





Mitsubishi Programmable Controllers Training Manual Safety Programmable Controller Basic Course

SAFETY PRECAUTIONS

(Always read these instructions before using the products.)

When designing the system, always read the relevant manuals and give sufficient consideration to safety. During the exercise, pay full attention to the following points and handle the product correctly.

[EXERCISE PRECAUTIONS]

- Do not touch the terminals while the power is on to prevent electric shock.
- Before opening the safety cover, turn off the power or ensure the safety.
- Do not touch the movable portion.

- Follow the instructor's direction during the exercise.
- Do not remove the module of the demonstration machine or change wirings without permission.
 Doing so may cause failures, malfunctions, personal injuries and/or a fire.
- Turn off the power before mounting or removing the module.
 Failure to do so may result in malfunctions of the module or electric shock.
- When the demonstration machine (such as X/Y table) emits abnormal odor/sound, press the "Power switch" or "Emergency switch" to turn off.
- When a problem occurs, notify the instructor as soon as possible.

REVISIONS

*The manual number is given on the bottom left of the back cover.

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INTRODUCTION

To help users to understand the MELSEC iQ-R series safety programmable controllers, this manual describes the safety standards, how to operate a safety programmable controller, and how to create/edit programs and set parameters using GX Works3.

RELEVANT MANUALS

Manual name [manual number]	Description	Available form
MELSEC iQ-R Safety Application Guide [SH-081538ENG]	Overview of safety systems, how to configure safety systems, examples of installation and wiring, and application programs	e-Manual PDF
MELSEC iQ-R Safety Function Block Reference [BCN-P5999-0815]	Specifications of the safety FBs	e-Manual PDF
Mitsubishi Safety Programmable Controller MELSEC iQ-R Series Machinery Directive (2006/42/EC) Compliance [BCN-P5999-0502]	Machinery Directive (2006/42/EC) for the mitsubishi safety programmable controller MELSEC iQ-R series	PDF
CC-Link IE Field Network Remote I/O Module (With Safety Functions) User's Manual [SH-081449ENG]	Procedures required to use safety I/O modules, system configuration, parameter setting, functions, and troubleshooting	e-Manual PDF
CC-Link IE Field Network Remote I/O Module User's Manual [SH-081114ENG]	Procedures required to use I/O modules, system configuration, parameter setting, functions, and troubleshooting	e-Manual PDF
MELSEC iQ-R Module Configuration Manual [SH-081262ENG]	system configuration, specifications, installation, wiring, maintenance, and inspection of MELSEC iQ-R series programmable controllers	e-Manual PDF
GX Works3 Operating Manual [SH-081215ENG]	System configuration, parameter settings, and online operations of GX Works3	e-Manual PDF
MELSEC iQ-R Programming Manual (Program Design) [SH-081265ENG]	Program specifications (ladder, ST, FBD/LD, and SFC programs)	e-Manual PDF
MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks) [SH-081266ENG]	Instructions for the CPU module and standard functions/function blocks	e-Manual PDF
MELSEC iQ-R Programming Manual (Module Dedicated Instructions) [SH-081976ENG]	Dedicated instructions for the intelligent function modules	e-Manual PDF
MELSEC iQ-R CPU Module User's Manual (Application) [SH-081264ENG]	Memory, functions, devices, and parameters of the CPU module	e-Manual PDF
MELSEC iQ-R CPU Module User's Manual (Startup) [SH-081263ENG]	Performance specifications, procedures before operation, and troubleshooting of the CPU module	e-Manual PDF
MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup) [SH-081256ENG]	Specifications, procedures before operation, system configuration, wiring, and communication examples of Ethernet, CC-Link IE Controller Network, and CC-Link IE Field Network	e-Manual PDF



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e-Manual has the following features:

- Required information can be cross-searched in multiple manuals.
- · Other manuals can be accessed from the links in the manual.
- The hardware specifications of each part can be found from the product figures.
- · Pages that users often browse can be bookmarked.

CONTENTS

SAFETY PRECAUTIONS	1
REVISIONS	3
RADEMARKS	3
NTRODUCTION	5
RELEVANT MANUALS	5

CHAPTER 1 OVERVIEW

СНА	PTER	R 1 OVERVIEW	10
1.1	Safety	y Programmable Controller	
1.2	Featu	res of MELSEC iQ-R series Safety Programmable Controller	
	1.2.1	Safety CPU and safety remote I/O module	
	1.2.2	System configuration	
	1.2.3	Integration of standard control and safety control	12
	1.2.4	Integration of standard communications and safety communications	13
	1.2.5	Interfacing with MELSERVO-J4 series general-purpose AC servo	14
1.3	Demo	onstration Machine Used in the Training	15

CHAPTER 2 CONFIGURATION

2.1	Safety	Application Configuration Example	16
2.2	Demo	nstration Machine	17
	2.2.1	Hardware configuration of demonstration machine (safety programmable controller side)	17
	2.2.2	Hardware configuration of demonstration machine (safety component side)	18
	2.2.3	System configuration of demonstration machine.	19
	2.2.4	Wiring specifications	19
	2.2.5	Wiring	20
2.3	Conne	ecting the Personal Computer and the Safety Programmable Controller and Powering on the	
	Demo	nstration Machine	23
2.4	Netwo	rk-Related Switch Settings	24
	2.4.1	Switch settings of each module	24
	2.4.2	Procedure after setting the switches	24
2.5	Param	eter Settings of Each Module	25
	2.5.1	Creating a new project.	25
	2.5.2	Module configuration settings	30
	2.5.3	Network configuration settings	36
	2.5.4	Network refresh settings	39
	2.5.5	Initializing all data in the programmable controller	40
	2.5.6	Converting the entire project	43
	2.5.7	Writing the project to the programmable controller	45
	2.5.8	Setting the CC-Link IE Field Network slave station.	48
	2.5.9	Enabling the CC-Link IE Field Network safety remote station.	54
	2.5.10	Setting the CC-Link IE Field Network safety communication parameters	57
	2.5.11	Writing parameters to the programmable controller after setting the CC-Link IE Field Network safety	
		communication parameters	60
2.6	Creati	ng a Safety Program	64
	2.6.1	Creating a new safety program	64
	2.6.2	Differences between safety programs and standard programs	66
	2.6.3	Standard/safety shared labels	67
	2.6.4	Safety program execution timing	70
2.7	Overa	II Flow of Training (System Start-up)	72

16

CHA	APTER 3 PREPARING THE DEMONSTRATION MACHINE	73
3.1	Creating a New Project	
3.2	Opening the Sequence Program	
3.3	Setting the Programmable Controller	
СНА	APTER 4 OPERATION	81
4 1	Operating the Safety System Demonstration Machine	81
Ŧ. I	4.1.1 Starting the demonstration machine	
	4.1.2 Operating the demonstration machine	
	4.1.3 Ladder monitor	
СНА	APTER 5 DIAGNOSTICS AND MAINTENANCE	89
5 1	Checking the Diagnostic Result at Error Occurrence Using GX Works3	89
	5.1.1 Diagnostic function of the safety programmable controller	89
	5.1.2 Checking an error (disconnection)	94
	5.1.2 Checking an error (short circuit)	95
5.2	How to Recover from an Error	96
	5.2.1 Powering off and on the demonstration machine	
	5.2.2 Holding down the operation preparation switch (RESET) for five seconds	
	5.2.3 Using the auto recovery parameter	
٩PP	PENDICES	103
Appe	endix 1 Ladder Programs Used in This Manual	103
Appe	endix 2 Profile Registration.	106
Appe	endix 3 User Management	108
	Appendix 3.1 Adding, deleting, and changing a login user	108
	Appendix 3.2 Access levels of users	112
4ppe	endix 4 Calculating Safety Response Time	
4ppe	endix 5 Safety Programmable Controller	
	Appendix 5.1 General specifications	113
	Appendix 5.2 Specifications of the CPU module	113
	Appendix 5.3 Specifications of the power supply module.	113
	Appendix 5.4 Specifications of the base unit	113
	Appendix 5.5 Functions of the safety programmable controller	113
1 ppe	endix 6 Safety Remote I/O Module	113
	Appendix 6.1 Specifications of the safety remote I/O module	113
_	Appendix 6.2 Terminal layout of the safety remote I/O module	113
۹ppe	endix 7 Clearing an Error of the Safety Programmable Controller	
Appe	endix 8 Parameter List	
٩pbe		
	Appendix 9.1 Overview.	
	Appendix 9.2 List of instructions and FUNS/FBS	
\n=-	Appendix 9.0 Stanuard function blocks	
vbbe v v v v v v v v v v v v v v v v v v v	mula in Salety Function Blocks	
vhbe	mult 11 Special Relay (SM)	
-hhe Vuuc	ndix 13 Safety Special Relay (SA)SM)	
whhe		

Appendix 14 Safety Special Register (SA\SD)	115
Appendix 15 Error Codes	115

1 OVERVIEW

1.1 Safety Programmable Controller

The safety programmable controller is an international safety standards certified controller and prevents labor accidents. It performs safety control by turning safety output off responding to safety input. Safety input means a signal input from a safety component (such as an emergency stop switch and a safety light curtain) that complies with the international safety standards. Safety output means a signal output to a hazard (such as a motor and a robot) to stop power supplied to it. The safety programmable controller performs the high-level self-diagnostic function, which is one of the requirements of the international safety standards, at start-up and during operation. When an error occurs in the safety programmable controller itself, the controller detects the error during execution of the self-diagnostic function and forcibly turns off safety output. This prevents the loss of the safety function due to an error. The safety programmable controller differs the most from the standard programmable controller at this point.

The safety programmable controller has obtained the safety approval of the highest safety level for a programmable controller: Category 4 and PLe of ISO 13849-1:2006, SIL3 of IEC 62061:2012, and SIL3 of IEC 61508:2010. Users can use the safety programmable controller when configuring a safety system that complies with ISO 13849-1:2006 (Category 4 and PLe), IEC 62061:2012 (SIL3), and IEC 61508:2010 (SIL3).

1.2 Features of MELSEC iQ-R series Safety Programmable Controller

1.2.1 Safety CPU and safety remote I/O module

The Safety CPU and safety remote I/O module comply with the international safety standards: ISO 13849-1:2006 (Category 4 and PLe) and IEC 61508:2010 (SIL3). The Safety CPU can execute both standard programs and safety programs.

1.2.2 System configuration

The following is an example of the system configuration using the MELSEC iQ-R series safety programmable controller.



*1 Firmware version 07 or later

*2 Input: 32 points (single wiring), Output: 8 points (single wiring)

1.2.3 Integration of standard control and safety control

With the existing series of programmable controllers, standard control and safety control must be performed separately using two systems. It costs much for users to purchase and start up the systems. In addition, a large control panel is required so that two systems can be installed.

With MELSEC iQ-R series, the Safety CPU can execute both standard programs and safety programs, enabling standard control and safety control with one CPU module.

Modules for standard control (CPU module, I/O module, analog module, positioning module, counter module), module for safety control (Safety CPU), and common modules (power supply module, network module) can be all mounted on the same base unit. It means that only one system is enough for both standard control and safety control, saving costs, space, and wiring.



Integration of standard communications and safety 1.2.4 communications

The MELSEC-Q series Safety CPU performs only safety communications, and therefore two different networks are required for standard communications and safety communications. On the other hand, the MELSEC iQ-R series Safety CPU can perform both standard communications and safety communications, and therefore the required network is only one, CC-Link IE Field Network. In addition, you don't need to prepare dedicated cables because standard Ethernet cables can be used in the CC-Link IE Field Network system.



MELSEC-QS series



1.2.5 Interfacing with MELSERVO-J4 series general-purpose AC servo

The MELSEC iQ-R series programmable controller can interface with the MELSERVO-J4 series AC servo over CC-Link IE Field Network. Mount the Safety CPU and the Simple Motion module (RD77GF) on the same base unit. The AC servo amplifier can receive safety signals from the Safety CPU via the Simple Motion module over CC-Link IE Field Network.^{*1} Wiring between the safety remote I/O module and the MR-D30 functional safety unit is not required. *1 The Safety CPU (RDSFCPU-SET) does not support the inter-module synchronization function.

System configuration example



For details, refer to the following.

SERVO AMPLIFIERS & MOTORS MELSERVO-J4 catalog

■MELSERVO-J4 series general-purpose AC servo

The MELSERVO-J4 series general-purpose AC servo can perform safety control that conforms to Category 4 and PLe of ISO 13849-1:2006 and SIL3 of IEC 61508:2010 when it is used together with the MR-D30.

- The MR-J4-GF-RJ servo amplifier can execute the safety monitoring functions (STO, SS1, SS2, SOS, SLS, SBC, and SSM) when it is used together with the MR-D30. The safety monitoring functions can be set in parameters.^{*2}
- There is no need to turn off the control power of the servo amplifier, resulting in the reduction of the time required for a restart and the elimination of the home position return.
- An electromagnetic contactor for preventing unexpected motor start is not required.*3
- *2 Use the MR-D30 with the software version A1 or later.
- *3 For the MR-J4 series servo amplifier, no electromagnetic contactor is required to meet the STO requirements. In the system configuration above, however, an electromagnetic contactor is connected for servo alarm and preventing an electric shock.

IEC/EN 61800-5-2:2007 function	Safety level
STO (Safe torque off)	Category 4 and PLe of ISO 13849-1:2006, SIL3 of IEC 61508:2010
SS1 (Safe stop 1)	
SS2 (Safe stop 2) ^{*4}	
SOS (Safe operating stop) ^{*4}	
SLS (Safely-limited speed) ^{*5}	
SBC (Safe brake control)	
SSM (Safe speed monitor) ^{*5}	

*4 A servo motor with functional safety needs to be used to achieve the safety levels.

*5 If a servo motor with functional safety is not used, the safety levels achieved will be Category 3 and PLd of ISO 13849-1:2006 and SIL2 of IEC 61508:2010.

1.3 Demonstration Machine Used in the Training

In the actual work site, a safety guard shall be installed as shown below, surrounding the robot. No more measure is required if the robot is completely enclosed and no one ever approaches the hazard. However, a person will probably approach the robot for maintenance or a person may enter the safeguarded area from the opening.

In the training, we configure a safety system to stop the operation of the robot when a person enters the safeguarded area from the door or the opening and goes close to the robot. The entry of a person or an emergency stop in the event of a danger is handed over to the safety system as safety information using safety components (such as emergency stop switch, safety light curtain, and safety guard switch). The operation of the robot stops when a safety component detects the entry of a person or the emergency stop switch is pressed.

You can learn the basic safety functions using the demonstration machine.

< Image of the safety system>



2 CONFIGURATION

2.1 Safety Application Configuration Example

This chapter describes a configuration example of a safety application using a safety programmable controller, based on the system configuration of the demonstration machine shown below.



2.2 Demonstration Machine

2.2.1 Hardware configuration of demonstration machine (safety programmable controller side)

The following is the hardware configuration of the demonstration machine (safety programmable controller side).



2.2.2 Hardware configuration of demonstration machine (safety component side)

The following is the hardware configuration of the demonstration machine (safety component side).



Safety light curtain A sensor that is installed at an opening and stops a machine when a worker enters the hazardous area and the light is blocked off

2.2.3 System configuration of demonstration machine

The following is the system configuration of the demonstration machine.



2.2.4 Wiring specifications

Cables of the remote I/O modules used in the demonstration machine shall be connected as follows.

Safety	remo	te I/O	module
--------	------	--------	--------

No.	Component	Input	Input dark test	Output	Output dark test
1	Emergency stop switch	SA\X0-T0, SA\X1-T1	⊖ Executed	—	—
2	Safety light curtain	SA\X2, SA\X3, COM-	imes Not required	—	—
3	Safety guard switch	SA\X6-T0, SA\X7-T1	⊖ Executed	—	—
4	Electromagnetic contactor	SA\X4-T0, SA\X5-T1	⊖ Executed	SA\Y0+, SA\Y0-	⊖ Executed

Standard remote I/O module

No.	Component	Input	Input dark test	Output	Output dark test
1	Standard switch	X0-COM, X1-COM	N/A	—	-

2.2.5 Wiring

Entire wiring

The following is the entire wiring diagram of the demonstration machine.



Double wiring

The following cables are double-wired: between the emergency stop switch and the safety remote I/O module and between the safety guard switch and the safety remote I/O module.

By cross-checking input signals of double wiring, a safety input can be turned off even though either one of the signals has an error.

In the demonstration machine, the disconnection simulation switch for introducing the diagnostic function of the safety programmable controller is provided on the wiring of the emergency stop switch.



[Operation]

The operation when the disconnection simulation switch is turned on/off is as follows.

(Disconnection simulation switch: Off (normal operation))

Signals are input to both input terminals (X0 and X1), and the cross-check completes successfully. It means that there is no disconnection in the system.



(Disconnection simulation switch: On (disconnection))

No signal is input to the input terminal (X0), and the cross-check completes with an error. It means that there is a disconnection in the system.



2

Input dark test circuit

The input dark test circuit is provided in the emergency stop switch circuit and the safety guard switch circuit. A safety input can be turned off when a short-circuit error is detected. In the demonstration machine, the short-circuit simulation switch for introducing the diagnostic function of the safety programmable controller is provided between the output terminals T0 and T1. When the short-circuit simulation switch is turned on, a short circuit occurs between T0 and T1. As a result, test pulses output from T0 and T1 are not input to the input terminals (X0 and X1), and an error occurs.



[Operation]

The operation when the short-circuit simulation switch is turned on/off is as follows.

(Short-circuit simulation switch: Off (normal operation))

Test pulses are input to both input terminals (X0 and X1), and the normal operation is detected in the test pulse circuit. It means that there is no short circuit in the system.



(Short-circuit simulation switch: On (short circuit))

Test pulses are not input to the input terminals (X0 and X1), and an error is detected in the test pulse circuit. It means that there is a short circuit in the system.



2.3 Connecting the Personal Computer and the Safety Programmable Controller and Powering on the Demonstration Machine

Operating procedure



1. Connect the personal computer to the safety programmable controller with a USB cable.

2. Check that the demonstration machine is plugged into an outlet, and power it on.

ROBSFCPU READY READY ROBAR RUN USER BATTERY CARD READY CARD READY CARD READY FUNCTION ▼PULL CC-Link IE II-12 READY ERR MST D LINK SAFETY COM RUN SAFETY COM RUN SAFETY COM RUN SAFETY COM RUN CARD READY CARD READY COM RUN SAFETY COM RUN CC-Link IE II-12 CC-Link IE II-12 CC-Link IE II-12 READY READ

0

3. Check that the READY LED of the Safety CPU (R08SFCPU) and the safety function module (R6SFM) is on.

2.4 Network-Related Switch Settings

2.4.1 Switch settings of each module

Set switches of each module as follows.

Safety CPU

There is no network-related switch.

Safety function module

There is no switch.

CC-Link IE Field Network master/local module

There is no network-related switch.

CC-Link IE Field Network remote I/O module (with safety functions)

Set the station number setting switches (rotary switches). Set "01" in the configuration example shown on Page 16 Safety Application Configuration Example.



2.4.2 Procedure after setting the switches

Perform the following to enable the switch setting values.

Operating procedure

1. Power off and on the safety remote I/O module.

2.5 Parameter Settings of Each Module

This section describes the module configuration and parameter settings using GX Works3 for the configuration example shown on Page 16 Safety Application Configuration Example.

2.5.1 Creating a new project

Operating procedure

MELSOFT GX Works3				
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 Click □ on the toolbar or select [Project] → [New] (□[ctri]] + □[]) from the menu.

- 2. Click the drop-down button of "Series".
- **3.** Select "RCPU" from the drop-down menu.



- 4. Click the drop-down button of "Type".
- **5.** Select "R08SF" from the drop-down menu.

6. Click the drop-down button of "Program Language". Select "Ladder" from the dropdown menu. Then, click the [OK] button.



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🐗 RCPU

New

Series

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User Name:	melsec 8		_				
Access Level	Administrators		-				
Access Level.	Administrators						
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Re-enter Password:							
Password Strength: 🔇 🌖 🥥							
Please enter the password with 6 to 32 single-byte characters, numeric characters, alphabets A-Z, a-z, single-byte space and!"#\$%&()"+,/;:<=>?@[\]^_'{}~. Passwords are case-sensitive.							
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8. Enter the user name, password, and re-enter password.

User Name: melsec

Password: melsec

9. Click the [OK] button.

10. Enter the file name.File name: sample**11.** Click the [Save] button.

·····	12. Click the [Setting Change] button.
MELSOFT GX Works3	
Add a module. [Module Name] R08SFCPU [Start I/O No.] 3E00	
Module Setting (12) Setting Change	
Module Label:Not use Sample Comment:Use	
Do Not Show this Dialog Again OK	
 ۲٫	1
Options E	13. Set "Use Module Label" to "Yes".
Content Editor Content Editor Content Editor Content Editor Content Editor Content Editor Content Editor	14. Click the [OK] button.
Back to Default Back to User Default Set as User Defaul A OK Cancel	
MELSOFT GX Works3	15. Click the [OK] button.
Add a module. [Module Name] R08SFCPU [Start I/O No.] 3E00	
Module Setting Setting Change	
Module Label:Use Sample Comment:Use	
Do Not Show this Dialog Again	
∇	

2 CONFIGURATION



16. The dialog box that confirms an addition of the label of selected module ("R08SF" here) appears. Click the [OK] button.

17. A new project is created.



2.5.2 Module configuration settings

Operating procedure

1. Double-click [Module Configuration] in the Navigation window. If the dialog box about parameter information appears, click the [OK] button.

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MELSOFT GX Works3										
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∎ ∰ [®] MAIN										Contact instructions
🗏 🙋 ProgPou		When y	rou finish editing M	odule Configurati	on, fix the					
ProgramBody		paramet	ters to reflect to t	neir respective fu	nctions.					
Fixed Scan		🗆 Do n	ot show this dialog	again.						PO Fa Hi M Lib
🚻 Event		You	are able to change	e this setting thro	ugh the					Input the Configuration Det $P \times$
1 Standby		Opti	ons menu.							
In Execution Type			ОК							
FB/FUN										
🔳 📠 Label										
E Global Label										
M+Global										
🖾 📇 Structured Data Types						_				
🖪 🎆 Device	Progress									4 ×
🖬 🤔 Parameter										^
Connection Destina	Outout ## Progress									<u> </u>
		melsec	R08SF	Ho	st		0/2 St	ер		Overwrite CAP NUM:
				1.14			1.14 0.			



- 2. The "Module Configuration" window appears. Select the following from the "Element Selection" window.
- Main Base: R35B
- Power Supply: R62P
- Safety CPU: Place the CPU module in the "Module Configuration" window on the base unit.
- CPU Extension: R6SFM
- Network Module: RJ71GF11-T2

MELSOFT GX Works3				
Project Edit Find/Replace Conve	rt View Online Debug Di	agnostics Tool Window Help		_ 8 ×
i 🗅 📂 💾 🗁 🙄 i 🥹	- , :X 🗈 🗂 🗠 🛯 🖻	🛛 🖙 🕾 🖄 🚵 🚑 🖉 🕅	u III i I	⊕,⊖,⊕ 🔋 🕫 🛥 🖉 🖉 🖷 👘 👘 👘
	= = 🔐 🔗 🌄 🐄	1a		
Navigation $ au imes$	Module Configuration ×	ProgPou (PRG) (Local Label Set	ProgPou (PRG) [LD] 2Step	य । र
				(Find POU)
Project				E # # # # # #
Module Configuration				ST IN X I WH
📼 🔚 Program				
ili Initial				Display Target: All •
				Main Base
E 🚰 ProgPou				Extension Base
a Local Label				RQ Extension Base
🙀 ProgramBody				PLC CPU
Fixed Scan				Process CPU -
Event				
No Execution Type				PO Fa Hi M Lib
Unregistered Program				Input the Configuration Det 🌵 🗙
💼 FB/FUN				
🖬 🌆 Label				
🚍 👫 Global Label				No confirmation detailed
M+Global				information found.
🛛 😝 Structured Data Types				
🖬 🕍 Device	Output			4 ×.
🖬 🛃 Parameter	Check Version of Profile	rror: 0 🚺 🛦 Warning: 0 🛛 🎯 Informati	on 💷 * 🖉 🗣 🕵	
	No. Result Explanation			
	Contrast III December			
Connection Destina	Uniput Tell Progress	maker D08SE	Hot	
		KU8SP	Host	CAP NOM



3. Select the main base unit "R35B" in the "Element Selection" window, and drag and drop it to the "Module Configuration" window.

- Display Target: All -R Serie Main Base Exte nsion Ba RQ Extension Base PLC CPU Process CPU SIL2 Process CPU Safety CPU C Controlle Head Mod

- 4. Select modules in the "Element Selection" window, and drag and drop them to the "Module Configuration" window in the same way as Step 3.
- Power Supply: R62P
- Safety CPU: Place the CPU module in the "Module Configuration" window on the base unit.
- CPU Extension: R6SFM
- Network Module: RJ71GF11-T2



3

Find POU

Display Target:

-R Series

🔳 R33B

K35

📖 R38B

R35B

R38RB-HT

🆇 🕰 | 👘 | 🖓 - 🐼 | 🙀 ៉ 🗙

POU... Fav... Hist... Mo... Libr...

No configuration detailed information

All

3 Slots (Type req

8 Slots (Type req

8 Slots (Extended

(Type red

Module Configuration * ×

POW

Ē

CPU 0 1 2 3



5. Check the module configuration. Right-click in the "Module Configuration" window, and select [Check] \rightarrow [System Configuration].

╌

Check that no error exists, and click the [OK] button.

wo	CPU 0 1 2 3	4
	STA#	
8	Cut	
Pa	Сору	
	Paste	
	Delete	
	Select All	
	Bring to Front	
	C IL D I	
	Send to Back	
	Module Status Setting (Empty)	
	Check	•
	Parameter	• 🐴 Fix(S)
XV	Start XY Batch Input	Detailed Configuration Information Input Window
	Default Points Batch Input	
	Properties	
	Open System Parameter	
	Open System Parameter	

MELSOFT GX Works3

1

Fix the parameter. Are you sure you want to continue?

[Caution]

- If other PLC CPU module is deleted, refresh setting between multiple CPUs will be deleted.
- (2) Interlink transmission setting will be deleted if the following operations are executed for the module which can use
 - interlink transmission setting.
 - When the module is deleted
 - When the start I/O No. is changed
 - When the control CPU is changed from the host CPU to the other CPU.
- (3) Redundant module group setting will be deleted if the
- following operations are executed for the module which can use the redundant module group setting.
- When the module is deleted
- When the start I/O No. is changed
- When the control CPU is changed from the host CPU to the other CPU
- (4) Copied module parameters and module extended parameters are copied to the pasted module.
 - The setting value will be default ones for the following cases. - When the station type is different between copied module
 - and pasted module - When the module that was copied in different project was
 - pasted.





8. Click the [Yes] button.

23

7. Fix the module configuration. Right-click in the "Module Configuration" window, and select [Parameter] \rightarrow [Fix].

MELSOFT GX Works3	9.	Click the [Setting Change] button.
Add a module. [Module Name] R6SFM [Start I/O No.] 0000		
Module Setting 9 Setting Change		
Module Label:Not use Sample Comment:Use		
Do Not Show this Dialog Again OK		
∇		
Options	10	Set "Use Module Label" to "Yes".
Save Device Comment Use Module Label Yes ▼ Add New Module Message No No Navigation User Library Show the confirmation message in adding module Yes ▼ Other Editor Other Editor Message ▼ ▼	11.	Click the [OK] button.
Image: Section of the section of th		
Back to Default Back to User Default Set as User Default OK Cancel		
了		
	12	Click the [OK] button.
Add a module. [Module Name] R6SFM [Start I/O No.] 0000		
Module Setting Setting Change		
Module Label:Use Sample Comment:Use		
Do Not Show this Dialog Again		
$\mathbf{\nabla}$		
13. Click the [OK] button.

MELSO	DFT GX Works3	
(Add a module. [Module Name] RJ71GF: [Start I/O No.] 0010	11-T2
I	Module Setting	Setting Change
	Module Label:Not use	*
		Ŧ
	Do Not Show this Dialog Again	ок 13

2.5.3 Network configuration settings

Set the network configuration for the configuration example shown on Page 16 Safety Application Configuration Example.

Operating procedure

1. Double-click [Parameter] \rightarrow [Module Information] \rightarrow [RJ71GF11-T2] in the Navigation window.





2. Set "Station Type" to "Master Station".





- 🖧 0010:RJ71GF11-T2 Module Para... 🗙 🏢 Module Configuration 🚋 ProgPou [PRG] [Local Label Set... 🙀 ProgPou [P 4 ► 🗢 Setting Input the Setting Item to Search Network Configuration Setting rk Configuration Settings 4 ed Setting> Refresh Settings Required Settings
 Station Type
 Network No.
 Station No.
 Parameter Setting Method
 Bacic Settings
 Network Configuration Setting
 Network Configuration
 Network Configuration
 Network Configuration
 Network Configuration Refresh Settings <Detailed Setting> Network Topology Network Topology Line/Star Operation of Master Station after Reconnection
 Operation of Master Station after Reconnection Return as Master Operation Station Explanation Set the network configu Chec<u>k</u> Restore the Default Settings Item List Find Result
 - **4.** Double-click [Basic Settings] → [Network Configuration Settings] → "<Detailed Setting>".

 ∇

2

5. The following window appears.

When the [Yes] button is clicked, the parameters of the slave station are saved into the project file. Click the [Yes] button here.





- **6.** Drag and drop the following from the "Module List" window.
- Basic Digital Input Module
- NZ2GFSS2-32D
- Extension Digital Output Module
- NZ2EXSS2-8TE
- Basic Digital I/O Combined Module
- NZ2GF2B1-32DT

For the profile registration method, refer to the following.

Page 106 Profile Registration

 Click the [Close with Reflecting the Setting] button.

2.5.4 Network refresh settings

Operating procedure

1. Double-click [Parameter] \rightarrow [Module Information] \rightarrow [RJ71GF11-T2] in the Navigation window. Then, double-click [Basic Settings] \rightarrow [Refresh Setting] \rightarrow "<Detailed Setting>".

MELSOFT GX Works3		- • ×
<u>Project</u> Edit Eind/Replace Cor	onvert <u>V</u> iew <u>O</u> nline De <u>b</u> ug <u>D</u> iagnostics <u>T</u> ool <u>W</u> indow <u>H</u> elp	- & ×
🗄 🗅 📂 💾 🎒 🙄 🕡	: X = 2 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1	00 📖 🙄
128 2 2 2 4 5 3	유 때 짧 🔗 😼 🕸 🕲 🛊 🗤 🝦 🚥 🕸 🗉 👘 🗸	
Navigation 🛛 🖓 🗙	🕺 🚱 0010:RJ71GF11-T2 Module Para 🗙 🏢 Module Configuration 🐘 🚛 ProgPou [PRG] [Local Label Set 💿 🙆 ProgPou [PRG] [LD] 2Step 🔄	👻 El 🕂 🗡
•≝• •⊏ 🌣 All •	Setting Item List Setting Item	(Find POL
Project	Input the Setting Item to Search	40 MA
Module Configuration		*
FB/FUN	E Link Side CPU Side	- Gr 62
🗉 🚰 Label	No. Device Name Points Start End Target Device Name Points Start End	
🖬 🎬 Device	Basic Settings SB 💌 512 00000 001FF 🖶 Module Label 💌	×
E 🛃 Parameter	Network Contiguration St StV - 512 00000 001FF - Module Label -	inter-
ROBSECPU	Network Topology	
🔳 🙆 Module Information	B Application Settings	Display
10000:R6SFM		
0010:RJ71GF11-T2		
The remote Password		-
	Explanation	
	Set transfer range between devices of link special relay/register in CC-Link IE field network module, link device and CPU	*
	involue.	
	Check Restore the Default Settings	1 P ×
	Apply	
	Output	ą×
	Check Parameters 🔯 Error: 0 🛦 Warning: 0 🔞 Information 🏶 Check Warning: 0 🗆 👻 🖓 😪	
	No. Result Data Name Category Content	Error Code
Connection Des	Output 📼 Progress	
	melsec R08SF Host Overwrite	



2. Set the devices on the link side and the CPU side as follows. After setting the devices, click the [Apply] button.

Setting I	tting Item													
			Link Side	•				_	CPU S	ide				-
No.	Device Nan	ne	Points	Start	End		Target		Device Nam	ne	Points	Start	End	
-	SB	Ŧ	512	00000	001FF	+	Module Label	•						
-	- SW													
1	RX	Ŧ	80	00000	0004F	+	Specify Devic	•	Х	•	80	01000	0104F	
2	RY	Ŧ	80	00000	0004F	+	Specify Devic	•	Y	•	80	01000	0104F	
3	3 RWr 💌 16 00000 0000F 🗰 Specify Devic 💌 W 💌 16 00000 0000F													
4	4 RWw ▼ 16 00000 0000F 🗰 Specify Devic ▼ W ▼ 16 00100 0010F													
5	5													
Explanat The end	planation ne end number (hexadecimal) of the device range to be refreshed is displayed.													
	Check Restore the Default Settings													

2.5.5 Initializing all data in the programmable controller

This section describes how to initialize all data in the programmable controller.

Point P

If the programmable controller is newly purchased or is used in the different project, perform this operation.

Operating procedure



1. Select [Online] \rightarrow [User Authentication] \rightarrow [Initialize all PLC Data] from the menu.



2. Click the [Yes] button.



3. Click the [Yes] button.

2

5. Write user information to the programmable controller.

Select [Online] \rightarrow [User Authentication] \rightarrow [Write User Information to PLC] from the menu.



2.5.6 Converting the entire project

Operating procedure

1. Select [Convert] \rightarrow [Rebuild All] from the View Online Diagnostics Convert Debug menu. P Convert(B) F4 9 Online Program Change Shift+F4 P Rebuild All 1 Shift+Alt+F4 Check Syntax Program File Setting... Worksheet Execution Order Setting... Setting... 2. When "Label Assignment" is set to "Retain", Rebuild All x click the [Options] button. Rebuild all programs in the Project. 1 When "Label Assignment" is set to "Reassignment", skip over Step 2 and Step 3, and go to Step 4. Conversion Setting Execute rebuild with the following settings. Please check details in Options. Options Reassignment Others Do Not Use the Same Label Name in Global Label and Local Label Optimize the Number of Steps(Level 2) Check Program Execute Check Program after Completing Rebuild All OK Cancel 3. Set "Reassign Labels in Executing Rebuild All" × Options to "Yes", and click the [OK] button. Program Check 👪 Project • Execute Program Check after Build or Online Program No Target the SET instruction for duplicated coil check Yes 🔁 Program Editor 🚱 Other Editor 🔀 Edit Operational Setting Use the Same Label Name in Global Label and Local No -Find/Replace Optimization of Number of Steps Optimize the Number of Steps * * * * Yes Optimize Level Level 1 3 Reassign Labels in Executing Rebuild All Yes Convert Stop the Monitor in Executing Convert/Rebuild All No Check the data type of instruction argument No Online Program Chang Language for Instruction Conversion of Character St User Locale Reassign Labels in Executing Rebuild All a Intelligent Function Module Select whether to reassign labels in executing Rebuild All. Memory usage is optimized if Yes] is selected. Unable to execute Online Program Change or write to PLC while PLC is running. iQ Works Interaction

Import...

3

Set as User Defau

Back to Default

Back to User Default

Export..

Cancel



4. Check that "Label Assignment" is set to "Reassignment", and click the [OK] button.

Operating procedure

MELSOFT GX Works3

Onli	ne	Debug	Diagnostics	Tool	Window					
	Current Connection Destination									
2 0	Re	ad from P	LC							
-	W	rite to PLC			(1)					
	Ve	rify with P	۲LC		Y					
	Re	mote Ope	eration(S)							
	Sa	fety PLC 0	Operation		•					
	Re	dundant l	PLC Operation	(G)	•					
	Us	er Data								
	Se	t Clock								
	M	onitor			•					
	FB	Property	Management	(Online)						
	W	atch			•					
	Us	er Authen	tication		•					

 Select [Online] → [Write to PLC] from the menu.

- 2. If the user authentication with the programmable controller is not completed, the "Use Authentication" window appears. Click the [OK] button.
- User authentication with PLC is in incomplete status. Please operate it after completing user authentication. The function which is limited according to access level exists. For details, please refer to the manual. <ES:010a4300>
 - ∇

User Authentication	(PLC)	X
Log on to PLC. Please enter the Use	er Name registered in PLC.	
User Name:	melsec	
Password:	••••• 3	۲
Log on as a	GUEST	OK Cancel
	\mathbf{r}	

3. Enter the password. (Password: melsec)





\bigtriangledown



4. Click the [OK] button.

5. After the project is written to the programmable controller, click the [Close] button.

6. Check the descriptions of "Confirmation 1" and "Confirmation 2", select the both checkboxes, and click the [Close] button.

- 7. Click the [Select All] button, and then click the [Execute] button.
- Open/Close All(\underline{T}) Deselect All(\underline{N}) 6 Last Change Size (Byte) 4 iQ-R Safety or • > > . odule Pa Memory Card Par 7/19/2019 2:40:24 PM Not Calculate 2 7/19/2019 2:40:24 PM Not Calculater ord Global Label -66 6 1 × × Global Lab Not Calculate Not Calculate 7/25/2019 11:12:45 . 2 MAIN V Size Calco Data Memory Free 5116/5 Free 914/9 Inc SD Ne nory Card Free 0/0KB 7 Close Execute

SD Memory Card

Read 🔛 🖉 Verify 🖳 🏈 🇊

🚮 Intelligent Function

Setting Re

🖳 🕽 🌆 🗤 📃

Parameter + Program(<u>F</u>) Sele

7

ect <u>A</u>ll



(10)

- **8.** Every time the project is written to the safety programmable controller, e-Manual Viewer starts up and precautions for the safety operation mode switching are displayed. Click the [×] button.
- **9.** After the project is written to the programmable controller, power off and on the demonstration machine.

- 10 11 12 13 0 2 3 1 MELSEC 14 15 16 17 18 19 1A 1B 7 B 5 6 4 PW RUN MODE DLINK SAFETY ERR. 8 Α С D Е F 1C 1D 1E 1F 10 NZ2GFSS2-32D \bigcirc $|\bigcirc$ STATION NO. 0Q 00 хо то X10 T2 1112 TEST +24\ <u>iõo</u> (\cap) 1001 1001 Х11 ТЗ X1 O X2 T0 K12 T2 +24\ \square 6 240
 - **10.** Check that the D LINK LED of the safety remote I/O module is on.

Setting the CC-Link IE Field Network slave station

This section describes how to write parameters to the slave station (safety remote I/O module).

Point P

2.5.8

The operations described on earlier pages of this manual must be completed, and the slave station (safety remote I/O module) must be recognized on CC-Link IE Field Network.

Select [Diagnostics] \rightarrow [CC-Link IE Field Diagnostics] from the menu, and check that the slave station can be monitored normally.



Operating procedure

1. Double-click [Parameter] \rightarrow [Module Information] \rightarrow [0010:RJ71GF11-T2] in the Navigation window. Then, double-click [Basic Settings] \rightarrow [Network Configuration Settings] \rightarrow "<Detailed Settings".



- **2.** Select [Tool] \rightarrow [Options].
- 😫 CC IE Field Configuration (Start I/O: 0010) CC IE Field Configuration Edit View Tool Close with Disca be Setting Close with Reflecting the Setting 2 Options. Detect Now ent Method: Point/Start
 Link Scan Time (Approx.): 0.72 ms Mode Setting: Online (Standard Mode) Assignn
 RX/RY Setting
 RWw/RWr Setting
 Refresh Device

 Points
 Start
 End
 Points
 Start
 End
 RX
 . No. Model Name STA# Station Type Ŧ 0 Host Station 0 Master Station 1 NZ2GFSS2-32D 80 0000 004F 16 0000 000F **-**1 Remote Device Station NZ2EXSS2-8TE **E** 2 NZ2GF2B1-32DT 2 Intelligent Device Station 32 0050 006F 20 0010 0023 1 STA#1 STA#2 ost Statio STA#0 Maste Total STA#:2 Line/Star NZ2GFSS2-3 NZ2EXSS2-8 NZ2GF2B1-3 2D TE 2DT •
 - ∇
- Option Setting

Save the parameter set by "Parameter Processing of Slave Station" to project.

3 the option and turn OFF in the operation of reading from PLC. clear the parameter information of "Parameter Processing of Slave Station" in the operation of Detect Now. For the clear condition details of the option or parameter information, please refer to "iQ Sensor Solution Reference Manual".

4

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ОК



- **3.** Check that the "Save the parameter set by "Parameter Processing of Slave Station" to project." checkbox is selected.
- 4. Click the [OK] button.

×

Cancel

 Right-click on "NZ2GFSS2-32D", and select [Online] → [Parameter Processing of Slave Station].

et Mo	dule Information:	NZ2GFSS2-32 Start I/O No.:	D,NZ2EXSS2 0010 - Static	1-8TE on No.:1						
od se	ection:	Parameter writ	te		•	'he parameters are i	read from the	e target	module.	
Param	neter Information					Clear All "Read \	/alue"		Clear	All "Write Value"
	Select All	Cancel All	Selections		(oy "Initial Value" to "	Write Value"		Copy "Read	Value" to "Write Value"
	Name		Initial V	1 04	CH-1	Te V	/rite Value	Unit	Setting Range	Description
Stati	on parameter		9	o cui	Ctri+;	I G		_		
V	Transmission inte	rval monitori	35 E	🖹 🖸 Сору	Ctrl+(3	5 ms	4 to 1000	Set the transmission in
Basic	module parameter	<i>c</i>		Paste	Ctrl+1					
N.	Wining selection (or input	0.000	Delete			Devilate out	-	_	Set the wring method
-	Winng selectio	n of input XU	U: Not u	2 cierce		1	Double wi		_	Set the same value to
-	wining selector	n of input X1	U: Not use			1	Double WI		_	Set the same value to
-	Wiring selectio	n of input X2	0: Not use	d		1	: Double wi	•		Set the same value to
-	Wiring selection	n of input X3	0: Not use	d		1	: Double wi			Set the same value to
_	···· Wiring selection	n of input X4	0: Not use	:d	_	1	: Double wi			Set the same value fo
4	1 Ulisian aslastic	a of load VE	III III	.d	_		Daubla ui	-	-	Cat the energy unlies for
roce	ss Option			There i	is no opti	in the selected pro	cess.			
The re Acces Proce For in	efreshed device val ises the PLC CPU by ss is executed acco formation on items ble safety module v	ues of remote I, rusing the curre rding to the par not displayed or when succeed to	/O or remote ent connectio ameters writ in the screen	e registers r on destinati tten in the l , please ref	may be o ion. Plea PLC CPU fer to the	erwritten. check if there is any Operating Manual.	/ problem wit	h the co	nnection destinati	on.
Ena									Execute	. Torone ter Troceasing



6. Right-click on "Initial Value", and select [Copy].

- 7. Right-click on "Write Value", and select [Paste].
- **8.** Change the write values as necessary. Use the default values here.
- 9. Set "Method selection" to "Parameter write".
- **10.** Click the "Execute Parameter Processing" button.

11. Click the [Yes] button.

23 MELSOFT GX Works3 The process "Parameter write" will be executed, targeting the selected parameters. The operation of the slave station may be change by the execution of 4 the process "Parameter write". Also it may overwrite the device value of the PLC CPU refreshing the remote I/O and remote registers. Please confirm safety before the execution. -Please confirm that the Connection Destination PLC is correct. -Please confirm that the CC IE Field module is set correctly. -Please confirm that the target slave station is correct. Do you want to execute? 11 Yes No





 ∇

2



15. Right-click on "NZ2GF2B1-32DT", and select [Online] \rightarrow [Parameter Processing of Slave Station].

- Parameter Processing of Slave Station

 Target Models Information:
 Intractor State 1000 Statem No.12

 Interformation:
 Intractor state 1000 Statem No.12

 Interformation:
 Intractor state 1000 Statem No.12

 Interformation:
 Interformation:

 Cancel Af Selectors:
 Cancel Af Selectors:

 State 1000 selectors:
 Cancel Af Selectors:

 Output: INDUCESR statement
 Cancel Af Selectors:

 Output: INDUCESR statement
 Cancel Af Selectors:

 Output: INDUCESR statement
 Date:

 States contracts:
 States contracts:

 Output: INDUCESR state:
 States contracts:

 Output: INDUCESR state:
 States contracts:

 Date:
 Date:

 Date:
 Date:</t
- **16.** Right-click on "Initial Value", and select [Copy].

MELSOFT GX Works3

The process "Parameter write" will be executed, targeting the selected parameters.
 The operation of the slave station may be change by the execution of the process "Parameter write".
 Also it may overwrite the device value of the PLC CPU refreshing the remote I/O and remote registers.
 Please confirm safety before the execution.
 Please confirm that the Connection Destination PLC is correct.
 Please confirm that the CZ IE Field module is set correctly.
 Please confirm that the target slave station is correct.

- 17. Right-click on "Write Value", and select [Paste].
- **18.** Change the write values as necessary. Use the default values here.
- 19. Set "Method selection" to "Parameter write".
- **20.** Click the "Execute Parameter Processing" button.



23



2.5.9 Enabling the CC-Link IE Field Network safety remote station

This section describes how to enable the safety remote station (slave station) following Page 48 Setting the CC-Link IE Field Network slave station. The operating procedure to display the "CC IE Field Configuration" window is the same as the procedure described on Page 48 Setting the CC-Link IE Field Network slave station.

Operating procedure



 On the "CC IE Field Configuration" window, right-click on "NZ2GFSS2-32D", and select [Online] → [Command Execution of Slave Station].



- **2.** Set "Method selection" to "Safety module validation".
- **3.** Click the [Execute] button.



4. Check the items on the displayed window. After the check is completed without any problem, click the [Yes] button.

5. Click the [Yes] button.

兄

User Authentication (PLC)										
Log on to PLC. Please enter the Use	r Name registered in PLC.									
User Name:	melsec									
Password:	••••• 6	٩								
Log on as a	GUEST	OK Cancel								

6. Enter the password. (Password: melsec)



7. Click the [OK] button.

2.5.10 Setting the CC-Link IE Field Network safety communication parameters

Operating procedure

- Double-click [Parameter] → [Module Information] → [0010:RJ71GF11-T2] in the Navigation window. Then, double-click [Application Settings] → [Safety Communication Setting], and set "To Use or Not to Use the Safety Communication Setting" to "Use".
- 2. Double-click "<Detailed Setting>" of "Safety Communication Setting".

Navigation 🖓	40010:RJ71GF11-T2 Module Para × III M	lodule Configuration 🛛 🐽 ProgPou [PRG] [LD] 2Step	4 ▷ 🛩
· 문· 이미 🔅 🗛	Setting Item List	Setting Item	
Noject	Input the Setting Item to Search	Item	Setting
Module Configuration		Supplementary Cyclic Settings	
🗉 🔚 Program		System Switching Monitoring Time	2000 ms
💼 FB/FUN		😑 Link Scan Mode	Sequence Scan Asynchronous
🖬 🏥 Label	⊕-∰ Required Settings	Constant Link Scan Time	0 ms
🗖 🚰 Device	🖨 🙋 Basic Settings	Station-based Block Data Assurance	Enable
💻 😥 Parameter	Network Configuration Settings	ing I/O Maintenance Settings	
🧬 System Parameter	Refresh Setting	Output Hold/Clear Setting during CPU STOP	Hold
🖿 👰 R08SFCPU	Operation of Master Station after Rev	Data Link Error Station Setting	Clear
🜮 CPU Parameter	Application Settings	Output Mode upon CPU Error	Clear
🚺 Module Parameter	Supplementary Cyclic Settings	Interrupt Settings	
Memory Card Parar	Interrupt Settings	Interrupt Settings	<detailed setting=""></detailed>
🔳 👸 Module Information	IP Address	IP Address	
0000:R6SFM	Communication Mode	IP Address	1.125
1 0010:RJ71GF11-T2	Dynamic Bouting	Communication Mode	
🏫 Remote Password	Event Reception from Other Stations	Communication Mode	Normal
	Module Operation Mode	Parameter Name	
	Interlink Transmission Settings	Parameter Name	
	Safety Communication Setting	Dynamic Routing	
		Dynamic Routing	Enable
		Event Reception from Other Stations	
		Event Reception from Other Stations	Enable
		Module Operation Mode	
		Module Operation Mode	Online
		Interlink Transmission Settings	
		Interlink Transmission Settings	<detailed setting=""></detailed>
		Safety Communication Setting	
		To Use or Not to Use the Safety Communication Setting	Use
		Safety Communication Setting	<detailed setting=""></detailed>
)	
		Explanation	
		Set the Safety Communication.	Ć.
	< >		
	Item List Find Result	Cneck Restore the Detault Settings	
			Apply
	P		



3. Click the [OK] button.



4. Set "Communication Destination" to "Local Network" on the "Safety Communication Setting" window.

										Setting Method									
										Start/End	•								
		Þ	letwork Config	uration	Configu	ed Module		Sending Interval	Cafety Defrech				Safety	Data Tran	sfer Device Setting				
No.	Communication	Network		0 C T		Communication	Open System	Monitoring Time	Monitoring Time	Re	ceive Data Stora	ge Devic				Send	Data Stori	age Devi	CB
	Destinguon	No.	Station No.	Station Type	Model Name	Destination		[ms]	[ms]		Device Name	Point	Start	End	Device Name	Points	Start	End	
1	-						-			Destination Station->		-							->Destination Station
2							-			Destination Station->		•			-				->Destination Station
3	Local Network	14	-							Destination Station->		•			-				->Destination Statio
4										Destination Station->		•			-				->Destination Statio
5	-									Destination Station->		•			-				->Destination Statio
6	-									Destination Station->		•			-				->Destination Statio
7							*			Destination Station->		•			-				->Destination Statio
8							*			Destination Station->		•			-				->Destination Statio
9							*			Destination Station->		•			-				->Destination Station
10	-									Destination Station->		-			-				->Destination Station



5. Select the safety communication target safety remote I/O module (NZ2GFSS2-32D), and click the [Add] button.

Sets the sage module for the safety communication safety in the fool sensel. (Casco) ••••••••••••••••••••••••••••••••••••	Select the target m	odule for the Safety Comm	unication Setting	×
Select (d) Reset All(g) Search In: Search Type Nodel Name (2) 2 Remons Device Search N1226752:320 5 4d Correl	Select the target mo (Caution) - The value will be r - Please set the Net local network.	dule for the safety communication s overwritten if the setting for the san work. Configuration Settings to set s	setting in the local network. ne station No. has already existed. safety communication setting for the	
Sacon No. Sacon Type Model Ianna Banna Davia Sacon N220552320 5 Add	Select <u>A</u> ll	Reset All(N)		
Image: Station N226553.320 5 Add Cancel	Station No.	Station Type	Model Name	
5	1	Remote Device Station	NZ2GFSS2-32D	
	5	5	6 Cancal	

- **6.** Set "Sending Interval Monitoring Time", "Safety Refresh Monitoring Time", "Receive Data Storage Device", and "Send Data Storage Device" as follows. After setting the parameters, click the [OK] button.
- Sending Interval Monitoring Time: 35.0 [ms]
- Safety Refresh Monitoring Time: 60.0 [ms]
- Receive Data Storage Device: SA\X, Start: 000000, End: 00001F
- Send Data Storage Device: SA\Y, Start: 000000, End: 00000F

Saf	fety (communication Se	tting																	×
											Setting Method									
	Stat/End 💌																			
Г	Network Configuration Configuration Configuration Safety Refresh Safety Data Transfer Device Setting									A										
	No.	Communication Destination	Network	Station No.	Station Turne	Model Name	Communication	Open Series	Monitoring Time	Monitoring Time	Re	ceive Data Stora	ge Device				Send 0	lata Stora	age Devic	• []
			No.	Station No.	Sumon Type	model Hume	Destination		[ms]	(ms)		Device Name	Points	Start	End	Device Name	Points	Start	End	
	1	Local Network	1	1	Remote Device	NZ2GFSS2-32D	-	Actr	35.0	60.0	Destination Station->	SAIX	- 32	000000	00001F	SAIY	16	000000	00000F	->Destination Station
	2										Destination Station->		-							->Destination Station
	3						-				Destination Station->		-			-				->Destination Station
	4							-	•		Destination Station->		-							->Destination Station
	5						•	-			Destination Station->		-			-				->Destination Station
	6							-			Destination Station->		-			-				->Destination Station
	7							-			Destination Station->		-			-				->Destination Station
	8							-			Destination Station->		-			-				->Destination Station
	9							-			Destination Station->		•			-				->Destination Station
			,,,,,,,																	•
1																				
		Check	Restore	the Default Set	tings	Output to File (for	Setting Confirmati	on)								6		OK		Cancel
L.																				
	_																			

 \mathcal{O}

7. Click the [Apply] button.

Navigation 🛛 🗸 🗙	🖞 0010:RJ71GF11-T2 Module Para 🗙 🏢 Mo	odule Configuration 🛛 🔒 ProgPou (PRG) [LD] 2Step	4 Þ -
□ੁ 🖓 🖓 🖓 🖓	Setting Item List	Setting Item	
A Project	Insuit the Cotting from to Second	Item	Setting
Module Configuration		Supplementary Cyclic Settings	
🗉 🚰 Program		System Switching Monitoring Time	2000 ms
💼 FB/FUN		- E Link Scan Mode	Sequence Scan Asynchronous
🖬 🌆 Label	🕫 🕘 Required Settings	Constant Link Scan Time	0 ms
🖬 👹 Device	🖻 🙋 Basic Settings	Station-based Block Data Assurance	Enable
🗏 🛃 Parameter	Network Configuration Settings	Up I/O Maintenance Settings	
🔮 System Parameter	Network Topology	 Output Hold/Clear Setting during CPU STOP 	Hold
E 🛃 ROBSFCPU	Operation of Master Station after Rec	Data Link Error Station Setting	Clear
CPU Parameter	Application Settings	Output Mode upon CPU Error	Clear
Module Parameter	Supplementary Cyclic Settings	Interrupt Settings	
Memory Card Parar	Interrupt Settings	Interrupt Settings	<detailed setting=""></detailed>
Module Information	Communication Mode	- IP Address	
0000:R65FM	Parameter Name	IP Address	1.125
0010:R071GF11-12	Dynamic Routing	Communication Mode	
The Remote Password	Event Reception from Other Stations	Communication Mode	Normal
	Module Operation Mode	Parameter Name	
	Safety Communication Setting	Dupamia Parting	
		Denoric Pouling	FH-
		Dynamic Routing Event Recention from Other Stations	Enable
		Event Reception from Other Stations	Fashle
		Module Operation Mode	Liable
		Module Operation Mode	Online
		Interlink Transmission Settings	Chilling .
		Interlink Transmission Settings	(Detailed Setting)
		Safety Communication Setting	(build build)
		To Use or Not to Use the Safety Communication Setting	Use
		Safety Communication Selfing	Contailed Setting>
		Explanation	
		Set the connection to execute safety communication and the transfe	range of safety device.
	< III >		
	have the Find Percet	Check Restore the Default Settings	
	Rem List I min resour		
			Apply

2.5.11 Writing parameters to the programmable controller after setting the CC-Link IE Field Network safety communication parameters



Online Debug Diagnostics Tool Window Current Connection Destination... Read from PLC... 3 -Write to PLC... Verify with PLC... Remote Operation(S)... Safety PLC Operation... ۲ Redundant PLC Operation(G) • CPU Memory Operation... Delete PLC Data... User Data Þ Set Clock... Monitor ۲ FB Property Management (Online)... Watch User Authentication.. ٠



🖳 🚺 🗰 Write 🔄 4 🚛 Road	9	1	Verif	/ 🔜 🧳	Delete			
Parameter + Program(E) Select All	Legend	Suilt-in Me	mory	SD M	emory Card	Intelligent Function Module		
Module Name/Data Name	•	Ø	(The	Detail	Title	Last Change	Size (Byte)	
iQ-B Safety programmable controller F				DC tas	THUE .	Lust change	Size (Dyte)	
Parameter								
System Parameter/CPU Parameter (V					7/19/2019 2:41:06 PM	Not Calculate	d
Module Parameter (Standard/Safety)						7/24/2019 4:20:09 PM	Not Calculate	d =
Memory Card Parameter						7/19/2019 2:40:24 PM	Not Calculate	d
Remote Password						7/19/2019 2:40:24 PM	Not Calculate	d
🖻 🏦 Global Label								
Global Label Setting						7/19/2019 2:40:33 PM	Not Calculate	d
Standard/Safety Shared Global Label						7/25/2019 11:12:45	Not Calculate	d
🕂 🌆 Program				Detail]			
MAIN	2					7/19/2019 2:40:33 PM	Not Calculate	d
Device Memory								*
Display Memory Capacity 😮 mory Capacity Program Memory								Free
								317/320KB
agend Data Memory								Free
Used								4250/5122KB
Increased Device/Label Memory (File Store	ge Area) —							Free
Decreased								850/914KB
Free: 5% or Less SD Nemory Card								Free 0/0KB

MELSOFT GX Works3

Svite

V

The following file already exists. Are you sure you want to overwrite it?

5

Yes to all

No to all

Cancel

Select [Online] → [Write to PLC] from the menu.

4. Click the [Select All] button, and then click the [Execute] button.

5. Click the [Yes to all] button.



7

<u>C</u>lose

6. After the parameters are written to the programmable controller, click the [Close] button.

7. Check the descriptions of "Confirmation 1" and "Confirmation 2", select the both checkboxes, and click the [Close] button.

- 8. Every time the parameters are written to the safety programmable controller, e-Manual Viewer starts up and precautions for the safety operation mode switching are displayed. Click the [×] button.
- **9.** After the parameters are written to the programmable controller, power off and on the demonstration machine.

🔛 e-	Manual Viewer - 18.4 Safety Programmable Co	ntroller Operations
ð	🔍 Cross Document Search 💦 🧧 18	14 Safety Programmab 🗙 🔰 🗸 🚺 🗸
E.	1 ↓ ④ → 🌟 및 🚍 🗉	🔣 💭 🧶 🔍 100% <u>5 MAINTENANCE AND IN > 18 CHECKING/CHANGIN > 18 4 Saleh Programmabi > Saleh operat.</u> 📿 📐
	Category -	Safety operation mode switching
100		The safety operation modes (safety mode or test mode) of a CPU module can be switched.
		For details on the operation, refer to the following:
		MELSEC IQ-R CPU Module User's Manual (Application) =
		Window
		[Online]
		Santh Tahing Operation Mode
		Current Operation Mode Text Mode
		Sealeh Ultra
	Contents	Point
	CONDITIONS OF USE FOR T	The safety operation mode of a running CPU module can be checked in the [Module Information List] tab on the "Module Disprostics" screen.
	RELEVANT WANUALS	
	1 FUNDAMENTALS OF GX W	Pressutions
	2 STSTEN DESIGN AND SEL	A project history is automatically registered when switching the safety operation mode
	4 DEBUGGING AND OPERA	For the method for checking registered histories, refer to the following:
	S MAINTENANCE AND INSPLE	17* Revision list screen
	15 PROTECTING DATA 16 NODULE DIAGNOSTI	Considerations before switching the safety operation mode
	17 SAMPLING DEVICE D	A
	18 CHECKING/CHANGIN 18 1 Clock Setting in	A CAUTION
	18.2 Remote Operation 18.3 Redundant Prop	■Test the programs fully in the application environment before switching the mode to the safety mode. ■Before switching to the safety mode, ensure that the programs and parameters of the intended safety
	Safety operation i	project have been written properly by the following operation.
	Safety backupites	Operating procedure
	K	K[0
	[SH-081215ENG-V] GX Works3 Operating In	P SH081215ENC-2C4C

MELSOFT GX Works3

V Test

1] 🔽

Do not show this message from next time

1

PW RUN MODE DLINK SAFETY ERR.	0 4 8 C	1 5 9 D	2 6 A E	3 7 B F	10 11 14 15 18 19 1C 1D	12 13 16 17 1A 1B 1E 1F	
+24V +24V +24V 24G 24C 24C 24C 24C				X0 T0 X1 T1 X2 T0 X3 T1		X10 T2 X11 T3 X12 T2 X13 T3	

10. Check that the SAFETY LED of the safety remote I/O module is on.

2.6 Creating a Safety Program

A program for safety control in the configuration example shown on Page 16 Safety Application Configuration Example must be created as a safety program.

Restriction (")

Safety programs are executed only as a fixed scan execution type program. The supported programming language is ladder only.

2.6.1 Creating a new safety program

Operating procedure



- Double-click [Project] → [Program] in the Navigation window. Then, right-click on [Fixed Scan].
- 2. Select [Add New Data].





- **3.** Click the drop-down button of "Category", and select "Safety".
- **4.** Click the [OK] button.

5. The safety program shown below is created in the same way as the standard program.





The icons of the safety program (MAIN1, ProgPou1, Local Label, ProgramBody) are displayed with yellow background.



<Safety program example>

The following is a part of the sequence program used in Page 73 PREPARING THE DEMONSTRATION MACHINE.



2.6.2 Differences between safety programs and standard programs

The following table lists the differences between safety programs and standard programs.

Item	Safety program	Standard program
Programming language	Ladder	Ladder, ST, FBD/LD, SFC
Program execution type	Fixed scan execution type	 Initial execution type Scan execution type Fixed scan execution type Event execution type Standby type
Number of executable programs	32	252 (including safety programs)
Applicable user device	 Safety input (SA\X) Safety output (SA\Y) Safety internal relay (SA\M) Safety link relay (SA\B) Safety timer (SA\T) Safety retentive timer (SA\ST) Safety counter (SA\C) Safety data register (SA\D) Safety link register (SA\W) 	 Input (X) Output (Y) Internal relay (M) Latch relay (L) Link relay (B) Link special relay (SB) Annunciator (F) Edge relay (V) Timer (T) Long timer (LT) Retentive timer (ST) Long retentive timer (LST) Counter (C) Long counter (LC) Data register (D) Link register (W) Link special register (SW)
Applicable system device	 Safety special relay (SA\SM) Safety special register (SA\SD) 	 Special relay (SM) Special register (SD) Function input (FX) Function output (FY) Function register (FD)

Restriction (")

The safety devices cannot be used in standard programs.

• An index modification and indirect specification cannot be performed in safety programs.

2.6.3 Standard/safety shared labels

A standard/safety shared label is used to send and receive data between safety programs and standard programs.

The following figure shows the data flow using a label, RESET, as an example.

When the label, RESET, is set as a standard/safety shared label, this label can be used in both Program A (safety program) and Program B (standard program).

Data can be sent and received using the standard/safety shared label.



Creating a standard/safety shared label

The following describes the procedure for creating a standard/safety shared label.

Operating procedure



New Data Baic Setting Category Data Type (Data Name) 3 Standard/Safety Shared Safety Shared Safety Shared Category Standard/Safety Shared Category Categor





- Double-click [Project] → [Label] in the Navigation window. And, right-click on "Label".
- 2. Select [Add New Data].

- **3.** Click the drop-down button of "Category", and select "Standard/Safety Shared".
- 4. Click the [OK] button.

- **5.** Enter the data name. Data Name: safety
- 6. Click the [OK] button.

7. Set the following label. This label can be referenced in the programs.

Label Name: safety_data_1 (optional) Data Type: Bit

MELSOFT GX Works3	
Project Edit Eind/Replace Com	vert View Online Debug Diagnostics Iool Window Help _ & ×
i 🗅 😬 💾 😂 🙄 i 🥥	
[동문과] 분위 [<u>일</u> 문 명 종	9 같 같 는 .
Navigation 🛛 🕂 🗙	🚯 safety [Global Label Setting] 🗡 🔍 🗄 🗸
Pter Pt 🔅 All 🔹	Giter> Show Details() >> Digolay Setting Check
An Project	Label Name Data Type English(Display Target) Access from External Device A
	1 safety_data_1 BitSAFETYDATA1
🖺 Initial	
🛛 🏥 Scan	Label Neuro Data Tina English (Tenjar Tenza)
Event 1 safet	y_data_1 Bit
🚹 Standby 🛛 🙎 🕹	
No Execution Type	۲ (ا
FB/FUN	Extended Display: Do Not Show Always
🗏 🌆 Label	System label is reserved to be registered. System label is reserved to be released. The system label is already registered to the system label database.
🖨 🔚 Global Label	To execute the Reservation to Register/Release for the system Researching to Register System Label
🛒 safety	abel, reflection to the system label database is required.
Structured Data Types	It is unnecessary to change reference side project when Reservation to release system Label Database Database
E Device	Only QR series/GO 12000 series is available for system label Ver.2. Import System Label Not Reflected: 0
	Change and save. Total: 0
·'	melsec R085F Host Row 2Column 4 CAP NUM!

8. The label (safety_data_1) in Step 7 can be used in both safety programs and standard programs.

Navigation	ų×	🖶 Prog	Poul (PF	(G] [LD] 2St	ep ×										4
🖳 🖉 😓 🖓 🖓	-	Write	÷	1	2	3	4	5	6	7	8	9	10	11	12
Project	<u>^</u>														
Module Configuration															(LIND)
🗏 🔚 Program		1	(0)												
🏨 Initial															
🗖 🏨 Scan				7	J										L
🗏 🏭 Fixed Scan						- 02			Or	Carros	Evt.	Dopl			
				9		• 30				Cance	LXIII	Dapi			
🖬 🛅 ProgPoul						5	🖹 safety_da	ta_1 BC	OL SAFETYD	ATA1					
💼 Local Label									Sett	ing					
ProgramBody															
🏨 Event															

Safety program execution timing 2.6.4

Safety programs are executed at every safety cycle time (refer to the figure below). Safety cycle processing is performed in the following order: safety input (refresh) \rightarrow safety program \rightarrow safety output (refresh).

Standard programs (+ END processing) are executed within the remaining time of the safety cycle time after safety programs are executed. If a standard program does not end within the remaining time of one safety cycle time, the rest of the program is executed in the remaining time of the next safety cycle time.



Tsc: Safety cycle time

Tsio: Safety programs A, B, C + Safety input/output processing time

(1): The processing time is stored in the following areas

Safety CPU: SD1890, SD1891 Safety function module: Un\G62, Un\G63

Setting a safety cycle time

A safety cycle time is set as follows.

Operating procedure

- 1. Double-click [Parameter] \rightarrow [CPU Parameter] in the Navigation window. Then, double-click [Safety Function Setting].
- 2. Set the safety cycle time. Use the default value here.

Navigation II ×	PROBSECPU CPU Parameter ×		4 ▷ 🗸
□ E - □□ 🔅 All 🔹	Setting Item List	Setting Item	
■ 🐏 ProgPou1 🔹 🖡 🔂 Local Label M ProgramBody	Input the Setting Item to Search	Item Safety Function Setting Safety Cycle Time	Setting
Event Standby Mo Execution Type Morgistered Program FB/FUN Ma Label Morgistered Program Elevent Constant Parameter € System Parameter	Pre- Name Setting ⊕ 10 Operation Related Setting ⊕ 11 Service Processing Setting ⊕ 16 Setting		
CPU Parameter Module Parameter Module Parameter Module Information Module Parameter Module Parameter	tem List Find Result	Set the safety functions.	Restore the Default Settings
			Apply
	melsec R08SF	Host	
Displayed items

Item	Description	Setting range	Default
Safety Cycle Time	Set a timing (safety cycle time) for executing safety programs and safety input/output processing.	1.0 to 1000.0 ms (in increments of 0.1 ms)	10.0 ms

2.7 Overall Flow of Training (System Start-up)

The following is the overall flow of training to be described on Page 73 PREPARING THE DEMONSTRATION MACHINE.

Flow of system start-up	
↓	
Connect a personal computer and the safety programmable controller.	েল Page 23 Connecting the Personal Computer and the Safety
\downarrow	Programmable Controller and Powering on the Demonstration
Power on the demonstration machine.	Wachine
Create a new project using GX Works3.	ি Page 73 Creating a New Project
↓	
Open a program stored in the specified folder.	েল Page 77 Opening the Sequence Program
\downarrow	
Set parameters of the safety programmable controller, safety remote station, and safety communication setting.	C Page 79 Setting the Programmable Controller
Write the program to the safety programmable controller.	E Page 79 Setting the Programmable Controller
\downarrow	
Ready	

3 PREPARING THE DEMONSTRATION MACHINE

The demonstration machine can be operated by writing sequence programs to the safety programmable controller and setting parameters to the safety remote station.

3.1 Creating a New Project

Operating procedure



1. Click \square on the toolbar or select [Project] \rightarrow [New] (\square + \square) from the menu.

- **2.** The "New" window appears. Click the dropdown button of "Series".
- **3.** Select "RCPU" from the drop-down menu.

- 4. Click the drop-down button of "Type".
- **5.** Select "R08SF" from the drop-down menu.

Click the drop-down button of "Program Language". Select "Ladder" from the dropdown menu. Then, click the [OK] button.





Add New User	
<u>U</u> ser Name:	melsec 8
Access Level:	Administrators
	Grant full access to all functions.
Password:	8
<u>R</u> e-enter Password.	
Password Strength:	
Please enter the passwor alphabets A-Z, a-z, single and!*\$\$%&*+,':<= Passwords are case-sens # Add a <u>G</u> UEST User	d with 6 to 32 single-byte characters, numeric characters, -byte space ->@[\^_'{}~. tive.
GUEST user is a user window when reading	who is able to skip entering password at User Authentication g/editing only a standard program.
	9 ОК Сапсе "
	-
	\checkmark
Save as	

8. Enter the user name, password, and re-enter password.

User Name: melsec

Password: melsec

9. Click the [OK] button.

Save as					
Save in:	鷆 sample		- 😋 🎓 📂 🛄 -		
œ	Name	*	Date modified	Туре	
Recent Places		No items match	your search.		
Desktop					
() Libraries					
Computer				(1)	
Network	File name:	melsecsafety 10		Save	
	Save as type:	GX Works3 Project (.gx3)		Cancel	
	Title(A):				
Other Format:					
Save	as a Workspace Fe	ormat Project			
Please (MELSC	change the window FT Navigator supp	vs with this button to use worksp oorts this format.)	pace format project.		



11. Click the [Save] button.

	12. Click the [OK] button.
MELSOFT GX Works3	
Add a module. [Module Name] R08SFCPU [Start I/O No.] 3E00	
Module Setting Setting Change	
Module Label:Not use Sample Comment:Use	
Do Not Show this Dialog Again OK 12	
۲ ۲	
\sim	1.3 The dialog box that confirms an addition of the
MELSOFT GX Works3	label of selected module ("R08SF" here)
In the option setting shown below, set whether to automatically reflect the changes to program editor if label name is edited in label editor.	appears. Click the [OK] button.
[Other Editor] -> [Label Editor Common] ->	
[Track label name automatically in program editor] * Caution	
It may take several minutes to reflect.	
Do not show this dialog again	
ок 13	
ۍ ج	-
V	14. A new project is created.
Image: Source View Online Debug Diagnostics Tool Window Help ● Image: Project Edit End/Replace Convert View Online Debug Diagnostics Tool Window Help ● Image:	
■ Constant	

melsec

R08SF

Host

3.2 Opening the Sequence Program

This section describes how to open the sequence program "iQ-R Safety programmable controller" stored in the specified folder.

Operating procedure



1. Click \bowtie on the toolbar or select [Project] \rightarrow [Open] from the menu.





- The "Open" window appears. Specify the location where the sequence program "iQ-R Safety programmable controller" is stored.
- **3.** Click the sequence program "iQ-R Safety programmable controller".
- **4.** Click the [Open] button to open the specified sequence program.

	5.	The "User Authentication" window appears.
User Authentication (Project)		Enter the following user name and password.
Log on to project.	Use	r Name: melsec
Please enter the User Name and Password registered in the Project.	Pas	sword: melsec
User Name: melsec 5	6.	Click the [OK] button.
Password: 5		
Log on as a GUEST 6 OK Cancel		
$\mathbf{\nabla}$		
MELSOFT GX Works3	7.	The dialog box that confirms an addition of the label of selected module ("R08SF" here)
In the option setting shown below, set whether to automatically reflect the changes to program editor if label name is edited in label editor.		appears. Click the [OK] button.
[Other Editor] -> [Label Editor Common] -> [Track label name automatically in program editor]		
* Caution It may take several minutes to reflect.		
Do not show this dialog again		
ок 7		
∇		
MELSOFT GK Works?	8.	The sequence program (ladder) is displayed.
· Project Edit End Replace Convert View Online Debug Dagnostics Tool Window Help #X · 한편 같이 가 · · · · · · · · · · · · · · · · · ·		
Non-graduation All Image: Non-graduation Image: Non-graduati		
(1) Initial • <td< th=""><th></th><th></th></td<>		
If Fixed Scan CompletionPreparation SM412		
th No forcettion Type 3 (4) 1(a) clock Diregistreed Program		
Second Control Co		
© Co Parameter 4		
PossibleProperDiving SM412		
6 Matrick release matured		
melsec R085F Host 0/14 Step Overwrite CAP 🦽		

3.3 Setting the Programmable Controller

The retrieved sequence program includes parameter settings such as the network refresh settings (refer to Page 39 Network refresh settings). However, writing the retrieved program to the demonstration machine is not enough to operate as a safety programmable controller.

Perform the following operations.

Initializing all data in the programmable controller

For the operation method, refer to the following.

Page 40 Initializing all data in the programmable controller

Converting the entire project

For the operation method, refer to the following.

Page 43 Converting the entire project

Setting the CC-Link IE Field Network slave station

These parameters have already been set to the retrieved sequence program. Execute only "Parameter write" on the "Parameter Processing of Slave Station" window.

For the setting method, refer to the following.

Page 48 Setting the CC-Link IE Field Network slave station

Enabling the CC-Link IE Field Network safety remote station

For the operation method, refer to the following.

Page 54 Enabling the CC-Link IE Field Network safety remote station

Setting the CC-Link IE Field Network safety communication parameters

For the setting method, refer to the following.

Page 57 Setting the CC-Link IE Field Network safety communication parameters

These parameters have already been set to the retrieved sequence program, and therefore the safety communication setting is not required.

Writing parameters to the programmable controller

For the operation method, refer to the following.

Field Network safety communication parameters

Checking the demonstration machine operation controller

After setting above, check that the indicator lamp of the operation preparation switch (RESET) is flashing. Flashing of the lamp indicates the normal operation of the demonstration machine.



Precautions

If the indicator lamp of the operation preparation switch (RESET) is off, the demonstration machine may have failed. Immediately stop the operation, and report to the instructor.

4 OPERATION

4.1 Operating the Safety System Demonstration Machine

4.1.1 Starting the demonstration machine

Check that the indicator lamp (yellow) of the operation preparation switch (RESET) is flashing, and perform the following operations.



4.1.2 Operating the demonstration machine

Check that the demonstration machine has started normally, and then operate the safety components.

The following shows the operating procedure of the demonstration machine, including the three operations (pattern 1, pattern 2, and pattern 3) of the safety components.



Operating procedure

■Pattern 1: Press the emergency stop switch.



1. Press the emergency stop switch of the demonstration machine (safety component side).

Application: To discover hazards and stop the demonstration machine.

- The fan stops. The indicator lamp of the start switch (RUN) turns off, and the stop indicator lamp (STOP) turns on. The SA\X0, SA\X1, SA\Y0, and SA\Y1 LEDs of the safety remote I/O module used in the demonstration machine (safety programmable controller side) turn off.
- **3.** Return the emergency stop switch to its original position.

(Turn the emergency stop switch clockwise.)

- **4.** Check that the stop indicator lamp (STOP) is off and the indicator lamp of the operation preparation switch (RESET) is flashing, and then press the operation preparation switch (RESET).
- Check that the indicator lamp of the start switch (RUN) is flashing, and press the start switch (RUN). The demonstration machine recovers, and the fan starts its operation again.

■Pattern 2: Block off the light from the safety light curtain.



1. Bring your hand near the fan of the demonstration machine (safety component side), and block off the light from the safety light curtain.

Application: To detect a person entering from the opening.

- The fan stops. The indicator lamp of the start switch (RUN) turns off, and the stop indicator lamp (STOP) turns on. The SA\X2, SA\X3, SA\Y0, and SA\Y1 LEDs of the safety remote I/O module used in the demonstration machine (safety programmable controller side) turn off.
- **3.** Remove your hand, and stop blocking off the light.

- **4.** Check that the stop indicator lamp (STOP) is off and the indicator lamp of the operation preparation switch (RESET) is flashing, and then press the operation preparation switch (RESET).
- Check that the indicator lamp of the start switch (RUN) is flashing, and press the start switch (RUN). The demonstration machine recovers, and the fan starts its operation again.

■Pattern 3: Remove the actuator of the safety guard switch.



1. Remove the actuator of the safety guard switch of the demonstration machine (safety component side).

Application: To detect opening of the safety guard.

- The fan stops. The indicator lamp of the start switch (RUN) turns off, and the stop indicator lamp (STOP) turns on. The SA\X6, SA\X7, SA\Y0, and SA\Y1 LEDs of the safety remote I/O module used in the demonstration machine (safety programmable controller side) turn off.
- **3.** Insert the removed actuator into its original position.

- **4.** Check that the stop indicator lamp (STOP) is off and the indicator lamp of the operation preparation switch (RESET) is flashing, and then press the operation preparation switch (RESET).
- Check that the indicator lamp of the start switch (RUN) is flashing, and press the start switch (RUN). The demonstration machine recovers, and the fan starts its operation again.

4.1.3 Ladder monitor

The non-safety status caused by the safety component operations described on Page 82 Operating the demonstration machine can be checked using the ladder monitor function of GX Works3.

Window

1. Double-click [Project] \rightarrow [Program] \rightarrow [Fixed Scan] \rightarrow [MAIN1] \rightarrow [ProgPou1] \rightarrow [ProgramBody] in the Navigation window to open the fixed scan execution type program.



2. Click
on the toolbar or select [Online] → [Monitor] → [Monitor Mode] from the menu. The window switches to the monitoring mode.



The ladder monitor windows displayed during each safety component operation are shown below:

Pattern 1: Press the emergency stop switch.

(1) The device for the emergency stop switch, SA\X0, turns off.



Pattern 2: Block off the light from the safety light curtain.

(1) The device for the safety light curtain, SA\X2, turns off.



Pattern 3: Remove the actuator of the safety guard switch.

(1) The device for the safety guard switch, SA\X6, turns off.



5 DIAGNOSTICS AND MAINTENANCE

5.1 Checking the Diagnostic Result at Error Occurrence Using GX Works3

5.1.1 Diagnostic function of the safety programmable controller

An error (disconnection, short circuit) of the safety remote I/O module connected can be checked using the sensor/device monitor function of GX Works3.

Operating procedure





 Select [Diagnostics] → [Sensor/Device Monitor] from the menu.

2. Select a module to be diagnosed, and click the [OK] button.

Module Selection	(Sensor/Device Monitor)	<u> </u>
Start the Sensor/D	evice Monitor of the selecte	d module.
Start I/O	Network Type	Module Name
-	Ethemet	R08SFCPU
0010	CC-Link IE Field	RJ71GF11-T2 2
	2 ок	Cancel
	Ъ	

- 3. Click the [Yes] button.
- MELSOFT GX Works3 23 The information of the connected module will be read and the configuration will be displayed. Do you want to execute? - The configuration currently displayed will be cleared and the information is updated to the information of the connected module. - Clear all the holding parameter information of slave station parameter processing. - Please confirm that the connection destination PLC is correct. - Please confirm that the master module is set correctly. "Station-specific mode setting" will be set with initial value.
 Display the value for "RX/RY Setting" and "RWw/RWr Setting" when writing network configuration setting in master station. 3 Yes No
 - ∇

💾 Se	nsor/D	evice	Monito	r for O	C IE Field	l (Start I	/0:0010))						-		×
<u>S</u> er	nsor/De	evice I	Aonito	<u>E</u> dit	View	Online										
		_	Detect	Now	_	1					Monito	or —				=
												Start Mo	onitoring		Stop M	lonit
													-			
										RX	/RY Setti	ng	RWw	/RWr Se	tting	
		No.		Mode	el Name		STA#	Station Ty	be	Points	Start	End	Points	Start	End	h
	-	1	NZ2GF	SS2-32	D		1	Remote Device Sta	tion	80	0000	004F	16	0000	000F	=
	-	-	NZ2EX	SS2-8TE			-	-								
	**	2	NZ2GF	2B1-32	DT	_	2	Intelligent Device S	tation	32	0050	006F	20	0010	0023	-
	•														F	
				A #1			CTA #									
			51.	A#1			STA#.	2								
Hosts	station						- I.									
STA Tot	\#0 Ma al STA#	ister ≢:2			Detect	Now										
Line	e/Star				Dettect			(c) _ c) .:	_	_						
			NZ2G	F:	Parame	ter Pro	cessing	of Slave Station	_ (
			-	20	Comm	and Exe	cution d	or Slave Station	-1	4J						
			•		Backup	Slave S	tation									P.
: Ma	aitoria	a Info	mation		Restore	Slave S	tation									¥
: 10101	nitoning	ginio	mation		Open S	ystem (Configu	ration	•	-	-	-	-	-	-	-
M	odel N	ame	NZ2	GFSS2	-32D											
Sta	ate Mo	nitor														
				Link	Device				Current	Value			-			
				RX0					OFF(0)							
				RX1					OFF(0)							
				RX2 RX3					OFF(0)							
	-			RX4					OFF(0)							
	- 111			RX5					OFF(0)							
				RX6					OFF(0)							
				RX8					OFF(0)					-		
				1010					511(0)				-			

Select the safety remote I/O module
 "NZ2GFSS2-32D" in the list. Right-click on the module in the system configuration, and select [Online] → [Command Execution of Slave Station].

 \bigtriangledown

5. Click the [Yes] button.





mmand Execution of	f Slave Station	_			×	υ.	THE C
arget Module Inform	nation: NZ2GFSS2-32D,NZ2EXSS2-8TE Start I/O No.:0010 - Station No.:1	8					windo
ethod selection:	Error history read 9	The error history is rea	d from the t	arget module.	* *	9.	Set "N
Command Settin	g						and ci
Currentine Describ	There is no comm	nand setting in the selected process	s.				
Name		Read Value	Unit	Description	-		
Error history 1	read			1			
Error and Solu	tion	No error					
Error item nur	nber	0x0000					
[Error time] F	irst two digits of the year/Last two digits of th	ie year 0					
[Error time] N	Ionth/Day	0					
[Error time] H	econd/No Lise	0					
Error code de	tais 1	0x0000			-		
•					Þ		
.The refreshed de	avice values of remote 1/0 or remote registers	may be overwritten					
-Accesses the PL	C CPU by using the current connection destina	ition. Please check if there is any pr	oblem with t	he connection destination	i l		
-Process is execut	ted according to the parameters written in the	e PLC CPU. afer to the Operating Manual					
-For information o	in certs not displayed on the screen, please re	erer to the Operating Manual.		(9)		
					Execute		
Cours in t	00010				Close		
Jave III C	ne CSV Tie	公					
Javeni	ne CSV me	₽				 10	- Click
MELSOFT (GX Works3	₽			2	10	. Click
AELSOFT (3X Works3		cuted.		Σ	10	. Click
AELSOFT (GX Works3 The process "Error histo The operation of the sla	ry read" will be exerve station may be o	cuted. change	: by the execut	tion of	10	- Click
MELSOFT (3X Works3 The process "Error histo The operation of the sla the process "Error histor	ry read" will be exe ve station may be o y read".	cuted. change	: by the execut	tion of	10	. Click
	GX Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th	ry read" will be exe ve station may be o y read".	cuted. change	: by the execut	tion of	10	. Click
AELSOFT (GX Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th	ry read" will be exe ve station may be o y read". e device value of the	cuted. change ne PLC	e by the execut CPU refreshin	tion of g the	10	. Click
IELSOFT (3X Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th remote I/O and remote	ry read" will be exe ve station may be o y read". e device value of th registers.	cuted. change ne PLC	: by the execut CPU refreshin	tion of ug the	10	. Click
MELSOFT (GX Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th remote I/O and remote Please confirm safety be	ry read" will be exe ve station may be o y read". e device value of th registers. efore the execution	cuted. change ne PLC	e by the execut CPU refreshin	tion of g the	10	. Click
IELSOFT (GX Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th remote I/O and remote Please confirm safety be	ry read" will be exe ve station may be o ry read". e device value of th registers. efore the execution	cuted. change ne PLC	: by the execut CPU refreshin	tion of Ig the	10	. Click
AELSOFT (3X Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th remote I/O and remote Please confirm safety be	ry read" will be exe ve station may be o y read". e device value of th registers. efore the execution	cuted. change ne PLC	by the execut CPU refreshin	tion of g the	10	- Click
AELSOFT (GX Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th remote I/O and remote Please confirm safety be -Please confirm that the	ry read" will be exe ve station may be or y read". e device value of th registers. efore the execution e Connection Destin	cuted. change ne PLC nation	e by the execut CPU refreshin PLC is correct	tion of ig the	10	. Click
AELSOFT (GX Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th remote I/O and remote Please confirm safety be -Please confirm that the -Please confirm that the	ry read" will be exe ve station may be o y read". e device value of th registers. efore the execution e Connection Destin c C IE Field modul	cuted. change ne PLC nation e is set	by the execut CPU refreshin PLC is correct	tion of Ig the	10	. Click
AELSOFT (3X Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th remote I/O and remote Please confirm that the -Please confirm that the -Please confirm that the	ry read" will be exe ve station may be o y read". e device value of th registers. efore the execution c Connection Destin c C IE Field modul	cuted. change ne PLC nation le is set	by the execut CPU refreshin PLC is correct correctly.	tion of Ig the	10	. Click
MELSOFT (GX Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th remote I/O and remote Please confirm safety be -Please confirm that the -Please confirm that the -Please confirm that the	ry read" will be exe ve station may be o y read". e device value of th registers. efore the execution e CONNECTION Destin CONNECTION Destin e CONNECTION Destin e CONNECTION Destin e CONNECTION Destin e CONNECTION Destin e CONNECTION Destin e CONNECTION DESTIN	cuted. change ne PLC nation e is set n is cor	e by the execut CPU refreshin PLC is correct correctly. rrect.	tion of g the	10	. Click
MELSOFT (GX Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th remote I/O and remote Please confirm safety be -Please confirm that the -Please confirm that the -Please confirm that the -Please confirm that the Do you want to execute	ry read" will be exe ve station may be or y read". e device value of th registers. efore the execution e Connection Destin CC IE Field modul target slave station ?	cuted. change nation e is set n is cor	e by the execut CPU refreshin PLC is correct correctly. rrect.	tion of ig the	10	. Click
MELSOFT (3X Works3 The process "Error histo The operation of the sla the process "Error histor Also it may overwrite th remote I/O and remote Please confirm that the -Please confirm that the -Please confirm that the Do you want to execute	ry read" will be exerved station may be or y read". e device value of the registers. effore the execution e Connection Destine CC IE Field module target slave station ?	cuted. change ne PLC nation n is cor	e by the execut CPU refreshin PLC is correct correctly. rrect.	tion of ig the	10	. Click

- **8.** The "Command Execution of Slave Station" window appears.
- **9.** Set "Method selection" to "Error history read", and click the [Execute] button.

10. Click the [Yes] button.



11. The error history of the safety remote I/O module is displayed in "Execution Result".

Name	Read Value	Unit	Description
Error history 1 read			
Error and Solution	0204H Double input discre		
Error classification	450		
Error item number	0x0204		
[Error time] First two digits of the year/Last two digits of the year	2018		
[Error time] Month/Day	531		
[Error time] Hour/Minute	1532		
[Error time] Second/No Use	3800		
Error code details 1	0x0001		
< III			•

Item	Description	Example ^{*1}
Error and Solution	The error code and description of the error are displayed.	-
Error classification	The error classification of the safety error subset code is stored.	-
Error item number	The error item number of the safety error subset code is stored.	-
[Error time] First two digits of the year/ Last two digits of the year ^{*2}	The error date and time are displayed. (When the tens place of month, hour, and second is "0", "0" is omitted.)	2018
[Error time] Month/Day ^{*2}		531
[Error time] Hour/Minute ^{*2}		1532
[Error time] Second/No Use ^{*2}		3800
Error code details 1 to Error code details 7	The detailed information of some errors is stored. The data to be stored depends on the error. For details, refer to the following. CC-Link IE Field Network Remote I/O Module (With Safety Functions) User's Manual	-

*1 The values are the ones when an error occurs at 15:32:38, May 31th, 2018.

*2 The clock information of the error is based on the clock information acquired from the Safety CPU of the master station. When an error has occurred before the clock information is acquired, the error date and time are not recorded.

Point P

- The error history records up to 15 errors. If 16 or more errors occur, the recorded error is deleted from the oldest.
- If the same error occurs successively, only the first error is stored into the error history.
- Even after the module power supply is turned off and on, the error history is held.
- The clock information of the error is based on the clock information acquired from the Safety CPU of the master station. To acquire the exact error date and time, match the clock information of the Safety CPU with the actual time.
- To initialize the error history, set "Method selection" to "Error history clear request" on the "Command Execution of Slave Station" window, and click the [Execute] button.

5.1.2 Checking an error (disconnection)

This section describes how to check a disconnection using the sensor/device monitor function by deliberately generating a disconnection on the demonstration machine.

Before the training, check that the fan of the demonstration machine (safety component side) is operating properly. A disconnection is generated in the double wiring part. For details on the double wiring, refer to the following.

Operating procedure



1. Turn on the OPEN (disconnection simulation) switch of the demonstration machine (safety programmable controller side).

2. The indicator lamp of the start switch (RUN) turns off, and the stop indicator lamp (STOP) turns on.

3. The error is displayed in "Execution Result" as follows.

(The error (disconnection) is displayed as "Double input discrepancy detection error".)

lame	Read Value	Unit	Description	
Error history 1 read				
Error and Solution	0204H Double input discre			
Error classification	450			
Error item number	0x0204			
[Error time] First two digits of the year/Last two digits of the year	2018			
[Error time] Month/Day	531			
[Error time] Hour/Minute	1532			
[Error time] Second/No Use	3800			
Error code details 1	0x0001			

Item	Description
Error and Solution	0204H Double input discrepancy detection error
Error classification	450
Error item number	0x0204
[Error time] First two digits of the year/Last two digits of the year	2018
[Error time] Month/Day	531
[Error time] Hour/Minute	1532
[Error time] Second/No Use	3800
Error code details 1 to Error code details 7	The detailed information of some errors is stored. The data to be stored depends on the error. For details, refer to the following. CC-Link IE Field Network Remote I/O Module (With Safety Functions) User's Manual

5.1.3 Checking an error (short circuit)

This section describes how to check a short circuit using the sensor/device monitor function by deliberately generating a short circuit on the demonstration machine.

Before the training, check that the fan of the demonstration machine (safety component side) is operating properly. A short circuit is generated in the input dark test circuit. For details on the input dark test circuit, refer to the following.

Operating procedure



1. Turn on the SHORT (short-circuit simulation) switch of the demonstration machine (safety programmable controller side).

2. The indicator lamp of the start switch (RUN) turns off, and the stop indicator lamp (STOP) turns on.

3. The error is displayed in "Execution Result" as follows.

(The error (short circuit) is displayed as "Input dark test error".)

Name	Read Value L		Description
Error history 1 read			
Error and Solution	0205H Input dark test error		
Error classification	450		
Error item number	0x0205		
[Error time] First two digits of the year/Last two digits of the year	2018		
[Error time] Month/Day	601		
[Error time] Hour/Minute	921		
[Error time] Second/No Use	2200		
Error code details 1	0x00F3		
< III	•		•

Item	Description
Error and Solution	0205H Input dark test error
Error classification	450
Error item number	0x0205
[Error time] First two digits of the year/Last two digits of the year	2018
[Error time] Month/Day	601
[Error time] Hour/Minute	921
[Error time] Second/No Use	2200
Error code details 1 to Error code details 7	The detailed information of some errors is stored. The data to be stored depends on the error. For details, refer to the following. CC-Link IE Field Network Remote I/O Module (With Safety Functions) User's Manual

5.2 How to Recover from an Error

This section describes how to recover from errors described in Section 5.1.2 and Section 5.1.3.

5.2.1 Powering off and on the demonstration machine

This section describes the recovery procedure by powering off and on the demonstration machine.

Operating procedure



STOP RUN RESET

1. Turn off the OPEN (disconnection simulation) switch and the SHORT (short-circuit simulation) switch.

2. Turn off the main power supply, and turn it on again.



3. When the demonstration machine recovers, the indicator lamp of the operation preparation switch (RESET) flashes.

5.2.2 Holding down the operation preparation switch (RESET) for five seconds

This recovery method uses the function block in the program. This section describes the recovery procedure and the program operation.

Program name: RESET (Program type: Scan execution type)

Function block name: M+RJ71GF11_RemoteReset

Operating procedure



Off!

Off!

Flashing!

1. Turn off the OPEN (disconnection simulation) switch and the SHORT (short-circuit simulation) switch.

 Hold down the operation preparation switch (RESET) for five seconds. The function block, M+RJ71GF11_RemoteReset, starts up.

3. When the demonstration machine recovers, the indicator lamp of the operation preparation switch (RESET) flashes.

Program operation

When the operation preparation switch (RESET) is held down, the program operates as follows.

1. The "ResetPushButton" label in the program turns on, starting up the function block, M+RJ71GF11_RemoteReset. M+RJ71GF11_RemoteReset sends a remote STOP request to the target station (safety remote I/O module) and then sends a remote RESET request.

For details on the function block, M+RJ71GF11_RemoteReset, refer to the following.

2. M20 (Interlock release instruction) turns on, and the interlock circuit is released.



5.2.3 Using the auto recovery parameter

This recovery method uses the auto recovery parameter of the safety programmable controller. This section describes the recovery procedure, auto recovery parameter setting, and recovery timing.

This method can be used to recover from a disconnection.

The auto recovery parameter has already been set to the program used in the demonstration machine.

Operating procedure



1. Turn off the OPEN (disconnection simulation) switch.

2. The fan stops. The indicator lamp of the start switch (RUN) turns off, and the stop indicator lamp (STOP) turns on.

3. Press the emergency stop switch of the demonstration machine (safety component side).

- **4.** Return the emergency stop switch to its original position.
- (Turn the emergency stop switch clockwise.)



5. When the demonstration machine recovers, the indicator lamp of the operation preparation switch (RESET) flashes.

Auto recovery parameter setting

When the disconnection cause is eliminated by enabling the double input discrepancy auto recovery function, the demonstration machine automatically recovers to the normal state.

The reset operation of the safety remote I/O module to clear the error is not required.

■Double input discrepancy auto recovery function setting

Operating procedure



 On the "CC IE Field Configuration" window, select "NZ2GFSS2-32D" in the list. Then, rightclick on the module, and select [Online] → [Parameter Processing of Slave Station].



	lodule Information:	NZ2GFSS2-320 Start I/O No.:0	,NZ2EXSS2-8TE 1010 - Station N	: o.:1							
thod s	selection:	Parameter write	2		Write p dosing	arameters this windo	to the target mo w, write paramet	dule. Sin ters or ex	ce the setting va port them before	alues are discarded by e closing the window.	
Para	meter Information				Cle	ar All "Rea	ad Value"		Clear	All "Write Value"	
Select All Cancel All			Selections		Copy "Initial Value" to "Write Value"				Copy "Read Value" to "Write Value"		
	Name		Initial Value	Unit	Read Value	Unit	Write Value	Unit	Setting Range	Description	
	Double input o	discrepancy d	0: Discrepa				0: Discrepa		a stange tunge	This setting value is igr	
	Double input of	discrepancy d	0: Discrepa				0: Discrepa			This setting value is igr	
	Double input of	discrepancy d	0: Discrepa				0: Discrepa			This setting value is igr	
	Double input of	discrepancy d	0: Discrepa				0: Discrepa			This setting value is igr	
	Double input of	discrepancy d	0: Discrepa				0: Discrepa	12		This setting value is igr	
V	Double input disc	crepancy auto	0: Not used				1: Used	ເວ		The operation of error	
V	 Double input dist 	crepancy dete								Set the allowable perio	
	Double input of	discrepancy d	1	x10ms		x10ms	1	x10ms	1 to 6000	This setting value is igr	
	Double input of	discrepancy d	1	x10ms		x10ms	1	x10ms	1 to 6000	This setting value is igr	
	Decible innect o	diagramment d	4	w10mg		v10mo	4	v10mo	1 80 6000	This catting unless is inc	
FIOC	23 0 0 001			There is I	no option in the	selected p	process.				
-The	refreshed device va esses the PLC CPU b tess is executed acco	lues of remote I/ y using the curre ording to the para not displayed on	O or remote reg nt connection de ameters written the screen, ple	isters ma estinatior in the PL ase refer	y be overwritte h. Please check C CPU. to the Operati	m. if there is ng Manual	any problem with	n the con	nection destination	on.	
-Acce -Proc -For i	able safety module v	when succeed to	write parameter	r			(シ	Execute	Parameter Processing	

The process "Parameter write" will be executed, targeting the selected

. The operation of the slave station may be change by the execution of

Also it may overwrite the device value of the PLC CPU refreshing the

-Please confirm that the Connection Destination PLC is correct. -Please confirm that the CC IE Field module is set correctly. -Please confirm that the target slave station is correct.

5

MELSOFT GX Works3

parameters.

the process "Parameter write".

Do you want to execute?

remote I/O and remote registers. Please confirm safety before the execution.

- 2. The "Parameter Processing of Slave Station" window appears. Set "Method selection" to "Parameter write".
- **3.** Scroll down the window, and set "Write Value" of "Double input discrepancy auto recovery setting" to "1: Used". This parameter has already been set to the program used in the demonstration machine.
- **4.** Click the "Execute Parameter Processing" button.



23

No

 User Authentication (PLC)
 Image: Constrained in PLC.
 <td

<u>Y</u>es



■Auto recovery timing

To clear the double input discrepancy detection error (disconnection), both actual input signals need to be turned off. The following figure shows the auto recovery timing from the double input discrepancy detection error.



(1) Both SA\X0 and SA\X1 turn off when a discrepancy is detected.

(2) A double input discrepancy detection error occurs.

(3) When both X0 and X1 turn on, the auto recovery is not performed.

(4) When both X0 and X1 turn off, the auto recovery is performed.

APPENDICES

Appendix 1 Ladder Programs Used in This Manual

The following are the ladder programs used in this manual.









Safety program (Type: Fixed scan execution type, Name: ProgPou1)

Appendix 2 Profile Registration

If the following modules are not displayed in the module list on the "CC IE Filed Configuration" window, register their profiles.

- NZ2GFSS2-32D (Basic digital input module)
- NZ2EXSS2-8TE (Extension digital output module)
- NZ2GF2B1-32DT (Basic digital I/O combined module)

Point P

Before registering the profile, download the following profile data from the MITSUBISHI ELECTRIC FA Global Website.

- 0x0000_NZ2GFSS2-32D_1_en.zip
- 0x0000_NZ2EXSS2-8TE_1_en.cspp.zip
- 0x0000_NZ2GF2B1-32DT_1_en.CSPP.zip

Restriction (")

Register profiles when no project is open.

Operating procedure



1. Select [Tool] \rightarrow [Profile Management] \rightarrow [Register] from the menu.


Appendix 3 User Management

Three access levels (Administrators, Developers, Users) are provided for projects used in the safety programmable controller. These access levels can be set to users who log in to the projects.

When a project is opened, the login window appears. Depending on the access level of the user, operations are restricted.

Appendix 3.1 Adding, deleting, and changing a login user

This section describes how to add, delete, or change a user who logs in the project used in the safety programmable controller.

Ор	erating procedure	
🖪 ME	LSOFT GX Works3	
Pro	ect Edit Find/Replace Convert View	Online Debug Diagnostics Tool Win
	New Ctrl+N	
	Open Ctrl+O	
	Close	
	Save Ctrl+S	
	Save As	
x.	Delete	
	Project Verify	
	Project Revision	
Ì.	Change Module Type/Operation Mode	
	Data Operation	
	Intelligent Function Module	
	Open Other Format File	
	Library Operation	
	Security •	User Management 1
	Printer Setup	Change User Password
	Page Setup	Security Key Setting
	Print Preview	Security Key Management
8	Print Ctrl+P	Block Password Setting
	Recent Projects(K)	File Password Setting
	Start GX Works2	
	Exit(Q)	

How to open the "User Management" dialog box

Select [Project] → [Security] → [User Management] from the menu.

- 2. The User Management 2 User List Number of Registration 1/128 Enable the GUEST User User Name Access Level melsec Administrators Add... Delete... Change... OK Cance
 - **2.** The "User Management" dialog box appears.

Adding a login user

Operating procedure

ser Management		×
User List	Number of Regis	ration 1/128
User Name 🔺	Access Level	
melsec	Administrators	
Add Delete	Change OK	Cancel



1. Click the [Add] button.

 The "Add New User" dialog box appears. Set the user name, access level, and password.
 User Name: melsec1

Access Level^{*1}: Developers

CCess Level . Developers

Password: melsec1

- *1 For the authority of each access level, refer to the following.
- **3.** Click the [OK] button.



4. A new user is added.

■Deleting a login user



■Changing a login user

Operating procedure

ser Management		2
User List	Number of Registration 2/128	
User Name 🔺	Access Level	
melsec	Administrators	
	0	



Add...

Delete...

Change...

OK

Cancel

- **1.** Select a user name whose access level to be changed. Select "melsec1" here.
- 2. Click the [Change] button.

- **3.** Set the access level. Select "Users"^{*1} here.
- **4.** Enter the password. (Password: melsec1)

Α

5. Click the [OK] button.

6. The access level of the user "melsec1" is changed to "Users".

Access levels

An access level is an operation privilege granted to a user who logs in to the project and the CPU module.

Access level		Operation authority	
High	Administrators	Administrator level A user of this level can perform all operations including the user management of the project and the CPU module.	
¥	Developers	 Developer level A user of this level can perform operations except for the user management and security setting. 	
Low	Users	Operator level A user of this level can browse the project and monitor the CPU module.	

Project function availability (operations that require user authentication)

The following table lists the project functions to be restricted depending on the access level of the user.

\bigcirc : Available, \times : Not available

Function	Access level			
	Administrators	Developers	Users	
Overwriting	0	0	×	
User management	0	×	×	
Deleting the user information of a project	0	×	×	
Project revision history	0	0	×	
Changing the module type and operation mode	0	×	×	
Online program change	0	0	×	

Appendix 4 Calculating Safety Response Time

Calculate the safety response time referring to the following.

MELSEC iQ-R Safety Application Guide

Appendix 1 Calculating Safety Response Time for System Configured with a Safety CPU

Appendix 2 Calculating Safety Response Time for System Connected to Multiple Safety CPUs

Appendix 5 Safety Programmable Controller

This section describes the specifications and functions of the safety programmable controller.

Appendix 5.1 General specifications

For details, refer to the following.

Section 4.1 General Specifications in the MELSEC iQ-R Module Configuration Manual

Appendix 5.2 Specifications of the CPU module

For details, refer to the following.

Section 2.1 CPU Module in the MELSEC iQ-R CPU Module User's Manual (Startup)

Appendix 5.3 Specifications of the power supply module

The specifications of the power supply module is the same between the safety programmable controller and the standard programmable controller.

For details, refer to the following.

Section 4.2 Performance Specifications of Power Supply Module in the MELSEC iQ-R Module Configuration Manual

Appendix 5.4 Specifications of the base unit

The specifications of the base unit is the same between the safety programmable controller and the standard programmable controller.

For details, refer to the following.

Section 4.3 Performance Specifications of Base Unit in the MELSEC iQ-R Module Configuration Manual

Appendix 5.5 Functions of the safety programmable controller

For details, refer to the following.

PART 5 WHEN USING THE SAFETY CPU in the MELSEC iQ-R CPU Module User's Manual (Application)

Appendix 6 Safety Remote I/O Module

This section describes the specifications of the safety remote I/O module.

Appendix 6.1 Specifications of the safety remote I/O module

For details, refer to the following

Chapter 2 SPECIFICATIONS in the CC-Link IE Field Network Remote I/O Module (With Safety Functions) User's Manual

Appendix 6.2 Terminal layout of the safety remote I/O module

For details, refer to the following.

Section 2.2 Performance Specifications in the CC-Link IE Field Network Remote I/O Module (With Safety Functions) User's Manual

Appendix 7 Clearing an Error of the Safety Programmable Controller

For details, refer to the following.

Section 6.3 Error Clear and Appendix 1 Error Codes in the MELSEC iQ-R CPU Module User's Manual (Application)

Appendix 8 Parameter List

For the parameter list, refer to the following.

Appendix 10 Parameter List in the MELSEC iQ-R CPU Module User's Manual (Application)

Appendix 9 Instructions

This section describes the instructions used in the safety programmable controller.

Appendix 9.1 Overview

- Instruction configuration
- Data specification method
- Execution condition
- Instruction processing time reduction
- Precautions on programming

For details, refer to the following.

PART 1 OVERVIEW in the MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

Appendix 9.2 List of instructions and FUNs/FBs

- CPU module instructions
- Module dedicated instructions
- Standard functions
- Standard function blocks
- For details, refer to the following.

PART 2 LISTS OF INSTRUCTIONS AND FUN/FB in the MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

Appendix 9.3 CPU module instructions

For details, refer to the following.

PART 3 SEQUENCE INSTRUCTIONS, PART 4 BASIC INSTRUCTIONS, PART 5 APPLICATION INSTRUCTIONS in the MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

Appendix 9.4 Module dedicated instructions

For details, refer to the following.

PART 6 MODULE DEDICATED INSTRUCTIONS in the MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

MELSEC iQ-R Programming Manual (Module Dedicated Instructions)

Appendix 9.5 Standard functions

For details, refer to the following.

PART 7 STANDARD FUNCTIONS in the MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

Appendix 9.6 Standard function blocks

For details, refer to the following.

PART 8 STANDARD FUNCTION BLOCKS in the MELSEC iQ-R Programming Manual (CPU Module Instructions, Standard Functions/Function Blocks)

Appendix 10 Safety Function Blocks

Safety function blocks are the manufacturer provided function blocks that have received the certifications of ISO 13849-1:2015 (PLe), IEC 62061:2012 (SIL3), and IEC 61508:2010 (SIL3).

Safety function blocks can only be used in the MELSEC iQ-R series Safety CPU.

For details, refer to the following.

MELSEC iQ-R Safety Function Block Reference

Appendix 11 Special Relay (SM)

For details, refer to the following

Appendix 4 List of Special Relay Areas in the MELSEC iQ-R CPU Module User's Manual (Application)

Appendix 12 Special Register (SD)

For details, refer to the following

Appendix 5 List of Special Register Areas in the MELSEC iQ-R CPU Module User's Manual (Application)

Appendix 13 Safety Special Relay (SA\SM)

For details, refer to the following.

Appendix 6 List of Safety Special Relay Areas in the MELSEC iQ-R CPU Module User's Manual (Application)

Appendix 14 Safety Special Register (SA\SD)

For details, refer to the following.

Appendix 7 List of Safety Special Register Areas in the MELSEC iQ-R CPU Module User's Manual (Application)

Appendix 15Error Codes

For details, refer to the following.

Appendix 1 Error Codes in the MELSEC iQ-R CPU Module User's Manual (Application)

Mitsubishi Programmable Controllers Training Manual Safety Programmable Controller Basic Course

MODEL	SCHOOL-R-SAFETY-E
MODEL CODE	-
	-

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