Signal		Select this to perform the positioning start.
		Positioning Data No.	Set a positioning data number.
	Block start		Select this to perform the block start.
		Block No.	Set a block number.
		Point No.	Set a point number.
	Multiple Axes Simultaneous Start		Select this to perform the multiple axes simultaneous start.
		Multiple Axes Simultaneous Positioning Start Data No.	Set positioning data numbers for each axis.
Step			Select this to perform the step start, and select the step mode.
External Command			Validate a speed-position switch and/or a position-speed switch.
	External Command Valid		Select this to validate external commands.
	Speed-position Switching Enable Flag		Select this to validate the external command of speed-position switch.
	Position-speed Switching Enable Flag		Select this to validate the external command of speed-position switch.

3. **Click the** [Starting] **button.**

The positioning operation is started.

Screen button

● [Continue]

Performs the step start from the next positioning data number when the button is clicked during the step standby status.

● [Set]

Validates the items selected for "External Command".

■ JOG, manual pulse generator, and OPR tests

Perform the JOG, manual pulse generator, and OPR tests.

Operating procedure

1. **Select "JOG/Manual Pulse Generator/OPR" for "Select Function" on the** <u>Positioning Test</u> **screen.**
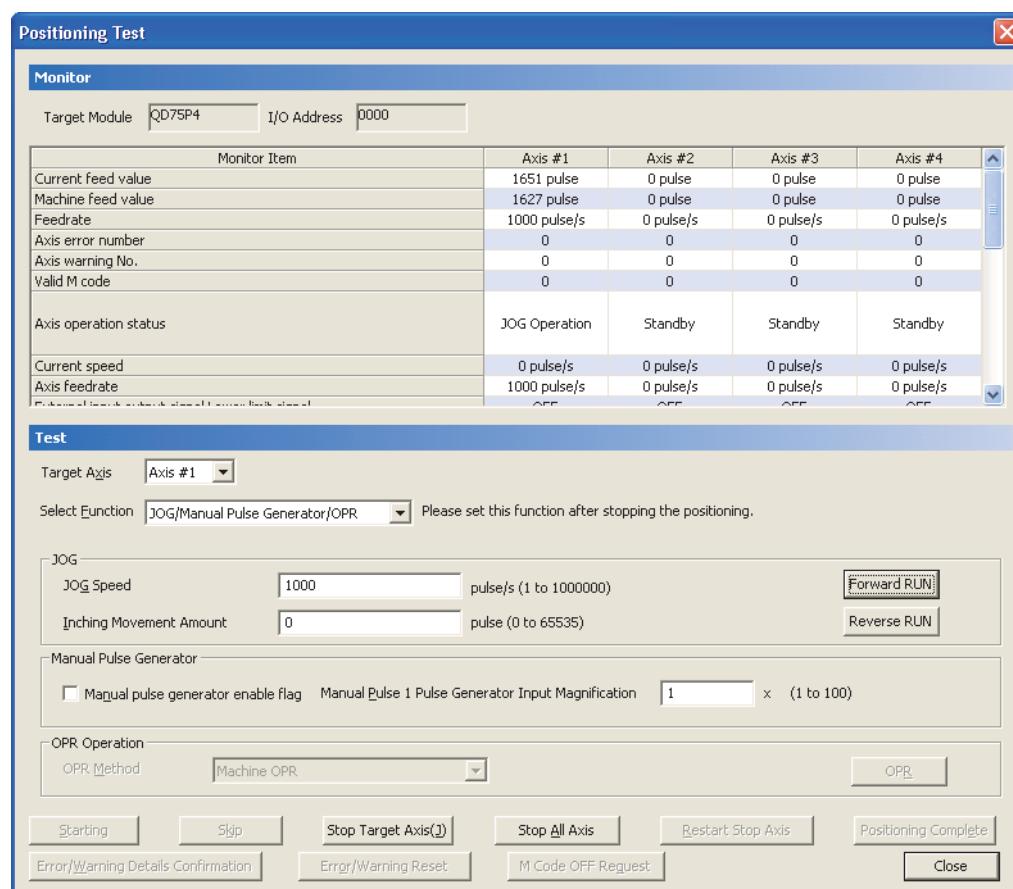
2. **Set the items on the screen.**

Item	Description
JOG	–
JOG Speed	Set the JOG speed for JOG operation. This item is ignored for inching operation.
Inching Movement Amount	Set the travel amount for inching operation. Set '0' for JOG operation.
Manual Pulse Generator	Select "Manual pulse generator enable flag" to perform the manual pulse generator operation and enter a value for "Manual Pulse1 Pulse Generator Input Magnification".
OPR Operation	Select the OPR method.

3. **Click the** Forward RUN **/** Reverse RUN **button.**

For the JOG operation (when "Inching Movement Amount" is '0'), performs the JOG operation in forward rotation or reverse rotation while pressing the button.

For the inching operation (when "Inching Movement Amount" is more than '1'), outputs pulses for the amount of inching in forward rotation or reverse rotation by each click.

Screen button

● OPR

Performs the OPR control when the positioning operation is in a suspended status.

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■ **Speed change test**

Change the speed of axis which is being operated under the positioning start test, JOG test, or OPR test.

Operating procedure

1. **Select "New Speed" for "Select Function" on the** <u>**Positioning Test**</u> **screen.**
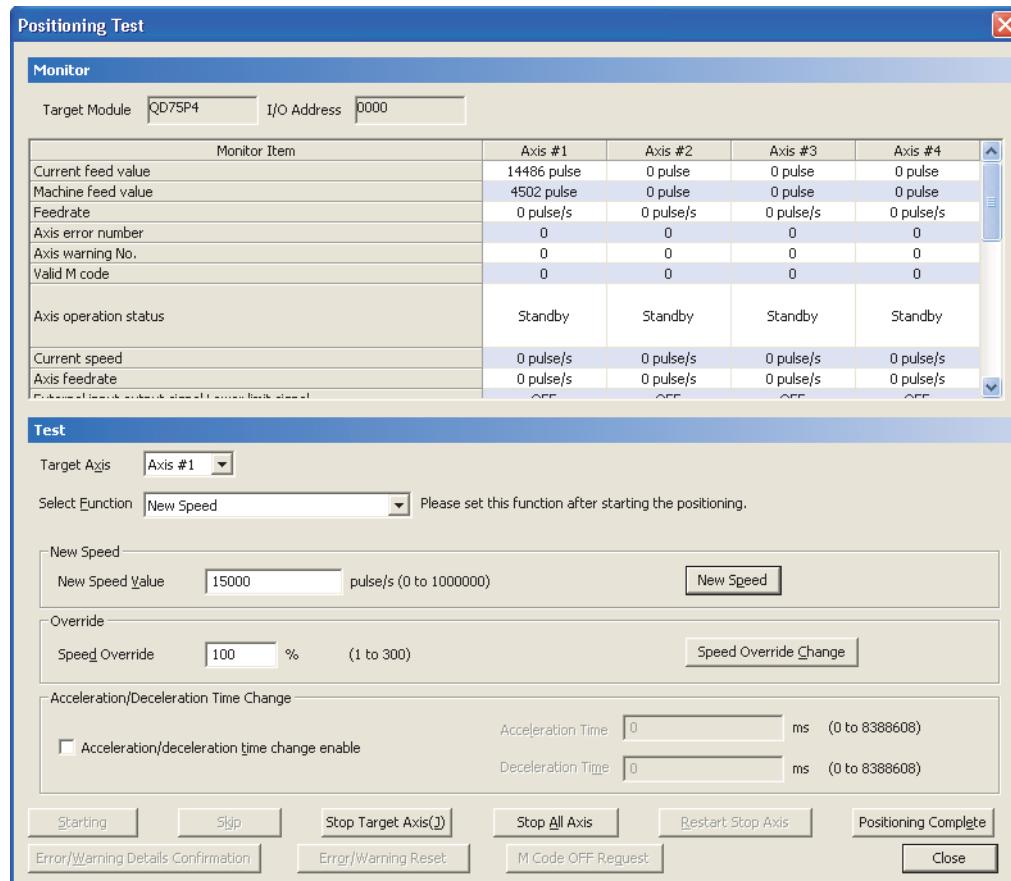
2. **Set the items on the screen.**

Item	Description
New Speed	Set a speed. Set '0' to stop the operation.
Override	Set a value to override the speed of positioning operation.
Acceleration/Deceleration Time Change	Select this to permit the change on acceleration/deceleration time, and specify the acceleration time and/or deceleration time.

3. **Click the** New Speed **button.**

The speed is changed.

Screen button

● Speed Override Change
Performs the speed override during the positioning operation.

■ **Current value change test**

Change the current feed value when the positioning operation is in a suspended status or a step standby status.

Operating procedure

1. **Select "Current Value Changing" for "Select Function" on the** <u>Positioning Test</u> **screen.**
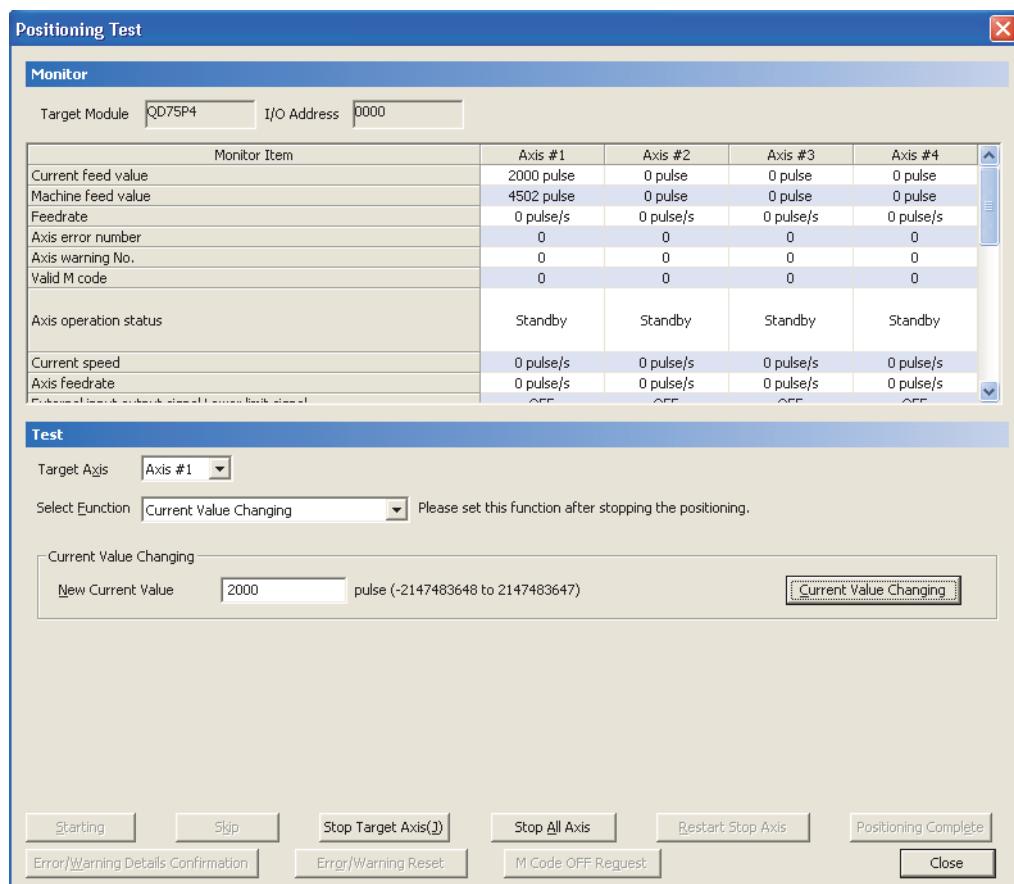
2. **Set the item on the screen.**

Item	Description
Current Value Changing	Set a new current value.

3. **Click the** <u>Current Value Changing</u> **button.**

The current feed value is changed.

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3.5.3   Wave trace

Perform the wave trace of QD75/LD75 positioning module.
The wave trace function displays the waveform data of speed command during the positioning operation. The value shifts of each axis operated online by the positioning module are displayed. This function is not supported by QD75M/QD75MH.

Screen display

Select [Tool] $\Rightarrow$ [Intelligent Function Module Tool] $\Rightarrow$ [QD75/LD75 Positioning Module] $\Rightarrow$ [Wave Trace] ( ).
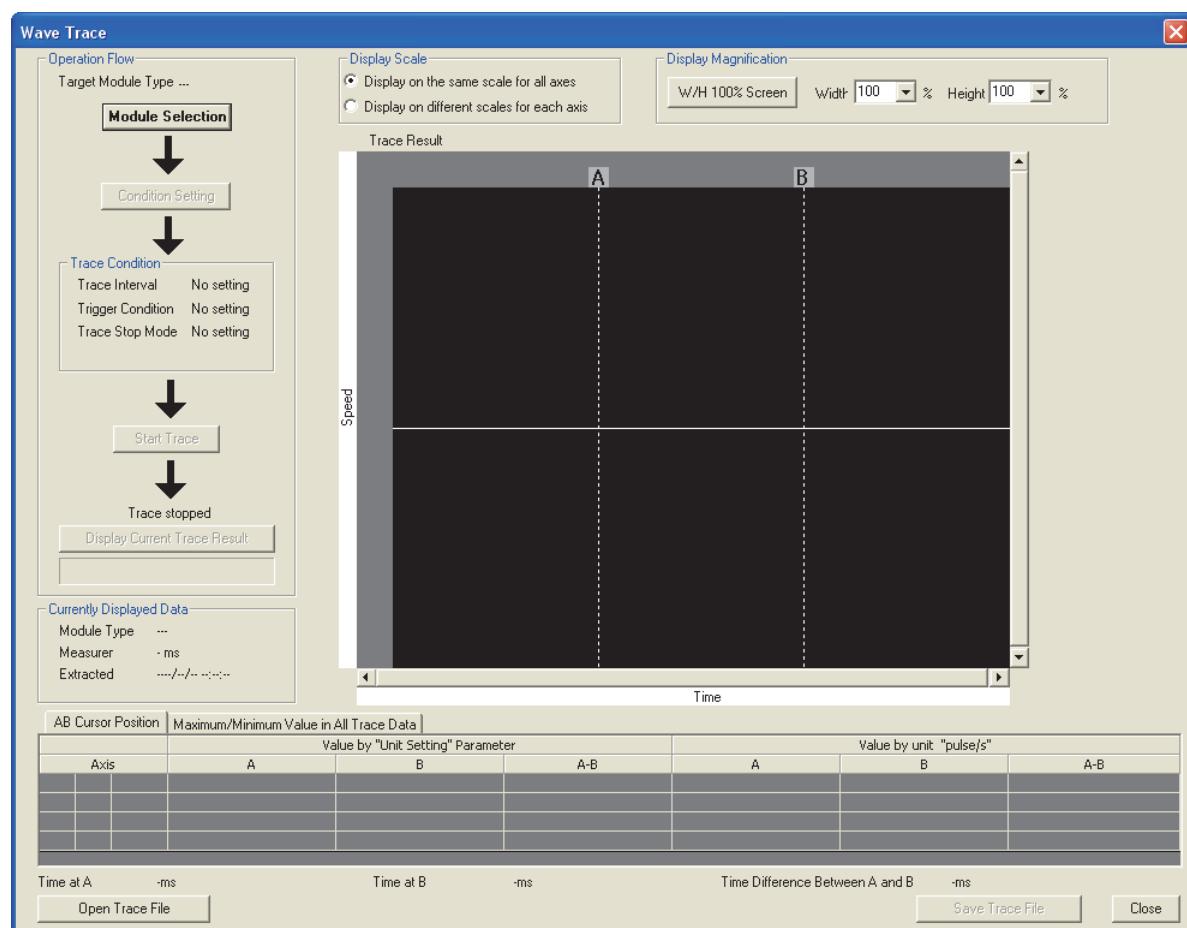
Operating procedure

*1.* **Click the** `Module Selection...` **button.**

The Module Selection (Wave Trace) screen is displayed.
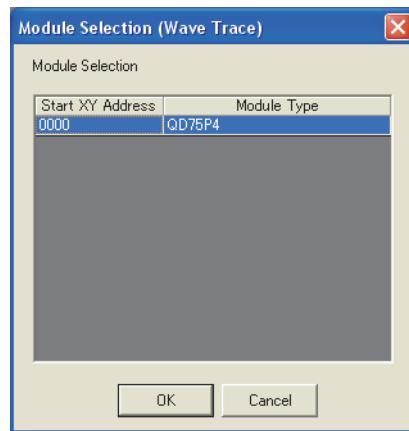
2. **Select a module to perform the wave trace and click the** `OK` **button.**

3. **Click the** `Condition Setting` **button.**

The Wave Trace Condition Setting screen is displayed.
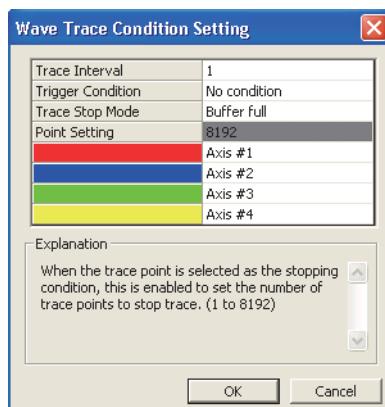
4. **Set the trace condition and click the** `OK` **button.**

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5. **Click the** Start Trace **button.**

The wave trace is started.

When the completion condition is satisfied, or by clicking the Display Current Trace Result button, the trace data are read and displayed on the screen.
The values at each position can be checked on the <<AB Cursor Position>> tab by dragging the AB cursor in "Trace Result".
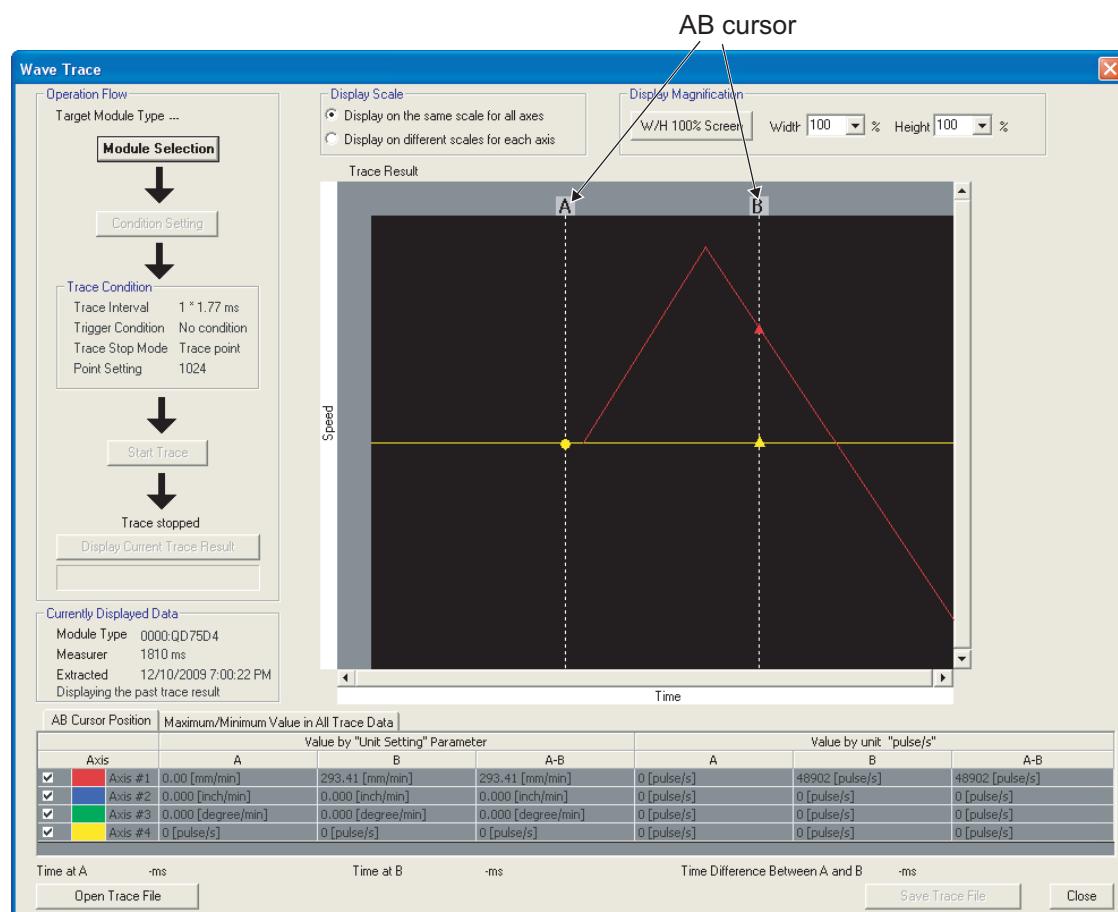
Screen button

● W/H 100% Screen
Returns the width and height scales to 100%, and initializes the graph display scale.

● Open Trace File
Reads the trace data stored on a personal computer and displays them on the Wave Trace screen.

● Save Trace File
Stores the obtained trace data on a personal computer.

3.5.4   Location trace

Perform the location trace of QD75/LD75 positioning module.
The location trace function displays the location data of two-axis interpolation and simultaneous start (two axes).
This function is not supported by QD75M/QD75MH.

Screen display

Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒
[QD75/LD75 Positioning Module] ⇒ [Location Trace] (📊).
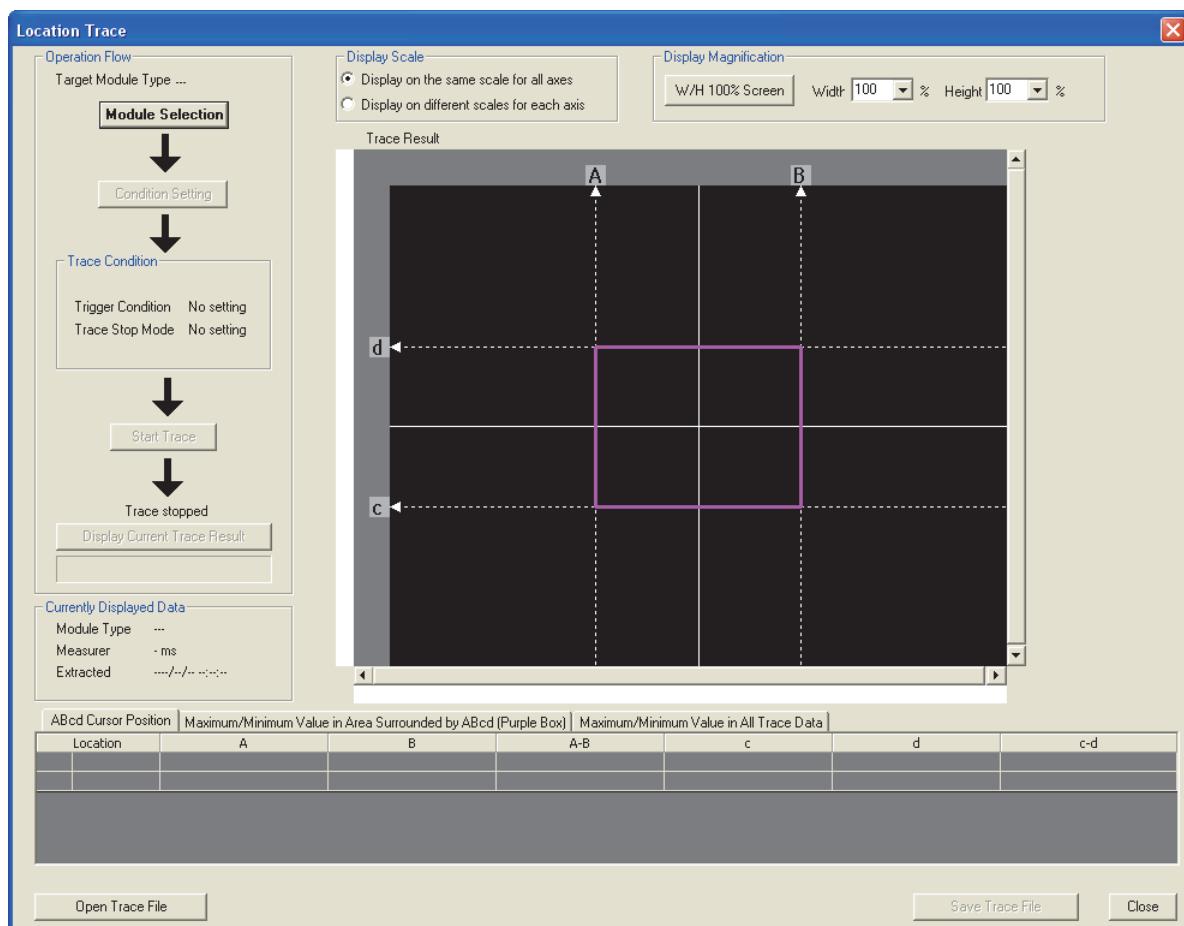
Operating procedure

1. **Click the** Mod<u>u</u>le Selection **button.**

The Module Selection (Location Trace) screen is displayed.
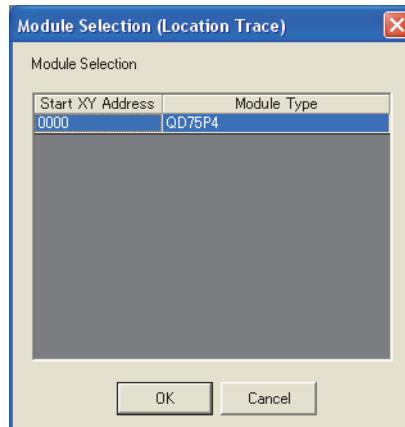
2. **Select a module to perform the location trace and click the** OK **button.**

3. **Click the** Condition S<u>e</u>tting **button.**

The Location Trace Condition Setting screen is displayed.
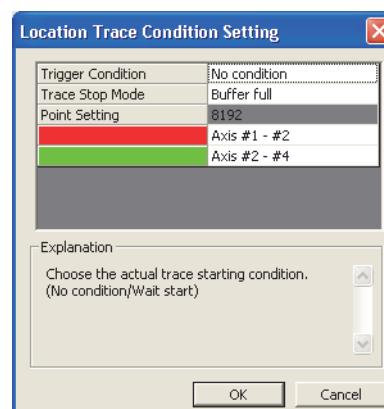
4. **Set the trace condition and click the** OK **button.**

5. **Click the** [Start Trace] **button.**

The location trace is started.

When the completion condition is satisfied, or by clicking the [Display Current Trace Result] button, the trace data are read and displayed on the screen.

The values at each position can be checked on the <<AB Cursor Position>> tab by dragging the AB cursor in "Trace Result".

AB cursor

cd cursor

■ **Screen button**

For the screen buttons, refer to Section 3.5.3.

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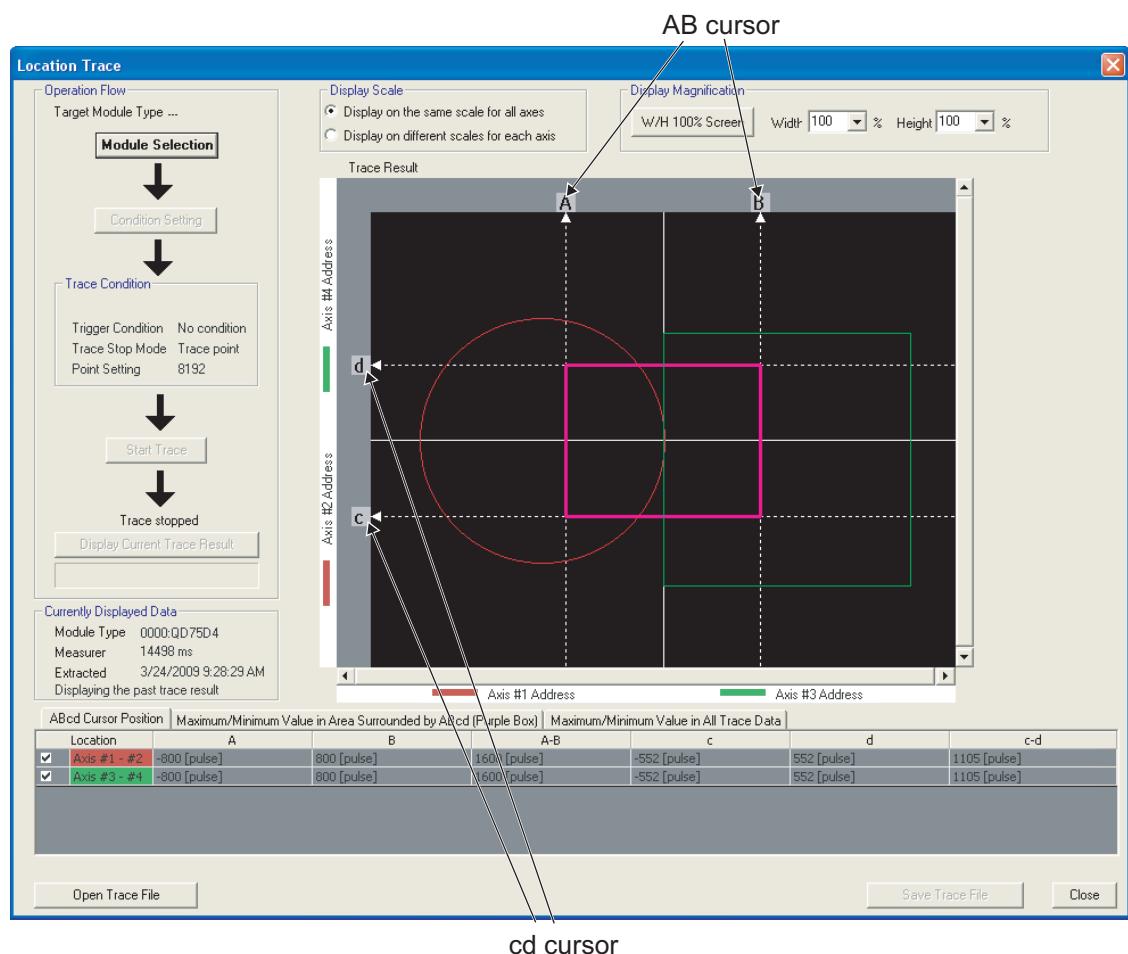
3.5.5　Requesting parameter initialization and flash ROM write

Request a buffer memory data write from the QD75/LD75 positioning module to the flash ROM. Buffer memory data can be initialized and applied to the flash ROM.
Parameters, servo parameters, positioning data, and block start data (including condition data) of all ranges are written in batch from the buffer memory to the flash ROM.

Operating procedure

1. **Select [Tool] ⇒ [Request of Parameter Initialization/Flash ROM Write Request].**

   The <u>Request of Parameter Initialization/Flash ROM Write Request</u> screen is displayed.
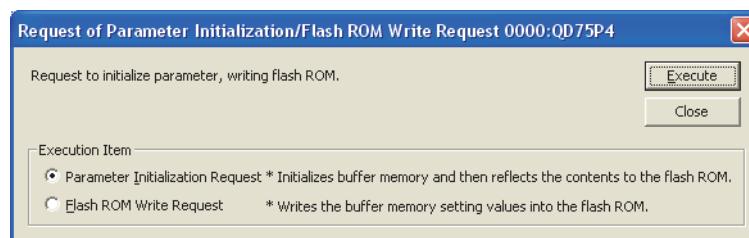
2. **Select an item under "Execution Item", and click the [Execute] button.**

   The request of the selected item is executed.

3.5.6 Convenient functions for editing data

The following explains the convenient functions for editing data of QD75/LD75 positioning module.

■ Displaying guidance of QD75/LD75 positioning module

For QD75/LD75 positioning module, the explanations of each item of intelligent function module data can be checked on the Intelligent Function Module Guidance window.
A detailed explanation of the item at the cursor position is displayed when editing data.

Screen display

Select [View] ⇒ [Docking Window] ⇒ [Intelligent Function Module Guidance] (❓).
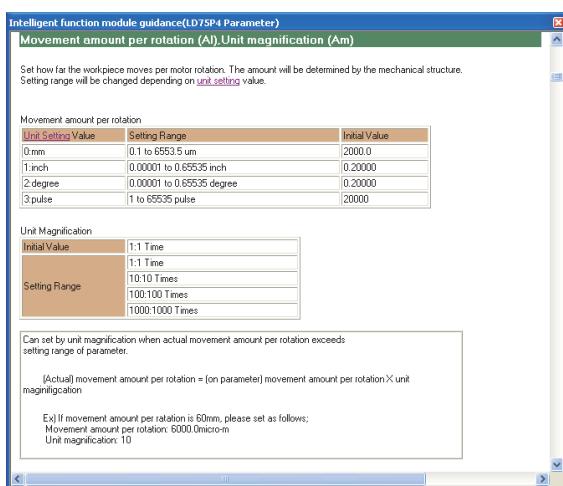
Point

● **Items displayed in blue**
   A detailed explanation of the selected item can be displayed by clicking the item displayed in blue.
● **Displaying/hiding the Intelligent function module guidance window**
   To display/hide the Intelligent function module guidance window, select [Tool] ⇒ [Options] ⇒ "Intelligent Function Module" ⇒ "Guidance" ⇒ "Display intelligent function module guidance".
   For details of displaying/hiding the Intelligent function module guidance window, refer to the following manual.
   ☞ GX Works2 Version 1 Operating Manual (Common)

■ Jump

Move the cursor to the specified data number on the positioning data setting screen.

Operating procedure

1. **Select [Edit] $\Rightarrow$ [Jump].**

The Jump screen is displayed.
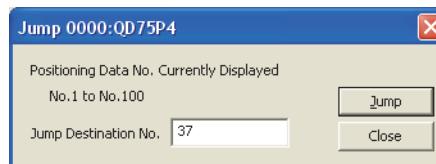
2. **Enter a positioning data number of the jump destination.**

3. **Click the** Jump **button.**

The cursor moves to the specified positioning data number.

■ Setting maximum/minimum/default value

Set a maximum value, minimum value, or default value on the setting screen of parameters or servo parameters.

Operating procedure

1. **Select the item to which a maximum value, minimum value, or default value is set.**

2. **Select [Edit] $\Rightarrow$ [Set Maximum Value]/[Set Minimum Value]/[Set Default Value].**

The maximum/minimum/default value is set.

■ Calculating electronic gear

Check the electronic gear on the parameter setting screen according to the set data.

Operating procedure

• **Select [Edit]] $\Rightarrow$ [Computation of Electronic Gear].**

The calculation result of the electronic gear is displayed.
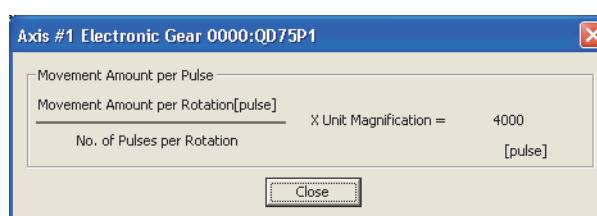
■　**Initialization of rows/columns**

Initialize data in the rows/columns on the positioning data setting screen or the block start data setting screen.

Operating procedure

1. **Select the row(s) or column(s) whose data to be initialized.**

2. **Select [Edit] ⇒ [Initialization of Row]/[Initialization of Column].**

The data of the selected row(s) or column(s) are initialized.

■　**Inserting/deleting rows**

Insert/delete rows on the positioning data setting screen or the block start data setting screen.

Operating procedure

1. **Select the item(s) where a row(s) is/are inserted above or whose row(s) to be deleted.**

2. **Select [Edit] ⇒ [Insert Row]/[Delete Row].**

The row(s) is/are inserted above the selected item, or the row(s) of the selected item(s) is/are deleted.

■　**Copying/Pasting positioning data**

Copy/paste the setting of positioning data on the positioning data setting screen.

Operating procedure

1. **Select the item of the positioning data number to be copied.**

2. **Select [Edit] ⇒ [Positioning Data Copy].**

Data of the positioning data number at the cursor position are copied.

3. **Select the item of the positioning data number to be pasted.**

4. **Select [Edit] ⇒ [Positioning Data Paste].**

The copied data of positioning data number is pasted to the selected row.

■ Block start copy

Utilize specified block start data to another axis or block on the block start data setting screen.

Operating procedure

1. **Select [Edit] ⇒ [Block Start Copy].**

The Block Start Copy screen is displayed.
The screen image below is an example when the operation is performed on the data of QD75P4.
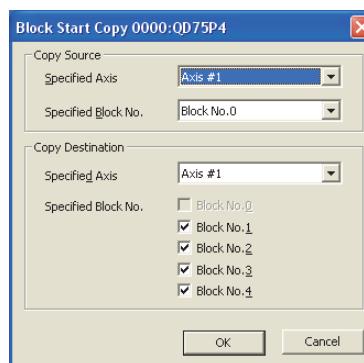
2. **Specify the axis or block number of the copy destination, and click the** [OK] **button.**

The block start copy is executed.

■ Editing M code comments

Set comments to the M code, which is required for synchronizing with the positioning control, on the positioning data setting screen. M code comments are saved only within the project.

Operating procedure

1. **Select [Edit] ⇒ [M Code Comment Edit].**

The M Code Comment Edit screen is displayed.
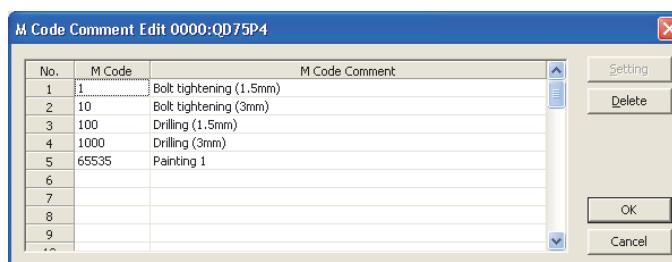
2. **Set the items on the screen.**

Item	Description
M Code	Enter M code numbers within the range from 1 to 65535. A maximum number of M code comments that can be set is 50.
M Code Comment	Enter M code comments.

3. **Click the** [OK] **button.**

M code comments are set.

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Screen button

● [Setting]

Applies the M code at the cursor position on the M Code Comment Edit screen to the row where the cursor is positioned on the positioning data setting screen.

● [Delete]

Deletes the M code and M code comment of the row at the cursor position.

■ Editing condition data

Set condition data such as condition start, wait start, simultaneous start of block start data, and start condition of FOR condition on the positioning data setting screen or the block start data setting screen.

Operating procedure

1. **Select [Edit] ⇒ [Condition Data Edit].**

The Condition Data List screen is displayed.
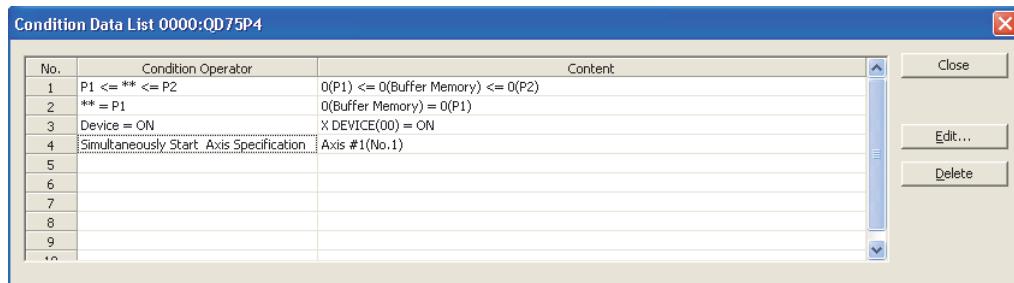
2. **Select the item to which condition data are set, and click the [Edit...] button.**

The Condition Data Edit screen is displayed.
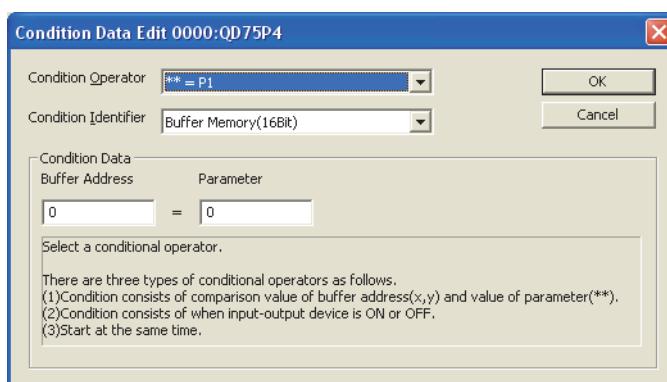
3. **Set the items on the screen.**

Item	Description
Condition Operator	Select a condition operator. "**" indicates buffer memory address. "P1" and "P2" indicate parameters (values to be specified). "Device" indicates X and Y devices.
Condition Identifier	Select a condition identifier.
Condition Data	Enter the condition data such as buffer memory address and parameter.

4. **Click the [OK] button.**

The condition data are set.
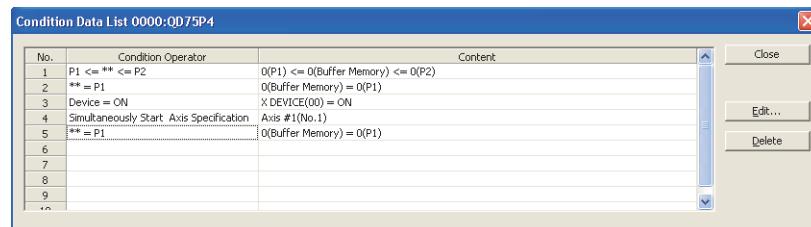
Screen button

● [Delete]
Deletes the condition data at the cursor.

■ Offline simulation

Simulate the waveform and location of set positioning data offline.

Operating procedure

- **Open the positioning data setting screen, and select [Tool] ⇒ [Offline Simulation], or click the [Offline Simulation] button.**
The Offline Simulation screen is displayed.

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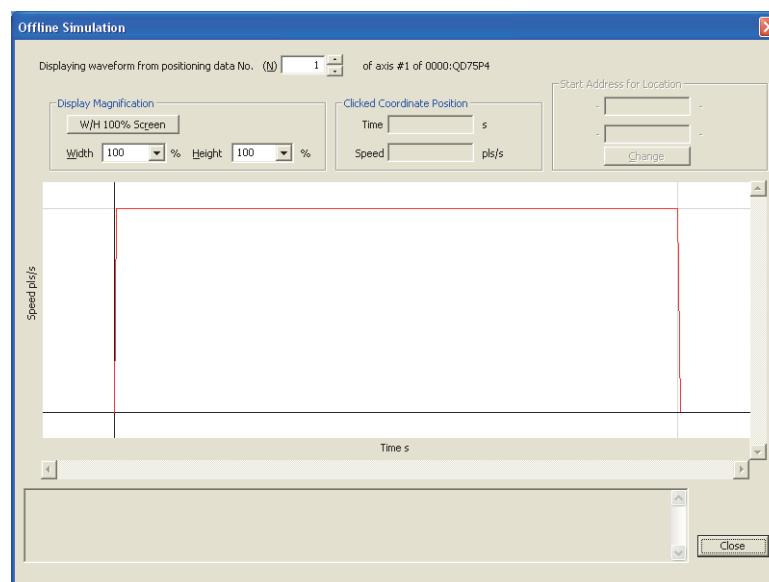
■ **Automatic command speed calculation**

Automatically calculate the constant speed of traveling time between the start position and the target position.

Operating procedure

1. **Open the positioning data setting screen, and select [Tool] ⇒ [Automatic Command Speed Calculation], or click the** Automatic Command Speed Calculation **button.**

The Automatic Command Speed Calculation screen is displayed.
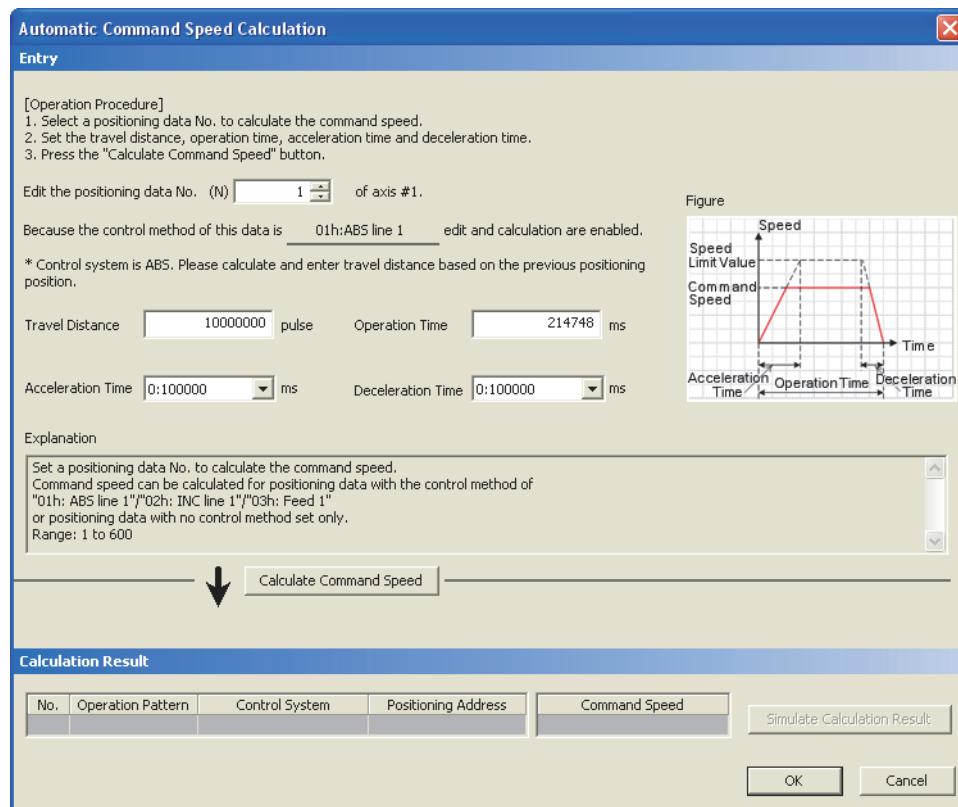
2. **Set the items according to the instructions on the screen.**

3. **Click the** Calculate Command Speed **button.**

The calculation result of command speed is displayed under "Calculation Result".
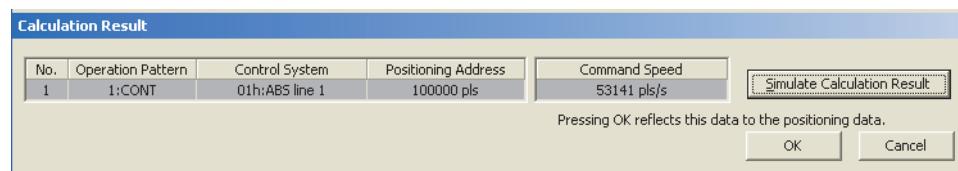
4. **Click the** [Simulate Calculation Result] **button.**

The Simulate Calculation Result screen is displayed.
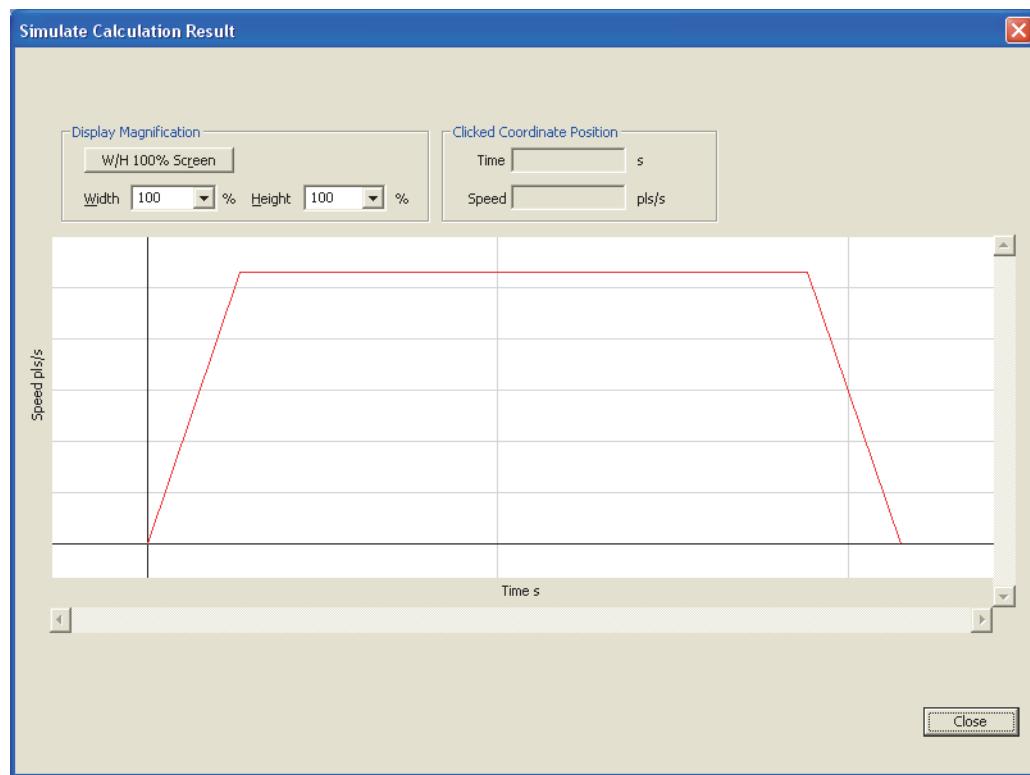
5. **Click the** [Close] **button.**

6. **Click the** [OK] **button.**

The calculation result is applied to the positioning data.

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■ **Automatic sub arc calculation**

Automatically calculate the positioning data of circular interpolation control to form a smooth arc (curve line) from the angle position created by two continuous linear interpolation controls.

Operating procedure

1. **Open the positioning data setting screen, and select [Tool] ⇒ [Automatic Sub Arc Calculation], or click the** Automatic Sub Arc Calculation **button.**

The Automatic Sub Arc Calculation screen is displayed.
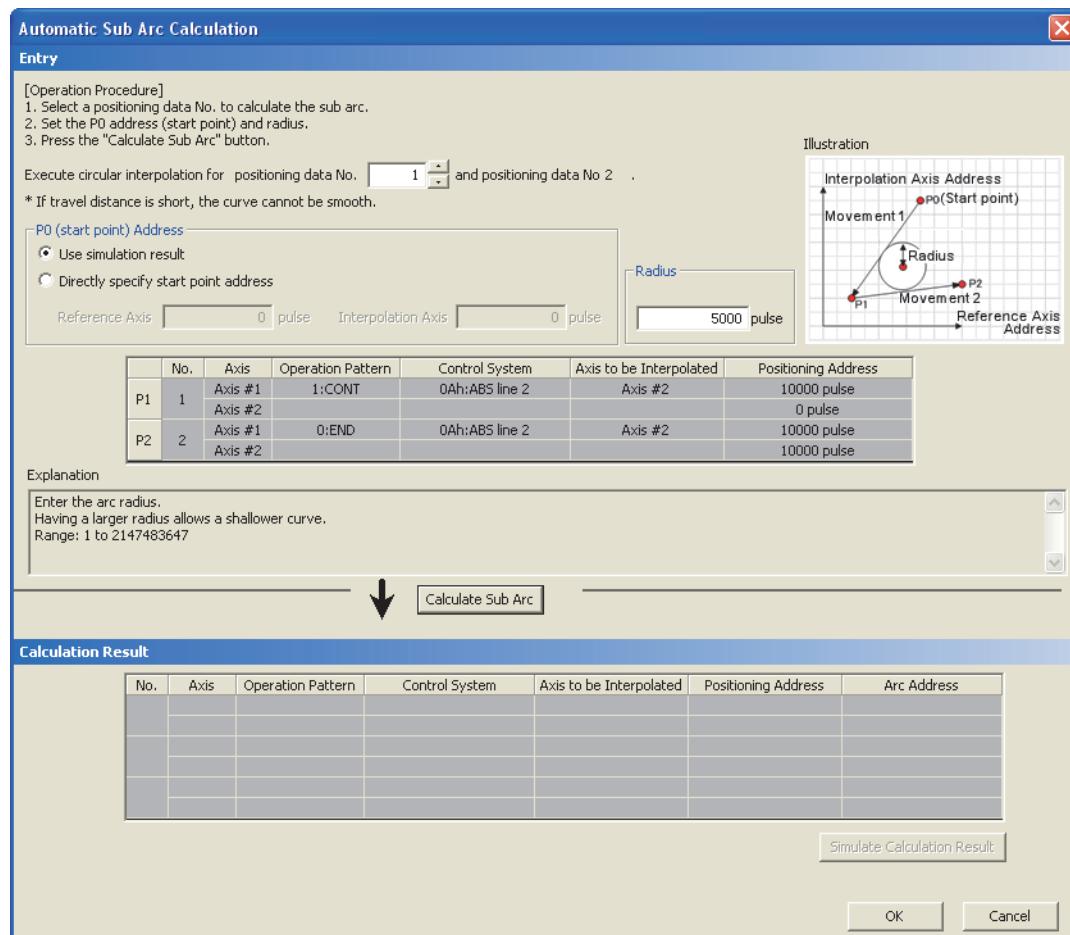
2. **Set the items according to the instructions on the screen.**

3. **Click the** Calculate Sub Arc **button.**

The calculation result of sub arc is displayed under "Calculation Result".

4. **Click the** Simulate Calculation Result **button.**

The Simulate Calculation Result screen is displayed.

5. **Click the** Close **button.**

6. **Click the** OK **button.**

The arc interpolation control data are added to the positioning data.

3.5.7　　Saving/reading data of positioning module

Save the data of positioning module set with GX Works2. Also, read the data of positioning module from the saved file, and update the data of positioning module on a project.
Use this operation to utilize only the data of positioning module from a GX Works2 project.
The parameter, positioning data, block starting data, servo parameter data of the QD75/LD75 positioning module can be saved/read.

■　　Saving data of positioning module

Save the data of positioning module to a file.

Operating procedure

1. **Select a positioning module to be saved to a file from the Project view.**

2. **Select [Project] ⇒ [Intelligent Function Module] ⇒ [Save the Positioning Module Data].**

The <u>Save the Positioning Module Data</u> screen is displayed.
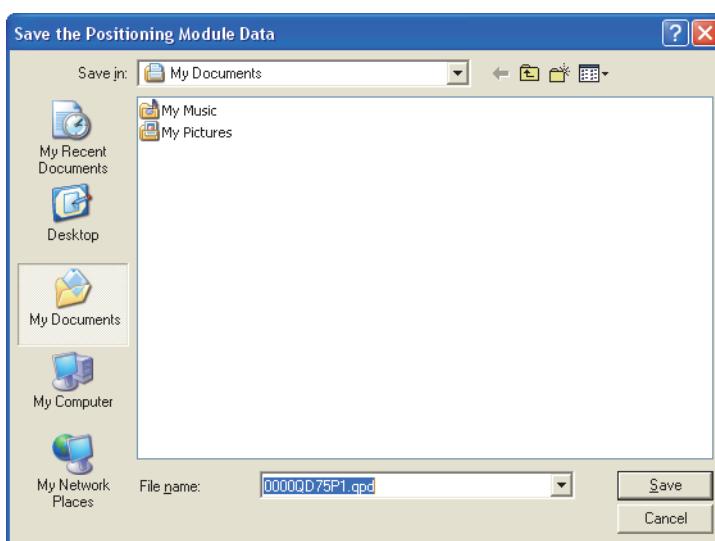
3. **Enter a name of the file to be saved, and click the [Save] button.**

The data of positioning module is saved in the save destination.

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■ **Reading data of positioning module**

Read the data of positioning module from a file, and update the data of positioning module on an open project.

Operating procedure

1. **Select a positioning module to which the data of positioning module is updated from the Project view.**

2. **Select [Project] ⇒ [Intelligent Function Module] ⇒ [Read from the Positioning Module Data].**

The Read from the Positioning Module Data screen is displayed.
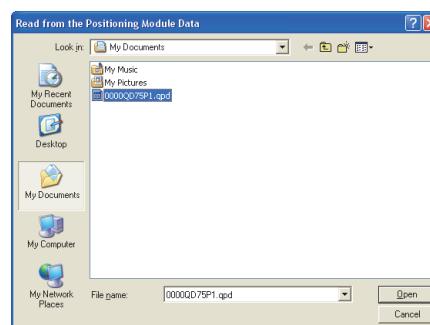
3. **Select a file name, and click the** Open **button.**

The Select Data to Read screen is displayed.
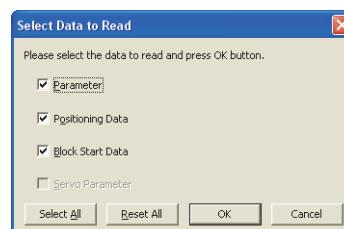
4. **Select the data of positioning module to be read, and select the** OK **button.**

The following message is displayed.
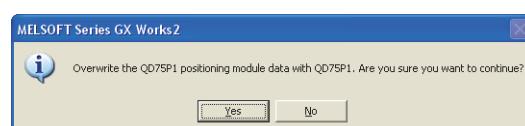
5. **Click the** Yes **button.**

The open project is overwritten with the data of positioning module selected on the Project view.

Point

● **Reading applicability by module model**
For QD75M/QD75MH, data can be read only when the module from which data is read and the module selected on the Project view are the same model.
For the QD75/LD75 positioning module other than QD75M/QD75MH, data can be read from the modules whose number of axes is same, even when the module from which data is read and the module selected on the Project view are the different model.

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3.5.8   Saving data to project files in GX Configurator-QP format

Save data of QD75/LD75 positioning module to a project file in GX Configurator-QP format.
This function is not supported by LD75P1/LD75P2/LD75D1/LD75D2.

Operating procedure

1. **Select a positioning module to be saved to a file from the Project view.**

2. **Select [Project] ⇒ [Intelligent Function Module] ⇒ [Save GX Configurator-QP Data].**
The Save GX Configurator-QP Data screen is displayed.
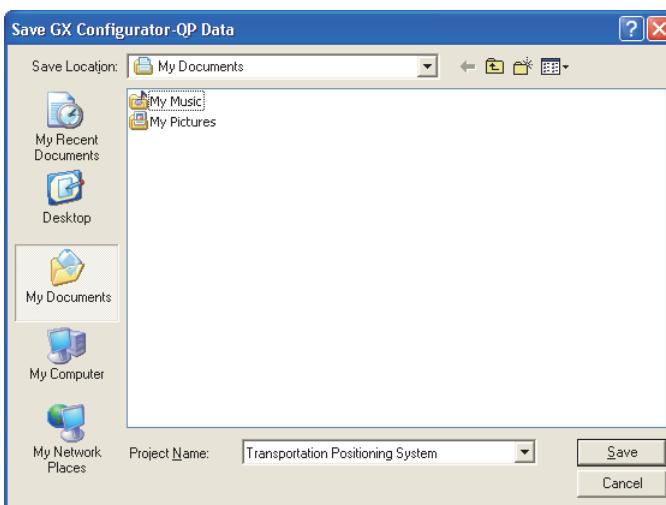
3. **Enter a project name, and click the [Save] button.**
The data of positioning module is saved in the save destination.

Point

● **Considerations for using project files in GX Configurator-QP**
The following are the considerations for using project files saved with this function in GX Configurator-QP.
  • Read project files with GX Configurator-QP Version 2.34L or later.
  • The connection destination setting for GX Works2 is not saved.
  • The auto refresh data is not saved.
    For saving the auto refresh data, select [Project] ⇒ [Export to GX Developer Format File].
  • The maximum number of characters that can be saved for positioning comment, M code comment and title is 32.
    Note that the title is saved as project title.
  • When entering characters of the language other than the one set for the project language, the data is saved as garbled characters.
    The data cannot be restored to the original character strings even if the garbled project file is read with GX Works2.
  • QD75xxN[1] is saved as QD75xx[1].
    The parameter range expanded with QD75xxN[1] is saved as it is written.
   [1] :   "xx" indicates P1/P2/P4/D1/D2/D4.

3.5.9 Importing GX Configurator-QP format project files

Utilize a project file created in GX Configurator-QP and add a new intelligent function module.

Operating procedure

1. **Select [Project] ⇒ [Intelligent Function Module] ⇒ [Import GX Configurator-QP Data].**

The Import GX Configurator-QP Data screen is displayed.
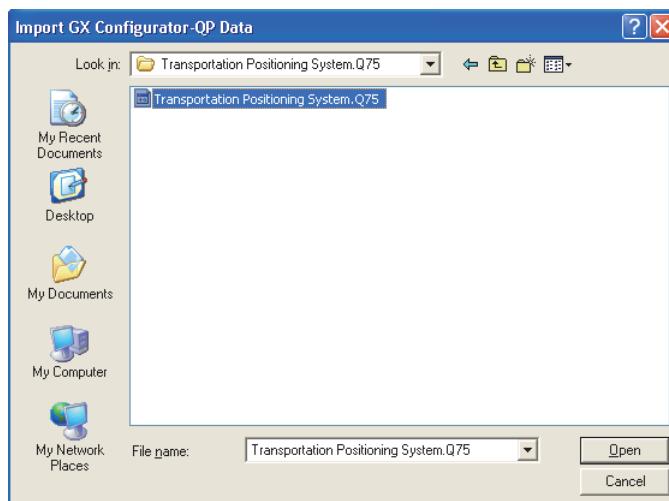
2. **Select a project file to be utilized.**

3. **Click the** `Open` **button.**

The New Module screen is displayed.
☞ Section 2.1.1
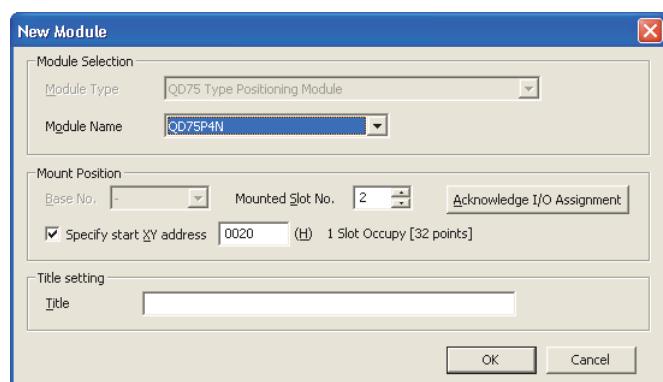
Point

● **Start XY address**
   The I/O address specified to the connection destination of the GX Configulator-QP[*1] project is displayed on the New Module screen.
   When the project with no connection destination settings is read, the empty slot number is set to the start XY address.
      *1 : Version 2.32J or later is supported.

● **Auto refresh**
   Since a GX Configurator-QP format project file does not contain the auto refresh data, the setting of auto refresh is not configured when the GX Configurator-QP data are imported.
   Configure the auto refresh setting as necessary.

● **Projects on QD75xx[*2] module**
   When utilizing the project on a QD75xx[*2] module, the project can be read as it is on a QD75xxN[*2] module.
      *2 : 'xx' indicates P1, P2, P4, D1, D2, or D4.

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3.6   Simple Motion Module

This section explains the operations of the intelligent function module tools related to the simple motion module.

3.6.1   Data setting of simple motion module

Parameters and positioning data of simple motion module are set by the simple motion module setting tool.
For the operating method of simple motion module setting tool, refer to the following manual.
☞ "Help" on the Simple Motion Module Setting Tool

Screen display

Select Project view ⇒ "Intelligent Function Module" ⇒ "(module)", and double-click "Simple Motion Module Setting".
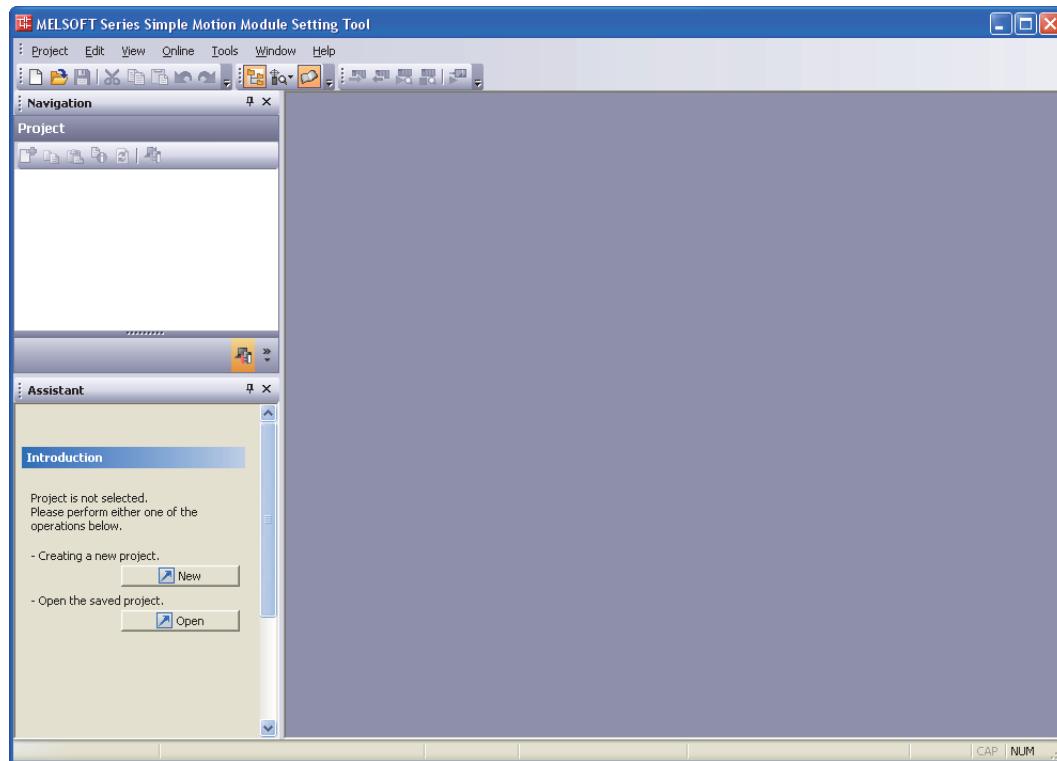
Point

● **Saving simple motion module settings**
   The simple motion module settings are managed as a project of simple motion module setting tool.
   Therefore, the simple motion module settings are not saved by saving a project of GX Works2.
   Save the simple motion module settings with the simple motion module setting tool.

3.7 Serial Communication/Modem Interface Module

This section explains the operations of the intelligent function module tools related to the serial communication module.

3.7.1 Applicable CPUs and Modules

The following table shows CPUs and modules applicable to each function.

Applicable CPU	Applicable module	Circuit trace	Predefined protocol support function
QCPU (Q mode)	QJ71C24,QJ71C24-R2	×	×
	QJ71C24N[*1],QJ71C24N-R2[*1], QJ71C24N-R4[*1]	○	○
LCPU	LJ71C24,LJ71C24-R2	○	○

*1 :   Use a module of which the function version is B with a serial number of which the first five digits are '10122' or later.

3.7.2   Circuit trace

Trace the communication data and communication control signals of the communication with the device controller.
The circuit trace function displays data stored in the monitoring buffer of the module.

■   Starting circuit trace

Store the trace data in the monitoring buffer to trace the communication data and communication control signal status.

Screen display

Select [Tool] ⇒ [Intelligent Function Module Tool] ⇒ [Serial Communication Module] ⇒ [Circuit Trace] ( ).
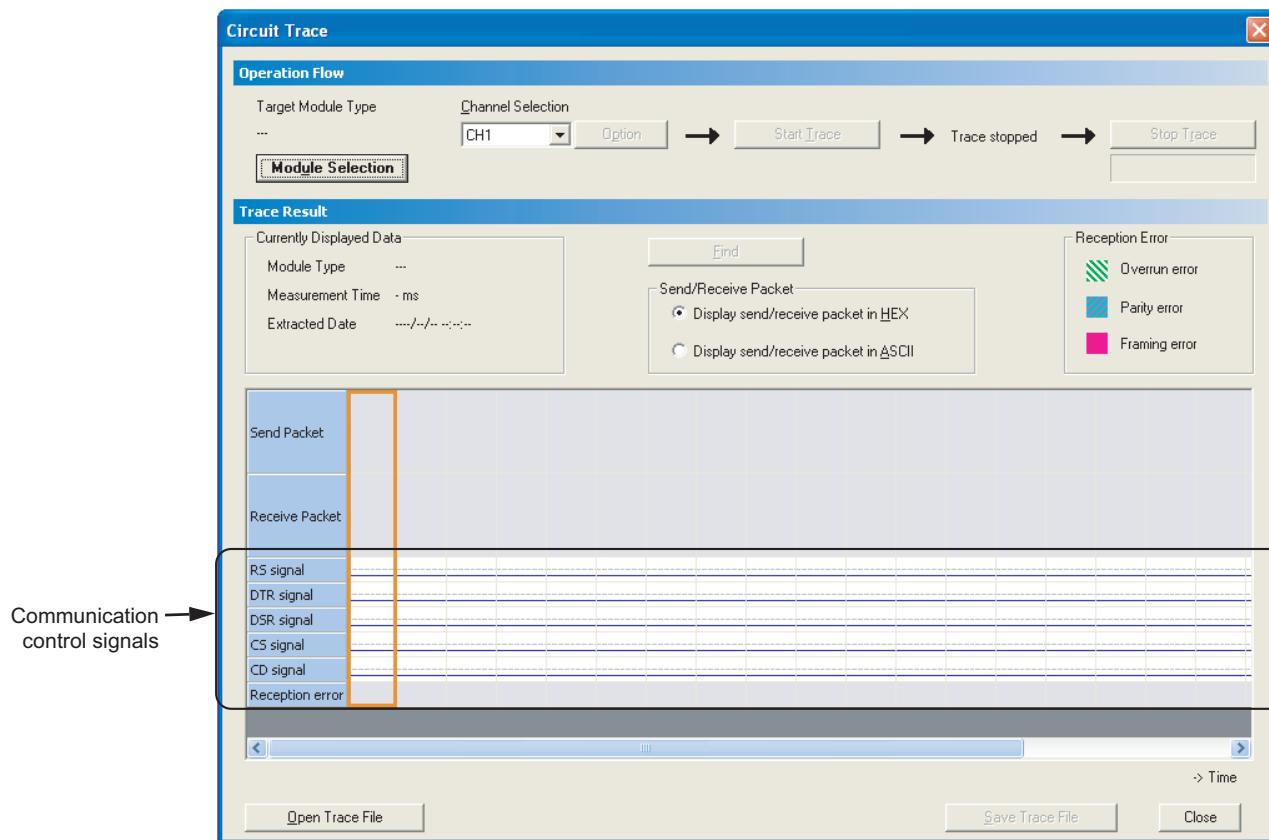
Operating procedure

1. **Click the** Mod**u**le Selection... **button.**

The Module Selection (Circuit Trace) screen is displayed.
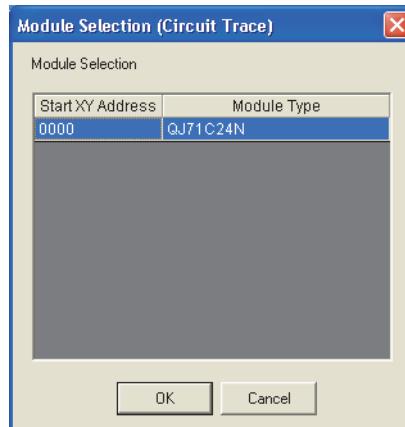
2. **Select a module to perform the circuit trace and click the** OK **button.**

3. **Select a channel from "Channel Selection".**

4. **Click the** Start **T**race **button.**

The message shown on the right is displayed.

5. **Click the** **Y**es **button.**

The circuit trace is started.

Display contents

Item		Description
Send Packet		Display send data and receive data respectively. For the data display format, the ASCII code or hexadecimal can be selected.
Receive Packet		
Communication control signals		Display the status of the RS/DTR/DSR/CS/CD signal and the receive error.
	RS/DTR/DSR/CS/CD signal	All signals are displayed with blue lines. When the obtained data does not have signal information, the signal is displayed as an OFF status.

Signal status	Display
When signal is ON	⌐
When signal is OFF	⌐

Item		Description
	Reception error	Display three kinds of errors: errors of overrun error, parity error and framing error.

Screen button

● [Find]
Displays the Find screen.
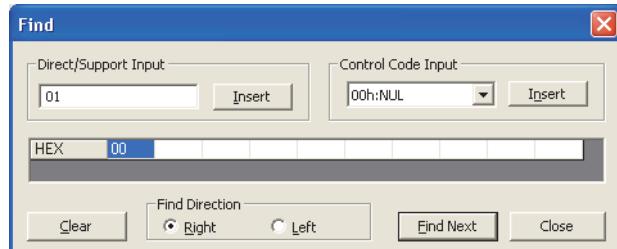
Operation

1. **Enter content to search for in "Direct/Support Input", or select data to search for in "Control Code Input", and click the [Insert] / [Insert] .**
Enter content in "Direct/Support Input" in display format selected in "Send/Receive Packet" on the Circuit Trace screen (Hexadecimal or ASCII characters).

2. **Click the [Find Next] button.**
The cursor moves to the corresponding part of the circuit trace.

Point

● **When the circuit trace has already been executed**
When the circuit trace has already been executed, the following message is displayed.

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■ **Setting circuit trace option**

Set the monitoring buffer area starting address and size of the module on which the circuit trace data are stored, and the stopping condition.

Screen display

Click the [Option...] button on the <u>Circuit Trace Option</u> screen.

Operating procedure

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

Item	Description
Circuit Trace Data Storage Area Setting	–
Start Address	Set the starting address of the monitoring buffer area to which the trace data are stored.
size	Set the size of the monitoring buffer area to which the trace data are stored. Set the maximum address[*1] for the trace data storage space in the range between 2602_H to $3FFF_H$ ($C02_H$ to $1AFF_H$ for the user-specified area). Note that the range of this value is checked at start of the circuit trace when using the user-specified area.
Stop setting	–
Stop by occurrence of timer 0 time-out error	Select this to stop the circuit trace when the timer 0 is timeout.

*1 : The maximum address for the trace data storage space can be calculated by the following formula.
Maximum address for the trace data storage space = "Monitoring buffer starting address" + "Monitoring buffer size" - 1

2. **Click the [OK] button.**

The following message is displayed.
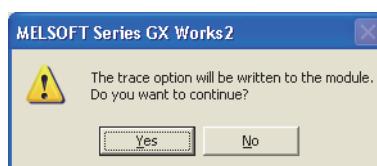
3. **Click the [Yes] button.**

The set values are written to the module.

■ Saving circuit trace result

Save the circuit trace data obtained by the circuit trace on the personal computer.

Operating procedure

- **Click the** Save Trace File **button on the Circuit Trace screen.**

■ Opening trace files

Read the trace data saved on the personal computer and display the data on the Circuit Trace screen.

Operating procedure

- **Click the** Open Trace File **button on the Circuit Trace screen.**

3.7.3 Predefined protocol support function

For the predefined protocol support function, refer to Chapter 4.

3.7.4 Flash ROM operation

The following explains the flash ROM operation such as permitting/prohibiting data write to the flash ROM of serial communication module.

Operating procedure

1. **Open the intelligent function module data to which the flash ROM operation is performed.**

2. **Select [Tool] ⇒ [Flash ROM Operation].**

The Flash ROM Operation screen is displayed.
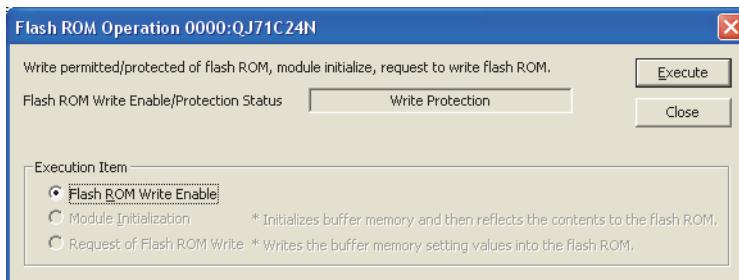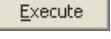
3. **Select an item under "Execution Item", and click the** Execute **button.**

The selected item is executed.

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3.8 AnyWireASLINK Configuration Window

This section explains the operations on the AnyWireASLINK Configuration window.

For the online operations, refer to the following manual.
☞ **iQ Sensor Solution Reference Manual**

3.8.1 Setting AnyWireASLINK system configuration

For QCPU (Q mode)/LCPU/FXCPU/CC IE Field head module projects, set the system configuration by dragging and dropping the module data from "Module List".

The actual system configuration can also be applied to the AnyWireASLINK Configuration window with the automatic detection of connected devices.
For the automatic detection of connected devices, refer to the following manual.
☞ iQ Sensor Solution Reference Manual

Screen display

Select Project view ⇒ "Intelligent Function Module[*1]" ⇒ "(AnyWireASLINK interface module)" ⇒ "AnyWireASLINK Configuration".

    *1 :   For FXCPU, "Special Module (Intelligent Function Module)" is displayed.
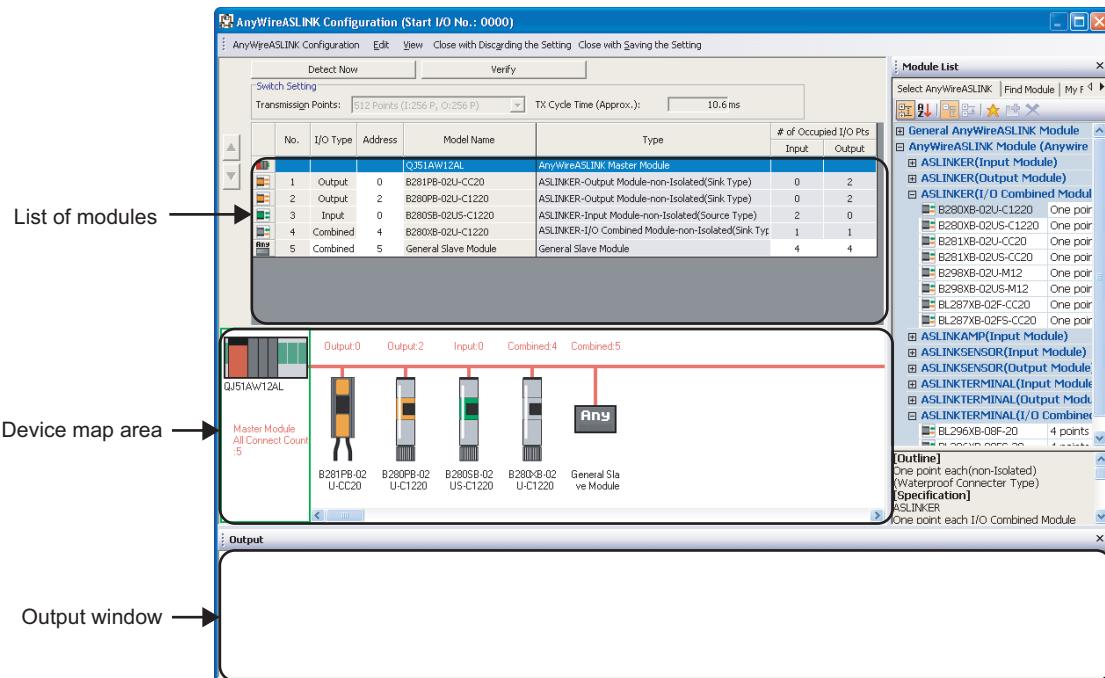
Operating procedure

1. **Select the module from "Module List", and drag and drop it to the 'list of modules' or 'device map area'.**

The slave module is added to the 'list of modules'.
The added module is displayed on the 'device map area'.
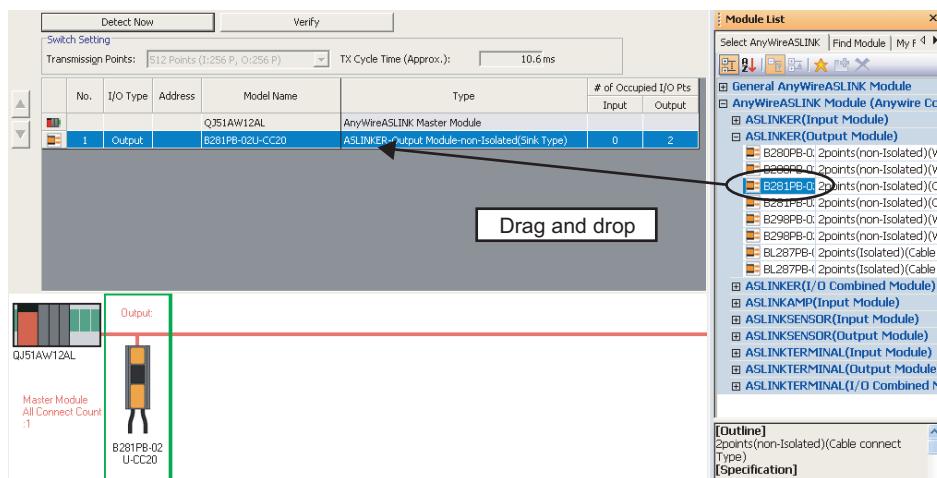
2. **Set the address for the added slave module.**

For general-purpose AnyWireASLINK module, set the input/output type, address, and occupied I/O points.
The addresses of all slave modules can be set automatically. (☞ Section 3.8.4)

3. **Select [Close with Saving the Setting].**

Exit the settings of AnyWireASLINK configuration.

Screen button

● **Detect Now**

Detect the actual system configuration automatically and apply it to the AnyWireASLINK Configuration window. (Automatic detection of connected devices)
For the setting operation procedure with the automatic detection of connected devices and its considerations of the 'list of modules' and 'device map area', refer to the following manual.
☞ iQ Sensor Solution Reference Manual

● **Verify**

Reads the module information and the equipment configuration from the actual system configuration, and verifies them with the AnyWireASLINK configuration being displayed.
For the operating procedure and considerations for verifying the connected devices with the configuration, refer to the following manual.
☞ iQ Sensor Solution Reference Manual

● ▲/▼

Moves the position of the module selected in the 'list of modules' up/down.

3.8.2 Replacing general-purpose AnyWireASLINK module

Replace a general-purpose AnyWireASLINK module with the specific module.

Operating procedure

1. **Select the general-purpose AnyWireASLINK module to be replaced from the 'list of modules' on the AnyWireASLINK Configuration window.**

2. **Select [AnyWireASLINK Configuration] ⇒ [Change Module] ⇒ [Replace General AnyWireASLINK Module].**

The Replace General AnyWireASLINK Module screen is displayed.
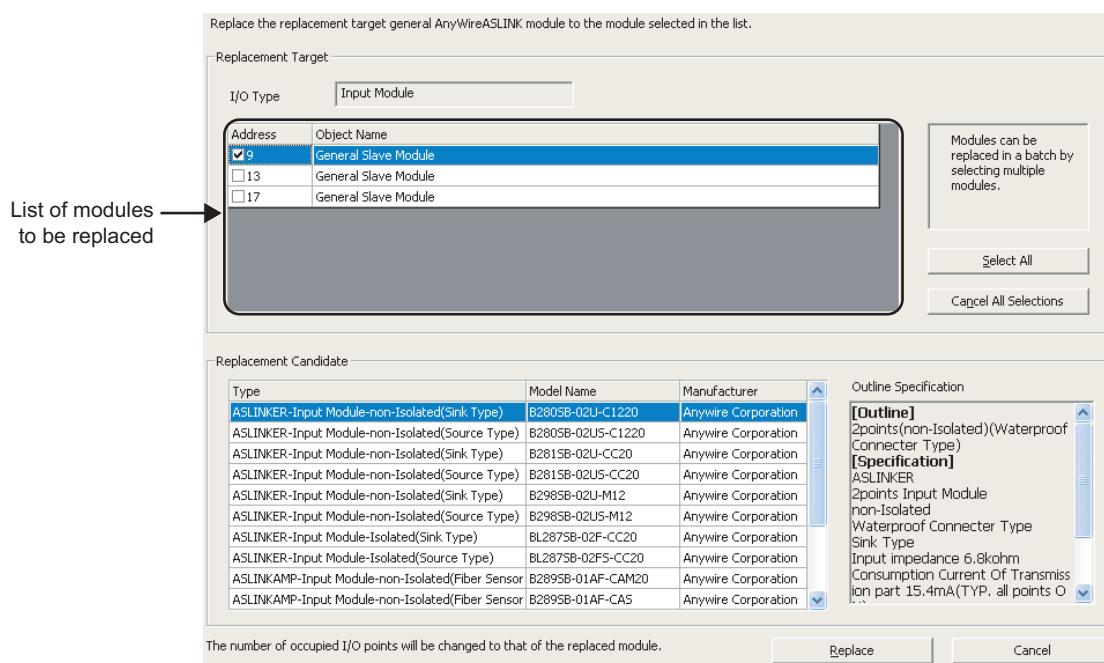
3. **Set the items on the screen.**

Item		Description
Replacement Target		Display the input/output type of the general-purpose AnyWireASLINK module selected on the AnyWireASLINK Configuration window.
	List of modules to be replaced	Display the modules with the same condition as the one selected for "Replacement Target". Select the check box(es) on the "Address" column of the module to be replaced. Two or more modules can be selected.
Replacement Candidate		Select the module to be replaced with.

4. **Click the** [Replace] **button.**

The general-purpose AnyWireASLINK module in the 'list of modules' is replaced with the module selected for "Replacement Candidate". The general-purpose AnyWireASLINK module displayed on the 'device map area' is replaced with the module selected for "Replacement Candidate".
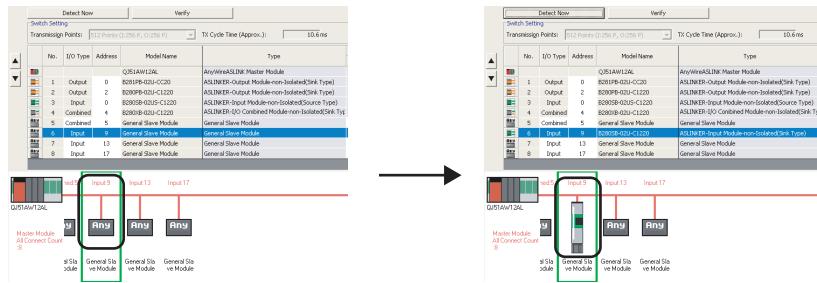
The general-purpose module is replaced with the selected module.

Screen button

● [Select All]

Selects all modules displayed on "Replacement Target".

● [Cancel All Selections]

Cancels the selected status of all modules selected for "Replacement Target".

3.8.3 Changing to general-purpose AnyWireASLINK module

Change a slave module to a general-purpose AnyWireASLINK module.

Operating procedure

1. **Select the module to be changed in the 'list of modules' on the AnyWireASLINK Configuration window.**

2. **Select [AnyWireASLINK Configuration] ⇒ [Change Module] ⇒ [Replace General AnyWireASLINK Module].**

The module is changed to the corresponding general-purpose AnyWireASLINK module.

3.8.4 Entering address automatically

Enter the address for the slave module on the 'list of modules' automatically.
The address is set by number in ascending order based on the input/output type and occupied I/O points.

Operating procedure

● **Select [AnyWireASLINK Configuration] ⇒ [Address Auto-Input].**

The address is entered for the "Address" column automatically.

3.8.5 Checking system configuration

Check whether the equipment configuration of AnyWireASLINK is correct after setting the module information on the AnyWireASLINK Configuration window.

Operating procedure

- **Select [AnyWireASLINK Configuration] ⇒ [Check] ⇒ [System Configuration].**

  The system configuration of AnyWireASLINK is checked.
  Check the result of the system configuration check on the Output window.

## 3.8.6 Checking devices assigned to AnyWireASLINK modules

Display refresh devices assigned to AnyWireASLINK modules.
Set the AnyWireASLINK parameters in advance.

Screen display

Select [View] ⇒[Docking Window] ⇒ [Device Reference] (📟).
● **Slave Module List**

List of slave modules →

● **I/O Device List**

List of I/O devices →
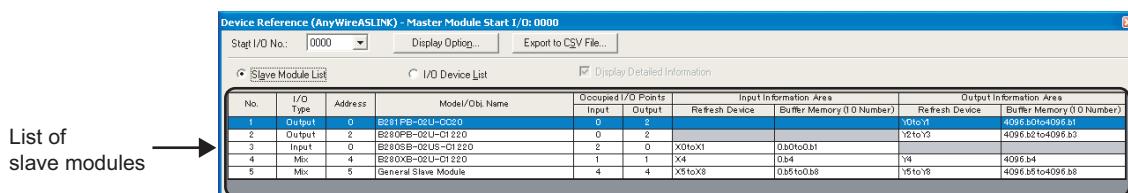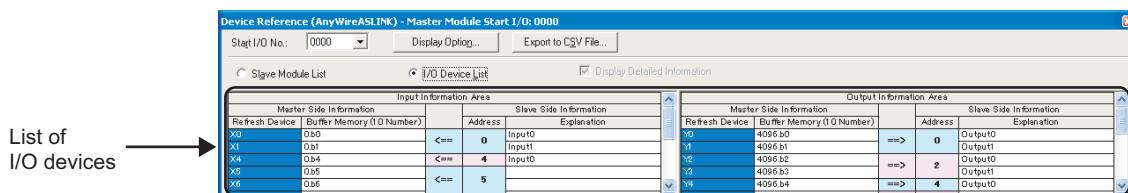
Operating procedure

- **Set the items on the screen.**

Item	Setting status
Start I/O No.	Select the start I/O number of AnyWireASLINK master module from the list displayed by clicking ▼ to display the list.
Slave Module List	Select this to switch the display between the list of slave modules and the list of input/output devices.
I/O Device List	
Display Detailed Information	This item is grayed out in the selected status. The detailed information is always displayed.

Display contents

Item	Description
Slave Module List	Displayed when "Slave Module List" is selected.
List of slave modules	Display the list of slave modules of the master module specified with the start I/O number.
I/O Device List	Displayed when "I/O Device List" is selected.
List of I/O devices	For the AnyWireASLINK master module specified with the start I/O number, the assignment status of addresses of the slave modules and refresh devices of the master side are displayed in the sections of input information area and output information area. The "Explanation" column will be blank when the profile is not registered.

Screen button

● [Display Option...]

Opens the screen to set the display options.
Select the item for "Displayed Contents for Model Name" and "Buffer Memory Display Format" by clicking ▼, and click the [OK] button.
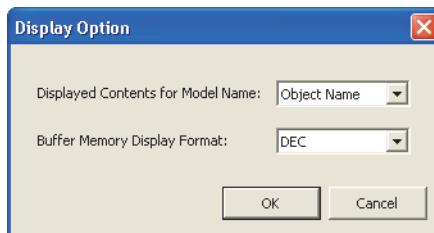
● [Output CSV File...]

Opens the screen to set the purpose and the output format of CSV file output.

Set "Application", "Output Data Range", and "Label Output Format", and click the [Execute] button.
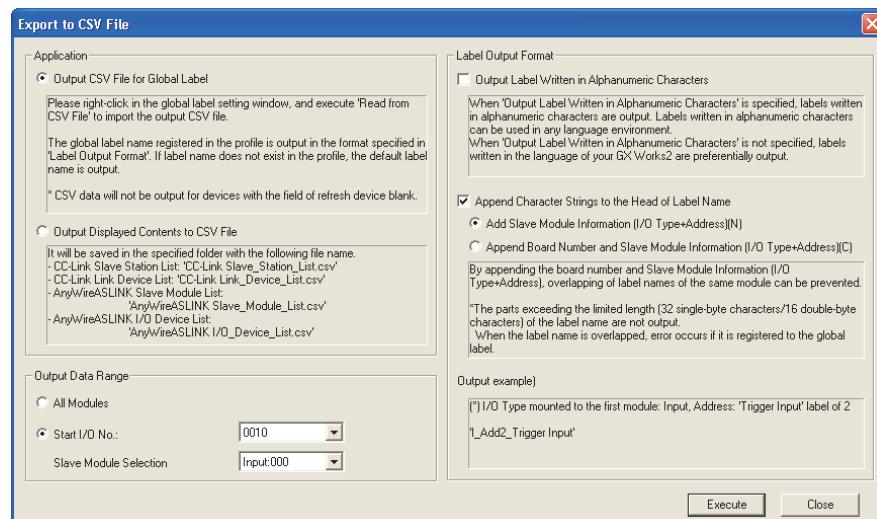
When "Output CSV file for global label" is selected for "Use", the output CSV file can be imported on the Global Label Setting screen.
(☞ GX Works2 Version 1 Operating Manual (Simple Project))
(☞ GX Works2 Version 1 Operating Manual (Structured Project))

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3.9 FXCPU Intelligent Function Module

This section explains the operations of the setting tool related to FXCPU intelligent function module.

3.9.1 Data setting of intelligent function module

Parameters of intelligent function module are set by the setting tool of each module.
For the operating methods for the setting tools, refer to the following manuals.
☞ FX Configurator-FP OPERATION MANUAL
☞ Operation Manual for FX-ENET series setting tool

Screen display

Select Project view ⇒ "Special Module (Intelligent Function Module)" and double-click "(module)".
The setting tool of the double-clicked module is displayed.
The following is a screen of FX Configurator-FP.
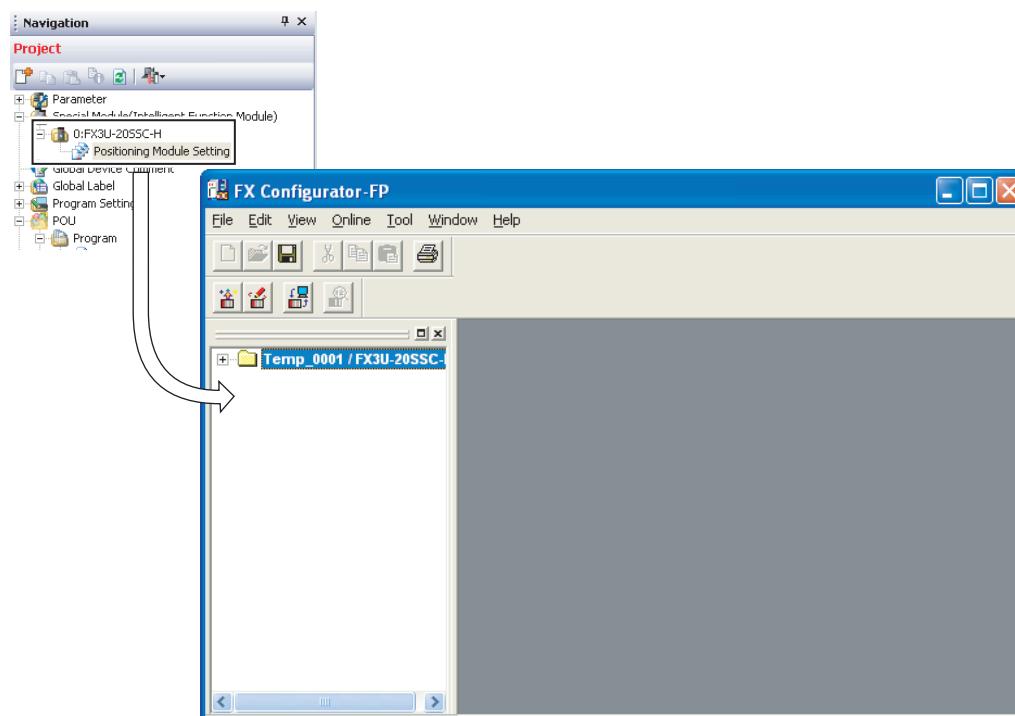
3.9.2 Saving data of intelligent function module

Save the data of intelligent function module to a file.

Operating procedure

1. **Select an intelligent function module to be saved to a file from the Project view.**

2. **Select [Project] ⇒ [Intelligent Function Module] ⇒ [Save/Read FX Special Module Data] ⇒ [Save FX Special Module Data].**
The <u>Save FX Special Module Data</u> screen is displayed.
The following is a screen of FX Configurator-FP.
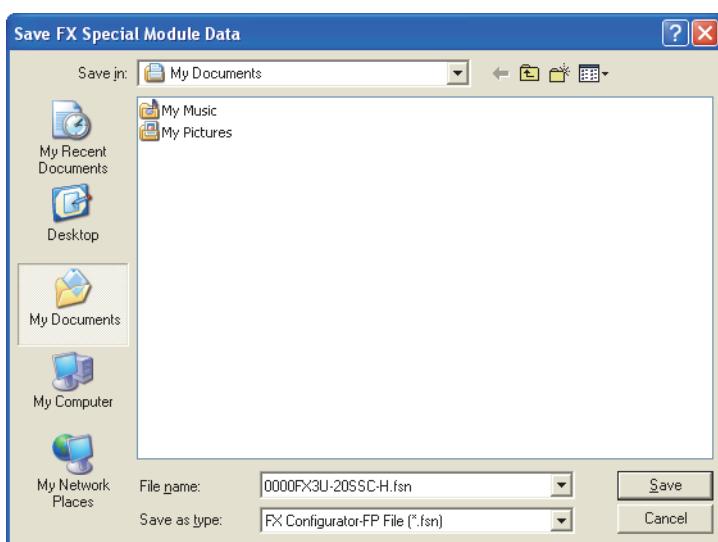
3. **Enter a name of the file to be saved, and click the** Save **button.**
The data is saved in the save destination.

3.9.3 Reading data of intelligent function module

Read the data of intelligent function module from a file, and update the data of intelligent function module on an open project.

Operating procedure

1. **Select an intelligent function module to which the data is updated from the Project view.**

2. **Select [Project] ⇒ [Intelligent Function Module] ⇒ [Save/Read FX Special Module Data] ⇒ [Read from FX Special Module Data].**

The Read from FX Special Module Data screen is displayed.
The following is a screen of FX Configurator-FP.
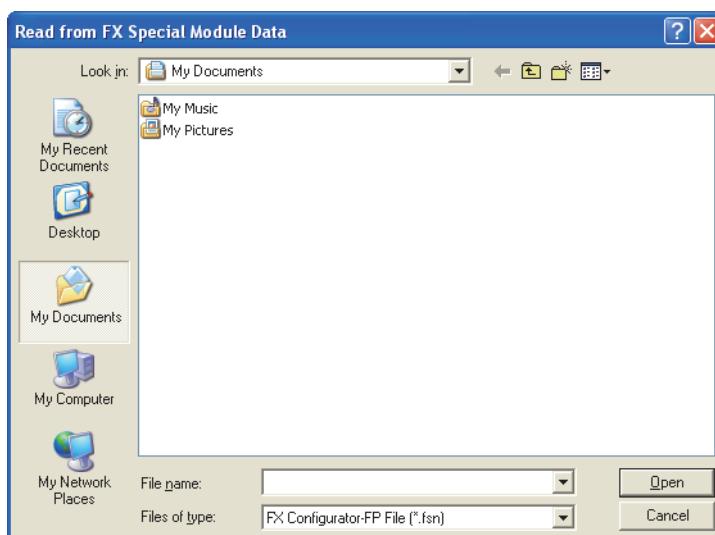
3. **Select a file name and click the** `Open` **button.**

The following message is displayed.
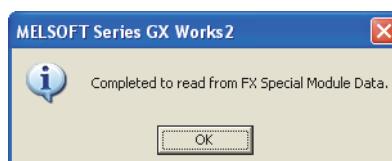
4. **Click the** `OK` **button.**

The open project is overwritten with the data of intelligent function module selected on the Project view.

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3.9.4 Adding new intelligent function module data

Utilize a project file created in setting tool and add a new intelligent function module.

Operating procedure

1. **Select [Project] ⇒ [Intelligent Function Module] ⇒ [Save/Read FX Special Module Data] ⇒ [Read new FX Special Module Data].**

The Read from FX Special Module Data screen is displayed.
The following is a screen of FX Configurator-FP.
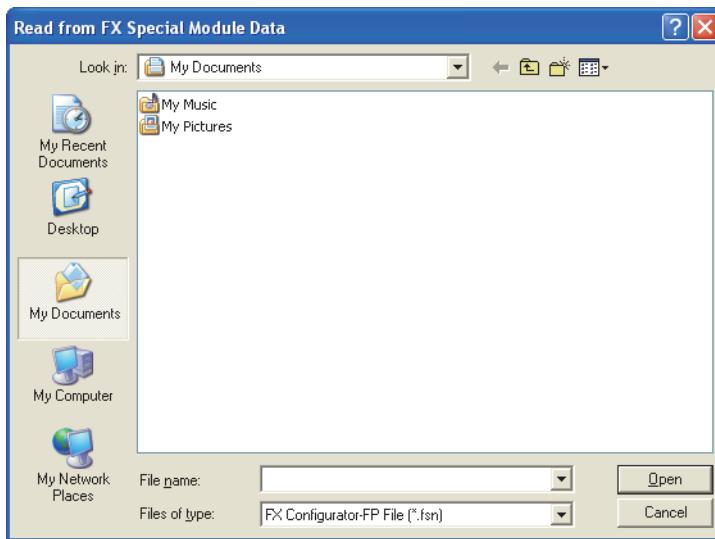
2. **Select a project file to be utilized.**

3. **Click the** Open **button.**

The New Module screen is displayed. (☞ Section 2.1.1)
The following is a screen of FX Configurator-FP.

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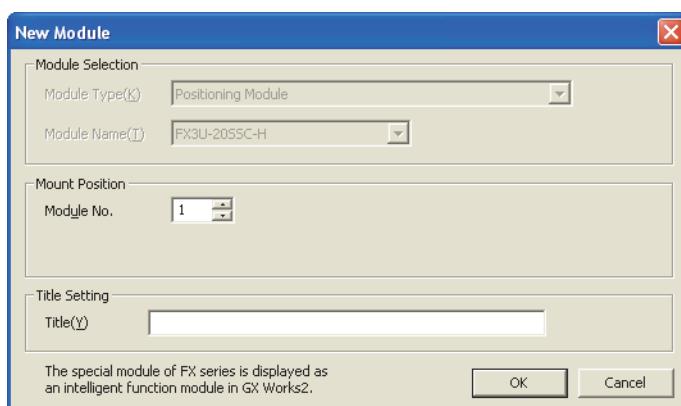
4 PREDEFINED PROTOCOL SUPPORT FUNCTION

**This chapter explains the operations of the predefined protocol support function.
The screens used in this chapter are the screens of serial communication module.**

4.1 Functions of Predefined Protocol Support Function

This section explains the predefined protocol support function.
For details on the operation specifications of the predefined protocol support function, refer to the following manual.
☞ **GX Configurator-SC Version2 Operating Manual (Protocol FB support function)**

4.1.1 Supported modules

The following table shows the modules which support each menu of the predefined protocol support function.

Menu name	Module model
Serial communication module	QJ71C24N, QJ71C24N-R2, QJ71C24N-R4, LJ71C24, LJ71C24-R2
Ethernet module[*1]	QJ71E71-100, LJ71E71-100
Built-in/Adapter Serial[*2]	L02S, L02S-P, L02[*3], L02-P[*3], L06[*3], L06-P[*3], L26[*3], L26-P[*3], L26-BT[*3], L26-PBT[*3]
Built-in Ethernet[*4]	Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV, L02, L02-P, L06, L06-P, L26, L26-P, L26-BT, L26-PBT

*1 : Set "Predefined protocol" to "Fixed Buffer Communication Procedure" for open setting of Ethernet network parameter.
*2 : Set "Predefined protocol" to "Select Function" in the <<Built-in Serial Setting>> tab or <<Adapter Serial Setting>> tab of PLC parameter.
*3 : These modules can be connected from serial port when using RS-232 adapter (L6ADP-R2) or RS-422/485 adapter (L6ADP-R4).
*4 : Set "Predefined protocol" to "Open System" in the <<Built-in Ethernet Port Setting>> tab of PLC parameter.

4.1.2 List of functions

The following tables show the list of functions of the predefined protocol support function.

File		Reference
New	Create a new protocol setting file.	Section 4.5.1
Open	Open the existing protocol setting file.	Section 4.5.2
Close	Close an open protocol setting file.	Section 4.5.5
Save	Save the protocol setting file.	Section 4.5.4
Save As	Name and saves a protocol setting file.	
Open Other Data		–
	Serial Communication Module Format	Open a protocol setting file of serial communication module format.	Section 4.5.3
	Ethernet Module Format	Open a protocol setting file of Ethernet module format.	
	Built-in/Adapter Serial Format	Open a protocol setting file of built-in/adapter serial format.	
	Built-in Ethernet Format	Open a protocol setting file of built-in Ethernet format.	
Print	Print such as a protocol setting.	Section 4.10
Exit	Exit the predefined protocol support function.	Section 4.3

Edit		Reference
Add Protocol	Add a protocol.	Section 4.6.1
Change to Editable Protocol	Change the protocol selected from the predefined protocol library to an editable one.	Section 4.6.2
Protocol Detailed Setting	Set the protocol detailed setting such as the number of retries of protocol transmission and whether to clear OS area (receive data area).	Section 4.6.3
Add Receive Packet	Add a receive packet.	–
Delete	Delete the protocol.	Section 4.6.5
Copy	Copy the protocol.	
Paste	Paste the protocol.	
Delete Multiple Protocols	Batch-delete multiple protocols.	–
Copy Multiple Protocols	Batch-copy multiple protocols.	
Paste Multiple Protocols	Batch-paste multiple protocols.	
Device Batch Setting	Batch-set devices used in a protocol.	Section 4.7.4
Save User Protocol Library	Save the protocol being set as a user protocol library.	Section 4.6.6

Module Read/Write		Reference
Read from Module	Read protocol settings from the module.	Section 4.8.1
Write to Module	Write registered protocol settings to the module.	
Module Verification	Compare protocol settings being opened with those written in the module.	Section 4.8.2

Tool		Reference
Setting Device List	Display the list of devices used in protocols.	Section 4.7.5
Register Predefined Protocol Library	Import the predefined protocol library provided by Mitsubishi Electric Corporation.	Section 4.6.7

Debugging Support Function[1]		Reference
Module Selection	Select a module to be debugged.	Section 4.9.1
Protocol Execution Log	Display the protocol execution logs and the protocol execution results.	Section 4.9.2
State Monitor	Monitor signals, communication error information, operation setting switches, and protocol execution status of the module.	Section 4.9.3

*1 :　Not applicable to Ethernet module, built-in/adapter serial and built-in Ethernet.

Window		Reference
Cascade	Cascade windows.	–
Tile Horizontally	Tile windows horizontally.	
(Switch to other window)	Display the open window.	

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4.2   Operating Procedure of Predefined Protocol Support Function

This section shows the operating procedure for writing protocols to the module using the predefined protocol support function.

```
        ┌──────────────────────────────────────────────┐
        │ Start up the predefined protocol support     │
        │ function ☞ *1                                 │
        └──────────────────────────────────────────────┘
                            │
        ┌──────────────────────────────────────────────┐
        │ Open the Protocol Setting screen ☞ *2,*3      │
        └──────────────────────────────────────────────┘
                            │
        ┌──────────────────────────────────────────────┐
        │ Add a protocol to be used ☞ *4                │
        └──────────────────────────────────────────────┘
                            │
                   ╱────────────────╲         YES
                  ╱ Set the protocol  ╲────────────────┐
                  ╲ as an editable     ╱                │
                   ╲ one? ☞ *4        ╱                 │
                    ╲────────────────╱                  │
                            │ NO                         │
        ┌───────────────────────────┐   ┌───────────────────────────┐
        │ Select a registered       │   │ Configure details of the  │
        │ protocol from the         │   │ protocol ☞ *5,*6           │
        │ predefined protocol       │   │                            │
        │ library ☞ *4              │   │                            │
        └───────────────────────────┘   └───────────────────────────┘
                            │                           │
                            │◄──────────────────────────┘
        ┌──────────────────────────────────────────────┐
        │ Write protocols to a module ☞ *7              │
        └──────────────────────────────────────────────┘
                            │
        ┌──────────────────────────────────────────────┐
        │ Exit the predefined protocol support          │
        │ function ☞ *1                                 │
        └──────────────────────────────────────────────┘
```
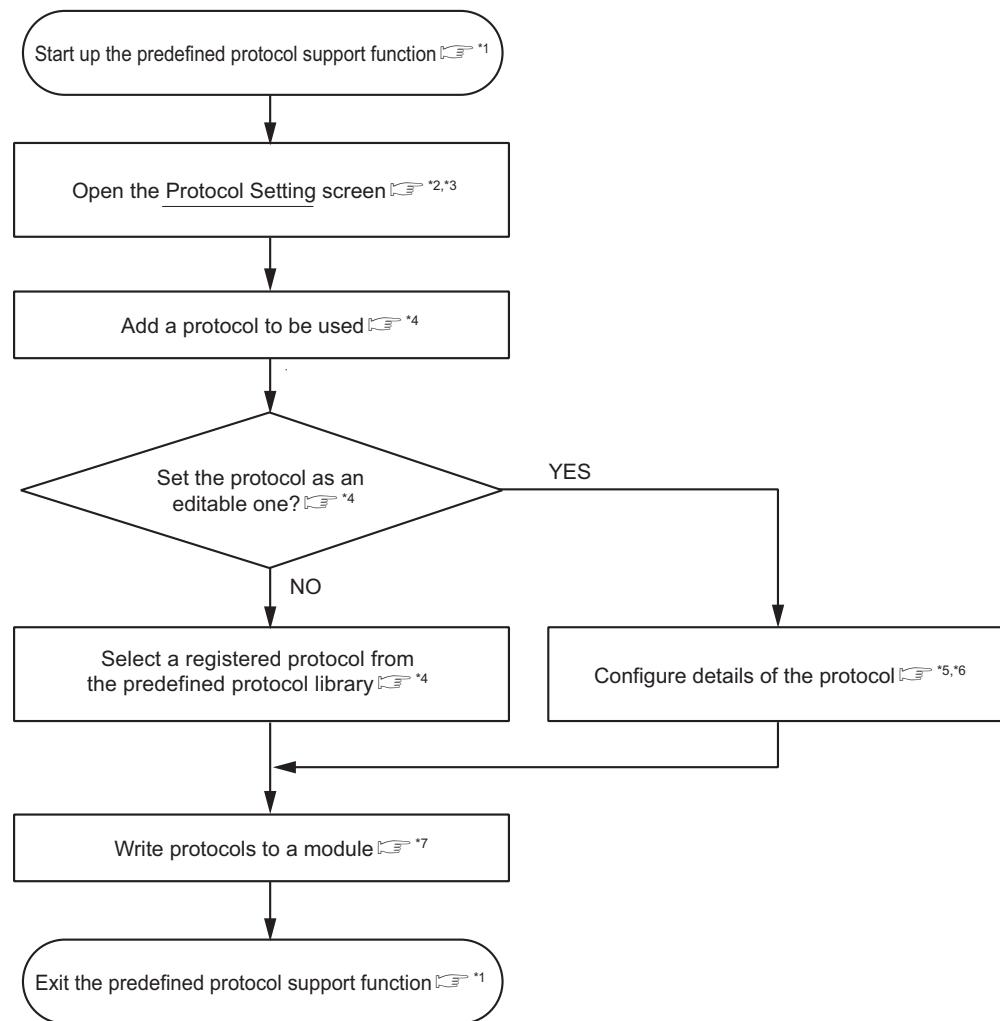
*1 :   Section 4.3
*2 :   Section 4.5.1
*3 :   Section 4.5.2
*4 :   Section 4.6.1
*5 :   Section 4.6
*6 :   Section 4.7
*7 :   Section 4.8.1

> **Point**
>
> ● **Executing a predefined protocol by a dedicated instruction**
>   To execute a predefined protocol, a program to execute the dedicated instruction (CPRTCL instruction, ECPRTCL instruction) is required.
>   For details of the dedicated instruction, refer to the following manual.
>   ☞ User's manual of each module
>   When using the dedicated instruction in Structured Ladder/FBD, refer to the following manual
>   ☞ MELSEC-Q/L Structured Programming Manual (Special Instructions)

4.3   Starting and Exiting Predefined Protocol Support Function

This section explains how to start and exit the predefined protocol support function.

■ Starting up

Start the predefined protocol support function.

Operating procedure

- **Select GX Works2 menu [Tool]** $\Rightarrow$ **[Predefined Protocol Support Function]** $\Rightarrow$ **[Serial Communication Module] / [Ethernet Module] / [Built-in/Adapter Serial] / [Built-in Ethernet].**
  The Predefined protocol support function is started up.
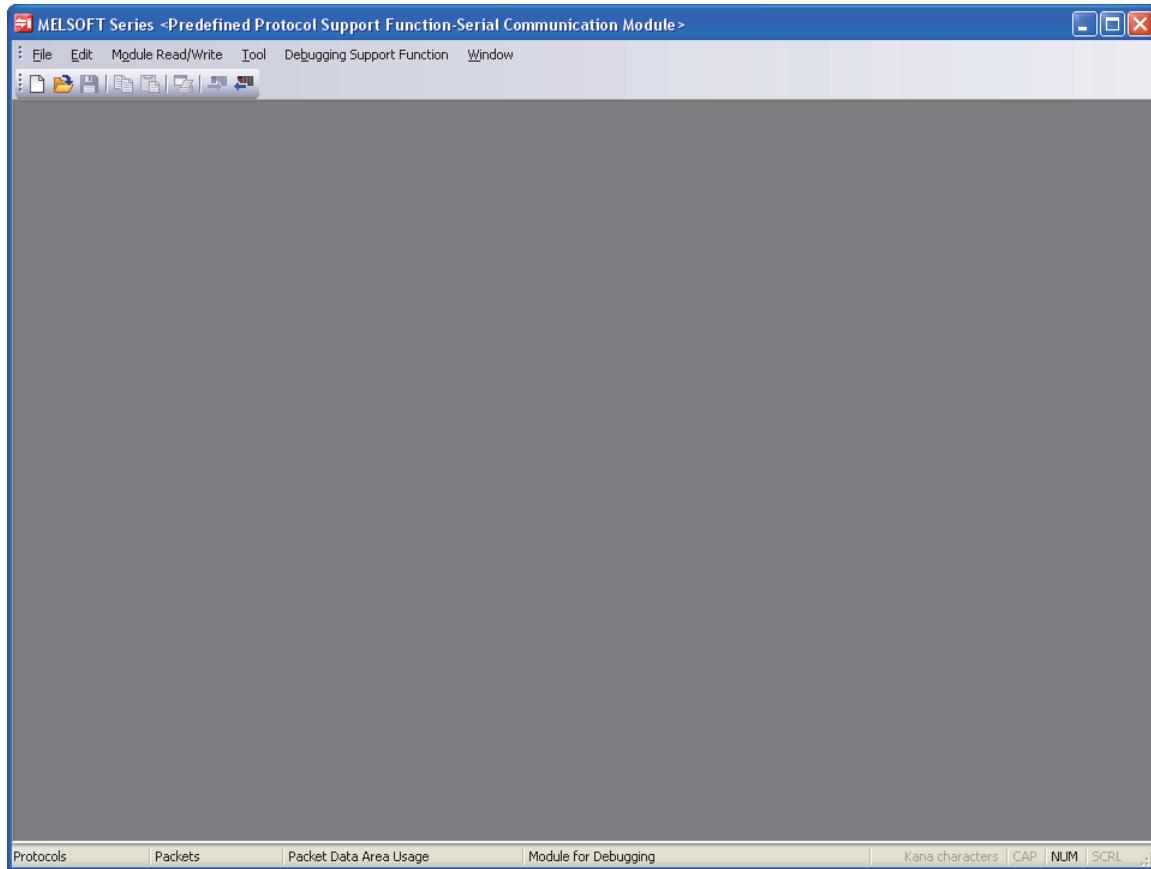
■ Exiting

Exit the predefined protocol support function.

Operating procedure

- **Select [File]** $\Rightarrow$ **[Exit].**

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4.4　Screen Configuration

This section explains the main frame (basic screen) of the predefined protocol support function that is displayed when it is started up.

4.4.1　Main frame configuration

The following shows the configuration of the main frame.

Screen display
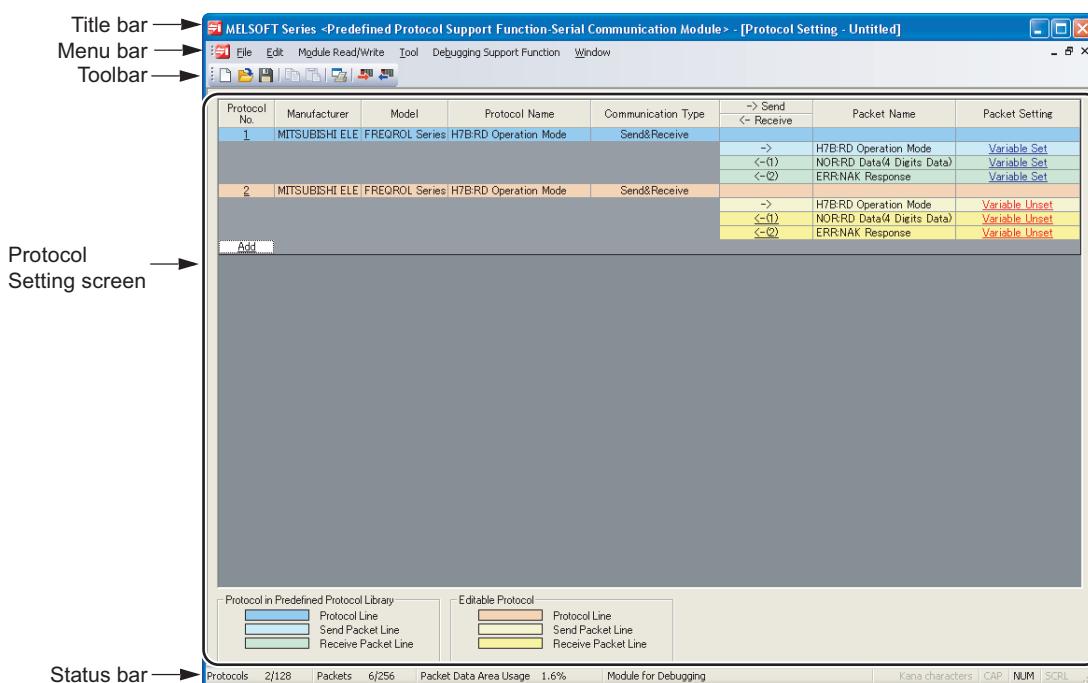
Display contents

Item	Description	Reference
Title bar	Display a file name.	–
Menu bar	Display menu options for executing each function.	–
Toolbar	Display tool buttons for executing each function.	–
Protocol Setting screen	A sub screen to configure/change protocols to be set to a module.	Section 4.5
Status bar	Display information about a protocol being edited.	Section 4.4.2

4.4.2   Status bar

The status bar displays information about a protocol being edited at the bottom of the screen.

Protocols	Packets	Packet Data Area Usage	Module for Debugging	Caps Lock	Num Lock	Scroll Lock

The following shows the information to be displayed.

Item	Description
Protocols	Display the number of registered protocols.
Packets	Display the number of registered packets.
Packet Data Area Usage	Display the percentage of the size of packet data being registered in the maximum registration area of the packet data area (flash ROM area in a module to store packet data for communication with other devices).
Module for Debugging	Display the module name, IO address, and channel of a debugging object module being selected.
Caps Lock	Display the effective status of the Caps Lock.
Num Lock	Display the effective status of the Num Lock.
Scroll Lock	Display the effective status of the Scroll Lock.

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4.5　　File Operations of Predefined Protocol Support Function

This section explains the basic file operations of the predefined protocol support function, such as creating new files, opening files, and saving files.

4.5.1　　Creating files

Create a new file of the protocol setting.

Operating procedure

- **Select [File] ⇒ [New] (📄).**

  The <u>Protocol Setting</u> screen is displayed.

Display contents

Item	Description
Protocol No.	Display the protocol number to be used in a pre-defined protocol dedicated instruction for ladder programs. The protocol number can be changed by selecting a number from the list. The assignable number is 1 to 128.
Manufacturer	Display the manufacturer's name of a target device of a protocol to be set.
Model	Display the target model of a protocol to be set.
Protocol Name	Display the name of a protocol to be set.
Communication Type	Display the communication type in a protocol to be set. Send Only : Send one send packet once. Receive Only : Receive a packet if it matches any of up-to-16 defined receive packets. Send&Receive: Send one send packet, and receives a packet if it matches any of up-to-16 defined receive packets.
-> Send/<- Receive	Display the packet direction. -> : Send <-(1) to <-(16) : Receive A receive packet number is displayed in ().
Packet Name	Display the packet name.
Packet Setting	Display the existence or non-existence of variables in an element, and set or unset of the variables. With 'Variable Unset', 'Element Unset', or 'Element error', the setting cannot be written to a module. No Variable : There is no variable in the element. Variable Set (in blue) : All variables are set. Variable Unset (in red) : There are one or more unset variables. Element Unset (in red) : There is no element in the editable protocol. Element error (in red) : The element does not meet requirement.
Protocol row	One protocol row is displayed for each protocol. The background is displayed in the following colors. Deep sky blue: Protocol selected from the predefined protocol library Orange : Editable protocol
Send packet row	One send packet row is displayed for each send packet. ('Send' means the communication toward an external device from a module.) The background is displayed in the following colors. Light sky blue : Protocol selected from the predefined protocol library Light yellow : Editable protocol
Receive packet row	One receive packet row is displayed for each receive packet. ('Receive' means the communication toward a module from an external device.) The background is displayed in the following colors. Pale green: Protocol selected from the predefined protocol library Yellow : Editable protocol
Cell for adding protocol	Display Add Protocol screen by clicking this cell or pressing the [Enter] key.

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4.5.2 Opening files

Read a protocol setting file saved on a personal computer or another data storage device.

Operating procedure

1. **Select [File] ⇒ [Open] (📩).**

   The Open screen is displayed.

2. **Select a protocol setting file (*.pcf/*.epc/*.rpc/*.tpc) and open the file.**

   The Protocol Setting screen is displayed.

4.5.3 Opening other format data

Read an other format protocol setting file saved on a personal computer or another data storage device.

Operating procedure

1. **Select [File] ⇒ [Open Other Data] ⇒ [Serial Communication Module Format]/ [Ethernet Module Format]/[Built-in/Adapter Serial Format]/[Built-in Ethernet Format].**

   The Open Other Data screen is displayed.

2. **Select a protocol setting file (*.pcf/*.epc/*.rpc/*.tpc) and open the file.**

   The Protocol Setting screen is displayed.

Point

● **Readable other format protocol setting files**
Other format protocol setting files that can be read for each predefined protocol function are as follows:

Predefined protocol support function	Other format protocol setting file
Serial communication module	Built-in/Adapter Serial (*.rpc)
Ethernet module	Built-in Ethernet (*.tpc)
Built-in/Adapter Serial	Serial communication module (*.pcf)
Built-in Ethernet	Ethernet module (*.epc)

● **Consideration when reading other format data**
If an other format protocol setting file is read with a built-in/adapter serial or built-in Ethernet, the "Non-conversion Variable" to which G devices are set will be unset status.
In this case, set the appropriate devices after reading the file.

● **When reading other format data with built-in/adapter serial**
When reading the protocol setting file of the serial communication module in which "Enable" is selected to "Clear OS area (receive data area) before protocol execution", the setting is changed to "Disable" and will be disabled.

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4.5.4　Saving files

Save a protocol setting being edited on a personal computer or another data storage device.

■　Saving protocol settings under the specified name

Save a protocol setting being edited under the specified name.

Operating procedure

1. **Select [File] ⇒ [Save As].**

The <u>Save As</u> screen is displayed.

2. **Set "Save in" and "File name" and save the file.**

The file is saved with the specified name and in the specified destination.

■　Saving protocol settings

Overwrite and save a protocol setting being edited.

Operating procedure

- **Select [File] ⇒ [Save] (📄).**

The data to be saved is overwritten on the existing protocol setting file.

4.5.5　Closing files

Close a protocol setting being opened.

Operating procedure

- **Select [File] ⇒ [Close].**

Point

● **When two-byte characters are garbled**
The predefined protocol support function is not supported by the Language selection function. Therefore, when the project language is changed, the data created using two-byte characters will be garbled.
The protocol setting file that contains two-byte characters must be opened with the language of the operating system on which the file is created, or GX Works2.

4.6   Editing Protocols

This section explains how to configure/change protocols to be set to a module on the <u>Protocol Setting</u> screen.

4.6.1   Adding protocols

Add a protocol.

Screen display

Click the "Add" cell, or press the ⟦Enter⟧ **key on the <u>Protocol Setting</u> screen.**
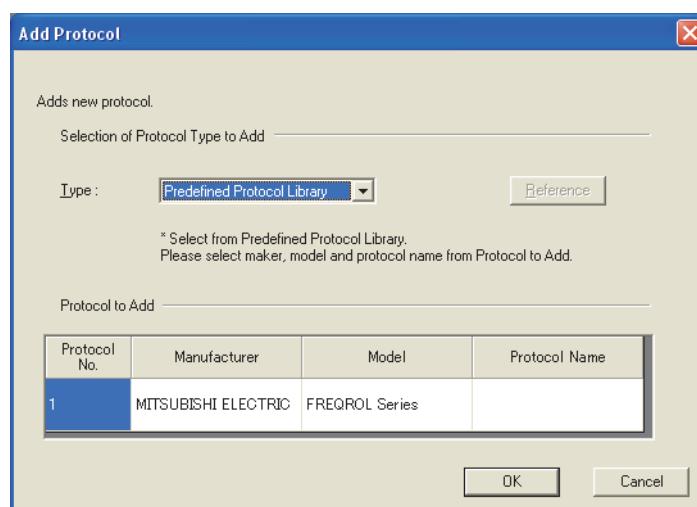
Operating procedure

- **Set the items on the screen.**

Item	Description
Selection of Protocol Type to Add	–
Type	Select a protocol type to be added. For "User Protocol Library", click the ⟦ Reference ⟧ button and specify the file of user protocol library. (☞ ■ Protocol type)
Protocol to Add	–
Protocol No.	Set the number of the protocol to be added.
Manufacturer	Set a manufacturer's name of the protocol to be added.
Model	Set a model of the protocol to be added.
Protocol Name	Set a name of the protocol to be added.

Point

● **"Select from Predefined Protocol Library"**
When "Select from Predefined Protocol Library" is selected, configure only "Send/Receive Data Storage Area" in a Non-conversion Variable/Conversion Variable among packet elements.

■ Protocol type

The following shows the 3 types of the protocol types.

Item	Description
Predefined Protocol Library	Add a protocol by selecting a protocol from the predefined protocol library and specifying "Protocol No.", "Manufacturer", "Model", and "Protocol Name". Other than "Protocol No." cannot be changed after a protocol addition.
User Protocol Library	Add a protocol by utilizing a protocol saved as a user protocol library. (Saving protocols as user protocol library ☞ Section 4.6.6)
Add New (Editable Protocol)	Add a protocol which can be edited by specifying only "Protocol No.". "Manufacturer", "Model", and "Protocol Name" can be changed after a protocol addition.

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4.6.2 Changing to editable protocols

Change a protocol selected from the predefined protocol library to an editable one.

Operating procedure

1. **Select a row of a protocol to be changed on the <u>Protocol Setting</u> screen.**

2. **Select [Edit] ⇒ [Change to Editable Protocol].**

The following message is displayed.
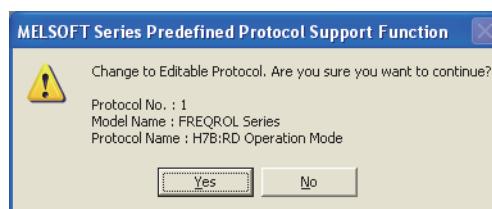
3. **Click the** [Yes] **button.**

Point

● **Restriction on changing a predefined protocol to an editable protocol**
Once a protocol has been changed to an editable protocol, it cannot be restored.
In addition, an editable protocol cannot be changed to a predefined protocol.

4.6.3   Configuring details of protocols

Configure the number of retries of a protocol and whether to clear the OS area (receive data area).

Screen display

Select a protocol row on the <u>Protocol Setting</u> screen and select [Edit] $\Rightarrow$ [Protocol Detailed Setting].

Operating procedure

- **Set the items on the screen.**

Item		Description
Connected Device Information[*1]	Manufacturer	Set a manufacturer's name of the protocol.
	Type	Set a device type of the protocol.
	Model	Set a model of the protocol.
	Version	Set a device version of the protocol.
	Explanation	Set a description for a device of the protocol.
Protocol Setting Information[*1]	Protocol No.	Displays a protocol number of the selected protocol.
	Protocol Name	Set a protocol name of the protocol.
	Communication Type	Select a communication type of the protocol.
Receive Setting	Clear OS area (receive data area) before protocol execution[*2,*3]	Select whether to clear the OS area (receive data area) of the module before the protocol execution. If 'Disable' is selected, the data received in the module before the protocol execution also become a receive target of the protocol.
	Receive Wait Time	Set waiting time after the module turns to the 'waiting for reception' status. If the communication with other devices is not available due to such as a cable disconnection and no matched packet can be received within the set time, the module determines an error and cancels the 'waiting for reception' status.

Item		Description
Send Setting	Number of Retries[2]	Set the number of times the module retries to send when the sending from the module has not been completed within the set time of "Monitoring Time". The module determines an error if the sending has not been completed despite the specified number of times of sending retries.
	Retry Interval[2]	Set the interval between the failure of sending from the module and the retry when the sending from the module has not been completed within the set time of "Monitoring Time".
	Standby Time	Set standby time between when a protocol set to the module turns to the execution status and when it actually sends the data. By setting this item, the send timing of the module can be adjusted to readiness of other devices to receive data.
	Monitoring Time[2]	Set waiting time between when the module turns to the 'sending' status and when the sending is completed. If the communication with other devices is not available due to such as a cable disconnection and the sending cannot be completed within the set time, the module determines an error and cancels the 'sending' status.

*1 :   For a protocol selected from the predefined protocol library, "Connected Device Information" and "Protocol Setting Information" cannot be modified.

*2 :   Not applicable to Ethernet module, and built-in Ethernet.

*3 :   Not applicable to built-in/adapter serial.

Screen button

● [Communication Parameter Batch Setting]
   Displays the Communication Parameter Batch Setting screen. (☞ Section 4.6.4)

Point

● **Example of when the data cannot be sent**
   When the set value of "Number of Retries" is 2, the module determines an error at the following timing if it cannot send the data.
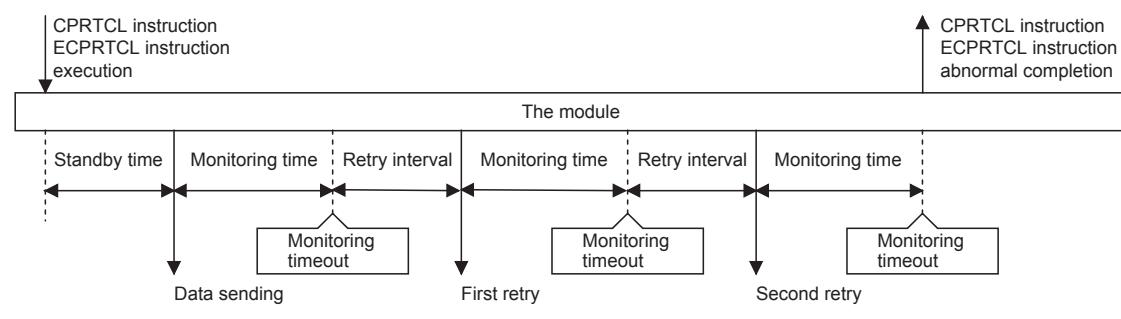
4.6.4   Setting send/receive parameters in batch

Configure parameters used for sending/receiving a protocol.

Screen display

Click the [Communication Parameter Batch Setting] **button on the <u>Protocol Detailed Setting</u> screen.**
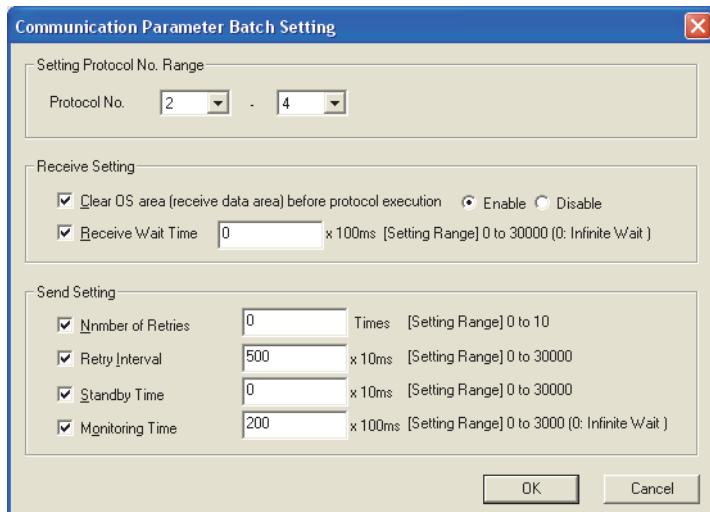
Operating procedure

- **Set the items on the screen.**

Item	Description
Setting Protocol No. Range	Select the start number and end number of the range of protocols to be set at once.
Receive Setting	Select items to be set at once.
Send Setting	Specified values of selected items are to be set at once.

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4.6.5   Deleting protocols/packets

Delete a protocol/packet.

Operating procedure

1. **Select a row of a protocol/packet to be deleted on the <u>Protocol Setting</u> screen.**

2. **Select [Edit] ⇒ [Delete], or press the ⌷Delete⌷ key.**

The row of the protocol/packet is deleted.

Point

● **Deleting protocols/packets**
- To delete multiple protocols at once, select [Edit] ⇒ [Delete Multiple Protocols] and specify the range.
- A send packet cannot be deleted.
- A receive packet cannot be deleted when the communication type is "Send&Receive" or "Receive Only" and there is only one receive packet.
- A packet in a protocol selected from the predefined protocol library cannot be deleted.

4.6.6   Saving protocols as user protocol library

Save a protocol being set as a user protocol library.

Operating procedure

1. **Select a cell of a protocol line on the <u>Protocol Setting</u> screen.**

2. **Select [Edit] ⇒ [Save User Protocol Library].**

The <u>Save User Protocol Library</u> screen is displayed.

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

Item	Description
ALL	Select this to save all protocols.
Selected Protocol No.	Select this to save a protocol of protocol number being selected.

Specify Protocol No.	Select this to save a protocol by specifying a protocol number.
	For specifying multiple protocol numbers, separate each protocol number with ",".
	For specifying consecutive protocol numbers, connect the first protocol number and last protocol number with "-".
	    Example) 1,3,6
	                  4-8
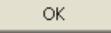
4. **Click the** <kbd>OK</kbd> **button.**

The Save As screen is displayed.
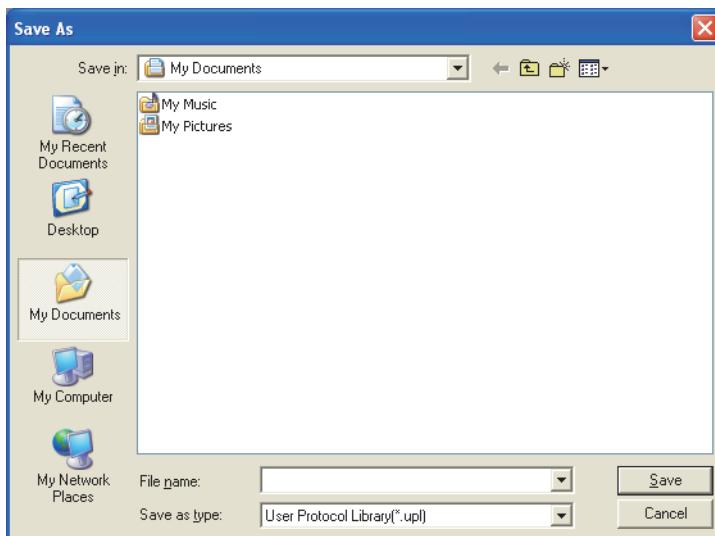
5. **Enter a file name and click the** <kbd>Save...</kbd> **button.**

Saved as a user protocol library.

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4.6.7 Registering predefined protocol library

Register the predefined protocol library provided by Mitsubishi Electric Corporation.
Registering the predefined protocol library enables to select the predefined protocol library which is registered on "Predefined Protocol Library" of the Add Protocol screen.

Operating procedure

1. **Select [Edit] ⇒ [Register Predefined Protocol Library].**

   The Open screen is displayed.
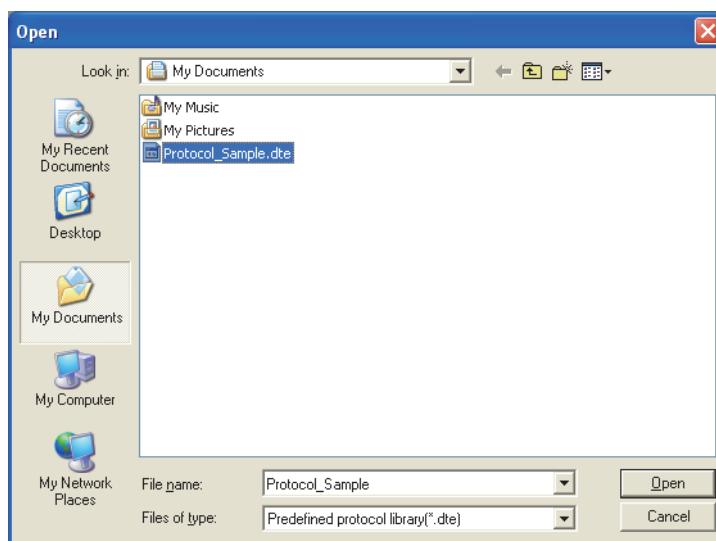
2. **Select a file name and click the** Open **button.**

   After the registration is completed, the following message is displayed.
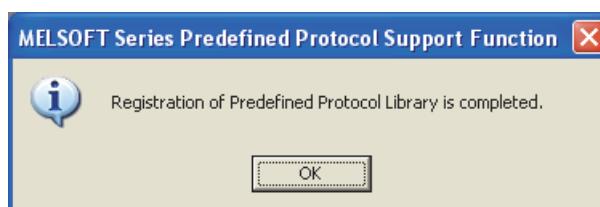
4.7   Setting Packets

Set packet elements of a registered protocol.

Screen display

Click a desired packet setting on the Protocol Setting screen.

Operating procedure

- **Set the items on the screen.**

Item		Description
Protocol No.		Display the protocol number of the specified protocol.
Protocol Name		Display the protocol name of the specified protocol.
Packet Type		Display 'Send Packet' or 'Receive Packet' as the type of the specified packet.
Packet Name		Set the packet name of the specified packet.[*1]
Packet No. (Receive packet only)		Display the packet number of the receive packet.
Element List	Element No.	Display the number of the packet element. The element number can be changed by selecting a number from the list.
	Element Type	Display the type of each element. For details, refer to the user's manual of the module.
	Element Name	Display the name of each element.
	Element Setting	Display the setting outline of each element. For details, refer to "■ Display examples of element settings" in this section. Display contents may vary depending on types of elements. To display the respective setting screen, click an editable cell[*2], or press the ⟦Enter⟧ key.
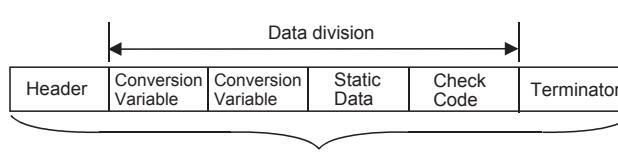
*1 :   Not editable for a protocol selected from the predefined protocol library.
*2 :   Displayed in red when a Variable unset error, Element error, or Calculating range error occurs, and displayed in blue when no error occurs.

Screen button

● Change Type

Changes the type of the packet element. (☞ Section 4.7.3)

● Add New

Adds a new packet element. (☞ Section 4.7.1)

● Copy

Copies the packet element at the cursor position.

● Paste

Pastes the copied packet element to the row next to the cursor position.

● Delete

Deletes the packet element at the cursor position.

■ Display examples of element settings

Element type	Display content		Display example
Header[*1] Static Data Terminator[*1]	"Code Type" is 'ASCII String'	Display the set value (ASCII string) with " ", and data length with ( ).	"TEXT" (4Byte)
	"Code Type" is 'ASCII Control Code'	Display the set value (ASCII control code) with [ ], and data length with ( ).	[CR](1Byte)
	"Code Type" is 'HEX'	Display the set value (HEX), and data length with ( ).	1AB2C3(3Byte)
Length	Range for calculation of data length		Object element3-8
	Display the code type using elliptical expressions. ASCII Hexadecimal : Hexadecimal ASCII Decimal[*1] : Decimal HEX : HEX		Hexadecimal
	Display the data flow using elliptical expressions. Forward Direction (Upper Byte -> Lower Byte) : Forward Forward Direction (Upper Byte -> Lower Byte) : Reverse Byte Swap (by Word) : Byte		Forward
	Data size		2Byte
Non-conversion Variable	For 'Fixed Length', display the address range of a device or buffer to be specified as a variable with [ ].For 'Variable Length', additionally display the starting address of a device or buffer memory which specifies the data length (or number of data) with another [ ].		Fixed Length : [D1-D2] Variable Length: [D1] [D2-D11]
	Fixed Length/Variable Length		Fixed Length
	Length of send/receive data		600Byte
	Displays the unit of stored data using elliptical expressions. Lower Byte + Upper Byte: Lower/Upper Byte Lower Bytes Only : Lower Byte		Lower/Upper Byte
	Displays the byte swap using elliptical expressions. Disable (Lower -> Upper): No Swap Enable (Upper -> Lower) : Swap		Swap

Element type	Display content	Display example
Conversion Variable[*1]	For 'Fixed Number of Data', display the address range of a device or buffer to be specified as a variable with [ ]. For 'Variable Number of Data', additionally display the starting address of a device or buffer memory which specifies the data length with another [ ].	Fixed Number of Data : [D1-D2] Variable Number : [D1] [D2-D11]
	Display "Conversion" using elliptical expressions. HEX -> ASCII Decimal : - Dec HEX -> ASCII Hexadecimal : - Hex ASCII Decimal -> HEX : Dec -> ASCII Decimal -> HEX : Hex ->	-> Hex
	Fixed Number of Data/Variable Number of Data	Variable Number
	Display "Number of data" using elliptical expressions.	Number of data (3)
	Number of digits of data	Digit (3)
	Display a blank-padded character (0/Space).	Padded (0)
	Display the conversion unit using elliptical expressions. Word : Word Double Word : Double	Double
	Display whether signed or not. Unsigned : Unsigned Signed : Signed	Signed
	When 'Signed' is selected in "Sign", display the positive sign character using elliptical expressions. None : none + : + 0 : 0 Space : space For the negative sign character, '-' is fixed.	Sign character (none)
	Display the number of decimals using elliptical expressions.	Decimal point (5)
	Display the delimiter using elliptical expression. No Delimiter : none Comma : comma Space : space	Delimiter (comma)
Check Code[*1]	Range for calculation of a check code	Object element2-7
	Display the processing method using elliptical expressions. Horizontal Parity : Parity Sum Check : Sum Check 16-bit CRC (for MODBUS): CRC MOD	Parity
	Display "Code Type" using elliptical expressions. ASCII Hexadecimal : -> Hex ASCII Decimal : Decimal HEX : HEX	Hexadecimal
	Display the complement calculation using elliptical expressions. No Complement Calculation : No calculation One's Complement : 1 complement Two's Complement : 2 complement	1 complement
	Display the data flow using elliptical expressions. Forward Direction (Upper Byte -> Lower Byte) : Forward Forward Direction (Lower Byte -> Upper Byte) : Reverse Byte Swap (by Word) : Byte	Forward
	Data size	2Byte
Non-verified Reception (Receive only)	Display the check size with ( ). ("Variable" is displayed when the set value is '0'.)	(123Byte)

*1 : Not applicable to Ethernet module.

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4.7.1 Adding new elements

Add an element.

Screen button

Click the [Add New] button on the <u>Packet Setting</u> screen.
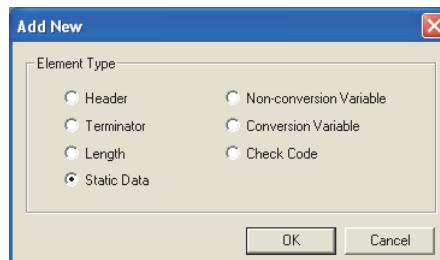
Operating procedure

- **Select "Element Type" and click the [OK] button.**

  The <u>Element Setting</u> screen for the selected element type is displayed.
  For details, refer to Section 4.7.2.

4.7.2　　Setting elements

Set each element.

■　Setting of header/static data/terminator

Configure the header/static data/terminator setting.

Screen display

Select "Header"/"Static Data"/"Terminator" on the <u>Add New</u> screen.
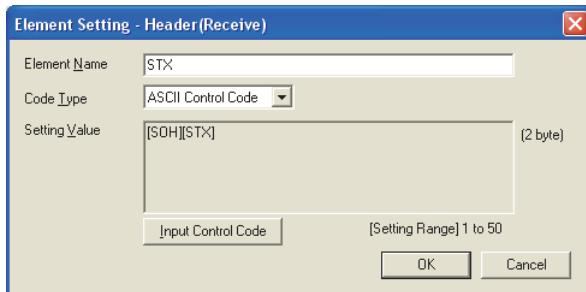
Operating procedure

- **Set the items on the screen.**

Item	Description
Element Name	Set a name of the element.
Code Type	Set a data type of the setting value.
Setting Value[*1]	Set value of the Header/Static Data/Terminator.

*1 :　When "HEX" is set to "Code Type", always input the setting value using upper-case characters. The setting value which has been input by lower-case characters is changed to upper-case characters when "Read from Module" is executed, therefore, the mismatch is detected when verifying the data.

Screen button

● **Input Control Code**

When "Code Type" is 'ASCII Control Code', displays the <u>ASCII Code Input</u> screen to select a control code to be set.
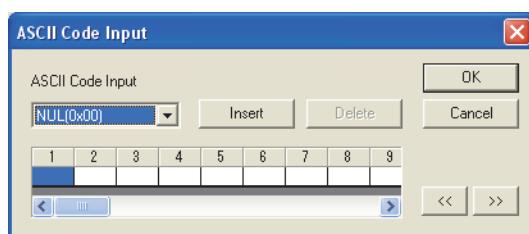
Operation

1. **Select an ASCII code from the list of "ASCII Code Input".**

2. **Click the　Insert　button.**
   The ASCII code is inserted to the cursor position.

■ Setting of length

Configure the length setting.

Screen display

Select "Length" on the Add New screen.
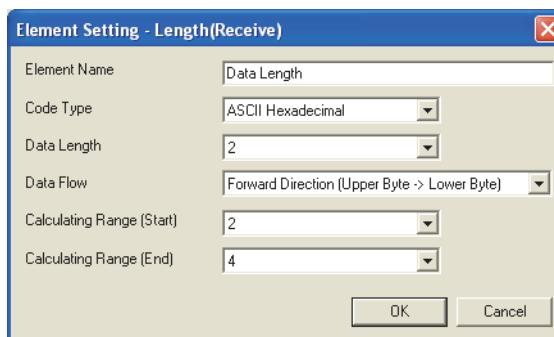
Element Setting - Length(Receive)

Element Name	Data Length
Code Type	ASCII Hexadecimal
Data Length	2
Data Flow	Forward Direction (Upper Byte -> Lower Byte)
Calculating Range (Start)	2
Calculating Range (End)	4

OK   Cancel

Operating procedure

- **Set the items on the screen.**

Item	Description
Element Name	Set a name of the element.
Code Type	Set a data type of the setting value.
Data Length	Select the data length on the line.
Data Flow	Select the sequence of data when "Data Length" is other than '1'.
Calculating Range (Start)/Calculating Range (End)	Select element numbers for the start and end of the calculating range.

■ **Setting of non-conversion variable**

Configure the non-conversion variable setting.

Screen display

Select "Non-conversion Variable" on the Add New screen.

Element Setting - Non-conversion Variable(Receive)	
Element Name	Slave Address
Fixed Length/Variable Length	Fixed Length
Data Length/Maximum Data Length	1 [Setting Range] 1 to 2048
Unit of Stored Data	Lower Byte + Upper Byte
Byte Swap	Disable (Lower -> Upper)

Data Storage Area Specification

Receive Data Storage Area   D1   (1 Word)

D1

[Specifiable Device Symbol]
X, Y, M, L, B, D, W, R, ZR, G (Buffer Memory)

OK   Cancel

Operating procedure

• **Set the items on the screen.**

Item	Description
Element Name	Set a name of the element.
Fixed Length/Variable Length	Select 'Fixed Length'/'Variable Length'.
Data Length/ Maximum Data Length	Set the data length. For 'Variable Length', set the maximum data length that can be specified to the data storage area.
Unit of Stored Data	Select 'Lower Byte + Upper Byte'/'Lower Bytes Only'.
Byte Swap	Select 'Disable (Lower -> Upper)'/'Enable (Upper - Lower)'.
Send (Receive) Data Length Storage Area (For 'Variable Length' only)	Set a starting address of devices on which the data length of the send (receive) data of the element is stored.
Send (Receive) Data Storage Area[1]	Fixed Length : Set a starting address of devices on which the value of a variable is stored. An ending address is automatically displayed. Variable Length : Devices of a starting address and an ending address on which the value of a variable is stored are automatically displayed according to the setting of the data storage area for the send (receive) area.

[1] : Not applicable to built-in/adapter serial and built-in Ethernet.

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■ Setting of conversion variable

Configure the conversion variable.

Screen display

Select "Conversion Variable" on the Add New screen.

Operating procedure

• **Set the items on the screen.**

Item	Description
Element Name	Set a name of the element.
Conversion	Select a conversion type.
Fixed Number of Data/Variable Number of Data	Select 'Fixed Number of Data'/'Variable Number of Data'.
Number of Send (Receive) Data	Set the number of the data (1 to 256). For 'Variable Number of Data', set the maximum number of data that can be specified to the data number storage area.
Number of Send (Receive) Digits of Data	Select 1 to 10 or 'Variable Number of Digits'.
Blank-padded Character at Send (Receive)	Select 'Space'/'0'. The setting value is invalidated and '-' is displayed when "Number of Send (Receive) Digits of Data" is 'Variable Number of Digits'.
Conversion Unit	Select 'Word'/'Double Word'.
Sign	Select 'Unsigned'/'Signed'.[*1]
Sign Character	Select 'None'/'+'/'0'/'Space' as a positive sign character when 'Signed' is selected in "Sign".
Number of Decimals	Select 'No Decimal Point'/1 to 9/'Variable Point'.[*1]
Delimiter	Select 'No Delimiter'/'Comma'/'Space'.
Send (Receive) Data Quantity Storage Area (For 'Variable Number of Data' only)	Specify a starting address of devices on which the number of the send (receive) data of the element is stored.[*2]
Send (Receive) Data Storage Area[*3]	Fixed Length : Specify a starting address of devices on which the value of a variable is stored.[*2] An ending address is automatically displayed. Variable Length : Devices of a starting address and an ending address on which the value of a variable is stored are automatically displayed according to the setting of the data storage area for the send (receive) area.

*1 : Applicable only when "Conversion" is 'HEX -> ASCII Decimal' or 'ASCII Decimal -> HEX'.
*2 : For the setting range, refer to ☞ ■ List of available devices for "Send (Receive) Data Storage Area".
*3 : Not applicable to built-in/adapter serial.

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■ Setting of check code

Configure the check code setting.

Screen display

Select "Check Code" on the Add New screen.
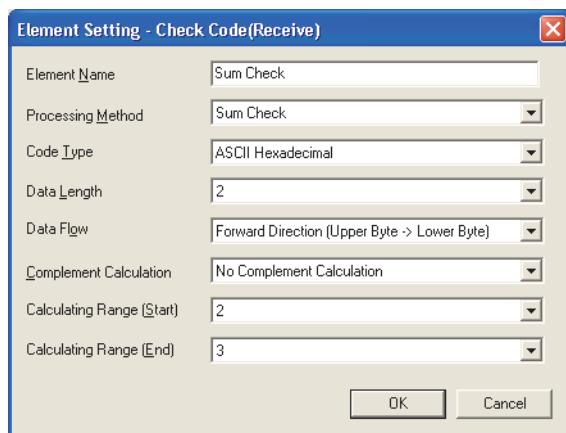
Operating procedure

- **Set the items on the screen.**

Item	Description
Element Name	Set a name of the element.
Processing Method	Select a calculating method.
Code Type[*1]	Select a send/receive format of the check code.
Data Length[*1]	Select the data length on the line.
Data Flow[*1]	Select the sequence of data when "Data Length" is other than '1'.
Complement Calculation[*1]	Select a type of complement calculation.
Calculating Range (Start)/Calculating Range (End)	Select element numbers for the start and end of the calculating range.

*1 : Not applicable when "Processing Method" is '16-bit CRC (for MODBUS)'.

■ **Setting of non-verified reception**

Configure the non-verified reception setting.

Screen display

Select "Non-verified Reception" on the Add New screen.
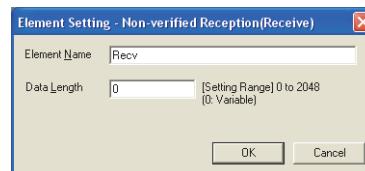
Operating procedure

- **Set the items on the screen.**

Item	Description
Element Name	Set a name of the element.
Data Length	Set the number of characters not to be verified.

■ **List of available devices for "Send (Receive) Data Storage Area"**

The following list shows the available devices for "Send (Receive) Data Storage Area".

● **QCPU (Q mode)**

Device name		Device symbol	Device range					
			Other than those mentioned on the right	Basic model QCPU	Other than those Universal model QCPU mentioned on the right	High-speed Universal model QCPU	Q00U/Q01U	Q00UJ
Internal user[1],[2]			–					
	Input	X	0 to 1FFFH	0 to 7FFH	0 to 1FFFH	0 to 1FFFH	0 to 1FFFH	0 to 1FFFH
	Output	Y	0 to 1FFFH	0 to 7FFH	0 to 1FFFH	0 to 1FFFH	0 to 1FFFH	0 to 1FFFH
	Internal relay	M	0 to 32767	0 to 32767	0 to 61439	0 to 61439	0 to 61439	0 to 61439
	Latch relay	L	0 to 32767					
	Link relay	B	0 to 7FFFH	0 to 7FFFH	0 to EFFFH	0 to EFFFH	0 to EFFFH	0 to EFFFH
	Data register	D	0 to 32767	0 to 32767	0 to 4212735	0 to 4910079	0 to 94207	0 to 32767
	Link register	W	0 to 7FFFH	0 to 7FFFH	0 to 4047FFH	0 to 4AEBFFH	0 to 16FFFH	0 to 7FFFH
File register			–					
File register		R[2]	0 to 32767	0 to 32767	0 to 32767	0 to 32767	0 to 32767	–
		ZR	0 to 1042431	0 to 1042431	0 to 4184063	0 to 4849663	0 to 65535	–
Buffer memory[3]			–					
Intelligent function module device		U□\G□	Q series-compatible C24N: 1024 to 6911, 9728 to 16383, 20480 to 24575 QJ71E71-100: 18432 to 20479					

[1] : Do not specify a local device.
[2] : Specify devices within the range specified in the Device setting of the PLC parameter.
[3] : Not applicable to built-in Ethernet.

● **LCPU**

Device name		Symbol	Device range	
			L02S/L02S-P/L02/L02-P	L06/L06-P/L26/L26-P/L26-BT/L26-PBT
Internal user[1],[2]			–	
	Input	X	0 to 1FFF$_H$	
	Output	Y	0 to 1FFF$_H$	
	Internal relay	M	0 to 61439	
	Latch relay	L	0 to 32767	
	Link relay	B	0 to EFFF$_H$	
	Data register	D	0 to 94207	0 to 421887
	Link register	W	0 to 16FFF$_H$	0 to 66FFF$_H$
File register			–	
	File register	R[2]	0 to 32767	
		ZR	0 to 65535	0 to 393215
Buffer memory[3]			–	
	Intelligent function module device	U□\G□	L series-compatible C24N: 1024 to 6911, 9728 to 16383, 20480 to 24575 LJ71E71-100: 18432 to 20479	

*1 : Do not specify a local device.
*2 : Specify devices within the range specified in the Device setting of the PLC parameter.
*3 : Not applicable to built-in/adapter serial and built-in Ethernet.

Point

● **CPU device**
When a CPU device is specified as the data storage area, the module performs the read/write CPU device process. If the total length of variables used in a packet exceeds 1920 bytes, 'read CPU device process'/'write CPU device process' of the module needs to be performed more than once, and the processing time might be longer.

● **Intelligent function module device (buffer memory)**
High-speed protocol processing is available because a Intelligent function module device (buffer memory) is not affected by the sequence scan of a programmable controller CPU.

● **Execution of a protocol including a Non-conversion Variable or Conversion Variable**
When executing a protocol including a Non-conversion Variable or Conversion Variable, do not change the value of a CPU device specified as a variable during execution of the dedicated instruction.

4.7.3 Changing element types

Change a type of an element to another.

Screen display

Select a cell of an element to be changed on the Packet Setting screen and click the `Change Type` **button.**
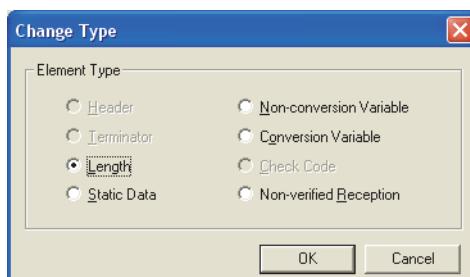
Operating procedure

1. **Select a new element type and click the** [OK] **button.**

The following message is displayed.
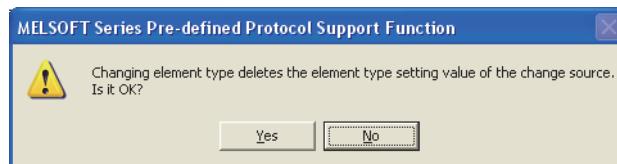
2. **Click the** [Yes] **button.**

The element setting screen for the selected element type is displayed.

4.7.4 Batch-setting devices

Batch-set devices used in protocols.

Screen display

Select [Edit] ⇒ [Device Batch Setting].
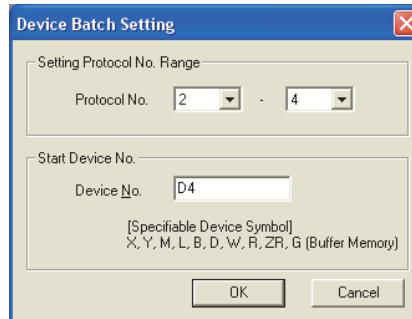
Operating procedure

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

Item	Description
Setting Protocol No. Range	Select a starting number and ending number of protocols to be batch-set.
Start Device No.*1	Select a starting number of devices to be batch-set.

*1 : Buffer memory cannot be set when using built-in/adapter serial or built-in Ethernet.

2. **Click the** [OK] **button.**

The following message is displayed.
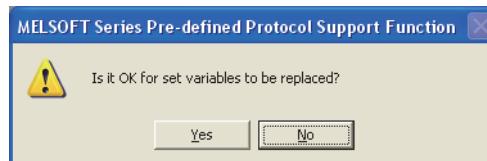
3. **Click the** [Yes] **button.**

The devices are set at once.

4.7.5 Confirming set devices in list view

Display a list of devices used in protocols in list view.

Screen display

Select [Tool] ⇒ [Setting Device List].
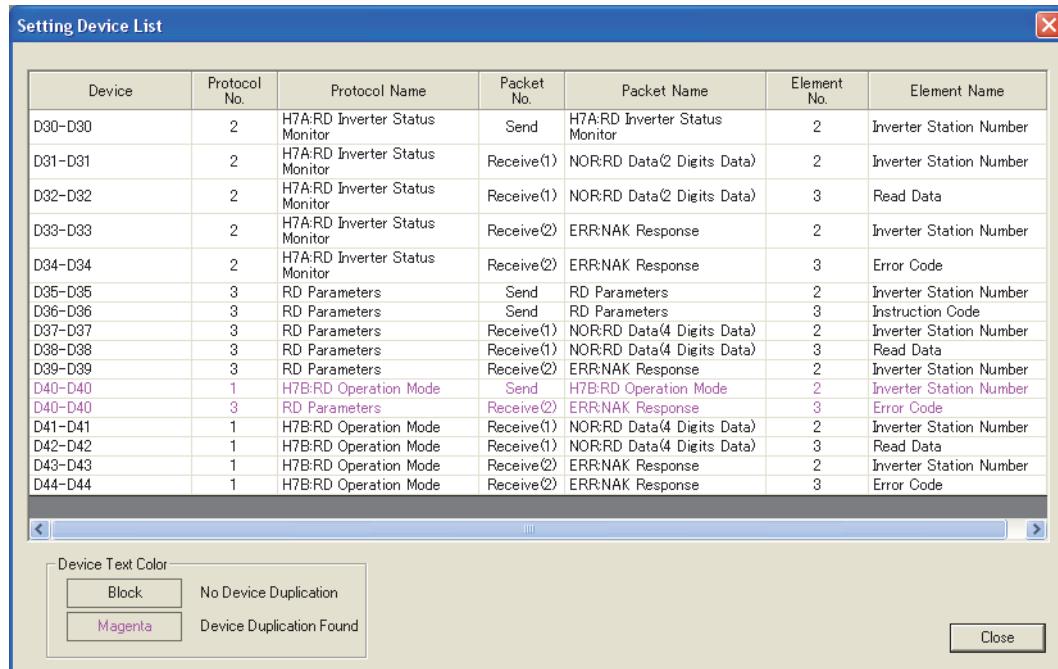
4.8 Writing/Reading/Verifying Protocol Settings

Write/read/verify protocol settings to/from/with the module.
For the Ethernet module connected to a Redundant CPU, set "Not Specified" for "Target System" on
the Transfer Setup screen.

4.8.1 Writing/reading protocol settings

Write data of the registered protocol settings to a selected module, and read the protocol settings from
a selected module.

Screen display

Select [Module Read/Write] ⇒ [Write to Module]/[Read from Module].
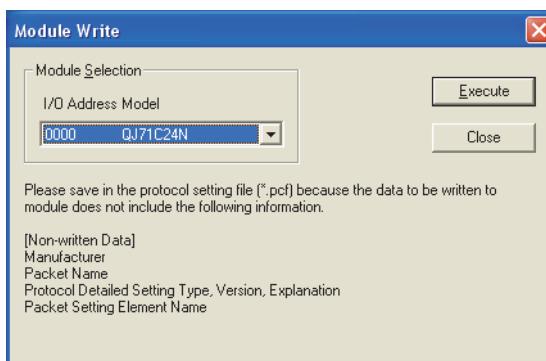
Operating procedure

- **Select a module/target memory and click the** Execute **button.**

    For the write to module process, the following message is displayed.

■ Workaround when the module detects a protocol setting data error

The settings of editable protocols may not be correct when the module detects a protocol setting data error after the protocol settings are written to the module.
In such case, correct the protocol settings according to the following procedure and rewrite them to the module.

Operation

1. Confirm the protocol number, packet number, and element number of the detected error in the protocol setting data error information (buffer memory 4086H to 4089H) of the module.

2. Confirm whether or not the following conditions are satisfied in the packet setting in which the error has been detected.
When any elements of No. 1 and any elements of No. 2 described in the following table are in the same packet, No. 1 must be placed before No. 2.

No.	Setting
1	• Conversion Variable (Fixed number of data, Fixed number of digits (1 to 10 digits), No sign character) • Conversion Variable (Fixed number of data, Fixed number of digits (1 to 10 digits), Variable decimal point) • Conversion Variable (Fixed number of data, Variable number of digits, Number of data is 1, Delimiter is comma or space)
2	• Non-conversion Variable (Variable length) • Conversion Variable (Variable number of data) • Conversion Variable (Fixed number of data, Variable number of digits, Number of data is 1, No delimiter) • Conversion Variable (Fixed number of data, Variable number of digits, Number of data is 2 or more) • Non-verified Reception (Variable number of characters)

3. Modify the protocol settings, and rewrite them to the module.

Point

● **Settings which may cause a 'protocol setting data error'**
A protocol setting data error may occur when any of the following data are set and written to the Q series C24N module with the serial number of which the first five digits are '10122'.

Element type	Setting
Conversion Variable	• "Sign" is 'Signed' • "Number of Decimals" is 1 to 9 or 'Variable Point' • "Delimiter" is 'Comma' or 'Space'
Non-verified Reception	• "Data Length" is '0' (variable number of characters)

● **Execution of write to module function during execution of CPRTCL instruction or ECPRTCL instruction**
An error may occur when the protocol setting data is written to a module during execution of the CPRTCL instruction or the ECPRTCL instruction.

● **Data not to be written to module**
The following data cannot be written to a module. Save these data in a protocol setting file.
• Manufacturer
• Packet Name
• Type, Version, Explanation in the protocol detailed setting
• Element Name in the packet setting

● **Considerations when using serial communication modules**
When an Ethernet module exists on the communication route, the Module read/write function cannot be performed. Set the communication route without connecting via Ethernet module.

● **Consideration when using Ethernet module**
When performing the Module read/write function, connect the programmable controller CPU to the personal computer.

4.8.2 Verifying protocol settings in personal computer side with those in module side

Compare the protocol setting being opened with that written to a selected module.

Operating procedure

1. **Select [Module Read/Write] ⇒ [Module Verification].**
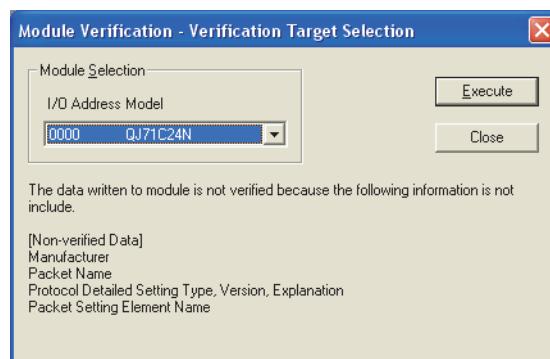
2. **Select a module and click the** Execute **button.**

If any mismatches are found, the following message is displayed.
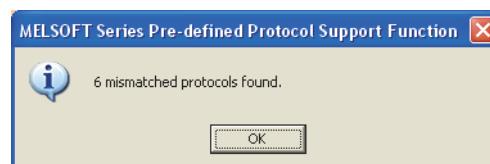
3. **Click the** OK **button.**

The verification result screen is displayed.

Display contents

Item	Description
Target Item	Display mismatch items. For items displayed on "Target Item", refer to ■ Contents displayed on "Target Item".
Result	Display 'Mismatch'.

Screen button

● [Copy to Clipboard]
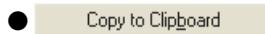
Copies all contents being displayed on the screen to the clip board in text format.

■ Contents displayed on "Target Item"

The following table shows items displayed on "Target Item" of the verification result screen.

Item		Description
Number of Protocols		This item is displayed when the total of registered protocols is mismatched.
Protocol No.1 to 128		The protocol number of a protocol which include any mismatches is displayed.
	Protocol No.	
	Predefined Protocol Library/ Editable Protocol	
	Protocol Detailed Setting Information	The first mismatched item is displayed by comparing items in top down order.
	Number of Packets	
	Packet Setting Information	

Point

● **Target of verification**
  As the following data cannot be written to a module, these data are not compared.
  • Manufacturer
  • Packet Name
  • Type, Version, Explanation in the protocol detailed setting
  • Element Name in the packet setting

● **Consideration when using Ethernet module**
  When performing the Module verification function, connect the programmable controller CPU to the personal computer.

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4.9   Debugging

This section explains how to debug the communication processing between the module and device controller.
Note that the debugging function is not supported by Ethernet module, built-in/adapter serial, and built-in Ethernet. Debug protocols with a commercially available protocol analyzer when using a module which is not supported by the debugging function.

4.9.1   Selecting debugging target modules

Select a module to be debugged. The protocol execution log display function and the state monitoring function are executed against the module selected in this function.

Screen display

Select [Debugging Support Function] ⇒ [Module Selection].
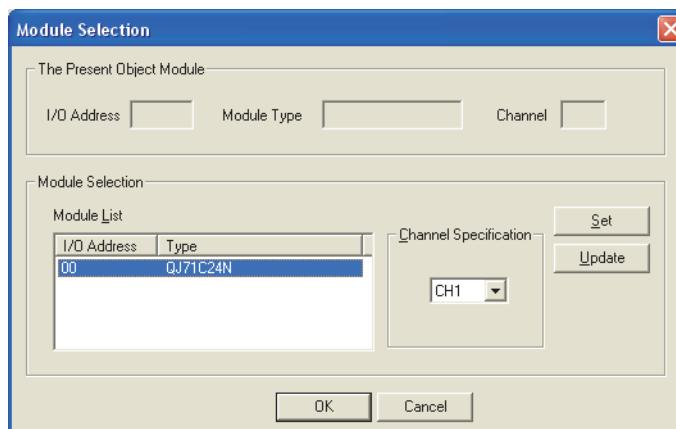
Operating procedure

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

Item	Description
The Present Object Module	Display the information of the selected module.
Module List	Select a debugging target module.
Channel Specification	Select the channel of the module.

2. **Click the   Set   button.**

The selected module and channel are set to "The Present Object Module".

3. **Click the   OK   button.**

The set values displayed on "The Present Object Module" are set as the target module.

Screen button

● **Update**
Displays the latest module list.

4.9.2 Displaying protocol execution logs

Display the protocol execution logs and the protocol execution results when the protocol settings are set.

Operating procedure

1. **Select a module to be debugged. (☞ Section 4.9.1)**

2. **Select [Debugging Support Function] ⇒ [Protocol Execution Log].**

The Protocol Execution Log screen is displayed.

Display contents

Item	Description
Object Module	Display the target module (I/O address and module type) and channel of the protocol execution logs being displayed.
No.	Display the execution logs in the order from the latest.
Start Time and Date	Display the start date of the protocol execution.
End time and Date	Display the end date of the protocol execution.
Model	Display the external device name.
Protocol No.	Display the executed protocol number.
Protocol Name	Display the executed protocol name.
Type	Display the communication type of protocol: 'Send Only', 'Receive Only', or 'Send&Receive'. When a functional protocol is executed, "Functional protocol" is displayed. When a protocol is executed using the dedicated instruction (CPRTCL instruction) by specifying its protocol number which is not written to the module, "Unregistered protocol No." is displayed.

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Item	Description
Execution Result	Display the execution results of the protocols. Error completion : Displayed with red background. Normal completion : Displayed with light green background. For protocols with the 'waiting for transmission', 'sending', 'waiting for reception', or 'receiving' status, the corresponding logs are displayed in light blue.
Error Code	Display the error code of error completion in red when the execution result is an error completion. When the result is a normal completion, '-' is displayed.
Retry	Display the number of send retries.
Packet No.	Display the receive packet numbers which are matched by the verification.

Point

● **Execution log option**

The registration conditions of logs can be specified by the execution log option specification for buffer memory (buffer memory address: 40E2$_H$, 40F2$_H$) or by the various control designations of the intelligent function module utility. The following are the registration conditions.

0th bit is OFF (0) : Stores the execution log for the protocols with the error completion only.
0th bit is ON (1) : Stores the execution status and the execution logs of all protocols.

Note that, only the logs of error protocols are displayed at the default setting. To display all protocol logs, set the registration condition in "Execution log options" of the various control designations in the intelligent function module data.

For details, refer to the following manuals.
☞ Q Corresponding Serial Communication Module User's Manual (Basic)
☞ MELSEC-L Serial Communication Module User's Manual (Basic)

4.9.3 State monitoring

Monitor signals, communication error information, operation setting switches, and protocol execution status.

For details, refer to the user's manual of each module.

Operating procedure

1. **Select a module to be debugged. (☞ Section 4.9.1)**

2. **Select [Debugging Support Function] ⇒ [State Monitor].**

The State Monitor screen is displayed.
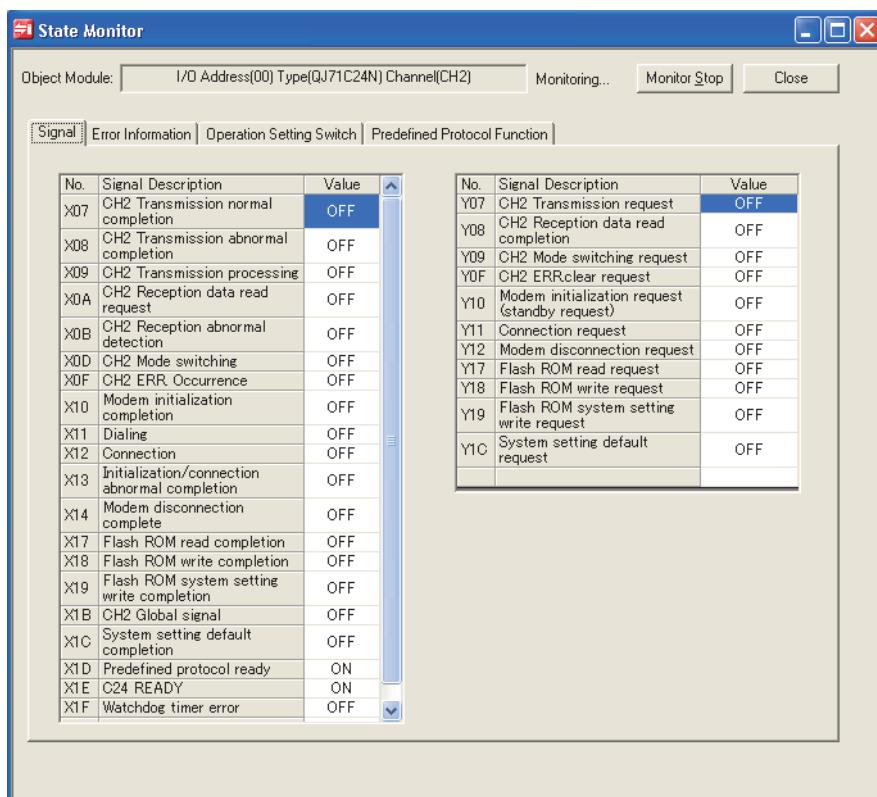
Display contents

Item	Description
<<Signal>>	Display the ON/OFF status of the X/Y/RS-232 signals. ☞ ■ Display contents of <<Signal>>
<<Error Information>>	Display the information of errors, such as a communication error. ☞ ■ Display contents of <<Error Information>>
<<Operation Setting Switch>>	Display the information of such as the operation switches and mode switch. ☞ ■ Display contents of <<Operation Setting Switch>>
<<Predefined Protocol Function>>	Display the information of such as the protocol execution status. ☞ ■ Display contents of <<Predefined Protocol Function>>

■ **Display contents of <<Signal>>**

Screen display

Select [Debugging Support Function] ⇒ [State Monitor] ⇒ <<Signal>>.
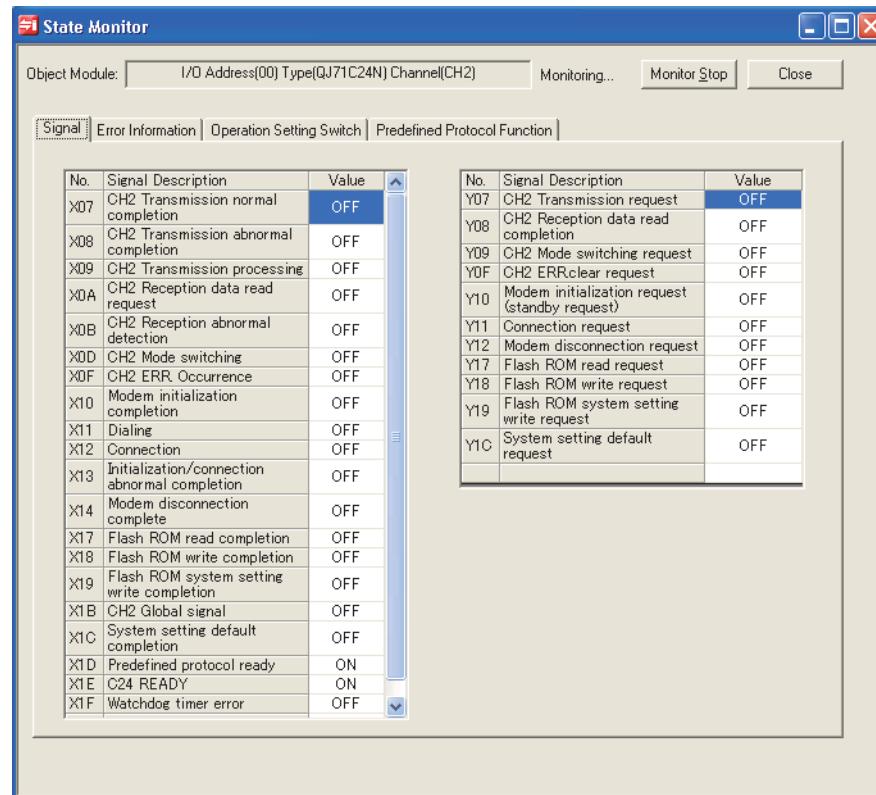
Display contents

Item	Description
X signal state monitor	Display the ON/OFF status of the X signals.[1]
Y signal state monitor	Display the ON/OFF status of the Y signals.
RS-232 signal monitor	Display the ON/OFF status of the RS-232 control signals.

[1] :   Protocols can be executed while the Predefined protocol ready (X1D) is ON.

■ Display contents of <<Error Information>>

Screen display

Select [Debugging Support Function] ⇒ [State Monitor] ⇒ <<Error Information>>.
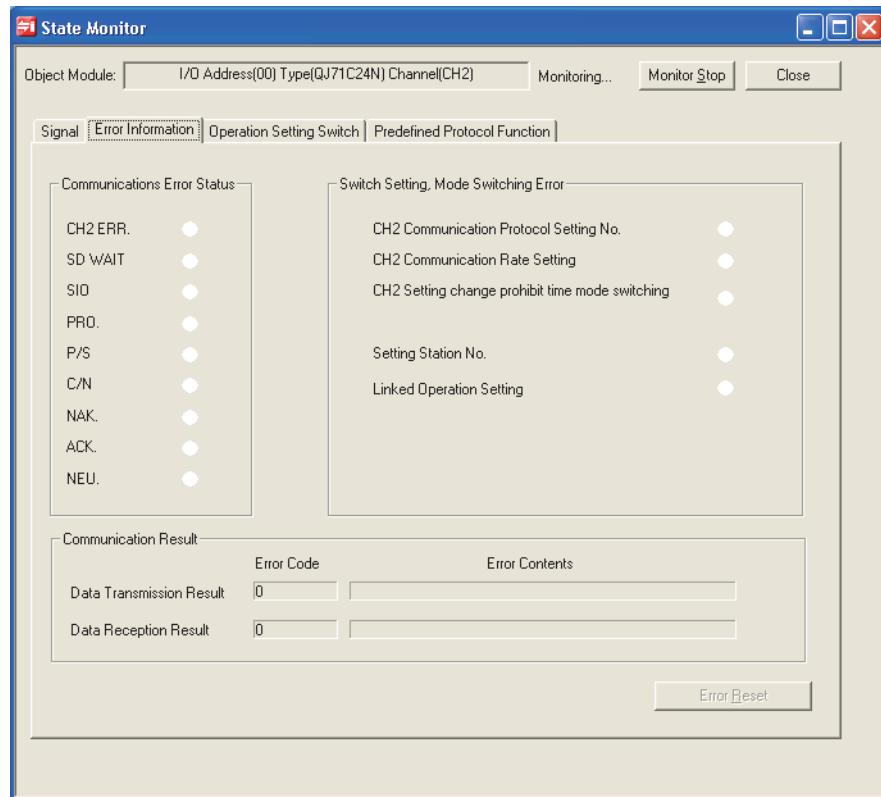
Display contents

Item	Description
Communication Error Status	Display the communication error status.
Switch Setting, Mode Switching Error	Display the switch setting and/or mode selection error status.
Communication Result	Display the error status of the communication result.

Screen button

● **Error Reset**

Resets the error information when XnE on CH1 or XnF on CH2 is ON.

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■ **Display contents of <<Operation Setting Switch>>**

Screen display

Select [Debugging Support Function] ⇒ [State Monitor] ⇒ <<Operation Setting Switch>>.
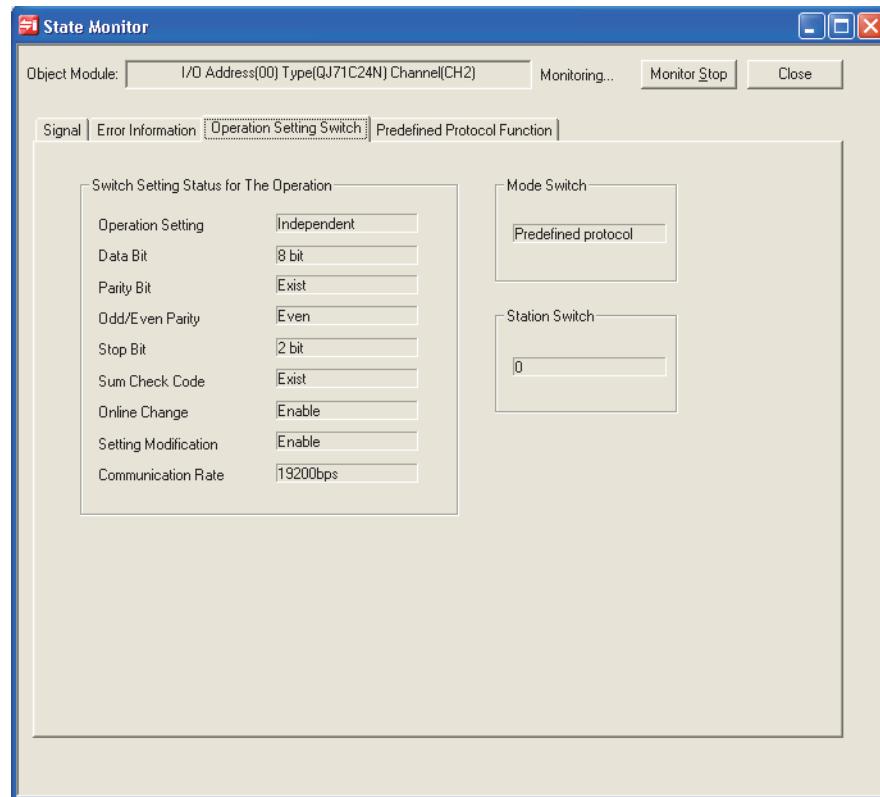
Display contents

Item	Description
Switch Setting Status for The Operation	Display the operation switch setting status.
Mode Switch	Display the communication protocol setting.
Station Switch	Display the station number setting.

■ **Display contents of <<Predefined Protocol Function>>**

Screen display

Select [Debugging Support Function] ⇒ [State Monitor] ⇒ <<Predefined Protocol Function>>.
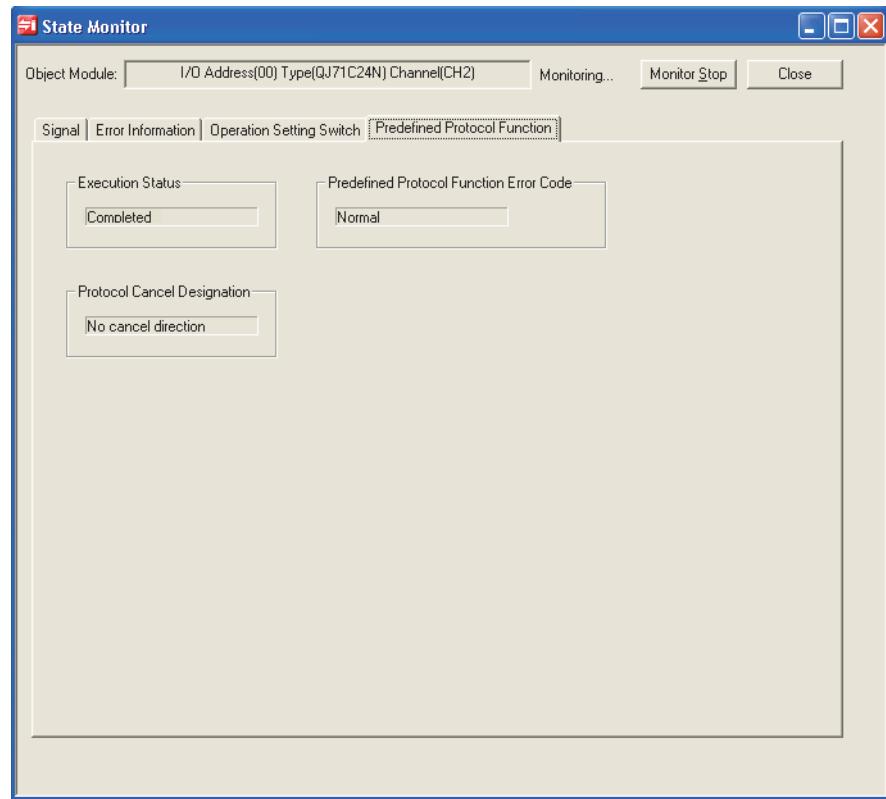
Display contents

Item	Description
Execution Status	Display the protocol execution status.
Protocol Cancel Designation	Display the protocol cancel designation status.
Predefined Protocol Function Error Code	Display the error code of the result from the error completion.

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4.10   Printing Protocol Settings

This section explains how to print protocol settings, packet settings, and setting device lists.

4.10.1   Print screen

Execute printing.

Screen display

Select [File] ⇒ [Print] (📇).
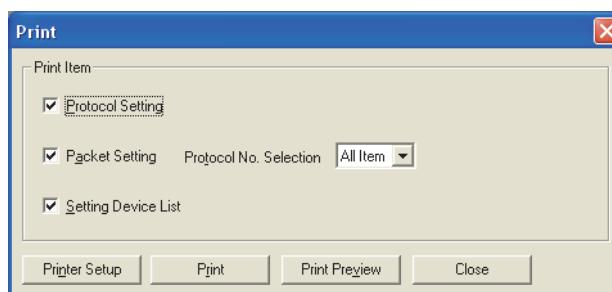
Operating procedure

1. **Set "Print item".**

2. **Click the** [Print] **button.**

Screen button
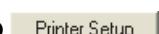
● [Printer Setup]
Displays the Printer Setting screen.
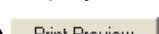
● [Print Preview]
Displays the Print Preview screen.

4.10.2   Print examples

The following shows print examples.

■   Protocol setting

■ Packet setting

[FA-E700.pcf   ] 2009/12/22 00:00

Registered Protocol No.	[1	]
Manufacturer	[MITSUBISHI ELECTRIC	]
Model	[FREQROL Series	]
Protocol Name	[H7B:RD Operation Mode	]
Packet Type	[Send Packet	]
Packet Name	[H7B:RD Operation Mode	]

Element No.	Element Type	Element Name	Element Setting
1	Header	ENQ	[ENQ](1Byte)
2	Conversion Variable	Inverter Station Number	[D300-D300](->HEX/Fixed Number/Number of data (1)/Digit (2)/Padded (0)/Word/Delimiter (none))
3	Fixed Data	Instruction Code	"7B"(2Byte)
4	Fixed Data	Waiting Time	"0"(1Byte)
5	Check Code	Sum Check	(Object element 2-4/Sum Check/Hexadecimal/No calculation/Forward/2Byte)
6	Terminator	CR	[CR](1Byte)

2 / 5 [Packet Setting]

■ **Setting device list**

[Untitled]   2009/12/24 10:49

Device	Protocol No.	Protocol Name	Packet No.	Packet Name	Element No.	Element Name
D30-D30	2	H7A:RD Inverter Status Monitor	Send	H7A:RD Inverter Status Monitor	2	Inverter Station Number
D31-D31	2	H7A:RD Inverter Status Monitor	Receive(1)	NOR:RD Data(2 Digits Data)	2	Inverter Station Number
D32-D32	2	H7A:RD Inverter Status Monitor	Receive(1)	NOR:RD Data(2 Digits Data)	3	Read Data
D33-D33	2	H7A:RD Inverter Status Monitor	Receive(2)	ERRNAK Response	2	Inverter Station Number
D34-D34	2	H7A:RD Inverter Status Monitor	Receive(2)	ERRNAK Response	3	Error Code
D35-D35	3	RD Parameters	Send	RD Parameters	2	Inverter Station Number
D36-D36	3	RD Parameters	Send	RD Parameters	3	Instruction Code
D37-D37	3	RD Parameters	Receive(1)	NOR:RD Data(4 Digits Data)	2	Inverter Station Number
D38-D38	3	RD Parameters	Receive(1)	NOR:RD Data(4 Digits Data)	3	Read Data
D39-D39	3	RD Parameters	Receive(2)	ERRNAK Response	2	Inverter Station Number
D40-D40	1	H7B:RD Operation Mode	Send	H7B:RD Operation Mode	2	Inverter Station Number
D40-D40	3	RD Parameters	Receive(2)	ERRNAK Response	3	Error Code
D41-D41	1	H7B:RD Operation Mode	Receive(1)	NOR:RD Data(4 Digits Data)	2	Inverter Station Number
D42-D42	1	H7B:RD Operation Mode	Receive(1)	NOR:RD Data(4 Digits Data)	3	Read Data
D43-D43	1	H7B:RD Operation Mode	Receive(2)	ERRNAK Response	2	Inverter Station Number
D44-D44	1	H7B:RD Operation Mode	Receive(2)	ERRNAK Response	3	Error Code

11 / 11   [Setting Device List]

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Appendix 1 List of Toolbars and Shortcut Keys

This section shows the list of toolbars and shortcut keys that can be used in operations of the intelligent function module.

For (Common) indicated in the Reference column and details of functions not described in this section, refer to the following manual.
☞ **GX Works2 Version 1 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.

■ "Program Common" toolbar icons

The following table shows the "Program Common" toolbar icons and the corresponding shortcut keys.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	—	Write to PLC	Write data to the programmable controller CPU.	(Common)
	—	Read from PLC	Read data from the programmable controller CPU.	
	—	Start Monitoring (All Windows)	Start monitoring all windows being opened.	
	—	Stop Monitoring (All Windows)	Stop monitoring all windows being opened.	
	F3	Start Monitoring	Start monitoring the window being operated.	
	Alt + F3	Stop Monitoring	Stop monitoring the window being operated.	

■ "Docking Window/Switch Project Data" toolbar icons

The following table shows the "Docking Window/Switch Project Data" toolbar icons.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	—	Intelligent Function Module Monitor	Display/hide the Intelligent Function Module Monitor window.	Section 2.4
	—	Intelligent Function Module Guidance	Display/hide the Intelligent Function Module Guidance window.	Section 3.5.6

■ **"Intelligent Function Module" toolbar icons**

The following table shows the "Intelligent Function Module" toolbar icons.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
📊	—	QD75/LD75 Positioning Module Wave Trace	Execute a wave trace of the QD75/LD75 positioning module.	Section 3.5.3
📊	—	QD75/LD75 Positioning Module Location Trace	Execute a location trace of the QD75/LD75 positioning module.	Section 3.5.4
📊	—	Serial Communication Module Circuit Trace	Execute a circuit trace of the serial communication module.	Section 3.7.2
📊	—	QD75/LD75 Positioning Module Test Monitor	Execute a positioning monitoring of the QD75/LD75 positioning module.	Section 3.5.1
📊	—	QD75/LD75 Positioning Module Test	Execute a positioning test of the QD75/LD75 positioning module.	Section 3.5.2
📊	—	Offset/Gain Setting of Temperature Input Module	Execute offset/gain setting of the temperature input module.	Section 3.2.1
📊	—	Offset/Gain Setting of Analog Module	Execute offset/gain setting of the analog module.	Section 3.1.1

■ **Other shortcut keys**

The following table shows other shortcut keys that are available regardless of the editing target.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
—	Ctrl + Shift + E	Add New Module	Add the intelligent function module data to the project being edited.	Section 2.1.1
—	Shift + F3	Start Watching	Start monitoring the current values of registered devices/labels and intelligent function module.	Section 2.4
—	Shift + Alt + F3	Stop Watching	Stop monitoring the current values of registered devices/labels and intelligent function module.	

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Appendix 1.2   Shortcut keys for operating intelligent function module data

The following explains the toolbar icons and the corresponding shortcut keys for operating intelligent function module data.

■   Toolbar icons for positioning monitoring function

The following table shows the toolbar icons for the positioning monitoring function.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	—	—	Monitor the operating status of positioning module.	Section 3.5.1
	—	—	Monitor the start history.	
	—	—	Monitor the error history.	
	—	—	Monitor the warning history.	
	F3	—	Start the positioning monitoring.	—
	Alt + F3	—	Stop the positioning monitoring.	—

■   Toolbar icons and shortcut keys for predefined protocol support function

The following table shows the toolbar icons and the corresponding shortcut keys for the predefined protocol support function.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + N	New	Create a new protocol setting.	Section 4.5.1
	Ctrl + O	Open	Open an existing protocol setting.	Section 4.5.2
	Ctrl + S	Save	Save the protocol information.	Section 4.5.4
	Ctrl + C	Copy	Copy the selected data.	—
	Ctrl + V	Paste	Paste the cut/copied data at the cursor position.	—
	—	Print	Print the protocol information.	Section 4.10
	—	Write to Module	Write data to a module.	Section 4.8.1
	—	Read from Module	Read data from a module.	

Appendix 2   Compatibility with GX Configurator-QP

The QD75/LD75 positioning module functions in GX Works2 are different in functionality and operability compared to the functions of GX Configurator-QP. Review the following considerations before use.

GX Configurator-QP function	Considerations for using GX Works2
Navigation	Use GX Configurator-QP
Sampling monitor	Use the sampling trace function. (☞ GX Works2 Version 1 Operating Manual (Common))
Diagnostics	Use the positioning test function. (☞ Section 3.5.2)

Appendix 3   Procedure for Use of GX Configurator-QP

Since GX Configurator-QP is included on the CD-ROM (Disc 2) of GX Works2 version 1.513K or earlier, GX Configurator-QP can be installed by the following procedure.

Operating procedure

1. **Copy the compressed file of GX Configurator-QP from the CD-ROM (Disc 2) onto HDD of the personal computer.**

The compressed file of GX Configurator-QP means the following file on the CD-ROM.

• 'CD-ROM drive'\Others\qp2-xxx.dat[1]
   *1 : 'xxx' are replaced with numbers and/or alphabets.

2. **Change the extension of the file copied onto the personal computer from 'dat' to 'exe'.**

The file name changes from 'qp2-xxx.dat' to 'qp2-xxx.exe'.

3. **Double-click 'qp2-xxx.exe' and decompress it to the desired directory.**

4. **Run 'SETUP.EXE' among the decompressed files.**

The installation of GX Configurator-QP starts.
For details of the installation procedure, refer to the following manual.
Use the product ID of GX Works2 for the installation.
☞ GX Configurator-QP Version 2 Operating Manual

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When exported from Japan, this manual does not require application to the
Ministry of Economy, Trade and Industry for service transaction permission.

Specifications subject to change without notice.