

# MELSEC iQ-R Series MELSEC PROCESS CONTROL Technical Guide Portal

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- R08PCPU
- R16PCPU
- R32PCPU
- R120PCPU
- R6RFM
- SW1DND-GXW3-E

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# 1 OVERVIEW

This technical guide provides an overview and description of the features of the process control system, as well as links to documents and websites that will be helpful in the selection of device/system configurations needed to configure the system, in developing programs, and in monitoring the system.

In addition, the replacement procedures from the MELSEC-Q series and links to information on software and sample libraries used to configure the system are provided as supplemental information.

## 1.1 Features of MELSEC Process Control

### Implementing loop control (process control) and sequential control (electrical control) with a single CPU module

- Both loop control and sequential control can be executed at high speed with a single CPU module (process CPU).

**Reference:** [MELSEC iQ-R Process CPU Module User's Manual \(Application\) 14.2 Process Control Function](#)

### Lineup of products including channel isolated analog module necessary for process control

- Our lineup of products includes channel isolated analog module and pulse input module that meet the needs for disconnection detection function and multi-channel configurations.

**Reference:** [MELSEC iQ-R Module Configuration Manual 1.2 Lists of Configuration Devices MELSEC iQ-R series Intelligent function module](#)

### Improving reliability with redundant system

- A highly reliable system can be configured by adopting redundant CPU modules, power supply modules, network modules, and main base units, as well as tracking cables, extension cables, and network cables.
- Redundancy of the CPU module is achieved through a combination of a process CPU module (RnPCPU) and a redundant function module (R6RFM).
- Redundancy of the remote head module (RJ72GF15-T2) required for the remote I/O station is also supported.

**Reference:** [MELSEC iQ-R Module Configuration Manual 1.1 Overall Configuration Redundant system](#)

### Integrated engineering of loop control (process control) and sequential control (electrical control) by GX Works3

- Loop control programs with high readability can be easily created by combining function blocks (process control FBs) using the FBD/LD language.
- Relay circuit-based sequential control (electrical control) programs can be easily created using the ladder language.

**Reference:** [MELSEC iQ-R Programming Manual \(Process Control Function Blocks/Instruction\) 1 PROCESS CONTROL FUNCTION BLOCKS AND PROCESS CONTROL INSTRUCTIONS](#)

### Maintenance functions for resolving malfunctions

- When an analog module or I/O module malfunctions, it can be replaced online without stopping the process CPU.
- The backup/restoration functions allow the system to be restored without the need for the engineering tool when a CPU that has malfunctioned is replaced with a new one.

**Reference:** [MELSEC iQ-R Online Module Change Manual 1 OVERVIEW](#)

### Configuration of comfortable monitoring control system with GENESIS64 integration

- You can configure a highly functional monitoring control system that meets a variety of needs through integration with GENESIS64.

<https://www.mitsubishielectric.com/fa/products/software/visualisation/genesis64/index.html>

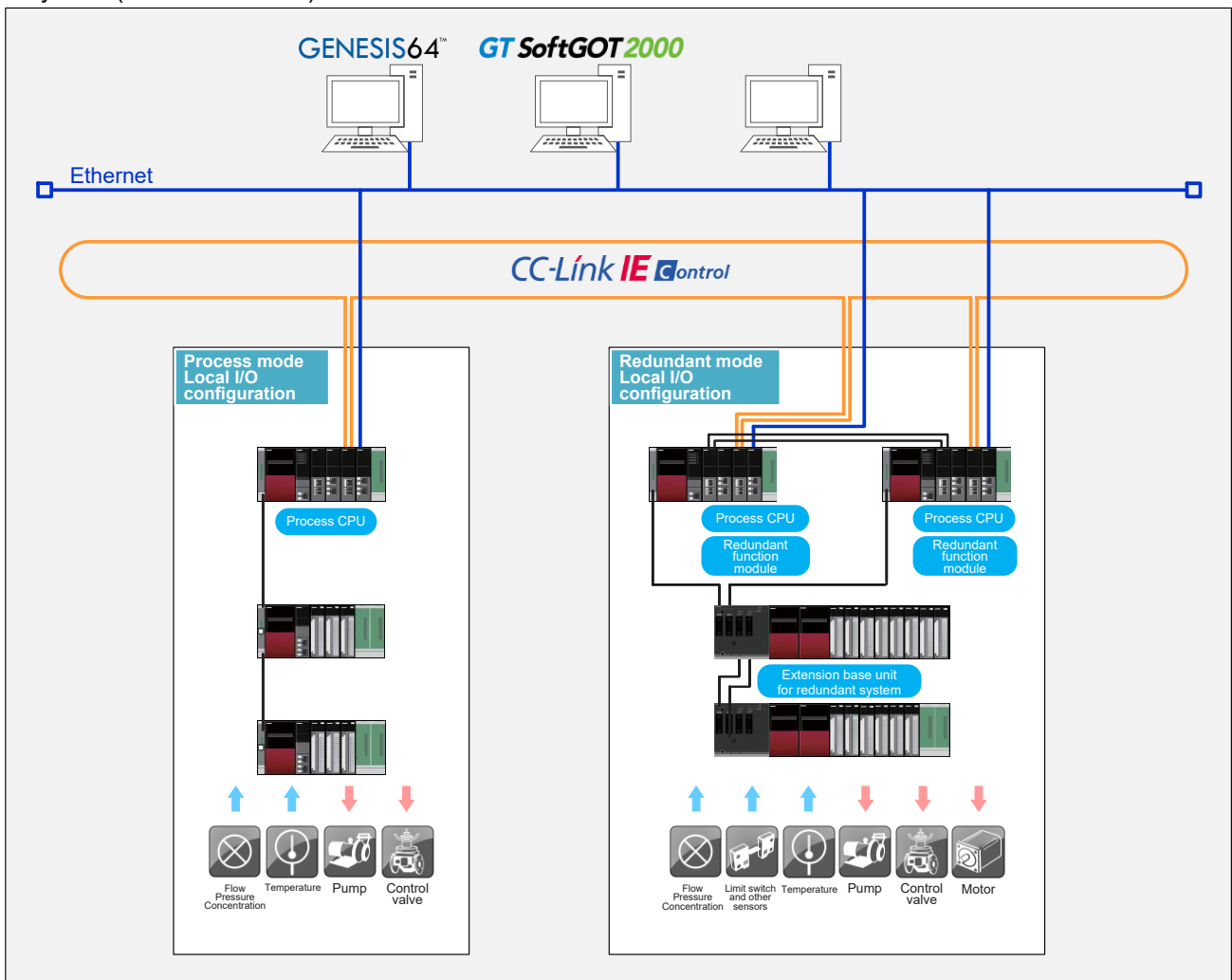
## 1.2 System Configuration

With MELSEC process control, the I/O configuration can be selected from a local I/O (extension base) configuration for close proximity placement, remote I/O configuration for remote placement, or a combination of these, depending on the scale of the target system and other requirements.

**Reference:** [MELSEC iQ-R Module Configuration Manual 1.1 Overall Configuration Redundant system](#)

### Local I/O (extension base) configuration

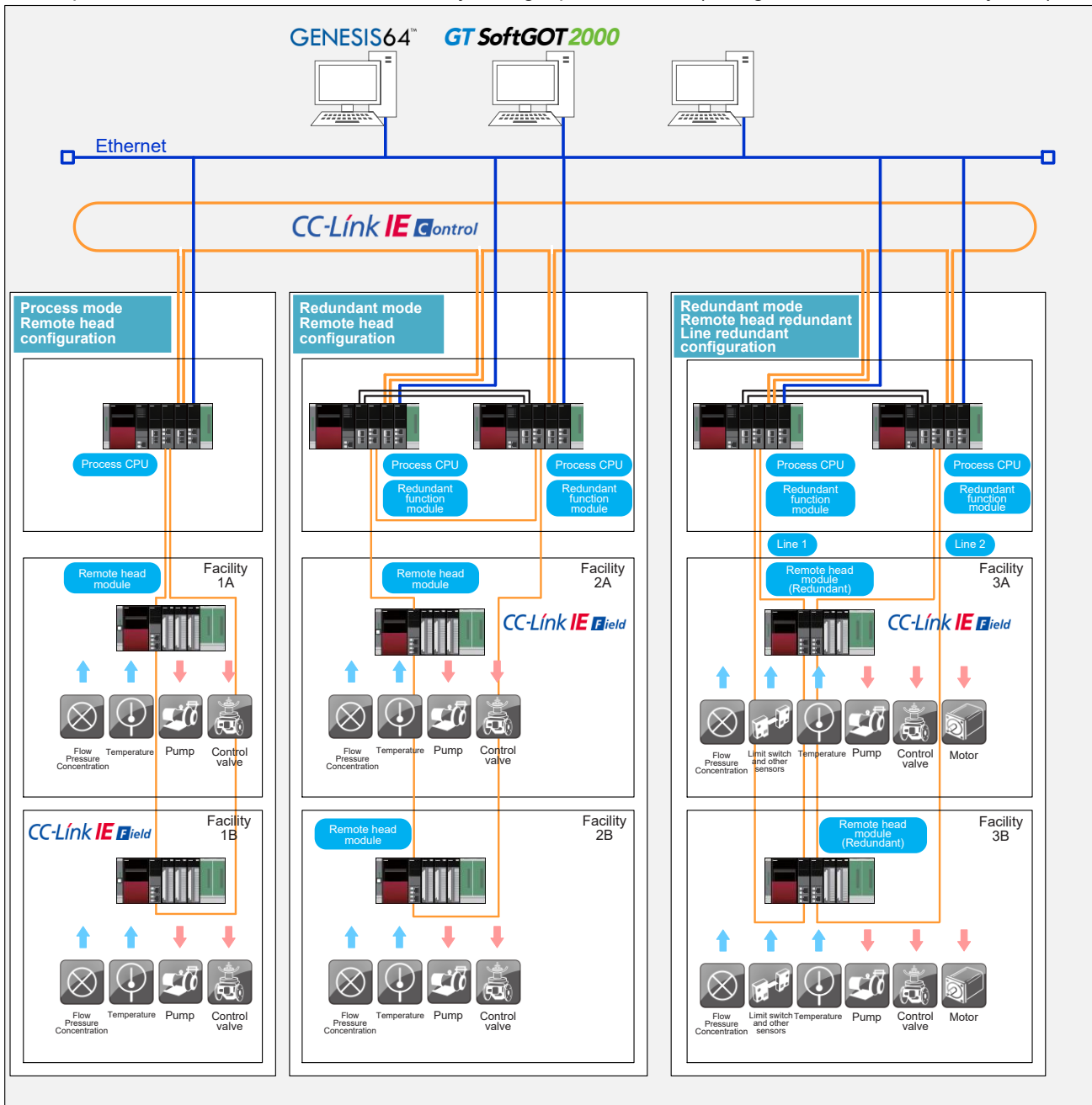
- A local I/O (extension base) configuration can be configured by mounting I/O and analog modules for the number suitable for the system scale on the extension base unit.
- In comparison with the remote I/O configuration in which I/O connections are made over networks, the I/O response is faster, which can reduce the I/O hold time when the systems are switched in a redundant system (redundant mode).



**Reference:** [MELSEC iQ-R Module Configuration Manual 1.1 Overall Configuration Redundant system Redundant system with redundant extension base unit](#)

## Remote I/O configuration (using remote head module)

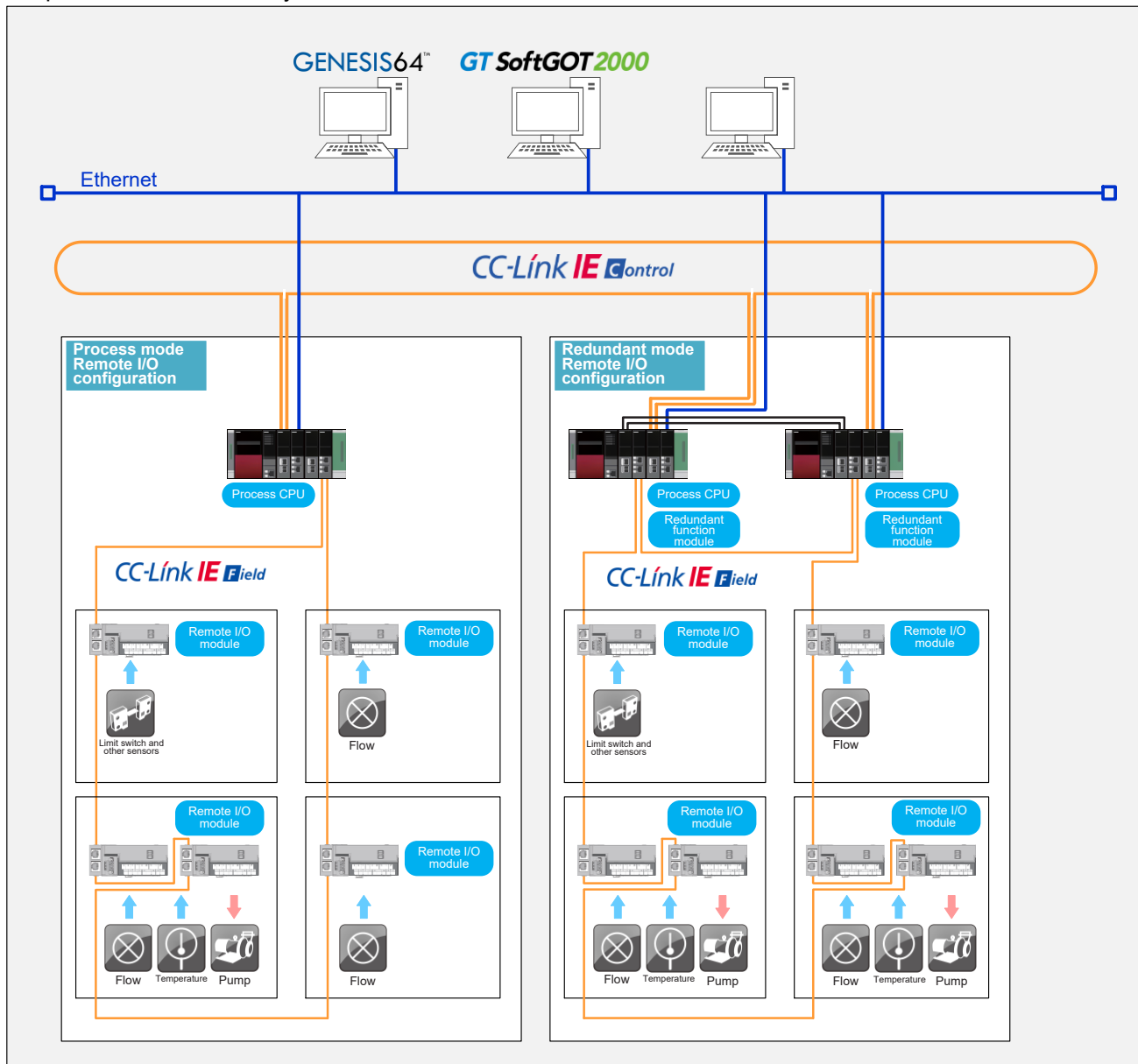
- A remote I/O configuration can be built by mounting a remote head module and I/O and analog modules for the number suitable for the system scale on the remote station and by connecting the remote head module to the CC-Link IE Field network.
- You can configure a redundant system by mounting two remote head modules on a remote station so that one module takes over when the other one malfunctions.
- Multiple remote stations can be controlled by a single process CPU (a single set in a redundant system).



Reference: [MELSEC iQ-R Module Configuration Manual 1.1 Overall Configuration Redundant system Redundant system for CC-Link IE Field Network](#)

## Remote I/O configuration (using remote I/O module)

- A remote I/O configuration can be built by applying remote I/O and analog modules compatible with CC-Link IE Field network.
- Monitoring and controlling the distributed devices are possible.
- Optimal for small-scale systems.



Reference: [MELSEC iQ-R Module Configuration Manual 1.1 Overall Configuration Redundant system Redundant system for CC-Link IE Field Network](#)

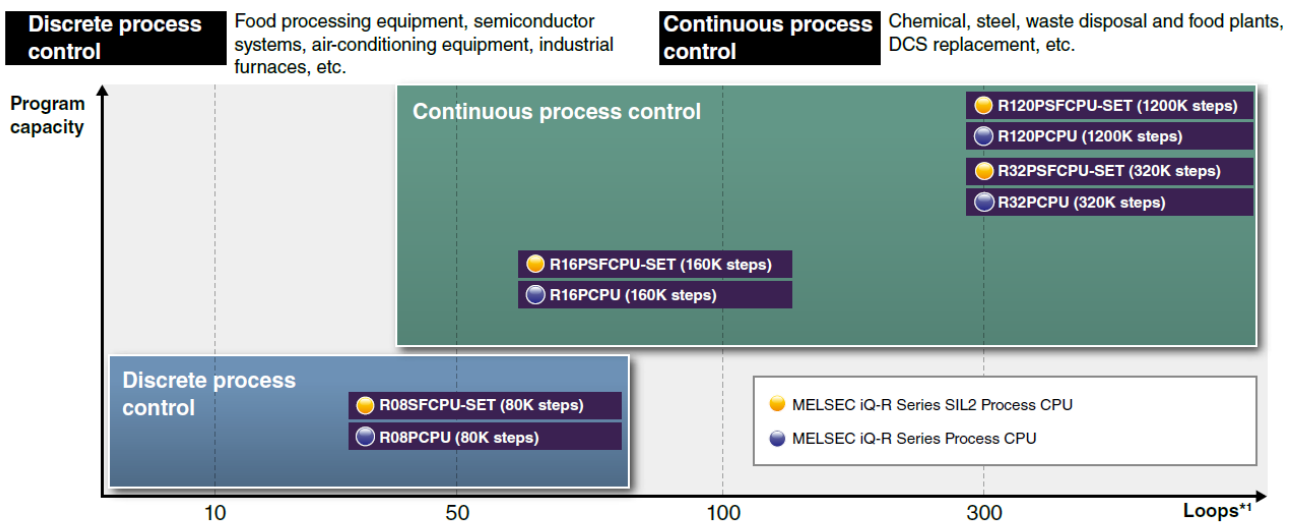
# 1.3 Lineup

This section introduces our lineup of process CPUs, network modules, and analog modules. Visit the MITSUBISHI ELECTRIC Factory Automation website for information on our lineup of latest products and other products.

## Process CPUs and redundant function modules

The process CPU is a CPU module that can achieve process control and high-speed electrical control with only one CPU. Depending on the scale of control (number of control loops), we offer four models that support programs ranging from 80 K steps to 1200 K steps, covering a wide range of applications from equipment process control to plant process control.

A redundant system can be configured by combining a process CPUs with redundant function module and can be applied to a system that requires high reliability.



\*1. The maximum amount of usable loops may change depending on the actual program size used. Please refer to the relevant manuals for further details.

Reference: [MELSEC iQ-R Module Configuration Manual 1.1 Overall Configuration Redundant system Redundant configuration of basic systems](#)

Reference: [MELSEC iQ-R Module Configuration Manual 1.2 Lists of Configuration Devices MELSEC iQ-R series](#)

Reference: [MELSEC iQ-R CPU Module User's Manual \(Startup\) 2 SPECIFICATIONS 2.1 CPU Module Process CPU](#)

Reference: [MELSEC iQ-R CPU Module User's Manual \(Startup\) 2 SPECIFICATIONS 2.4 Redundant Function Module](#)

# Network modules

We offer a lineup of network modules that meet the requirements of many different system applications. In a redundant system, a highly reliable network can be configured by reducing single points of failure with redundant connections using the CC-Link IE Field network and remote head redundancy.

## Network/advanced information modules and compatible process CPUs/remote head modules

**M** ...Main base **E** ... Extension base

Product name	Model	Process CPU			SIL2 process CPU	CC-Link IE Field Network remote head module	
		Process mode	Redundant mode			General	Redundant
		<b>M</b> <b>E</b>	<b>M</b>	<b>E</b>	<b>M</b>		
<b>Network module</b>							
CC-Link IE Controller Network	RJ71GP21-SX, RJ71GP21S-SX	●	●	-	●	-	-
	RJ71EN71	-	-	-	-	-	-
CC-Link IE Field Network	RJ71GF11-T2	●	●	-	●	-	-
	RJ71EN71	●	-	-	-	-	-
CC-Link	RJ61BT11	●	●	●	●	●	●
AnyWireASLINK	RJ51AW12AL	●	-	-	-	●	-
MELSECNET/H	RJ71LP21-25	●	●	-	-	-	-
	RJ71BR11	-	-	-	-	-	-
Ethernet	RJ71EN71	●	●	●	●	●	●
MODBUS®/TCP	Master station	●	●	●*1	●	●*1	●*1
	Slave station	●	●	●	●	●	●
MODBUS® RTU	Master station	●*2	●*2	●*2	-	●*2	●*2
	Slave station	●	●	●	-	●	-
PROFIBUS®-DP	Master station	●	●	-	●	●	●
	Slave station	●	-	●	-	●	●
CANopen®	RJ71CN91	●	-	-	-	-	-
EtherNet/IP™	RJ71EIP91	●	-	-	-	-	-
DeviceNet®	RJ71DN91	●	-	●	-	-	-
FL-net	ER-1FL2-T*3	●	-	●	-	●	●
BACnet®	RJ71BAC96	●	-	●	-	●	-
GP-IB interface	RJ71GB91	●	-	-	-	-	-
Serial communication	RJ71C24, RJ71C24-R2, RJ71C24-R4	●	●	●	-	●	●
<b>Advanced information module</b>							
MES interface	RD81MES96N	●	-	-	-	-	-
OPC UA server	RD81OPC96	●	●	-	-	-	-
High-speed data logger	RD81DL96	●	-	●	-	-	-
High-speed data communication	RD81DC96	●	-	-	-	-	-
C intelligent function	RD55UP06-V	●	●	-	-	-	-
	RD55UP12-V	●	●	-	-	-	-

\*1. Supported with the simple CPU communication function.  
 \*2. Supported with predefined protocol support function.  
 \*3. Mitsubishi Electric Engineering product

**Reference:** [MELSEC iQ-R Module Configuration Manual 1.2 Lists of Configuration Devices MELSEC iQ-R series Intelligent function module](#)

### Redundant system support function

**Reference:** [MELSEC iQ-R CC-Link IE Controller Network User's Manual \(Application\) 1.7 Redundant System Function](#)

**Reference:** [MELSEC iQ-R CC-Link IE Field Network User's Manual \(Application\) 1.6 Redundant System Function](#)

**Reference:** [MELSEC iQ-R CC-Link System Master/Local Module User's Manual \(Application\) APPENDICES 8 How to Use Standby Master Function in Redundant System](#)

**Reference:** [MELSEC iQ-R MELSECNET/H Network Module User's Manual \(Application\) 1.5 Redundant System Function\(RJ71LP21-25 Only\)](#)

**Reference:** [MELSEC iQ-R Ethernet User's Manual \(Application\) 1.18 Redundant System Function](#)

**Reference:** [MELSEC iQ-R Serial Communication Module User's Manual \(Application\) APPENDIX 8 Using MODBUS in a Redundant System](#)

**Reference:** [MELSEC iQ-R Profibus-DP Module User's Manual \(Application\) 1.13 Redundant System Function](#)

**Reference:** [MELSEC iQ-R DeviceNet Master/Slave Module User's Manual \(Application\) APPENDICES 6 Using the Module in the Redundant System with Redundant Extension Base Unit](#)

FL-net (OPCN-2) Interface module Model ER-1FL2-T User's Manual (Detailed Edition)

[https://www.mitsubishielectricengineering.com/sales/fa/meefan/product\\_information/products/er-1fl2-t.html](https://www.mitsubishielectricengineering.com/sales/fa/meefan/product_information/products/er-1fl2-t.html)

Reference: [MELSEC iQ-R OPC UA Server Module User's Manual \(Application\) APPENDIX 11 Use in a Redundant System](#)

Reference: [MELSEC iQ-R High Speed Data Logger Module User's Manual \(Application\) APPENDIX 16 When Using a Redundant System](#)

Reference: [MELSEC iQ-R C Intelligent Function Module User's Manual \(Application\) APPENDIX 6 Use in a Redundant System](#)

## Analog modules






We offer a lineup of analog modules that meet the requirements of many different system applications.

### (1) For local I/O (extension base) configuration and remote I/O configuration (using remote head module)

We offer multi-channel modules, channel isolated modules, and modules compatible with HART communication.

Reference: [MELSEC iQ-R Module Configuration Manual 1.2 Lists of Configuration Devices MELSEC iQ-R series Intelligent function module](#)

#### Analog input

	Number of channels	Current/voltage input		Current input			Voltage input	Temperature input	
			High-speed		HART communication-compatible	Distributor		Thermocouple	Resistance thermometer
Channel isolated	16	R60AD16-G							
	8	R60AD8-G						R60TD8-G	R60RD8-G
	6					R60AD6-DG			
Channel non-isolated	8			R60AD18	R60AD18-HA		R60ADV8		
	4	R60AD4		R60ADH4					

Reference: [MELSEC iQ-R Channel Isolated Analog-Digital Converter Module User's Manual \(Startup\)](#)

Reference: [MELSEC iQ-R Channel Isolated Analog-Digital Converter Module User's Manual \(Application\)](#)

Reference: [MELSEC iQ-R Channel Isolated Analog-Digital Converter Module \(With Signal Conditioning Function\) User's Manual \(Startup\)](#)

Reference: [MELSEC iQ-R Channel Isolated Analog-Digital Converter Module \(With Signal Conditioning Function\) User's Manual \(Application\)](#)

Reference: [MELSEC iQ-R Channel Isolated Thermocouple Input Module/Channel Isolated RTD Input Module User's Manual \(Startup\)](#)

Reference: [MELSEC iQ-R Channel Isolated Thermocouple Input Module/Channel Isolated RTD Input Module User's Manual \(Application\)](#)








Reference: [MELSEC iQ-R Analog-Digital Converter Module User's Manual \(Startup\)](#)

Reference: [MELSEC iQ-R Analog-Digital Converter Module User's Manual \(Application\)](#)

Reference: [MELSEC iQ-R HART-Enabled Analog-Digital Converter Module User's Manual \(Startup\)](#)

Reference: [MELSEC iQ-R HART-Enabled Analog-Digital Converter Module User's Manual \(Application\)](#)

## Analog output and pulse input

	Number of channels	Current/voltage output		Current output	Voltage output	Pulse input
			High-speed			
Channel isolated	16	R60DA16-G				
	8	R60DA8-G				RD60P8-G 
Channel non-isolated	8			R60DAI8 	R60DAV8 	
	4	R60DA4		R60DAH4 		

**Reference:** [MELSEC iQ-R Channel Isolated Digital-Analog Converter Module User's Manual \(Startup\)](#)

**Reference:** [MELSEC iQ-R Channel Isolated Digital-Analog Converter Module User's Manual \(Application\)](#)

**Reference:** [\(Startup\) MELSEC iQ-R Channel Isolated Pulse Input Module User's Manual](#)

**Reference:** [\(Application\) MELSEC iQ-R Channel Isolated Pulse Input Module User's Manual](#)




**Reference:** [\(Startup\) MELSEC iQ-R Digital-Analog Converter Module User's Manual](#)

**Reference:** [\(Application\) MELSEC iQ-R Digital-Analog Converter Module User's Manual](#)

## (2) For remote I/O configuration (using remote I/O module)

Only channel non-isolated modules are available.




## Analog input

	Number of channels	Current/voltage input	Current input	Voltage input
Channel non-isolated	8		NZ2GFCE-60ADI8 	NZ2GFCE-60ADV8 
	4	NZ2GF2B-60AD4 		

**Reference:** [CC-Link IE Field Network Analog-Digital Converter Module User's Manual](#)

**Reference:** [CC-Link IE Field Network Analog-Digital Converter Module \(e-CON Type\) User's Manual](#)

## Analog output

	Number of channels	Current/voltage output	Current output	Voltage output
Channel non-isolated	8		NZ2GFCE-60DAI8 	NZ2GFCE-60DAV8 
	4	NZ2GF2B-60DA4 		

**Reference:** [CC-Link IE Field Network Digital-Analog Converter Module User's Manual](#)

**Reference:** [CC-Link IE Field Network Digital-Analog Converter Module \(e-CON Type\) User's Manual](#)

# 2 SYSTEM SELECTION AND CONFIGURATION

## 2.1 System Selection

Use FA Integrated Selection Tool to select a system.

MELSEC iQ-R programmable controllers, remote I/O modules, FREQROL inverters, GOTs, etc. can be selected.

### FA Integrated Selection Tool



<https://www.mitsubishielectric.com/fa/products/select/index.html>

Use the selection tool for time and wire saving devices for programmable controllers to select wiring devices. Time and wire saving devices provided by Mitsubishi Electric Engineering can be selected.

[https://www.mitsubishielectricengineering.com/sales/fa/meefan/wire\\_saving\\_devices/selection\\_tool/](https://www.mitsubishielectricengineering.com/sales/fa/meefan/wire_saving_devices/selection_tool/)

## 2.2 System Configuration

### Example of actual system configuration

Refer to the following training manual for the FATEC training school.

Training School (FA) Service & Support | Mitsubishi Electric FA

[https://www.mitsubishielectric.com/fa/download/search.page?mode=schooltext&kisyu=/school\\_text&q=SH-082368ENG](https://www.mitsubishielectric.com/fa/download/search.page?mode=schooltext&kisyu=/school_text&q=SH-082368ENG)

• Mitsubishi Programmable Controllers Training Manual Redundant System Basic Course (SH-082369ENG) (4 NETWORK CONFIGURATION FOR REDUNDANT SYSTEMS)

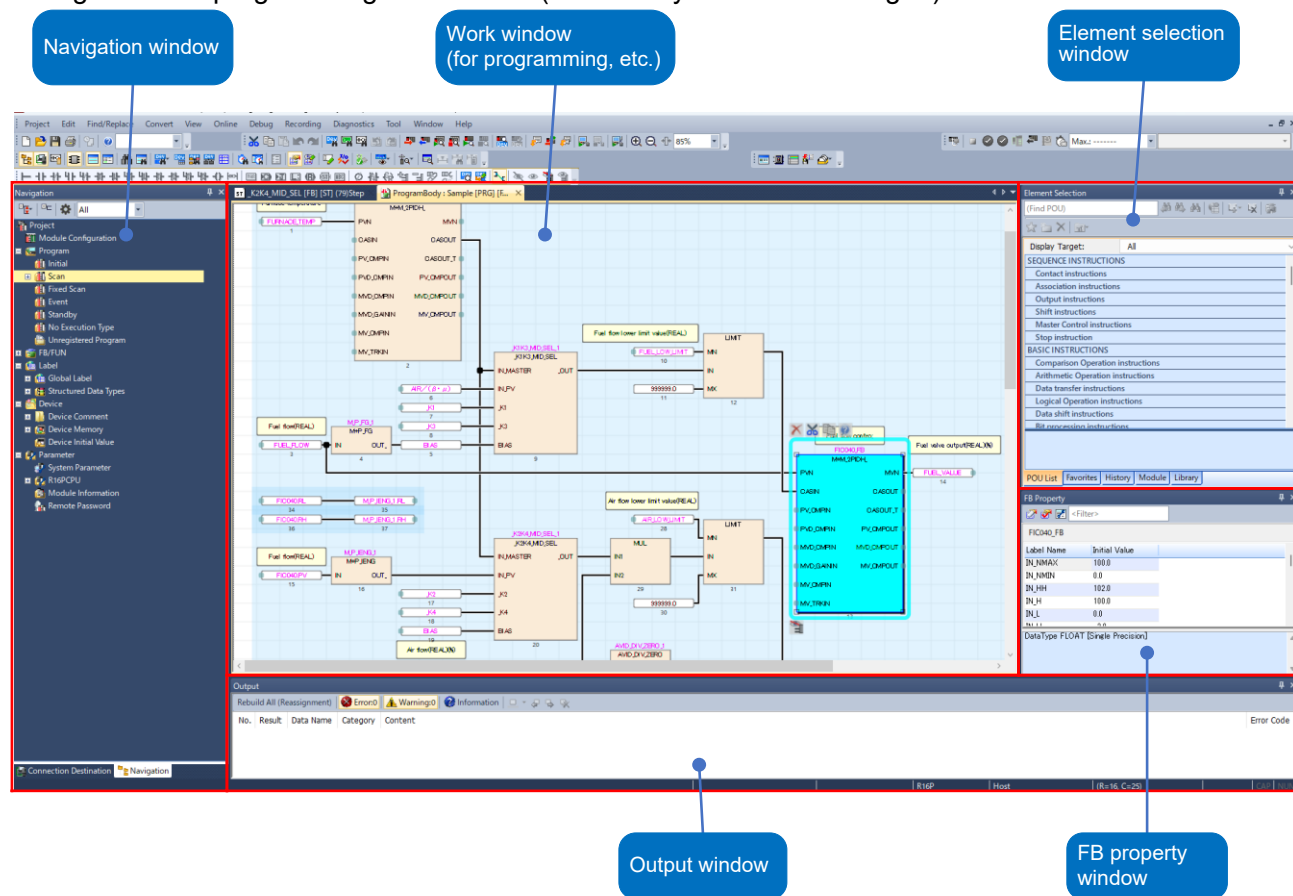
# 3 PROGRAMMING AND OPERATION CHECK ON HMI

## 3.1 Programming with the Process Control Function of GX Works3

Refer to the following manual for information on procedures from creating a project using the process control function of GX Works3 to operation check.

**Reference:** [MELSEC iQ-R Programming Manual \(Process Control Function Blocks/Instructions\) 1 OVERVIEW 3 PROCEDURE BEFORE USING PROCESS CONTROL FUNCTION BLOCK](#)

Configuration of programming tool window (window layout can be changed)



### A. Actual program example

Refer to the following training manual for the FATEC training school.

Search for Manuals Others Training Manual | Mitsubishi Electric FA

[https://www.mitsubishielectric.com/fa/download/search.page?mode=schooltext&kisyu=/school\\_text&q=SH-082349ENG](https://www.mitsubishielectric.com/fa/download/search.page?mode=schooltext&kisyu=/school_text&q=SH-082349ENG)

• MELSEC iQ-R Process Control Basic Course (SH-082349ENG) (5 CREATING A PROCESS CONTROL PROGRAM USING GX Works3)

### B. Sample programs and glossaries

**Reference:** [MELSEC PROCESS CONTROL Technical Guide/Sample Programs and Glossaries](#)

## C. FAQ

The following lists frequently asked questions and answers about projects using the process control function.

### C-1. Precautions for converting programs

<b>Q1</b>	<b>Which conversion operations can be used for converting a program for the process control function of GX Works3?</b>
A1	To convert a program for the process control function of GX Works3, use either [Rebuild all (reassignment)] or [Online program change]. Refer to the following manuals for information on changing conversion settings. <b>Reference:</b> <a href="#">2018-05 Differences of PX Developer and GX Works3 process control functions (FA-A-0236) 2.5 Converting Programs</a> <b>Reference:</b> <a href="#">GX Works3 Operating Manual 6.11 Converting Programs Converting a program file with the process control extension enabled</a>
<b>Q2</b>	<b>What are the conditions that requires converting (reassigning) all programs when converting a program?</b>
A2	Refer to the following manual for information on the conditions that requires converting (reassigning) all programs. <b>Reference:</b> <a href="#">GX Works3 Operating Manual 6.11 Converting Programs Operations that requires a conversion for all programs</a>

### C-2 Precautions for writing data to programmable controllers and starting simulations

<b>Q1</b>	<b>How can I write the process control project using GX Works3?</b>
A1	File registers are used for the process control function of GX Works3. Do not write all project files at once. Write only the CPU parameters first, and then reset or turn off and on the CPU. Then, perform the normal writing process. <b>Reference:</b> <a href="#">GX Works3 Operating Manual 13.1 Writing/Reading Programmable Controller Data File register</a>
<b>Q2</b>	<b>The faceplate display turns completely black and displays "FUNC Mismatch" during data writing to programmable controllers or when starting simulations. How can I resolve this issue?</b>
A2	Perform the correct writing procedure as described in the answer to Q1. If data is written using any other procedure, the faceplate display turns completely black and displays "FUNC Mismatch". "FUNC Mismatch" is displayed only in GX Works3 Ver. 1.120A or later. We recommend setting the following option to "No" when using the process control function of GX Works3. This can reduce errors in program writing at the time of starting simulations. [Tool] → [Options] → [Simulation] → [Automatically write programs and parameters when starting simulation]

### C-3 Tag FB parameters

<b>Q1</b>	<b>Changes to FB default value settings are not applied to programmable controllers.</b>
A1	During online operation, change the FB current values in the watch window. To write data to a programmable controller with the FB default value settings changed, convert (reassign) all programs when converting a program. Refer to the following manual for details on the precautions for applying changes. <b>Reference:</b> <a href="#">MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions) 3.6 Converting and Writing</a>
<b>Q2</b>	<b>Layout of tag FB parameters is different between PX Developer and GX Works3.</b>
A2	In PX Developer, both public variables and tag data in tag FBs are displayed as ".*". In GX Works3, though, public variables and tag data are displayed in different formats. "tag name_FB.*" is the format used for public variables (operation constants), and "tag name.*" is the format used for tag data. Refer to the following manuals for detailed information on public variables (operation constants) and tag data. <b>Reference:</b> <a href="#">MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions) 5 TAG FB</a> <b>Reference:</b> <a href="#">MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions) APPENDICES 1 Tag Data List</a> <b>Reference:</b> <a href="#">MELSEC iQ-R Programming Manual (Process Control Function Blocks/Instructions) 3.4 Editing an FBD/LD Program for Process Control Specifying tag data and public variables</a>
<b>Q3</b>	<b>When performing a device check for global label assignment in GX Works3, a device overlap occurs in the global label "M+PTAG". Provide more details.</b>
A3	In the process control function of GX Works3, the user-defined tag FBs use the system resource areas R2700 to R2829 (130 words) for internal processing. Since these areas are shared among multiple user-defined tag FBs, a device overlap may occur; however, user-defined tag FBs do not use these areas simultaneously, so they operate normally. If a device overlap occurs with a global label other than "M+PTAG", change the assigned device of the global label.

## 3.2 GOT Screen Generator

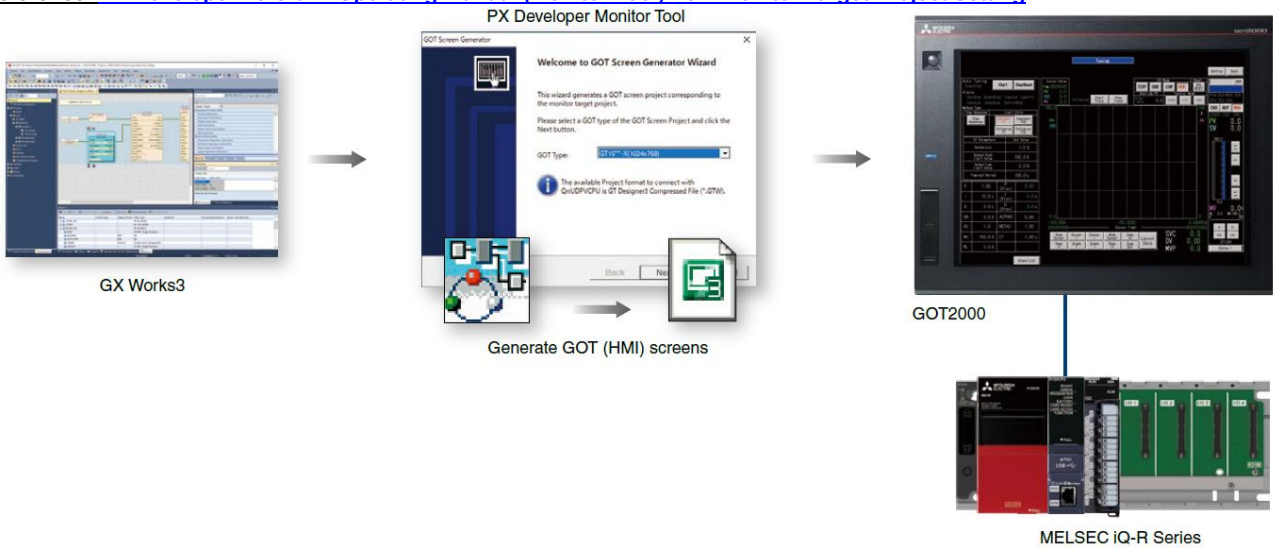
GOT2000 screens, such as faceplates and tuning screens, can be automatically generated from the projects created with the process control function of GX Works3 (projects with process control tag FBs). Settings for devices assigned to tag data do not need to be configured and programs do not need to be created for the automatically generated screens. Monitoring can be performed just by connecting the CPU to the GOT2000.

Note that only the CPU connected to the host station can be monitored. Multiple CPUs connected to other stations cannot be monitored.

**Reference:** [GX Works3 Operating Manual 14.13 Checking Tag Data PX Developer Monitor Tool interaction](#)

**Reference:** [PX Developer Version1 Operating Manual \(GOT Screen Generator\) 4 GENERATION PROCEDURES OF SCREEN PROJECT](#)

**Reference:** [PX Developer Version1 Operating Manual \(Monitor Tool\) 9.4 Monitor Target Project Setting](#)



### A. Actual screen examples

Refer to the following training manual for the FATEC training school.

Training School (FA) Service & Support | Mitsubishi Electric FA

[https://www.mitsubishielectric.com/fa/download/search.page?mode=schooltext&kisyu=/school\\_text&q=SH-082349ENG](https://www.mitsubishielectric.com/fa/download/search.page?mode=schooltext&kisyu=/school_text&q=SH-082349ENG)

• MELSEC iQ-R Process Control Basic Course (SH-082349ENG) (6.3 Monitoring via GOT Auto generation of GOT screen)

### B. FAQ

The following lists frequently asked questions and answers about the GOT screen generator.

#### B-1 GOT screen generation

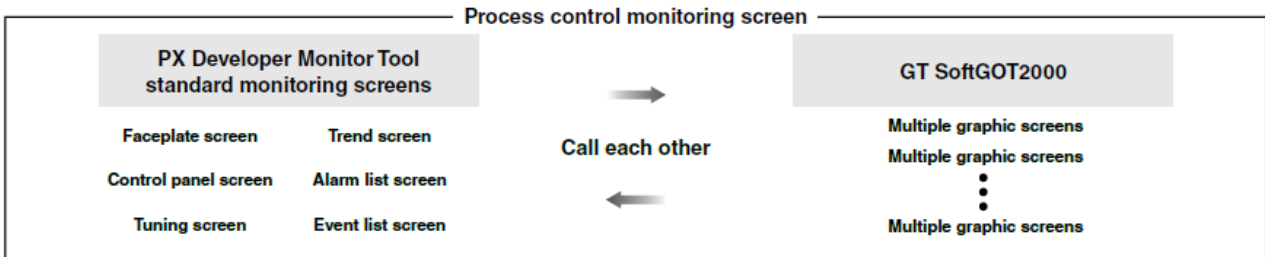
Q	Changes in a project using the process control function of GX Works3 are not applied to the GOT screens.
A	Reload the latest version of the GX Works3 project (*.FADB) into PX Developer Monitor Tool, and then generate the GOT screens.

### 3.3 GT SoftGOT Integration Function

The standard monitoring function of PX Developer Monitor Tool and GT SoftGOT2000 graphic screens can call each other<sup>1</sup>, which can significantly reduce the time needed to create process control monitoring screens for personal computers.

If GOT2000 monitoring screens have already been created for onsite monitoring, the screens can be reused.

Reference: [GT SoftGOT2000 Version1 Operating Manual](#) 4.15 Interaction with PX Developer

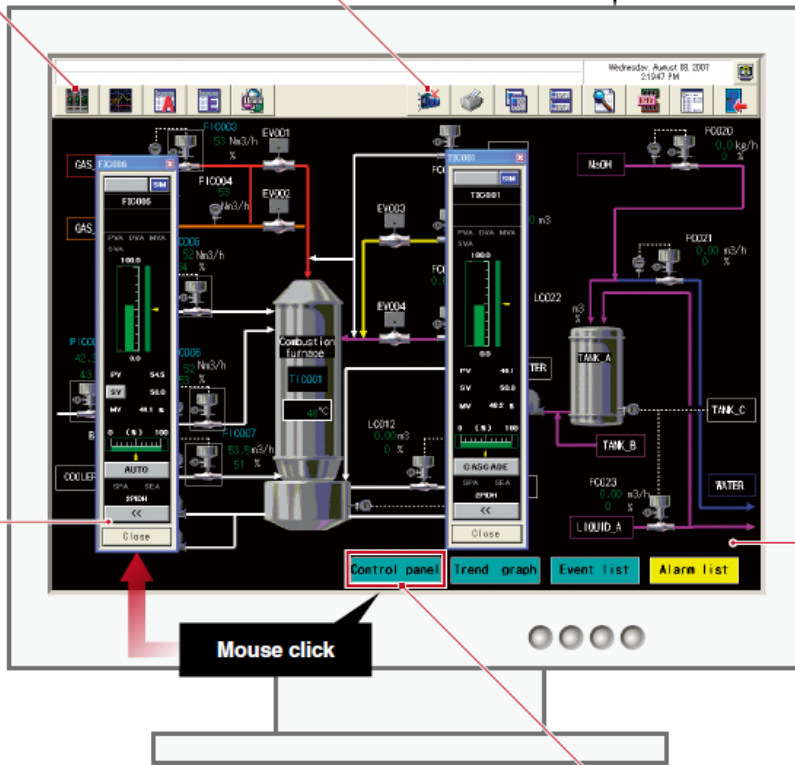


#### PX Developer monitor toolbar

Click buttons to switch between GT SoftGOT2000 base screen and other screens

#### PX Developer faceplate

Monitor, operate or tune loop control tags (position can be changed)



#### GT SoftGOT2000 base screen

Turn your desktop into a graphic monitoring window with the full-screen and back-screen mode

#### GT SoftGOT2000 touch switch object

Click to display various PX Developer Monitor Tool screens (position can be changed)

<sup>1</sup> PX Developer Ver. 1.40S or later is required for this function.

## 3.4 GENESIS64 Process Control Integration Function

Integration with GENESIS64 allows you to configure advanced monitoring and control systems. GENESIS64 has basic functions such as graphic monitoring, trend display, alarm and event management, and report generation, as well as functions such as high-speed data collection, energy management, scheduling, and wide-area monitoring, contributing to the overall monitoring of the factory and enhancing customers' productivity and quality.



**Multi-monitor display**



**Multi-view display**

### Support for Designing Process Control Screens with Asset Builder

Asset Builder is a function that supports you in configuring monitoring systems using AssetWorX functions with GraphWorX64 template screens. Key features include:

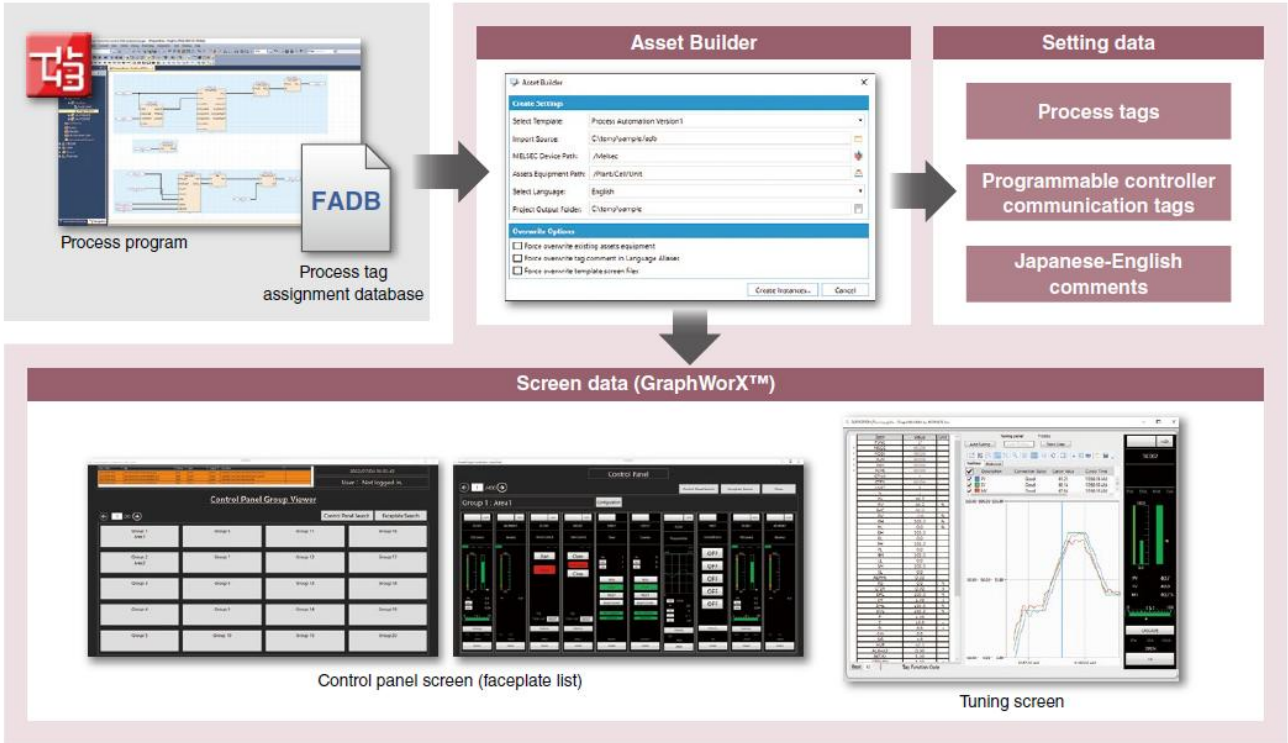
- Availability of template screens for various purposes such as process automation
- Automatic generation of elements in plants and factories as AssetWorX devices
- Automatic generation of communication tag settings
- Automation assignment of communication tag settings to AssetWorX devices

Process control programs created in the engineering software GX Works3 can be loaded into GENESIS64 to create monitoring screens for process control systems. Because the process control tag information is automatically assigned to faceplates and tuning screens, configuring the settings again in GENESIS64 is not required.

Refer to the following websites for detailed information on configuration procedures.

<https://documentation.iconics.com/v10.97.3/Content/Apps/WBDT/AssetBuilder/Quick Start/Process Automation Template Version/Create Instances.htm>

<https://documentation.iconics.com/v10.97.3/Content/Apps/WBDT/AssetBuilder/Quick Start/Process Automation Template Version/Operate screens.htm>



# 4 REPLACING MELSEC-Q SERIES WITH MELSEC iQ-R SERIES

## 4.1 System Replacement

Refer to the following documents when replacing systems.

Reference: [2023-09 MELSEC-Q Series to MELSEC iQ-R Series Migration Guide](#)

Reference: [2024-08 MELSECNET/H Transition Handbook \(MELSEC-Q Series\)](#)

The migration tool from the MELSEC-Q Series to the MELSEC iQ-R Series can be used to select the modules after replacement.

**Migration tool from the MELSEC-Q Series to the MELSEC iQ-R Series**

Select MELSEC-Q Series model.  
Recommended equivalent MELSEC iQ-R Series model can be checked.

MELSEC-Q Series model				MELSEC iQ-R Series model				
No.	Module/unit	Model	Quantity		Module/unit	Model	Quantity	Additional information
1	Select module/unit	Select model	1	➔	—	—	—	—
2	Select module/unit	Select model	1	➔	—	—	—	—
3	Select module/unit	Select model	1	➔	—	—	—	—
4	Select module/unit	Select model	1	➔	—	—	—	—
5	Select module/unit	Select model	1	➔	—	—	—	—
6	Select module/unit	Select model	1	➔	—	—	—	—
7	Select module/unit	Select model	1	➔	—	—	—	—

Clear input content    Display configuration list

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<https://www.mitsubishielectric.com/fa/ssl/products/cnt/plcq/ex/select/q2rmigration/q2rmigration.html>

## 4.2 Replacement from PX Developer Format Project

PX Developer projects and GX Works2 projects can be converted and used in GX Works3.

To open a PX Developer format project, select [Project] → [Open Other Format File] → [PX Developer Format] in GX Works3. The CPU model will be changed from a PX Developer-compatible model (Q series universal model process CPU or redundant CPU) to a GX Works3-compatible model (iQ-R series process CPU).

**Reference:** [GX Works3 Operating Manual 3.2 Creating a Project File Opening a PX Developer format project](#)

Parts that cannot be converted to GX Works3 format requires separate action after the file is read.

**Reference:** [GX Works3 Operating Manual APPENDIX 7 Replacement of Another Format Project Replacement of a PX Developer format project](#)

**Reference:** [2018-05 Differences of PX Developer and GX Works3 process control functions \(FA-A-0236\) 4 LIBRARY](#)

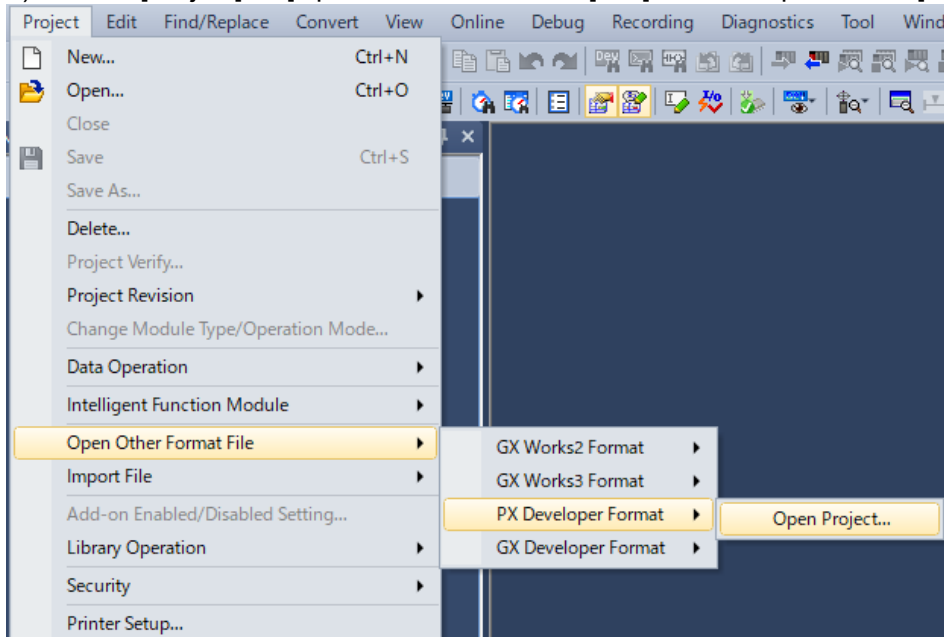
**Reference:** [2023-09 MELSEC-Q Series to MELSEC iQ-R Series Migration Guide 11.1 Project Migration Procedure PX Developer projects](#)

**Reference:** [2023-09 MELSEC-Q Series to MELSEC iQ-R Series Migration Guide 11.2 Instruction Migration Migration of PX Developer instructions](#)

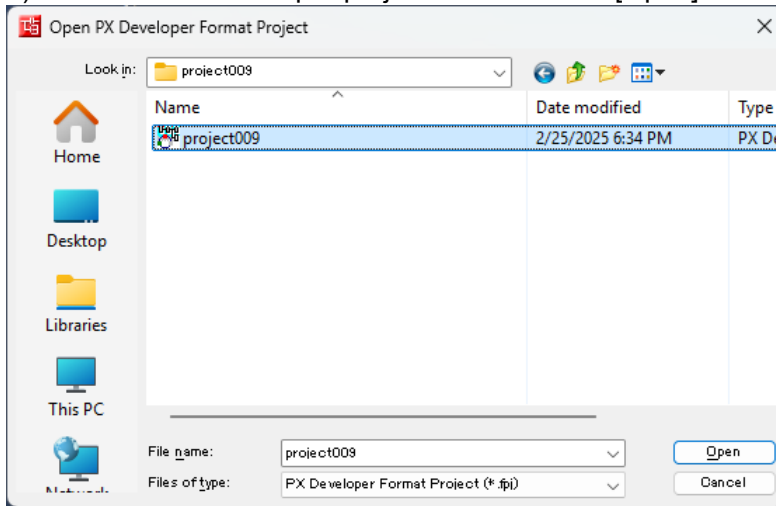
## Procedures for converting and opening PX Developer format projects

The following describes the procedures for converting and opening PX Developer format projects in GX Works3.

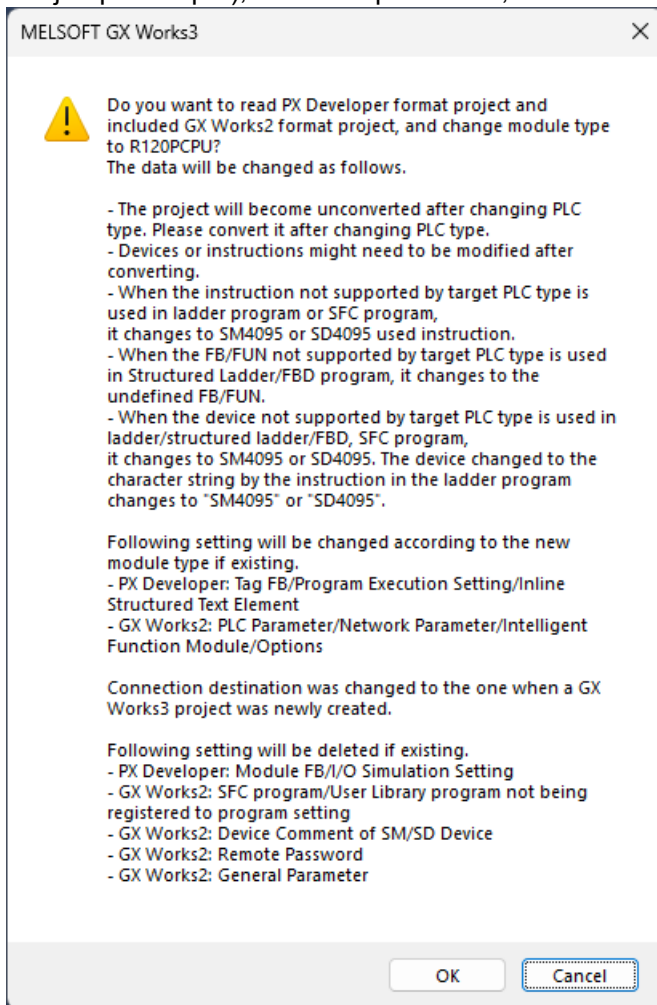
1) Select [Project] → [Open Other Format File] → [PX Developer Format] → [Open Project].



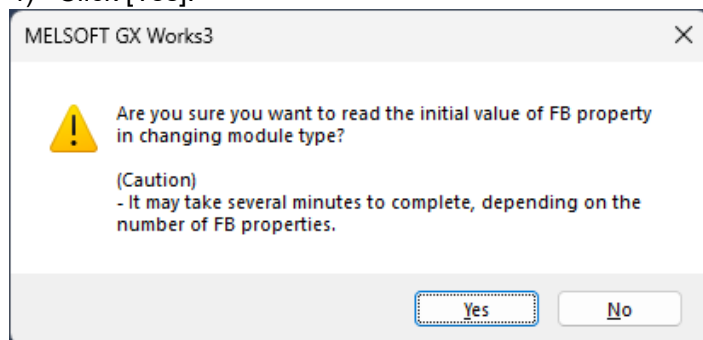
2) Select a PX Developer project and then click [Open].



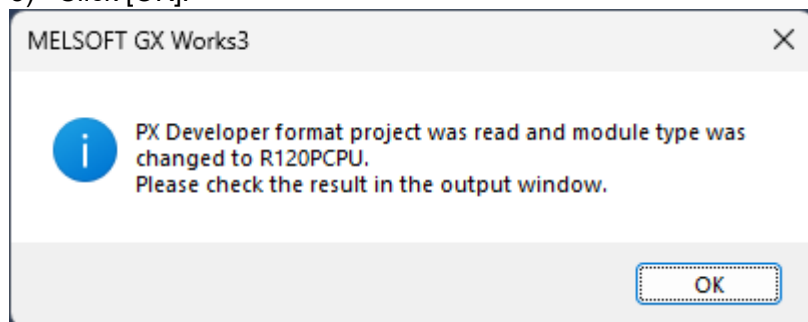
3) Click [OK]. If the message "Operation to open PX Developer format project was canceled." appears, jump to step 7), finish the procedure, and then return to step 1) and redo the entire procedure.



## 4) Click [Yes].



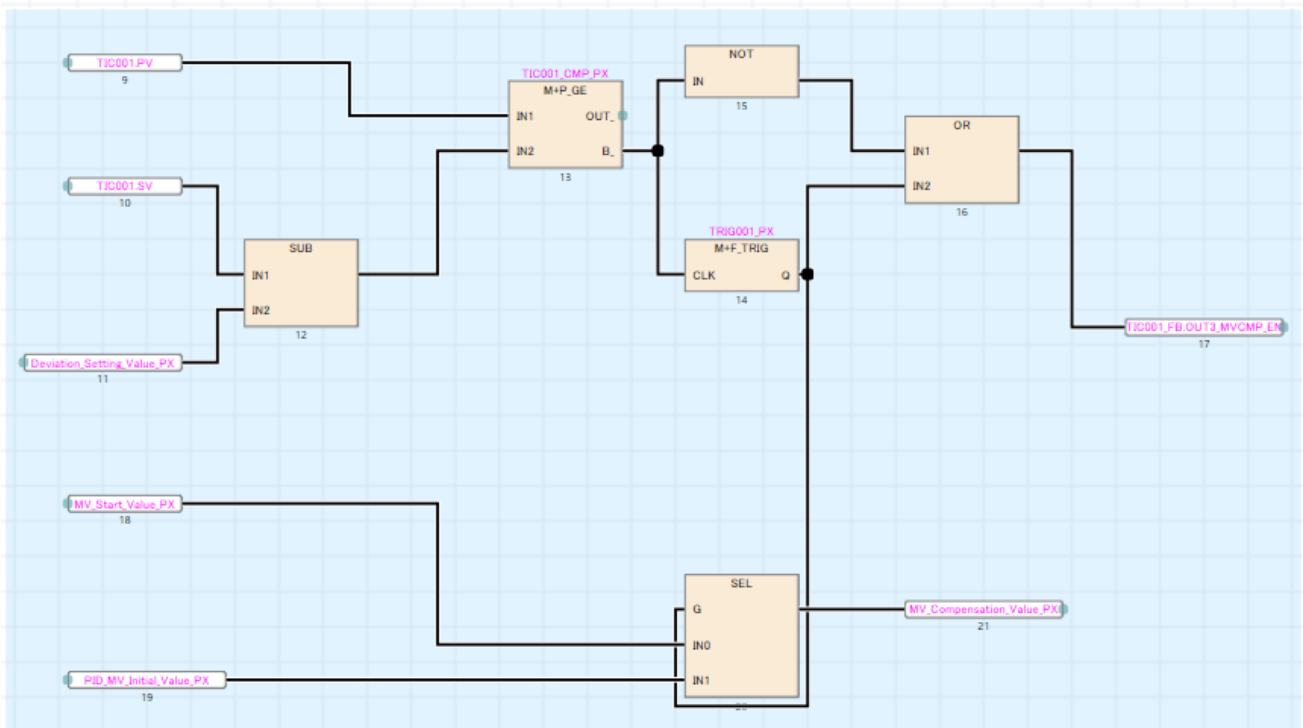
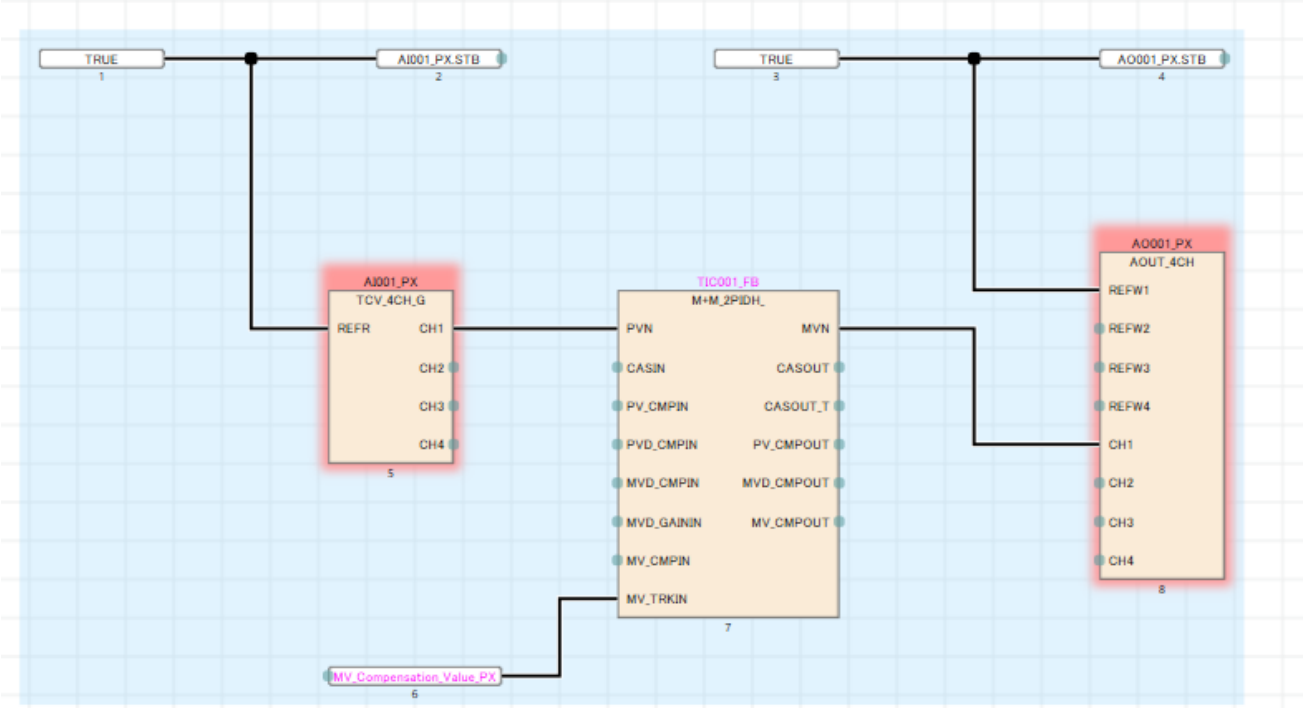
## 5) Click [OK].



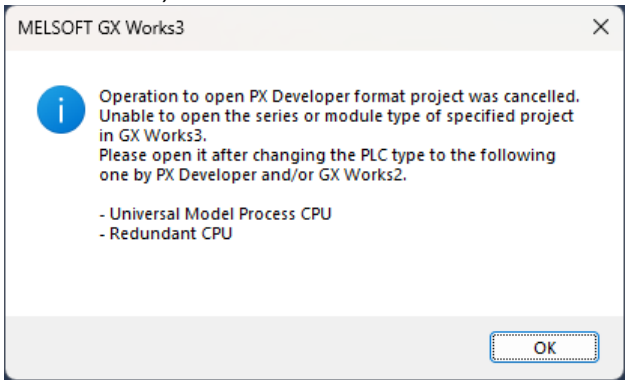
## 6) Check the change results displayed in the "Output" window. Check the parameter settings of the modules after replacement. If any modules are replaced with general intelligent modules, change the model name to the actual model used in GX Works3 and then configure the parameters.

No.	Result	Data Name	Category	Content
1	War...	-	System...	Change the model name of [I/O Assignment Setting] slot No.0 from 'Q64TDV-GH' to 'Gen. Intelligent Module (1 slot)'.
2	War...	-	System...	Change the model name of [I/O Assignment Setting] slot No.1 from 'Q64DA' to 'R60DA4(Q)'.
3	War...	R120PCPU	Module...	[External Device Configuration] Protocol of Connection No.1 was changed to [TCP].
4	War...	-	Options	Set to default other than reference/reflection target for device comment.
5	War...	-	Device ...	Delete it when R device was set.
6	War...	R120PCPU	Module...	[CC-Link IEF Basic Setting] ([PLC Parameter] -> [Built-in Ethernet Port Setting]) of GX Works2 was discarded if it has been set.
7	War...	R120PCPU	Module...	[Simple CPU Communication Setting] ([PLC Parameter] -> [Built-in Ethernet Port Setting]) of GX Works2 was discarded if it has been set.
8	War...	-	Remot...	Delete it when data existed.
9	War...	-	Project...	Delete it when data existed.
10	War...	-	Conne...	Connection destination was changed to the one when a GX Works3 project was newly created.
11	War...	-	-	The data for Module FB Declaration was deleted if it has been included.
12	War...	-	CPU Pa...	Execution order of the program might be changed. Please check the 'Program Setting' of CPU Parameter.
13	War...	-	-	Execution conditions were deleted. Please program them to FBD/LD editor.
14	War...	-	-	Execution conditions setting was deleted in FBD sheet. Please program them to FBD/LD editor.
15	War...	R120PCPU	CPU Pa...	[Device/Label Memory Area Setting] '33K word' was set to label area capacity.
16	War...	R120PCPU	CPU Pa...	[Device/Label Memory Area Setting] '33K word' was set to latch label area capacity.

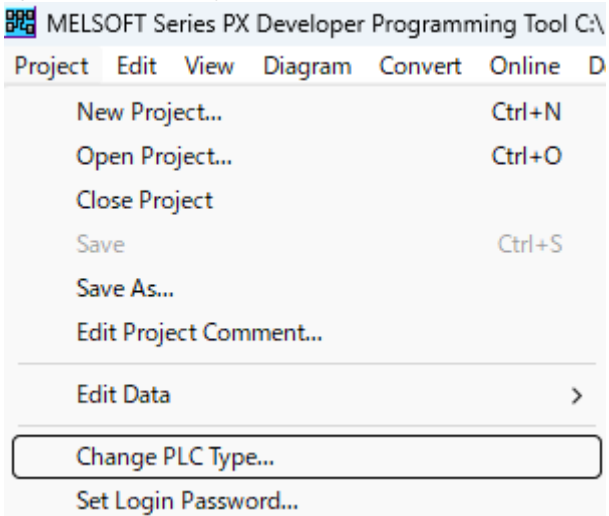
The conversion results are displayed in a worksheet. Parts that cannot be handled by GX Works3 requires separate action.



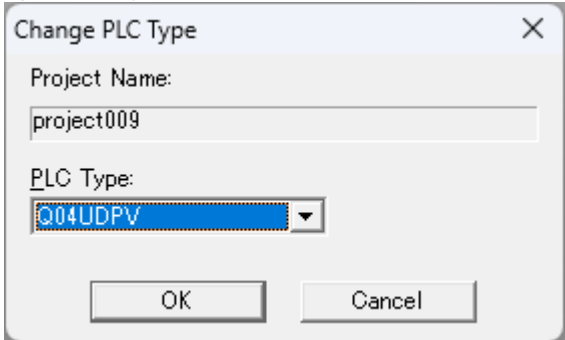
7) The following message appears when a process CPU (QnPHCPU) project is selected. In such a case, change the PLC type to a universal model process CPU in PX Developer (described in step 8) and later).



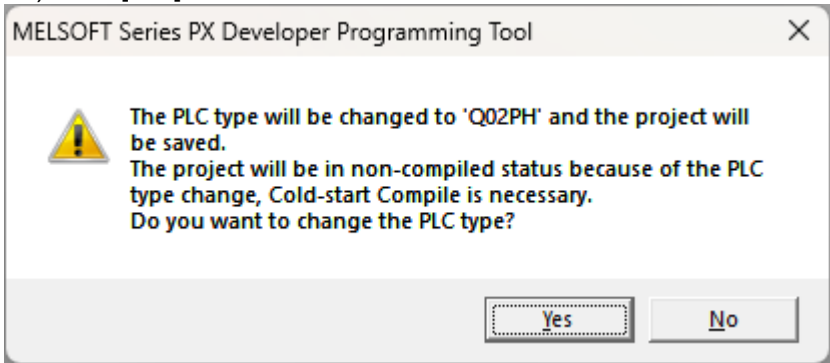
8) Open the project file to be converted in PX Developer and select [Change PLC Type].



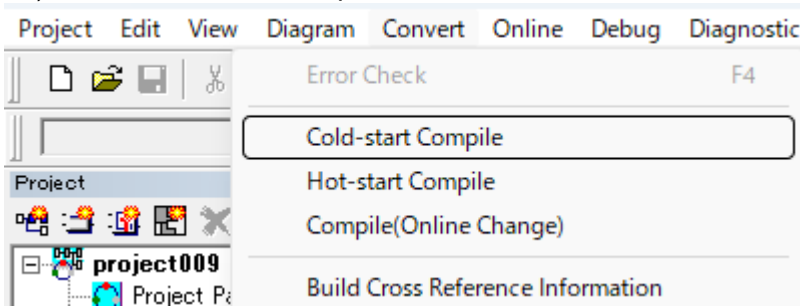
9) Specify the universal model process CPU (QnUDPVCPU) and click [OK].



10) Click [Yes].



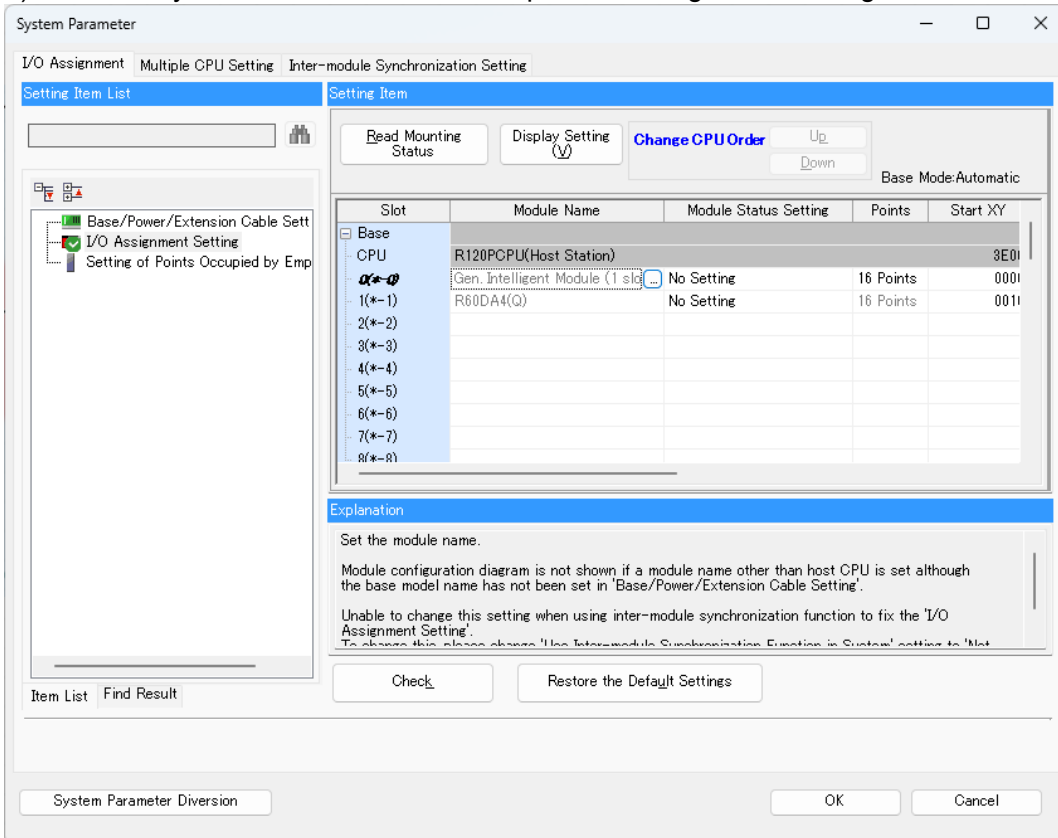
11) Execute cold-start compile.



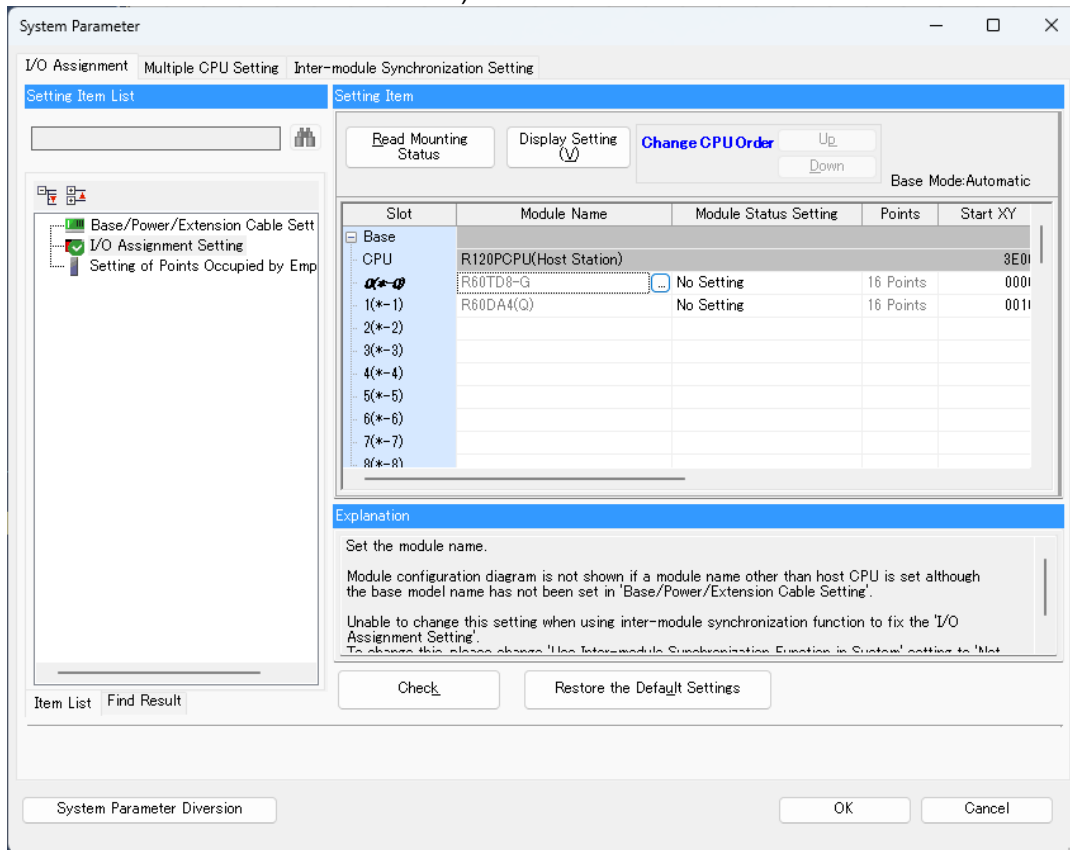
## Example of actions taken after converting and opening PX Developer format projects

The following shows the process example of changing the model name of a module replaced with a general intelligent module to a thermocouple input module (R60TD8-G) and then replacing the module FB of PX Developer with devices with configured refresh settings.

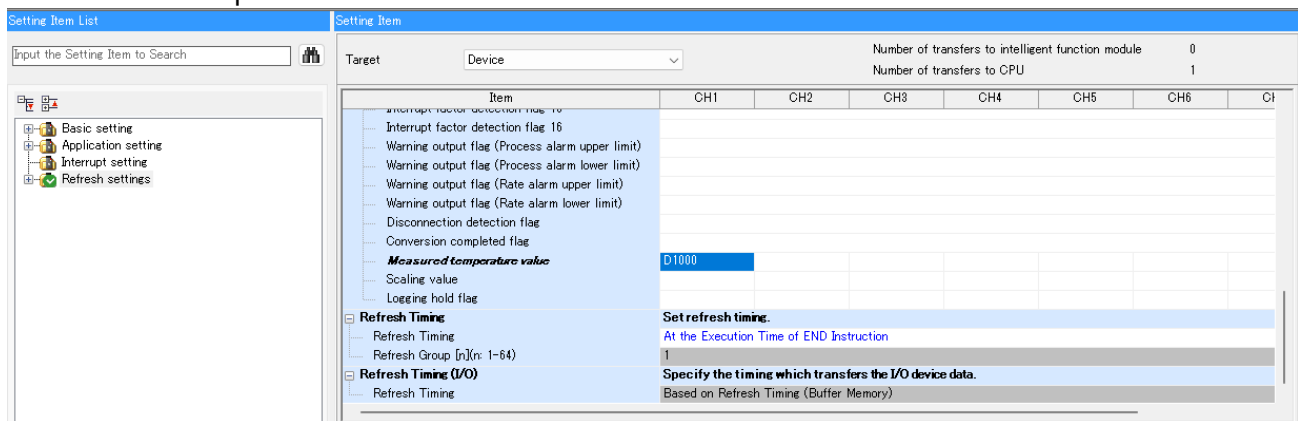
1) On the "System Parameter" window, open "I/O Assignment Setting".



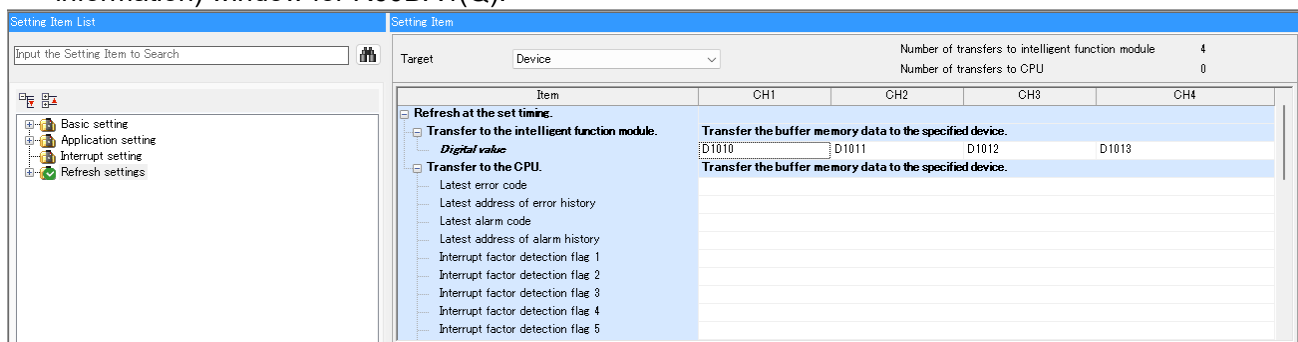
- Open the module model name menu and select "R60TD8-G" (module type: temperature input, module model name: R60TD8-G).



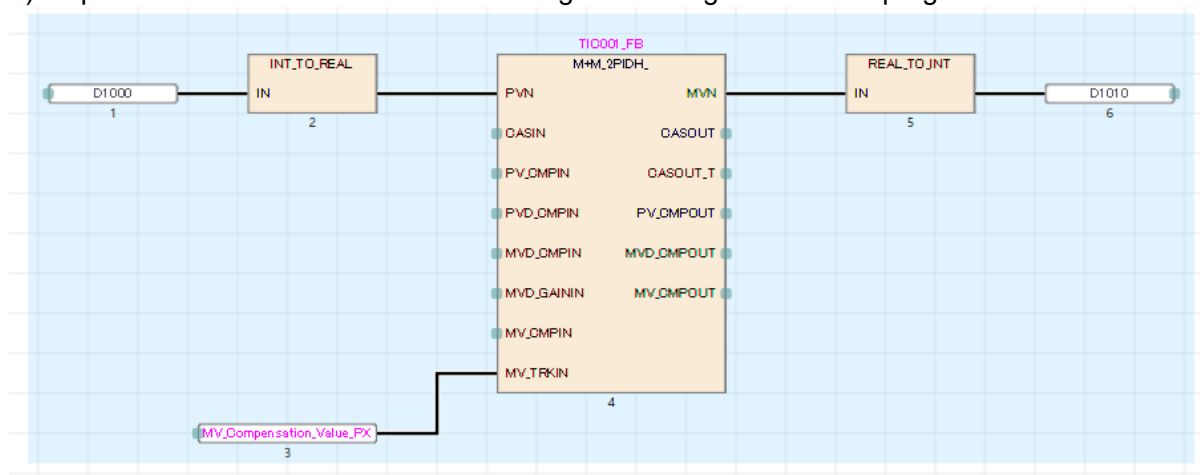
- On the parameter (module information) window for R60TD8-G, configure the refresh setting for the measured temperature value.



- In the same manner, configure the refresh setting for the digital value on the parameter (module information) window for R60DA4(Q).



5) Input the devices for which refresh settings are configured into the program.



# 5 DOWNLOAD

Manuals, software, and sample libraries can be downloaded from the MITSUBISHI ELECTRIC FA Global Website.

## 5.1 Manuals

Manuals listed in this chapter can be downloaded from the following link.

<https://www.mitsubishielectric.com/app/fa/download/search.do?kisyu=plcr&mode=manual>

## 5.2 Software

### MELSEC iQ-R software

<https://www.mitsubishielectric.com/fa/download/index.html>

1. [Download Target](#) → [Software](#) → Please select the country / region where you currently live.

#### ■ Configuration and programming product

GX Works3 Version 1

#### ■ Firmware

Firmware update information file for R08PCPU, R16PCPU, R32PCPU, and R120PCPU

Firmware update information file for R6RFM

Firmware update information file for RJ71EN71

Firmware update information file for RJ71GP21-SX and RJ71GP21S-SX

Firmware update information file for RJ71GF11-T2

Firmware update information file for RJ61BT11

#### ■ Field device management and configuration software

MELSOFT FieldDeviceConfigurator

#### ■ DTM

HART CommDTM: M\_CommDTM-HART

### MELSEC-Q software

<https://www.mitsubishielectric.com/fa/download/index.html>

1. [Download Target](#) → [Software](#) → Please select the country / region where you currently live.

#### ■ Configuration and programming product

PX Developer Version 1

PX Developer Monitor Tool Version 1

L(NA)08972ENG-B

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