

Servo System Controller

MELSEC iQ-R/iQ-F Series Motion Module Basics (Simple Motion Mode)

This training course is intended for those who will construct a motion control system using the Simple Motion mode of the MELSEC iQ-R/iQ-F Series Motion modules for the first time.

Click the Forward button at the upper right corner to proceed to the next page.

This course is designed for anyone new to the Simple Motion mode of the MELSEC iQ-R/iQ-F Series Motion modules to learn about system design, installation, wiring, setting, and programming.

This course requires the basic knowledge of the MELSEC iQ-R Series programmable controller or MELSEC iQ-F Series programmable controller in addition to AC servos and positioning control.

For beginners, we recommend the following courses.

- "MELSEC iQ-R Series Basic" Course or "MELSEC iQ-F Series Basics" Course
- "GX Works3 (Ladder)" Course
- "MELSERVO Basics (MR-J5)" Course
- "FA Equipment for Beginners (Positioning)" Course

PLCopen[®] is the registered trademark of PLCopen.

The contents of this course are as follows.
We recommend that you start from Chapter 1.

Chapter 1 Overview of Simple Motion Mode

This chapter describes the overview of Simple Motion mode and differences from the PLCopen[®] motion control FB mode.

Chapter 2 System of Simple Motion Mode

This chapter describes the hardware configuration of the servo system used in this course.

Chapter 3 Creating a Project

This chapter describes the procedure that begins with creating a project and extends through the setting of each parameter.

Chapter 4 Positioning Control and Interpolation Control Program

This chapter describes the initial setting (all axis servo ON), JOG operation, and program for operating the positioning data.

Chapter 5 Digital Oscilloscope

This chapter describes how to check the operation of the sample program by using a digital oscilloscope.

Final Test

5 sections in total (19 questions) Passing grade: 60% or higher

Introduction How to Use This e-Learning Tool

Go to the next page		Go to the next page.
Back to the previous page		Back to the previous page.
Move to the desired page		"Table of Contents" will be displayed, enabling you to navigate to the desired page.
Exit the learning		Exit the learning. Window such as "Contents" screen and the learning will be closed.

■Safety precautions

When you learn based on using actual products, please carefully read the safety precautions in the corresponding manuals and handle the product properly while taking all precautions for safety.

■Precautions in this course

The screen images shown in the course may differ from your actual software depending on the version. The following software versions are used in the course.

For the latest version of each software, check the Mitsubishi Electric FA Website.

MELSOFT GX Works3	Ver.1.082L	Simple Motion Module Setting	Ver.1.172E
MELSOFT MR Configurator2	Ver.1.130L		

The content of this course involves restrictions on the firmware version of each module.

- The firmware version of the iQ-R PLC CPU must be 44 or later (12 or later for R00/01/02CPU).
- The firmware version of the RD78G Motion module must be 16 or later.
- The firmware version of the iQ-F PLC CPU must be 1.230 or later.
- The firmware version of the FX5-□SSC-G Motion module must be 1.001 or later.

For how to update the firmware version, refer to the Mitsubishi Electric FA Website or the module configuration manual.

The book  icon indicates the reference manual.

The contents of the manuals described in this course are those of the following versions.

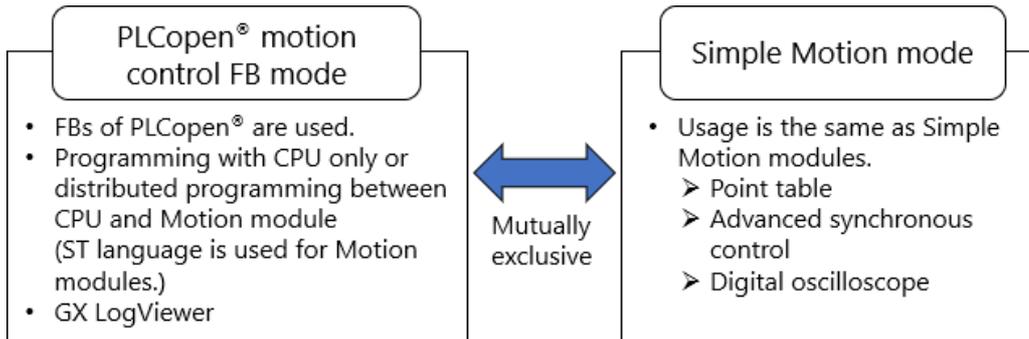
If the versions differ, the location of description and contents may be slightly different.

For the latest version of each manual, refer to the Mitsubishi Electric FA Website.

Manual name	Manual No.	Version
MELSEC iQ-R Motion Module User's Manual (Startup)	IB-0300406	F
MELSEC iQ-R Motion Module User's Manual (Network)	IB-0300426	F
MELSEC iQ-R Motion Module User's Manual (Application for Simple Motion Mode)	IB-0300572	D
MELSEC iQ-R Motion Module (Simple Motion Mode) Function Block Reference	BCN-B62005-1040	B
MELSEC iQ-F FX5 Motion Module/ Simple Motion Module User's Manual (Startup)	IB-0300251	H
MELSEC iQ-F FX5 Motion Module/ Simple Motion Module User's Manual (Application)	IB-0300253	J
MELSEC iQ-F FX5 Motion Module User's Manual (CC-Link IE TSN)	IB-0300568	C
MELSEC iQ-F FX5 Motion Module/ Simple Motion Module Function Block Reference	BCN-B62005-719	C

The RD78G Motion module has two different modes: "PLCopen[®] motion control FB mode" and "Simple Motion mode". This chapter describes the overview of Simple Motion mode and differences from the PLCopen[®] motion control FB mode.

Simple Motion mode is an operation mode compatible with RD77MS/GF, QD77MS/GF, and FX5-□SSC-S Simple Motion modules. The programming method and parameter settings are almost the same as the Simple Motion modules. It cannot be used with PLCopen[®] motion control FB mode. Therefore, they cannot be used in the same module.



The following table lists the modules that can use Simple Motion mode.

PLC series	Both Simple Motion mode and PLCopen [®] motion control FB mode	PLCopen [®] motion control FB mode only	Simple Motion mode only
iQ-R series	RD78G4 RD78G8 RD78G16 (Note)	RD78G32 RD78G64 RD78GHV, RD78GHW	-
iQ-F series	-	-	FX5-40SSC-G FX5-80SSC-G

(Note) For RD78G4, 8, and 16, the firmware version 16 or later supports Simple Motion mode.

The following table lists the differences from PLCopen[®] motion control FB mode.

Item	Simple Motion mode	PLCopen [®] motion control FB mode
Programming method	Programming with PLC CPU	Programming with PLC CPU only or distributed programming between PLC CPU and Motion module
Positioning	Point table method	Executed by Motion control FB
Synchronous control	Configured with the synchronous control parameter to start synchronous control for each axis	Executed by Motion control FB
Engineering tool	GX Works3, Simple Motion Module Setting Function	GX Works3, Motion Control Setting Function
Logging	Digital oscilloscope	Logging setting function and GX LogViewer

The following table lists differences from iQ-R/iQ-F series Simple Motion modules.

Item	Simple Motion mode of Motion modules	Simple Motion module	
Model	RD78G4/8/16 FX5-□SSC-G	RD77MS, QD77MS, LD77MS, FX5-□SSC-S	RD77GF, QD77GF
Supported network	CC-Link IE TSN	SSCNET III/H	CC-Link IE Field
Home position return setting	Configured with servo amplifier parameters (Note 1)	Configured with axis parameters	Configured with servo amplifier parameters (Note 1)
External signal (manual pulser) input	No (Note 2)	Yes	RD77GF: No (Note 2) QD77GF: Yes

(Note 1) Only the home position address as well as speed and acceleration/deceleration time for high-speed home position return should be configured with the axis parameters of the Simple Motion module.

(Note 2) When using a manual pulser with a module that has no external signal input, use the high-speed counter module, built-in counter function in CPU (only for iQ-F series), or the high-speed counter module of the network device (only for CC-Link IE Field) to connect it.

In this chapter, you have learned:

- What is Simple Motion mode?
- Modules that can use Simple Motion mode
- Differences from PLCopen[®] motion control FB mode
- Differences from Simple Motion modules

Point

What is Simple Motion mode?	<ul style="list-style-type: none"> • Simple Motion mode of Motion modules is an operation mode compatible with Simple Motion modules. • It cannot be used with PLCopen[®] motion control FB mode.
Modules that can use Simple Motion mode	<p>The following modules can use Simple Motion mode.</p> <ul style="list-style-type: none"> • RD78G4/8/16 • FX5-□SSC-G
Differences from PLCopen [®] motion control FB mode	<ul style="list-style-type: none"> • In Simple Motion mode, only the PLC CPU side is programmed. • The point table method is used for positioning. • Synchronous control is performed by setting the synchronous control parameter and turning on the synchronous control start for each axis.
Differences from Simple Motion modules	<ul style="list-style-type: none"> • The type of supported network and whether the external input (manual pulser input) is provided differ from Simple Motion modules. • Unlike SSCNETIII/H compatible Simple motion modules, parameters related to home position return are set on the servo amplifier side.

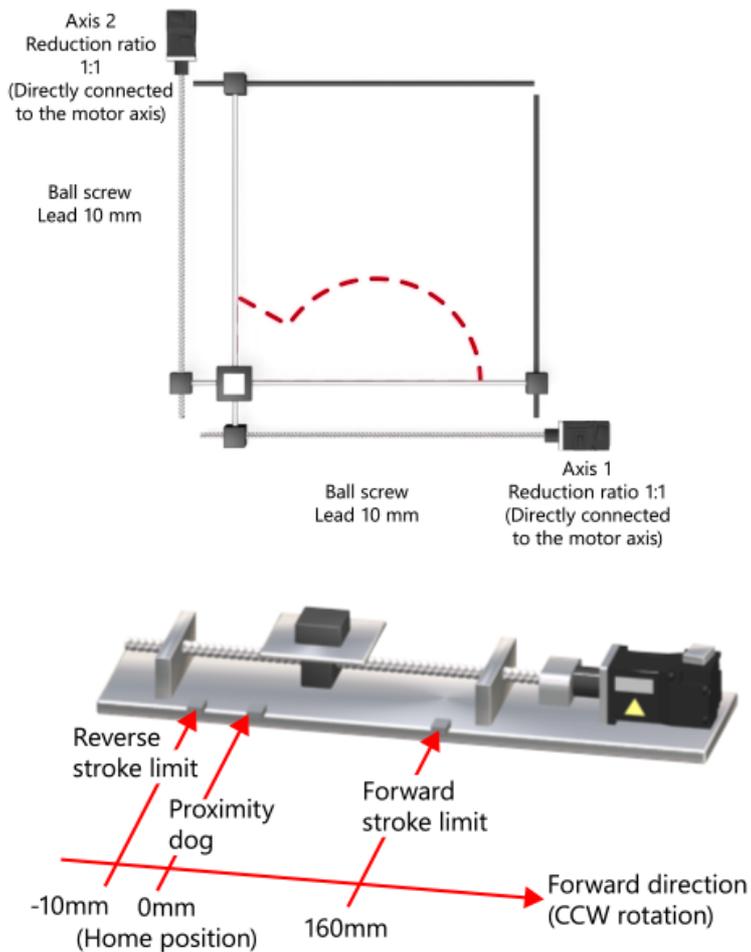
Chapter 2 System of Simple Motion Mode

This chapter describes the hardware configuration of the servo system used in this course.

2.1 Machine configuration

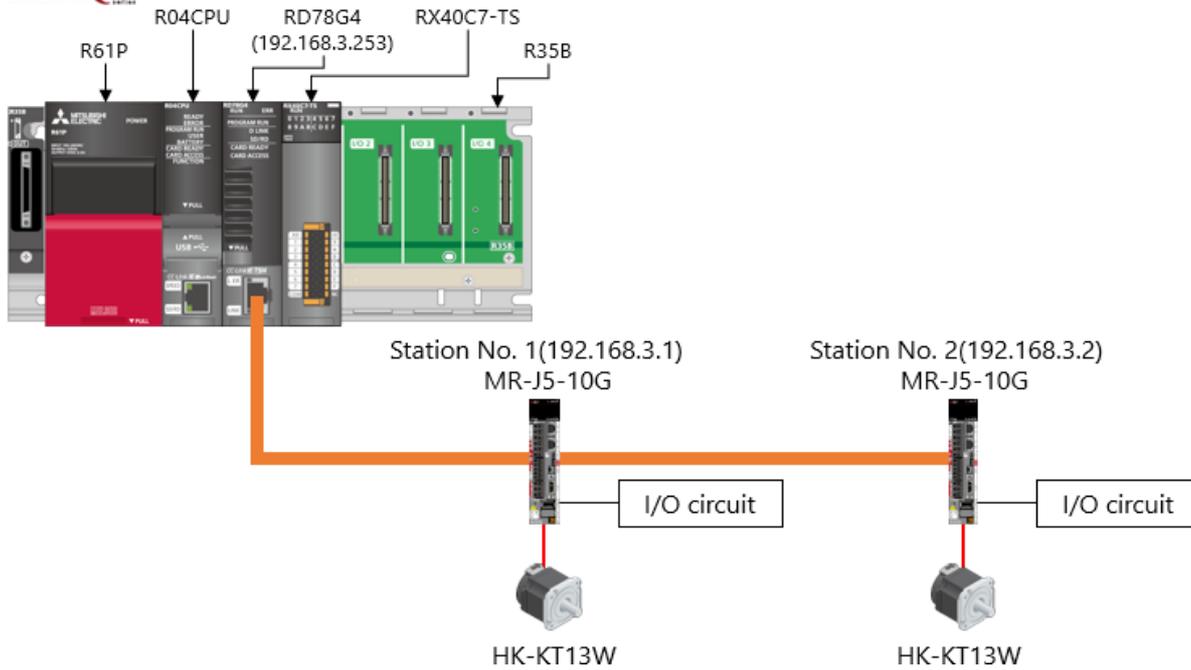
In this course, we use the machine configuration of the XY table shown below.

X-axis is represented as axis 1 and Y-axis is represented as axis 2. The location of the limit switch is assumed to be the same for X-axis and Y-axis.



In this course, we use the following system configuration.

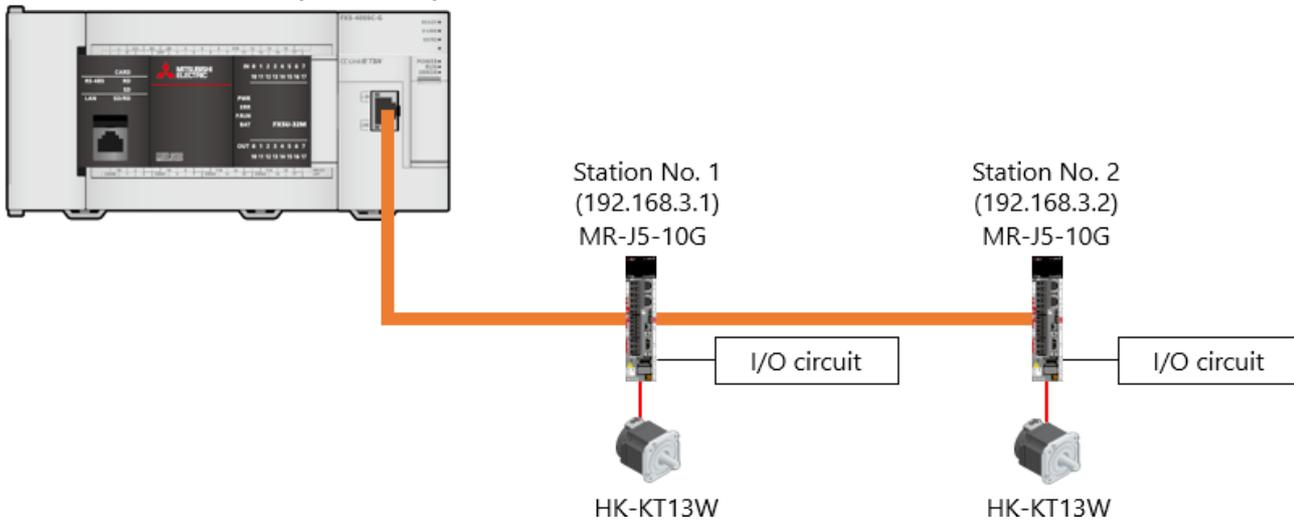
MELSEC iQ-R



MELSEC iQ-F

FX5U-32MT/ES

FX5-40SSC-G
(192.168.3.249)



2.3

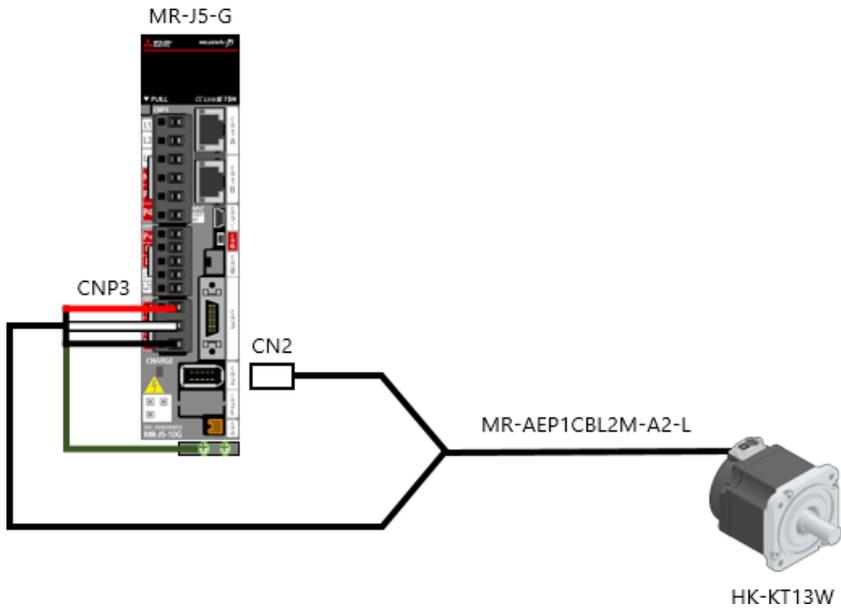
Wiring

This section describes external wiring such as wiring of the power supply for the programmable controller and servo amplifier, and the connection method of the servo motor.

2.3.1

Wiring of servo motor

A single cable type option MR-AEP1CBL2M-A2-L is used for the power cable and encoder cable of the servo motor.



2.3.2

Wiring of power supply and network cables

(1) Power supply wiring to the programmable controller

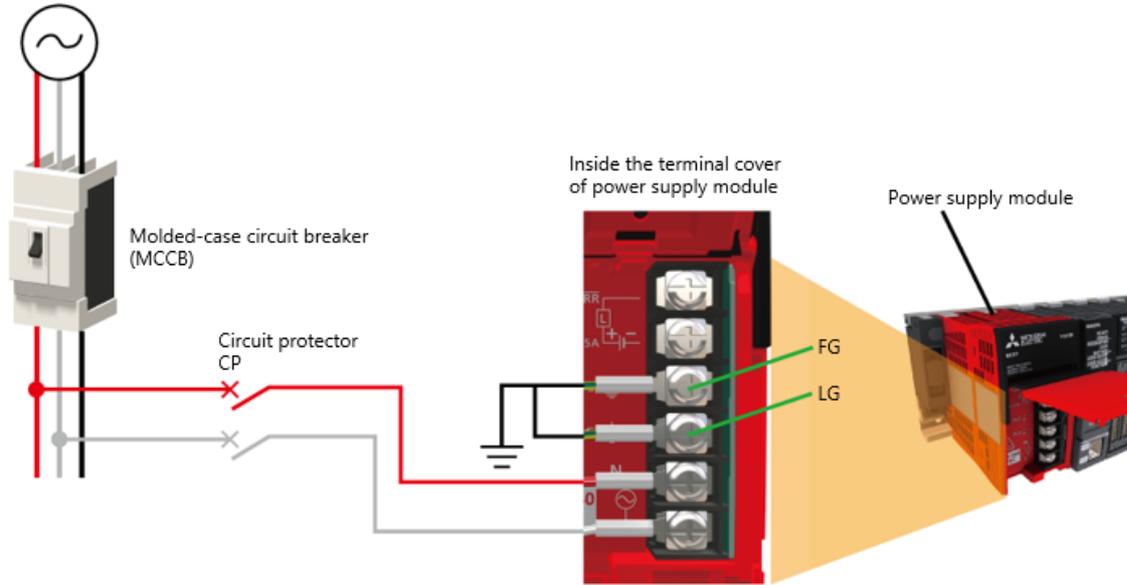
Wire the power supply to the programmable controller.

Connect the input AC power supply with the power input signal contacts (L and N).

The FG and LG contacts must be grounded with a ground resistance of 100 Ω or less.

MELSEC iQ-R

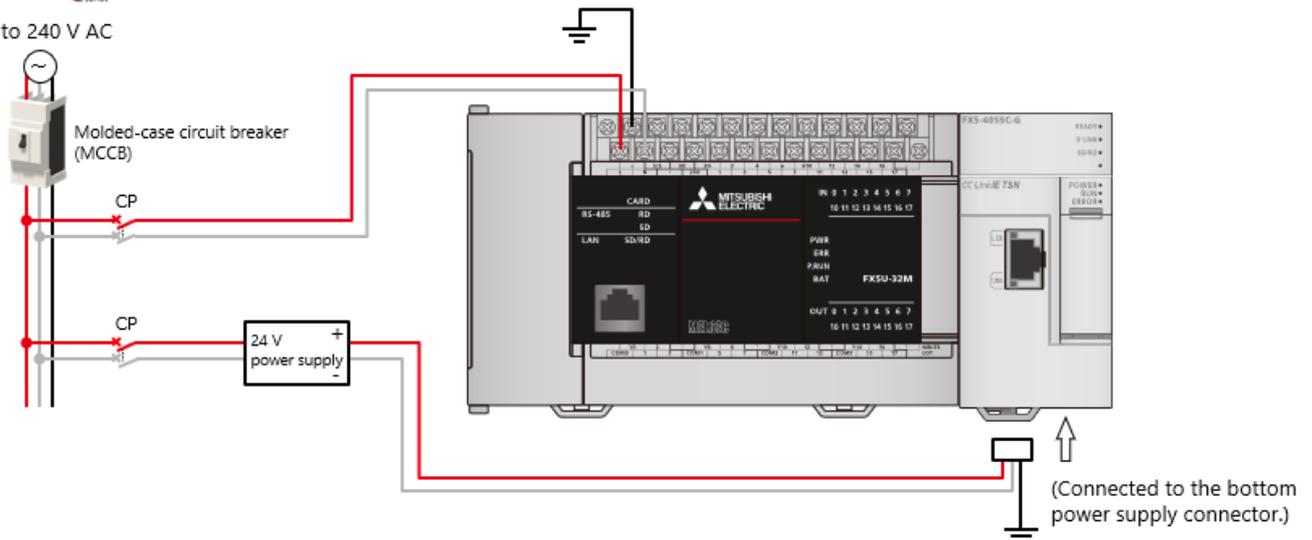
200 to 240 V AC



Item	Applicable cable size	Tightening torque
Power cable	18 to 14 AWG	1.02 to 1.38 N·m
Ground cable	18 to 14 AWG	1.02 to 1.38 N·m

MELSEC iQ-F

200 to 240 V AC



Item	Terminal block size	Tightening torque
Power cable	M3	0.5 to 0.8N·m
Ground cable	M3 (Use the cable with thickness of 14 AWG or higher.)	0.5 to 0.8N·m

2.3.2

Wiring of power supply and network cables

(2) Power supply wiring to the servo amplifier

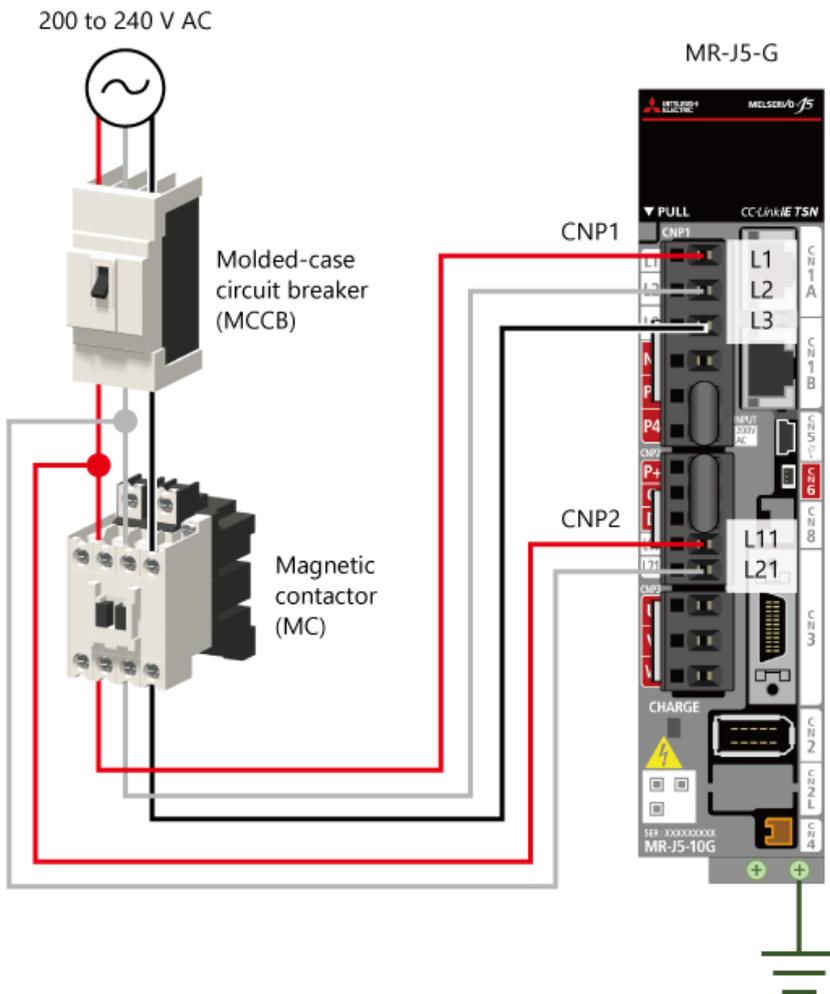
Wire the power supply to the main circuit power supply (L1, L2, L3) and control circuit power supply (L11, L21) of the servo amplifier.

The following shows a schematic diagram. The actual wiring and applicable cable size differ depending on the capacity.

For details, refer to the user's manual (hardware) of the servo amplifier.

Use a molded-case circuit breaker (MCCB) with the input cables of the main circuit power supply.

Always connect a magnetic contactor (MC) between the main circuit power supply and the L1/L2/L3 contacts of the servo amplifier.



2.3.2

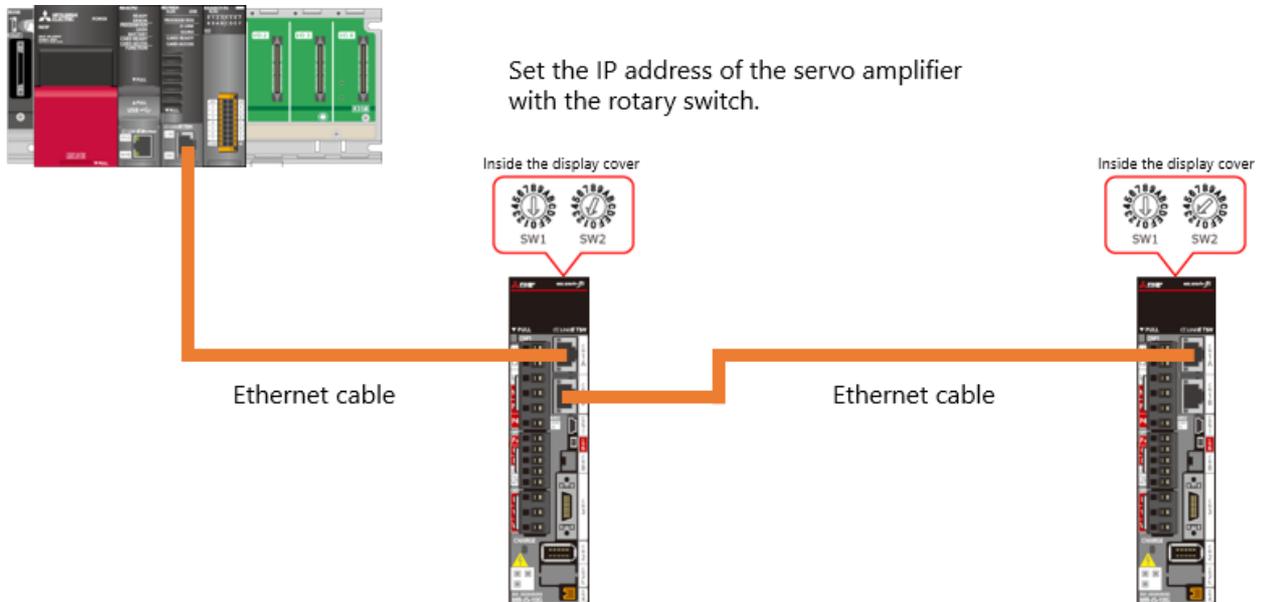
Wiring of power supply and network cables

(3) Wiring of network cables

Wire the network cables (Ethernet cables).

Use the Ethernet cables that meet the following standards.

Communication speed	Ethernet cable	Connector	Standard
1Gbps	Category 5e or higher, (double shielded/STP) straight cable	RJ45 connector	Cable that meets the following standards. <ul style="list-style-type: none">• IEEE802.3(1000BASE-T)• ANSI/TIA/EIA-568-B (Category5e)



2.3.3

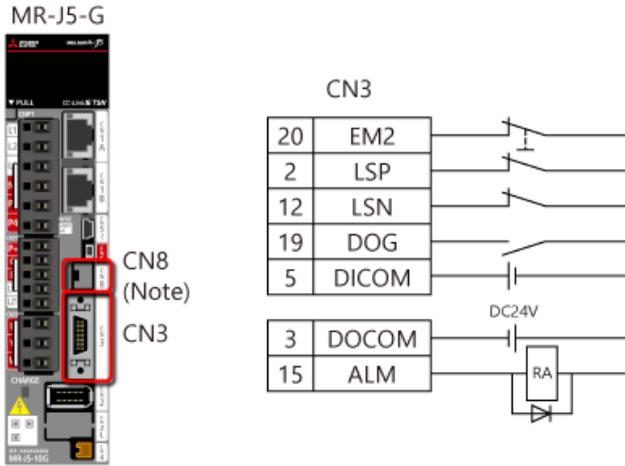
Wiring of peripheral circuits

(1) I/O circuit of the amplifier

Wire the I/O circuit of the servo amplifier as shown below for both axis 1 and axis 2.

Wire the proximity dog, forward/reverse rotation limits, and forced stop.

In addition, configure the circuit so that the magnetic contactor is turned off by the ALM output.



(Note) Since the STO function is not used in this course, do not remove the CN8 short-circuit connector attached with the servo amplifier.

2.3.3

Wiring of peripheral circuits

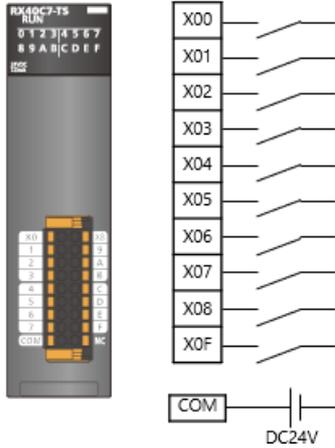
(2) External circuit of the input module

The following shows the external circuit wiring of the input module.

Use momentary switches for all the switches.

MELSEC iQ-R

RX40C7-TS

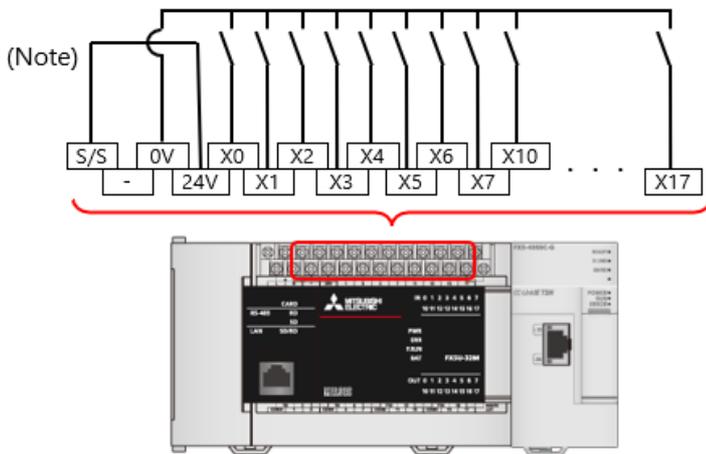


(Note)

- X00: Axis 1 forward run JOG
- X01: Axis 1 reverse run JOG
- X02: Axis 2 forward run JOG
- X03: Axis 2 reverse run JOG
- X04: Axis 1 home position return
- X05: Axis 2 home position return
- X06: Axis 1 single positioning
- X07: Axis 2 single positioning
- X08: Interpolation control start
- X0F: Error reset

(Note) Since the I/O No. of RX40C7-TS is 0020H, X20 to X28 and X2F are used in the program.

MELSEC iQ-F

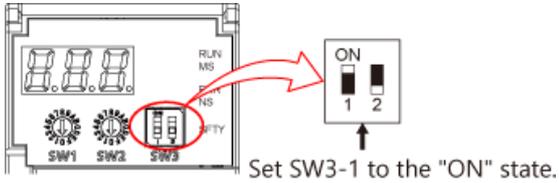


- X0: Axis 1 forward run JOG
- X1: Axis 1 reverse run JOG
- X2: Axis 2 forward run JOG
- X3: Axis 2 reverse run JOG
- X4: Axis 1 home position return
- X5: Axis 2 home position return
- X6: Axis 1 single positioning
- X7: Axis 2 single positioning
- X10: Interpolation control start
- X17: Error reset

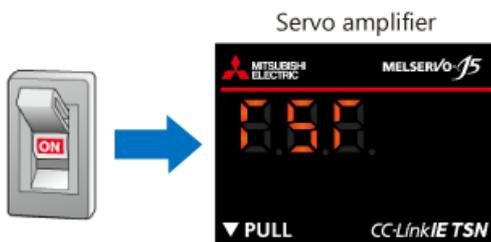
(Note) The service 24 V DC power supply for the programmable controller is used for the external input circuit.

After wiring, perform test operation with the servo amplifier alone to check the motion such as rotation direction. Follow the steps below to perform test operation.

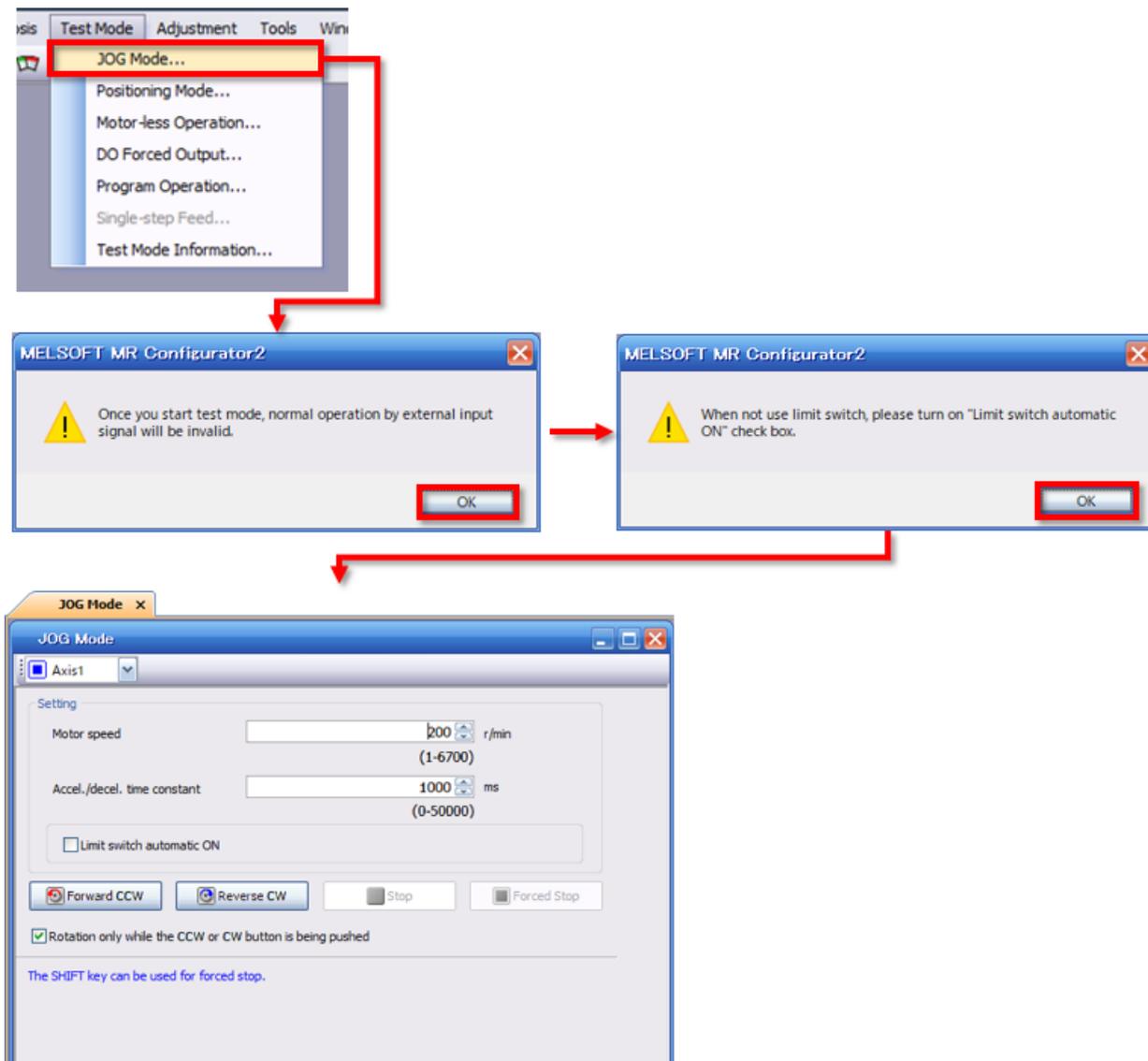
- (1) Turn off the power of the servo amplifier and programmable controller.
- (2) Turn on (up) the DIP switch (SW3-1) of the servo amplifier.



- (3) Connect the servo amplifier and personal computer with a USB cable or an Ethernet cable. (Note)
- (4) Turn on the power supply of the servo amplifier. "TST" is displayed in the monitor.



- (5) Start MR Configurator2 and perform test operation (JOG operation).



- (6) Check the rotation direction and motion of the machine.

(7) When test operation is finished, turn off the power of the servo amplifier and turn off the DIP switch (SW3-1).

(Note) When using an Ethernet cable, change the MR Configurator2 project to a multi-axis project.

Tips

When multiple servo amplifiers are used, Ethernet connection is convenient because there is no need to change cables. For details, refer to MR Configurator2 Help.

In this chapter, you have learned:

- Machine configuration
- System configuration
- Wiring
- Test operation

Point

Machine configuration	<ul style="list-style-type: none"> • The target system uses two ball screws to make an X-Y table.
System configuration	<ul style="list-style-type: none"> • For the iQ-R series, connect two MR-J5-G servo amplifiers to the Motion module RD78G4. • For the iQ-F series, connect two MR-J5-G servo amplifiers to the Motion module FX5-40SSC-G.
Wiring	<ul style="list-style-type: none"> • A servo motor uses single cable type option cables. • Set the fourth octet of the IP address with the rotary switch on the servo amplifier. • Connect the proximity dog signal, limit switch, and forced stop switch to the servo amplifier.
Test operation	<ul style="list-style-type: none"> • Change the DIP switch position on the servo amplifier and connect the personal computer. • Check the rotation direction of the servo motor with the test operation function of MR Configurator2.

This chapter describes the procedure that begins with creating a project and extends through the setting of each parameter. Note that screenshots of the iQ-R series are shown in the following pages. When using the iQ-F series, please replace them accordingly.

The project files to be created in this course can be downloaded from the links below.

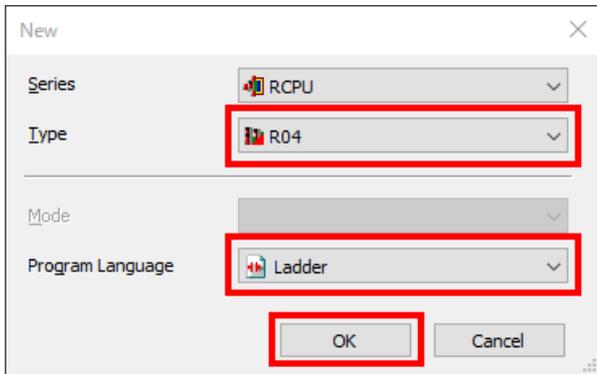
[RD78G_SimpleMode_Basics_Sample.zip \(1.90MB\)](#)

[FX5-SSC-G_SimpleMode_Basics_Sample.zip \(1.17MB\)](#)

(1) Select [Project] → [New] in GX Works3.

In the following window, select the model of the PLC CPU to be used and the programming language to be used in the PLC CPU.

After selecting them, click the [OK] button.

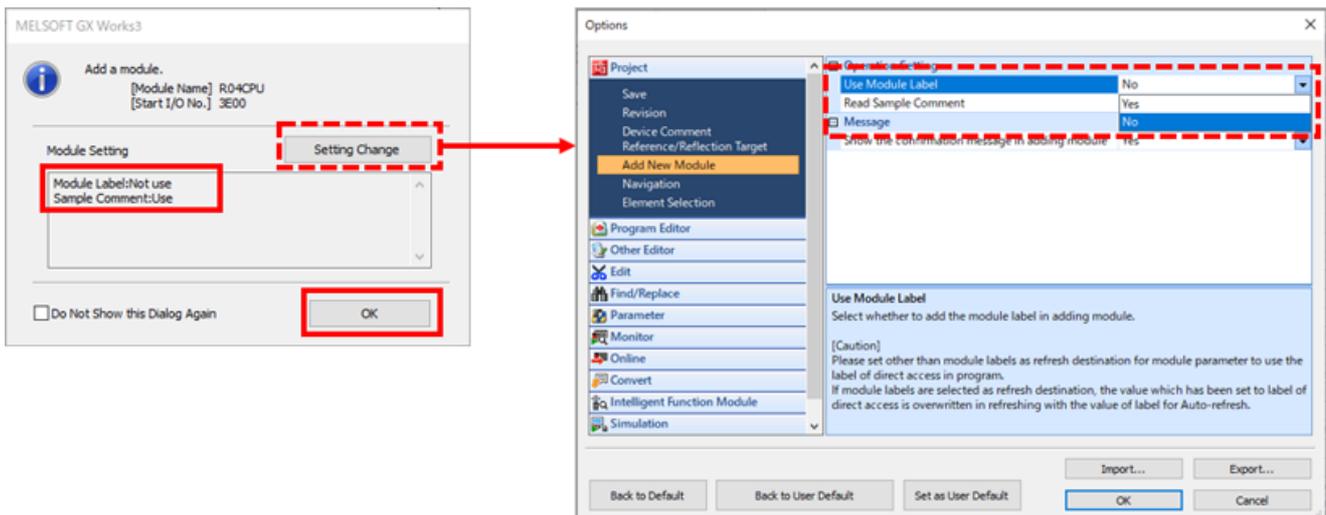


(2) When the following window appears, set whether to use the module label and sample comment.

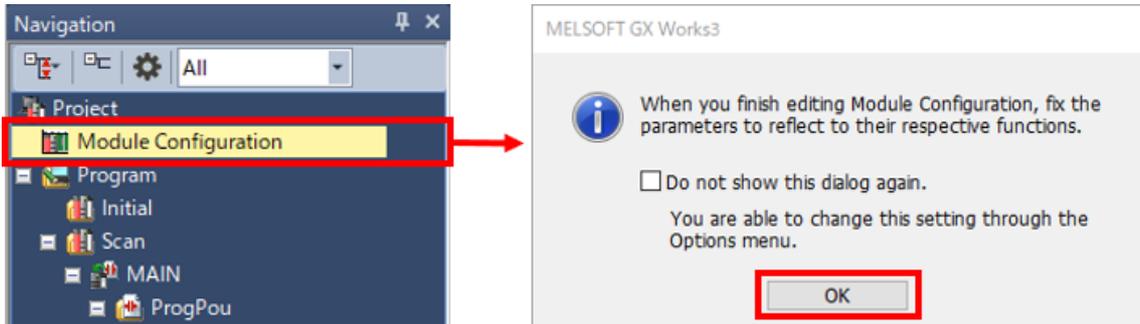
In this course, set both items to "Use".

If either of them is set to "Not use", click the [Setting Change] button and change the setting.

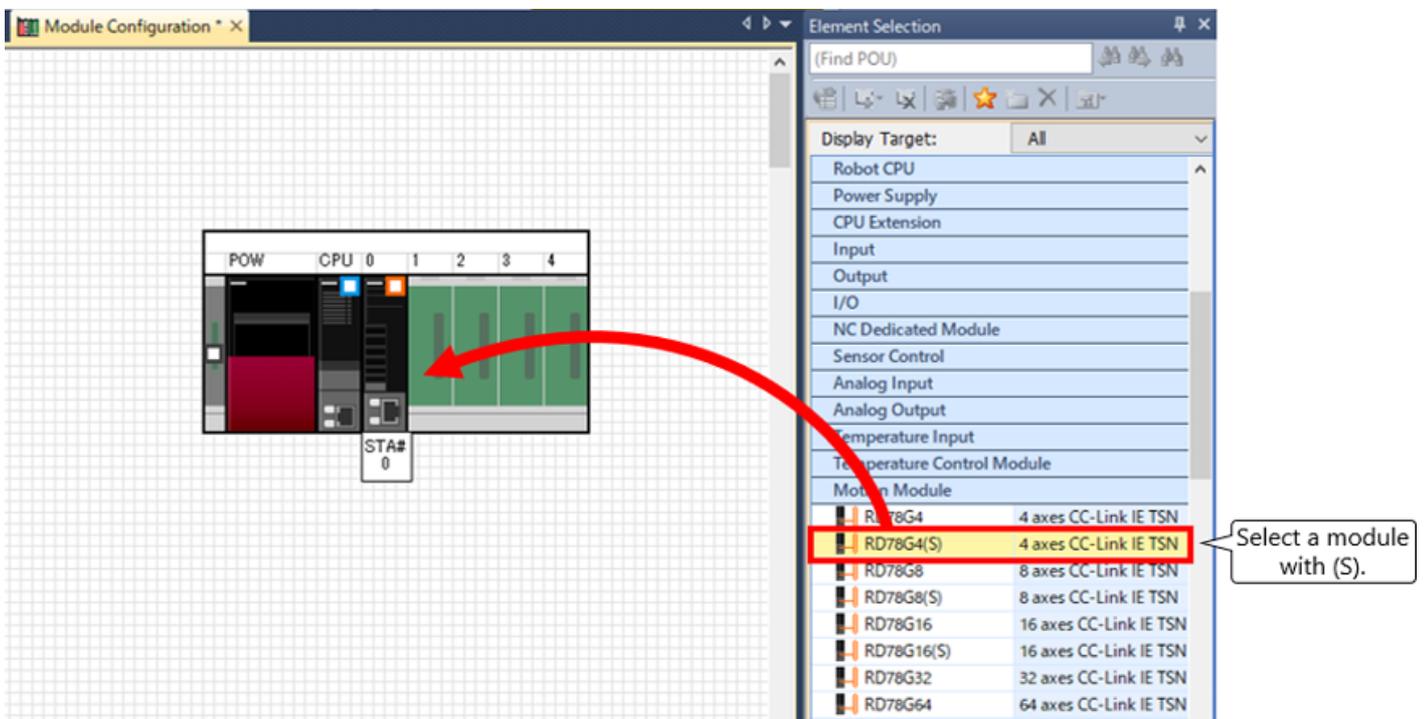
Click the [OK] button to open the project.



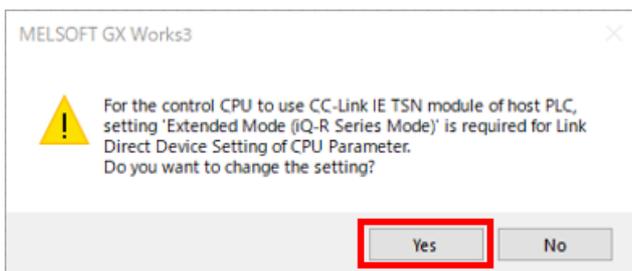
- (3) Double-click [Module Configuration] in the project tree.
When the following dialog box appears, click the [OK] button.



When the module configuration diagram opens, drag and drop the module from the Element Selection window on the right side, and create a module configuration diagram in the same way as that for the system configuration diagram (Section 2.2). For the Motion module, drag and drop a module with (S) at the end of the model.



When the module configuration diagram is complete, right-click the display and select [Parameter] → [Fix]. For the iQ-R series, the following message appears. Click the [Yes] button.



When the following dialog box appears, check that the sample comment and module label are set to "Use". If either of them is set to "Not use", click the [Setting Change] button and change the setting.

Click the [OK] button to complete the setting.

MELSOFT GX Works3

 Add a module.
[Module Name] RD78G4(S)
[Start I/O No.] 0000

Module Setting Setting Change

Module Label:Use
Sample Comment:Use

Do Not Show this Dialog Again

In the case of iQ-R series, select [Parameter] → [R04CPU] in the project tree and double-click [CPU Parameter].
Click [Link Direct Device Setting] from the setting item list.

Check that the link direct device setting is set to "Extended Mode (iQ-R Series Mode)".

If it is set to "Q Series Compatible Mode", change it to "Extended Mode (iQ-R Series Mode)".

When the setting is complete, click the [Apply] button in the lower right corner.

The screenshot shows the 'R04CPU CPU Parameter' configuration window. The 'Setting Item List' on the left has 'Link Direct Device Setting' selected. The 'Setting Item' table on the right shows the configuration for 'Link Direct Device Setting'.

Item	Setting
Pointer Type Label	8192 Points
Internal Buffer Capacity Setting	
Total Capacity	1536 K Byte
Data Logging Function	
Total Capacity	1280 K Byte
Setting No.1	128 K Byte
Setting No.2	128 K Byte
Setting No.3	128 K Byte
Setting No.4	128 K Byte
Setting No.5	128 K Byte
Setting No.6	128 K Byte
Setting No.7	128 K Byte
Setting No.8	128 K Byte
Setting No.9	128 K Byte
Setting No.10	128 K Byte
Memory Dump Function	
Link Direct Device Setting	Extended Mode (iQ-R Series Mode)
Link Direct Device Setting	Q Series Compatible Mode
Link Direct Device Setting	Extended Mode (iQ-R Series Mode)

The 'Link Direct Device Setting' dropdown menu is open, showing three options: 'Extended Mode (iQ-R Series Mode)', 'Q Series Compatible Mode', and 'Extended Mode (iQ-R Series Mode)'. The 'Apply' button is highlighted in the bottom right corner.

Explanation:
Set 'Q Series Compatible Mode' or 'Extended Mode (iQ-R Series Mode)' when using any one of the modules shown below as a network module to control.
- CC-Link IE TSN master/local module
- CC-Link IE Controller Network-equipped module when setting the Link points extended setting

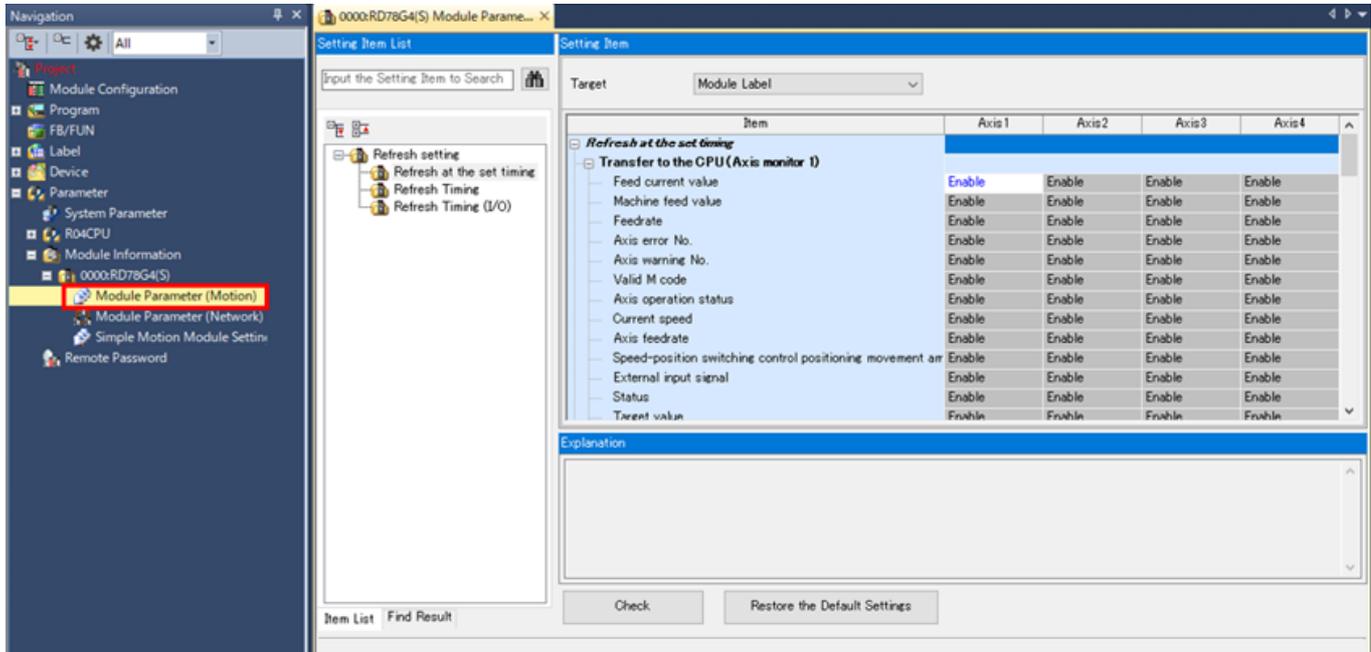
3.3 Motion module setting

3.3.1 Module parameter (motion)

In the project tree, select [Parameter] → [Module Information] → [0000:RD78G4(S)] and double-click [Module Parameter (Motion)].

Configure the refresh setting to transfer the values in the buffer memory of the Motion module to devices or module labels in the CPU module.

Use the initial values in this course. (The values in the buffer memory will be transferred to the module labels.)

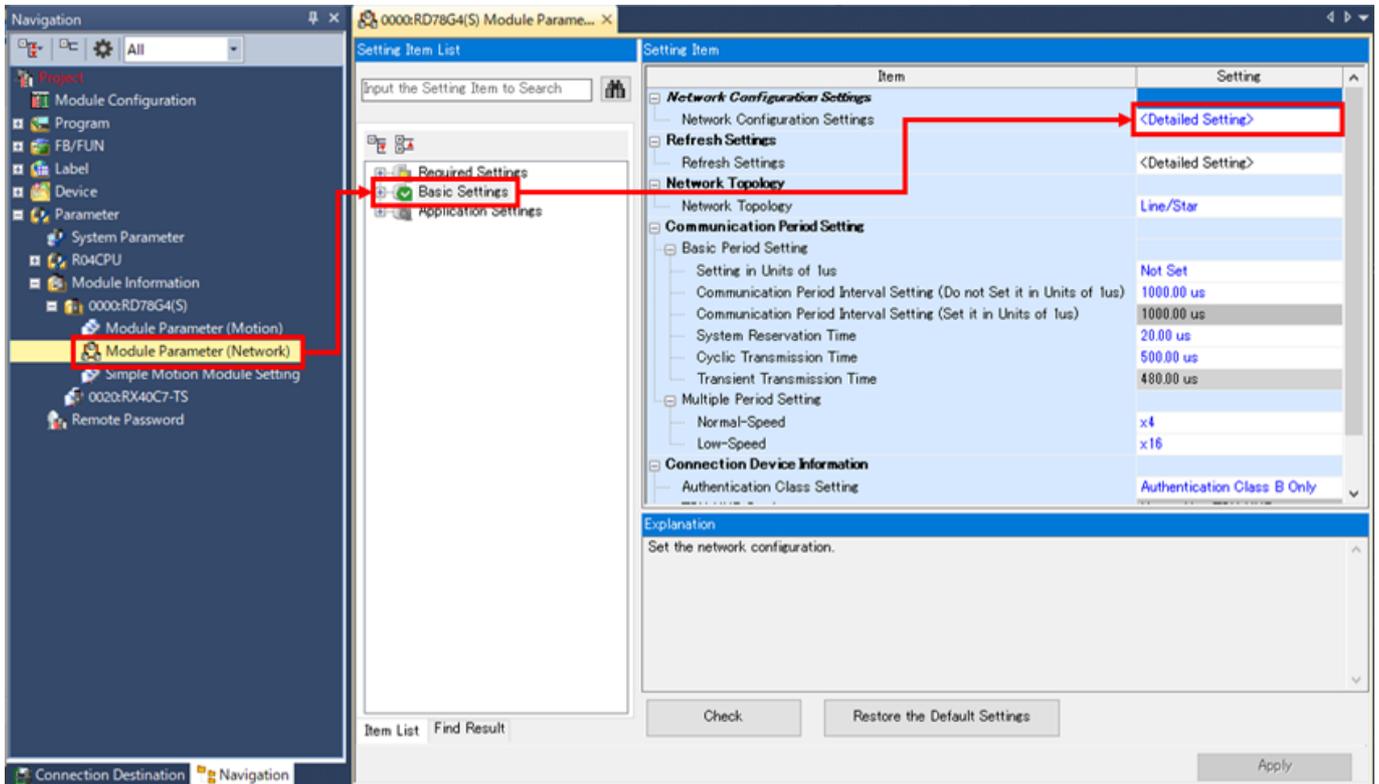


In the project tree, select [Parameter] → [Module Information] → [0000:RD78G4(S)] and double-click [Module Parameter (Network)].

In this section, set the device to be connected to the network and configure the link refresh.

(1) Network configuration setting

Select [Basic Settings] from the setting item list and double-click <Detailed Setting> in the Network Configuration Settings item.



[Point]

In [Required Settings], configure the settings such as the station type, IP address, and network number of the controller. Description of the settings is omitted here because the initial values are used in this course.

(1) Network configuration setting (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method:

Cyclic Transmission Time (Min.): 14.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	STA#	Station Type	Motion Control Station	RX Setting Points	RY Setting Points	RW Setting Points	RWw Setting Points	Parameter Automatic Setting
0	Host Station	0	Master Station						

Click the play button at the lower left of the window.

Host Station

STA#0 Master Station
Total STA#:0
Line/Star

Module List

- CC-Link IE TSN Selection
- Find Module
- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
- Master/Local Module
- Motion Module
- GOT2000 Series
- General-Purpose AC Servo
- General purpose Inverter
- DC Input
- Transistor Output
- I/O Combined
- Analog Input
- Analog Output
- Bridge module(CC-Link IE TSN-)

(1) Network configuration setting (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method:

Cyclic Transmission Time (Min.): 14.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	STA#	Station Type	Motion Control Station	RX Setting Points	RY Setting Points	RW Setting Points	RWw Setting Points	Parameter Automatic Setting
0	Host Station	0	Master Station						

Add the modules to be connected to the network in the CC-Link IE TSN Configuration window.

Host Station

STA#0 Master Station
Total STA#:0
Line/Star

Module List

- CC-Link IE TSN Selection
- Find Module
- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
- Master/Local Module
- Motion Module
- GOT2000 Series
- General-Purpose AC Servo
- General purpose Inverter
- DC Input
- Transistor Output
- I/O Combined
- Analog Input
- Analog Output
- Bridge module(CC-Link IE TSN-)

(1) Network configuration setting (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 14.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	STA#	Station Type	Motion Control Station	RX Setting Points	RY Setting Points	RW Setting Points	RWw Setting Points	Parameter Automatic Setting
0	Host Station	0	Master Station						

Module List

- CC-Link IE TSN Selection Find Module
- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
- Master/Local Module
- Motion Module
- GOT2000 Series
- General-Purpose AC Servo**
- General purpose Inverter
- Output
- ined
- ut
- Input
- Bridge module(CC-Link IE TSN-)

Click [General-purpose AC Servo].

Host Station

STA#0 Master Station
Total STA#:0
Line/Star

3.3.2 Module parameter (network)

(1) Network configuration setting (continued)

The screenshot shows the 'CC-Link IE TSN Configuration' software interface. At the top, there are tabs for 'Connected/Disconnected Module Detection' and 'Detailed Display'. Below these are settings for 'Mode Setting' (Online (Unicast Mode)), 'Assignment Method', 'Cyclic Transmission Time (Min.): 14.00 us', and 'Communication Period Interval (Min.): 250.00 us'.

No.	Model Name	STA#	Station Type	Motion Control Station	RX Setting Points	RY Setting Points	RW Setting Points	RWw Setting Points	Parameter Automatic Setting
0	Host Station	0	Master Station						

On the right side, there is a 'Module List' window. It contains a tree view of modules. The 'General Purpose AG Servo' folder is expanded, and the 'MR-J5-G' module is highlighted with a red box. A callout box with a blue border and white background points to this module, containing the text: 'Drag and drop [MR-J5-G] twice.'

At the bottom left, there is a 'Host Station' icon and a status box showing: 'STA#0 Master Station', 'Total STA#0', and 'Line/Star'.

(1) Network configuration setting (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

CC-Link IE TSN Configuration Edit View Close with Discarding the Setting Close with Reflecting the Setting

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	STA#	Station Type	Motion Control Station	RX Setting Points	RY Setting Points	RW Setting Points	RWw Setting Points	Parameter Automatic Setting
0	Host Station	0	Master Station						
1	MR-J5-G	1	Remote Station	<input checked="" type="checkbox"/>			24	20	<Detail Setting>
2	MR-J5-G	2	Remote Station	<input checked="" type="checkbox"/>			24	20	<Detail Setting>

MR-J5-G is registered to the station No. 1 and station No. 2.

Host Station

STA#0 Master Station
Total STA#:2
Line/Star

MR-J5-G MR-J5-G

Module List

CC-Link IE TSN Selection Find Module

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
 - Master/Local Module
 - Motion Module
 - GOT2000 Series
 - General-Purpose AG Servo
 - MR-J5-G Single Axis
 - MR-J5-G-RJ Single Axis
 - MR-J5D1-G Single Axis
 - MR-JET-G Single Axis
 - MR-J5D2-G 2-Axis Unif
 - MR-J5D2-G_B_Axis 2-Axis Unif
 - MR-J5W2-G 2-Axis Unif
 - MR-J5W2-G_B_Axis 2-Axis Unif
 - MR-J5D3-G 3-Axis Unif
 - MR-J5D3-G_BC_Axis 3-Axis Unif
 - MR-J5W3-G 3-Axis Unif
 - MR-J5W3-G_BC_Axis 3-Axis Unif
- General purpose Inverter
- DC Input
- Transistor Output
- I/O Combined
- Analog Input
- Analog Output
- Bridge module(CC-Link IE TSN)

[Outline]

Servo Amplifier(MELSERVO-J5 Series)
Single Axis

[Specification]

CC-Link IE TSN Class B
Output voltage: 3-Phase 0 to 240VAC

(1) Network configuration setting (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	STA#	Station Type	Motion Control Station	RX Setting Points	RY Setting Points	RW Setting Points	RWw Setting Points	Parameter Automatic Setting
0	Host Station	0	Master Station						
1	MR-J5-G	1	Remote Station	<input checked="" type="checkbox"/>			24	20	<Detail Setting>
2	MR-J5-G	2	Remote Station	<input checked="" type="checkbox"/>			24	20	<Detail Setting>

Check that the "Motion Control Station" checkbox is selected.

Host Station

STA#1 STA#2

MR-J5-G MR-J5-G

STA#0 Master Station
Total STA#:2
Line/Star

Module List

CC-Link IE TSN Selection Find Module

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
- Master/Local Module
- Motion Module
- GOT2000 Series
- General-Purpose AG Servo
 - MR-J5-G Single Axis
 - MR-J5-G-RJ Single Axis
 - MR-J5D1-G Single Axis
 - MR-JET-G Single Axis
 - MR-J5D2-G 2-Axis Unifit
 - MR-J5D2-G,B_Axis 2-Axis Unifit
 - MR-J5W2-G 2-Axis Unifit
 - MR-J5W2-G,B_Axis 2-Axis Unifit
 - MR-J5D3-G 3-Axis Unifit
 - MR-J5D3-G,BC_Axis 3-Axis Unifit
 - MR-J5W3-G 3-Axis Unifit
 - MR-J5W3-G,BC_Axis 3-Axis Unifit
- General purpose Inverter
- DC Input
- Transistor Output
- I/O Combined
- Analog Input
- Analog Output
- Bridge module(CC-Link IE TSN)

[Outline]

Servo Amplifier(MELSERVO-J5 Series)

Single Axis

[Specification]

CC-Link IE TSN Class B

Output voltage: 3-Phase 0 to 240VAC

(1) Network configuration setting (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

CC-Link IE TSN Configuration Edit View Close with Discarding the Setting Close with Reflecting the Setting

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	STA#	Station Type	Motion Control Station	RX Setting Points	RY Setting Points	RW Setting Points	RWw Setting Points	Parameter Automatic Setting
0	Host Station	0	Master Station						
1	MR-J5-G	1	Remote Station	<input checked="" type="checkbox"/>			24	20	<input type="checkbox"/> <Detail Setting>
2	MR-J5-G	2	Remote Station	<input checked="" type="checkbox"/>			24	20	<input type="checkbox"/> <Detail Setting>

Host Station STA#1 STA#2

MR-J5-G MR-J5-G

STA#0 Master Station
Total STA#:2
Line/Star

Scroll to the right.

Module List

CC-Link IE TSN Selection Find Module

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
 - Master/Local Module
 - Motion Module
 - GOT2000 Series
 - General-Purpose AG Servo
 - MR-J5-G Single Axis Unit
 - MR-J5-G-RJ Single Axis Unit
 - MR-J5D1-G Single Axis Unit
 - MR-JET-G Single Axis Unit
 - MR-J5D2-G 2-Axis Unit
 - MR-J5D2-G_B_Axis 2-Axis Unit
 - MR-J5W2-G 2-Axis Unit
 - MR-J5W2-G_B_Axis 2-Axis Unit
 - MR-J5D3-G 3-Axis Unit
 - MR-J5D3-G_BC_Axis 3-Axis Unit
 - MR-J5W3-G 3-Axis Unit
 - MR-J5W3-G_BC_Axis 3-Axis Unit
- General purpose Inverter
 - DC Input
 - Transistor Output
 - I/O Combined
 - Analog Input
 - Analog Output
 - Bridge module(CC-Link IE TSN-)

[Outline]

Servo Amplifier(MELSERVO-J5 Series)
Single Axis

[Specification]

CC-Link IE TSN Class B
Output voltage: 3-Phase 0 to 240VAC

(1) Network configuration setting (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

CC-Link IE TSN Configuration Edit View Close with Discarding the Setting Close with Reflecting the Setting

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	RY Setting Points	RWr Setting Points	RWw Setting Points	Parameter Automatic Setting	PDO Mapping Setting	IP Address	bn	tas
0	Host Station						192.168.3.253		
1	MR-J5-G		24	20	<Detail Setting>	<Detail Setting>	192.168.3.1		
2	MR-J5-G		24	20	<Detail Setting>	<Detail Setting>	192.168.3.2		

Check the IP address of the servo amplifier. There is no change in this course.

Host Station STA#1 STA#2

STA#0 Master Station
Total STA#:2
Line/Star

MR-J5-G MR-J5-G

Module List

CC-Link IE TSN Selection Find Module

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
 - Master/Local Module
 - Motion Module
 - GOT2000 Series
 - General-Purpose AG Servo
 - MR-J5-G Single Axis Unit
 - MR-J5-G-RJ Single Axis Unit
 - MR-J5D1-G Single Axis Unit
 - MR-JET-G Single Axis Unit
 - MR-J5D2-G 2-Axis Unit
 - MR-J5D2-G_B Axis 2-Axis Unit
 - MR-J5W2-G 2-Axis Unit
 - MR-J5W2-G_B Axis 2-Axis Unit
 - MR-J5D3-G 3-Axis Unit
 - MR-J5D3-G_BC Axis 3-Axis Unit
 - MR-J5W3-G 3-Axis Unit
 - MR-J5W3-G_BC Axis 3-Axis Unit
 - General purpose Inverter
 - DC Input
 - Transistor Output
 - I/O Combined
 - Analog Input
 - Analog Output
 - Bridge module(CC-Link IE TSN-)

[Outline]

Servo Amplifier(MELSERVO-J5 Series)

Single Axis

[Specification]

CC-Link IE TSN Class B

Output voltage: 3-Phase 0 to 240VAC

(1) Network configuration setting (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

CC-Link IE TSN Configuration Edit View Close with Discarding the Setting Close with Reflecting the Setting

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	RY Setting Points	RWr Setting Points	RWw Setting Points	Parameter Automatic Setting	PDO Mapping Setting	IP Address	bn las
0	Host Station						192.168.3.253	
1	MR-J5-G		24	20	<Detail Setting>	<Detail Setting>	192.168.3.1	
2	MR-J5-G		24	20	<Detail Setting>	<Detail Setting>	192.168.3.2	

When Simple Motion mode is used,
PDO mapping is not required.
(PDO mapping cannot be changed.)

Host Station STA#1 STA#2

STA#0 Master Station
Total STA#:2
Line/Star

MR-J5-G MR-J5-G

Module List

CC-Link IE TSN Selection Find Module

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
 - Master/Local Module
 - Motion Module
 - GOT2000 Series
 - General-Purpose AG Servo
 - MR-J5-G Single Axis C
 - MR-J5-G-RJ Single Axis C
 - MR-J5D1-G Single Axis C
 - MR-JET-G Single Axis C
 - MR-J5D2-G 2-Axis Unifi
 - MR-J5D2-G,B_Axis 2-Axis Unifi
 - MR-J5W2-G 2-Axis Unifi
 - MR-J5W2-G,B_Axis 2-Axis Unifi
 - MR-J5D3-G 3-Axis Unifi
 - MR-J5D3-G,BC_Axis 3-Axis Unifi
 - MR-J5W3-G 3-Axis Unifi
 - MR-J5W3-G,BC_Axis 3-Axis Unifi
 - General purpose Inverter
 - DC Input
 - Transistor Output
 - I/O Combined
 - Analog Input
 - Analog Output
 - Bridge module(CC-Link IE TSN-)

[Outline]

Servo Amplifier(MELSERVO-J5 Series)
Single Axis

[Specification]

CC-Link IE TSN Class B
Output voltage: 3-Phase 0 to 240VAC

(1) Network configuration setting (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

CC-Link IE TSN Configuration Edit View Close with Discarding the Setting Close with Reflecting the Setting

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	RY Setting Points	RWr Setting Points	RWw Setting Points	Parameter Automatic Setting	PDO Mapping Setting	IP Address	bn las
0	Host Station						192.168.3.253	
1	MR-J5-G		24	20	<Detail Setting>	<Detail Setting>	192.168.3.1	
2	MR-J5-G		24	20	<Detail Setting>	<Detail Setting>	192.168.3.2	

Next, configure the parameter settings of the servo amplifier.
Go to the next page.

Host Station STA#1 STA#2

STA#0 Master Station
Total STA#:2
Line/Star

MR-J5-G MR-J5-G

Module List

CC-Link IE TSN Selection Find Module

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
 - Master/Local Module
 - Motion Module
 - GOT2000 Series
 - General-Purpose AG Servo
 - MR-J5-G Single Axis
 - MR-J5-G-RJ Single Axis
 - MR-J5D1-G Single Axis
 - MR-JET-G Single Axis
 - MR-J5D2-G 2-Axis Unif
 - MR-J5D2-G,B_Axis 2-Axis Unif
 - MR-J5W2-G 2-Axis Unif
 - MR-J5W2-G,B_Axis 2-Axis Unif
 - MR-J5D3-G 3-Axis Unif
 - MR-J5D3-G,BC_Axis 3-Axis Unif
 - MR-J5W3-G 3-Axis Unif
 - MR-J5W3-G,BC_Axis 3-Axis Unif
 - General purpose Inverter
 - DC Input
 - Transistor Output
 - I/O Combined
 - Analog Input
 - Analog Output
 - Bridge module(CC-Link IE TSN-)

[Outline]

Servo Amplifier(MELSERVO-J5 Series)
Single Axis

[Specification]

CC-Link IE TSN Class B
Output voltage: 3-Phase 0 to 240VAC

(2) Parameter settings of the servo amplifier

When using Simple Motion mode, always set the parameters of the MR-J5-G servo amplifier as shown in the table below.

How to set the parameters of the servo amplifier is described on the next page.

Change the values shown in yellow from the initial values.

Writing values other than the setting values shown in the table below will cause "Servo parameter invalid".

In such a case, the servo parameters are automatically rewritten from the controller to the values in the table below when the power is turned on again.

Parameter		Initial value	Setting value
Basic	PA06 (Electronic gear numerator) (Note 1)	1	<ul style="list-style-type: none"> When the servo motor resolution is 26 bits: 16 (Rotary servo motor HK series, etc.) When the servo motor resolution is not 26 bits: 1
	PA07 (Electronic gear denominator) (Note 1)	1	1
Extension	PC79.0 (DI status read selection) (Note 1)	0h	Eh bit1: Returns the on/off state of DI1 pin. bit2: Returns the on/off state of DI2 pin. bit3: Returns the on/off state of DI3 pin.
I/O	PD41.2 (Limit switch enabled status selection) (Note 1)	0h	1h : Enabled only for homing mode
	PD41.3 (Sensor input method selection) (Note 1)	0h	1h: Input from controller (FLS/RLS/DOG) (Note 3)
	PD60.0 (DI pin polarity selection) (Note 1)	0h	0h bit0: DI pin polarity selection 1 (turned on at 24 V input) bit1: DI pin polarity selection 2 (turned on at 24 V input) bit2: DI pin polarity selection 3 (turned on at 24 V input)
Positioning control	PT01.1 (Speed/acceleration/deceleration unit selection) (Note 2)	0h	0h
	PT08 (Homing position data) (Note 1)	0	0
	PT15 (Software position limit +)	0	0
	PT17 (Software position limit -)	0	0
	PT29.0 (Device input polarity 1) (Note 1)	0h	1h: Dog detection with on

(Note)

1. The parameter is enabled after the Motion module or MR-J5-G is restarted.

2. The parameter is enabled after MR-J5-G is restarted.

3. Set "Input from controller" even when connecting the external signal to CN3 of the servo amplifier.

In addition, change the homing method from the initial value in this course.

Set the value as shown in the table below.

Parameter		Initial value	Setting value
Positioning control	PT45 (Homing method)	37 (method 37: Data set type)	-33 (Dog type rear end detection - CW direction with reference to Z-phase)

(2) Parameter settings of the servo amplifier (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

CC-Link IE TSN Configuration Edit View Close with Discarding the Setting Close with Reflecting the Setting

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	RY Setting Points	RWr Setting Points	RWw Setting Points	Parameter Automatic Setting	PDO Mapping Setting	IP Address	bn fas
0	Host Station						192.168.3.253	
1	MR-J5-G		24	20	<Detail Setting>	<Detail Setting>	192.168.3.1	
2	MR-J5-G		24	20	<Detail Setting>	<Detail Setting>	192.168.3.2	

Click the play button at the lower left of the window.

Host Station

STA#0 Master Station
Total STA#:2
Line/Star

MR-J5-G MR-J5-G

Module List

CC-Link IE TSN Selection Find Module

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
 - Master/Local Module
 - Motion Module
 - GOT2000 Series
 - General-Purpose AG Servo
 - MR-J5-G Single Axis
 - MR-J5-G-RJ Single Axis
 - MR-J5D1-G Single Axis
 - MR-JET-G Single Axis
 - MR-J5D2-G 2-Axis Unif
 - MR-J5D2-G_B_Axis 2-Axis Unif
 - MR-J5W2-G 2-Axis Unif
 - MR-J5W2-G_B_Axis 2-Axis Unif
 - MR-J5D3-G 3-Axis Unif
 - MR-J5D3-G_BC_Axis 3-Axis Unif
 - MR-J5W3-G 3-Axis Unif
 - MR-J5W3-G_BC_Axis 3-Axis Unif
 - General purpose Inverter
 - DC Input
 - Transistor Output
 - I/O Combined
 - Analog Input
 - Analog Output
 - Bridge module(CC-Link IE TSN-)

[Outline]

Servo Amplifier(MELSERVO-J5 Series)
Single Axis

[Specification]

CC-Link IE TSN Class B
Output voltage: 3-Phase 0 to 240VAC

(2) Parameter settings of the servo amplifier (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

CC-Link IE TSN Configuration Edit View Close with Discarding the Setting Close with Reflecting the Setting

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	RY Setting Points	RWr Setting Points	RWw Setting Points	Parameter Automatic Setting	PDO Mapping Setting	IP Address	bn las
0	Host Station						192.168.3.253	
1	MR-J5-G		24	24	<input checked="" type="checkbox"/>	<Detail Setting>	192.168.3.1	
2	MR-J5-G		24	24	<input type="checkbox"/>	<Detail Setting>	192.168.3.2	

To write the parameters of the servo amplifier from the controller, select the [Parameter Automatic Setting] checkbox.

Host Station

STA#0 Master Station
Total STA#:2
Line/Star

STA#1
MR-J5-G

STA#2
MR-J5-G

Module List

CC-Link IE TSN Selection Find Module

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
 - Master/Local Module
 - Motion Module
 - GOT2000 Series
 - General-Purpose AG Servo
 - MR-J5-G Single Axis Unit
 - MR-J5W2-G 2-Axis Unit
 - MR-J5W2-G_B_Axis 2-Axis Unit
 - MR-J5D3-G 3-Axis Unit
 - MR-J5D3-G_BC_Axis 3-Axis Unit
 - MR-J5W3-G 3-Axis Unit
 - MR-J5W3-G_BC_Axis 3-Axis Unit
- General purpose Inverter
- DC Input
- Transistor Output
- I/O Combined
- Analog Input
- Analog Output
- Bridge module(CC-Link IE TSN-)

[Outline]
Servo Amplifier(MELSERVO-J5 Series)
Single Axis

[Specification]
CC-Link IE TSN Class B
Output voltage: 3-Phase 0 to 240VAC

(2) Parameter settings of the servo amplifier (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

CC-Link IE TSN Configuration Edit View Close with Discarding the Setting Close with Reflecting the Setting

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	RY Setting Points	RWr Setting Points	RWw Setting Points	Parameter Automatic Setting	PDO Mapping Setting	IP Address	bn	las
0	Host Station						192.168.3.253		
1	MR-J5-G		24	20	<input checked="" type="checkbox"/>	<Detail Setting>	192.168.3.1		
2	MR-J5-G		24	20	<input checked="" type="checkbox"/>	<Detail Setting>	192.168.3.2		

Double-click <Detailed Setting>.

Host Station

STA#0 Master Station
Total STA#:2
Line/Star

5-G MR-J5-G

Module List

CC-Link IE TSN Selection Find Module

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi)
 - Master/Local Module
 - Motion Module
 - GOT2000 Series
 - General-Purpose AG Servo
 - MR-J5-G Single Axis Unit
 - MR-J5-G-RJ Single Axis Unit
 - MR-J5D1-G Single Axis Unit
 - MR-JET-G Single Axis Unit
 - MR-J5D2-G 2-Axis Unit
 - MR-J5D2-G_B_Axis 2-Axis Unit
 - MR-J5W2-G 2-Axis Unit
 - MR-J5W2-G_B_Axis 2-Axis Unit
 - MR-J5D3-G 3-Axis Unit
 - MR-J5D3-G_BC_Axis 3-Axis Unit
 - MR-J5W3-G 3-Axis Unit
 - MR-J5W3-G_BC_Axis 3-Axis Unit
 - General purpose Inverter
 - DC Input
 - Transistor Output
 - I/O Combined
 - Analog Input
 - Analog Output
 - Bridge module(CC-Link IE TSN-)

[Outline]

Servo Amplifier(MELSERVO-J5 Series)

Single Axis

[Specification]

CC-Link IE TSN Class B

Output voltage: 3-Phase 0 to 240VAC

(2) Parameter settings of the servo amplifier (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

CC-Link IE TSN Configuration Edit View Close with Discarding the Setting Close with Reflecting the Setting

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	RY Setting Points	RWr Setting Points	RWw Setting Points	Parameter Automatic Setting	PDO Mapping Setting	IP Address	bn las
0	Host Station						192.168.3.253	
1	MR-J5-G		24	20	<input checked="" type="checkbox"/>	<Detail Setting>	192.168.3.1	
2	MR-J5-G		24	20	<input checked="" type="checkbox"/>	<Detail Setting>	192.168.3.2	

Host Station #1 STA#2

STA#0 Master Station Total STA#:2 Line/Star

MELSOFT GX Works3

⚠ Please confirm that the configuration of the target slave station and that of the actual target modules match.
- Station-specific mode setting: Motion Mode

Do you want to continue the process?

Yes No

Warning will occur, but it will be cleared when the servo amplifier parameters are set in the next window.

Output

Error:0 Warning:3 Information:0

Warning Unset items exist in Link Device Setting of module Host Station. Please set it if necessary. Host Station NV_W02702

Warning The parameter of slave station is not set in module MR-J5-G where parameter automatic setting is enabled. It is necessary to set parameter in Parameter of Slave Station when using Slave Station Parameter Automatic Setting function

Warning The parameter of slave station is not set in module MR-J5-G where parameter automatic setting is enabled. It is necessary to set parameter in Parameter of Slave Station when using Slave Station Parameter Automatic Setting function

Module List

CC-Link IE TSN Selection Find Module

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsub
- Master/Local Module
- Motion Module
- GOT2000 Series
- General-Purpose AC Servo
 - MR-J5-G Single Ax
 - MR-J5-G-RJ Single Ax
 - MR-J5D1-G Single Ax
 - MR-JET-G Single Ax
 - MR-J5D2-G 2-Axis Ur
 - MR-J5D2-G_B_Axis 2-Axis Ur
 - MR-J5W2-G 2-Axis Ur
 - MR-J5W2-G_B_Axis 2-Axis Ur
 - MR-J5D3-G 3-Axis Ur
 - MR-J5D3-G_BC_Axis 3-Axis Ur
 - MR-J5W3-G 3-Axis Ur
 - MR-J5W3-G_BC_Axis 3-Axis Ur
- General purpose Inverter
- DC Input
- Transistor Output

[Outline]

Servo Amplifier(MELSERVO-J5 Series)

Single Axis

[Specification]

CC-Link IE TSN Class B

(2) Parameter settings of the servo amplifier (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

CC-Link IE TSN Configuration Edit View Close with Discarding the Setting Close with Reflecting the Setting

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: []

Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	RY Setting Points	RWr Setting Points	RWw Setting Points	Parameter Automatic Setting	PDO Mapping Setting	IP Address	bn las
0	Host Station						192.168.3.253	
1	MR-J5-G		24	20	<input checked="" type="checkbox"/> <Detail Setting>	<Detail Setting>	192.168.3.1	
2	MR-J5-G				<Detail Setting>	<Detail Setting>	192.168.3.2	

Click [Yes] when this message appears.

MELSOFT GX Works3

⚠ Please confirm that the configuration of the target slave station and that of the actual target modules match.
- Station-specific mode setting: Motion Mode

Do you want to continue the process?

Yes No

Host Station #1 STA#2

STA#0 Master Station
Total STA#:2
Line/Star

5-G MR-J5-G

Module List

CC-Link IE TSN Selection Find Module

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsub
- Master/Local Module
- Motion Module
- GOT2000 Series
- General-Purpose AC Servo
 - MR-J5-G Single Ax
 - MR-J5-G-RJ Single Ax
 - MR-J5D1-G Single Ax
 - MR-JET-G Single Ax
 - MR-J5D2-G 2-Axis Ur
 - MR-J5D2-G_B_Axis 2-Axis Ur
 - MR-J5W2-G 2-Axis Ur
 - MR-J5D2-G_B_Axis 2-Axis Ur
 - MR-J5D3-G 3-Axis Ur
 - MR-J5D3-G_BC_Axis 3-Axis Ur
 - MR-J5W3-G 3-Axis Ur
 - MR-J5W3-G_BC_Axis 3-Axis Ur
- General purpose Inverter
- DC Input
- Transistor Output

[Outline]
Servo Amplifier(MELSERVO-J5 Series)
Single Axis

[Specification]
CC-Link IE TSN Class B

Output

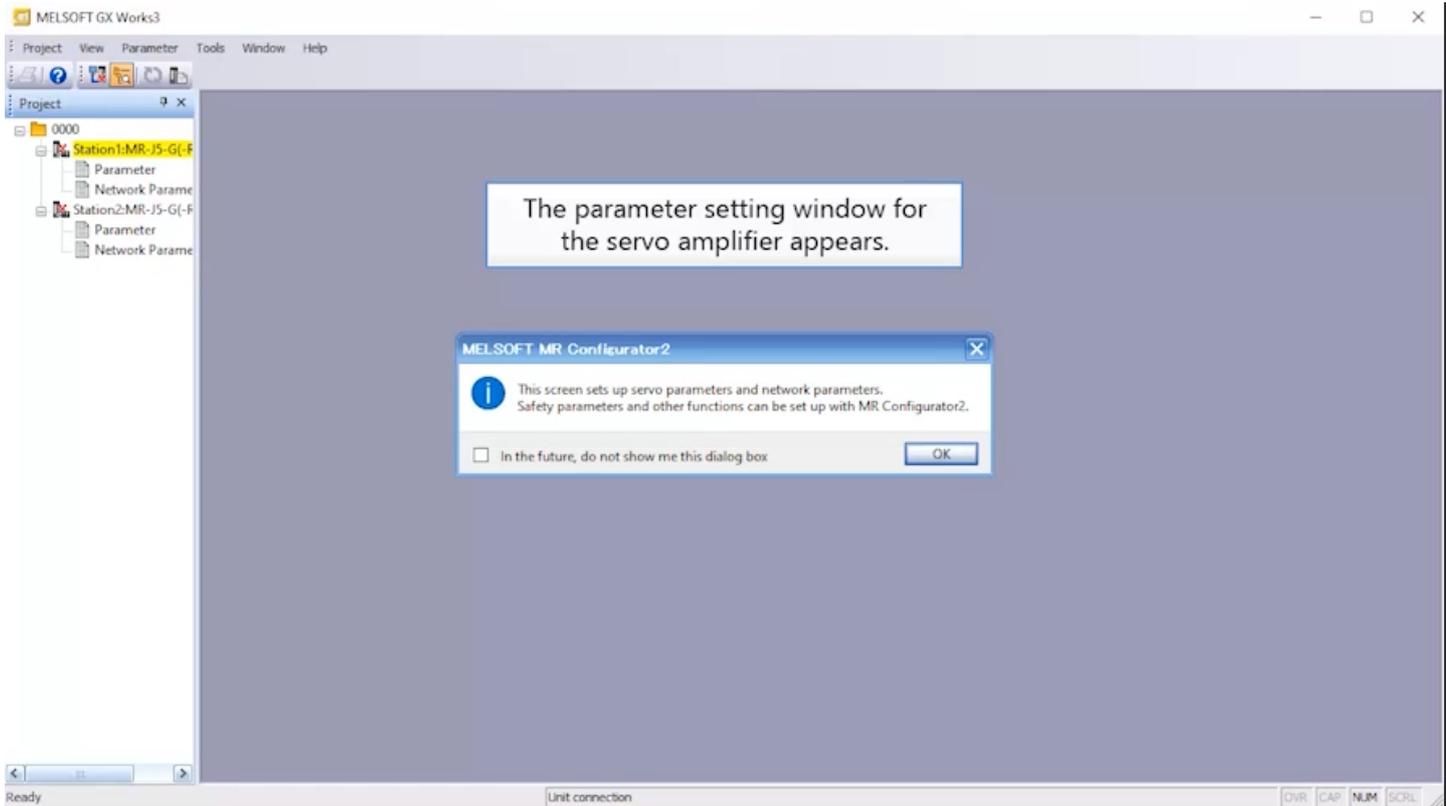
Error:0 Warning:3 Information:0

Warning Unset items exist in Link Device Setting of module Host Station. Please set it if necessary. Host Station NV_W02702

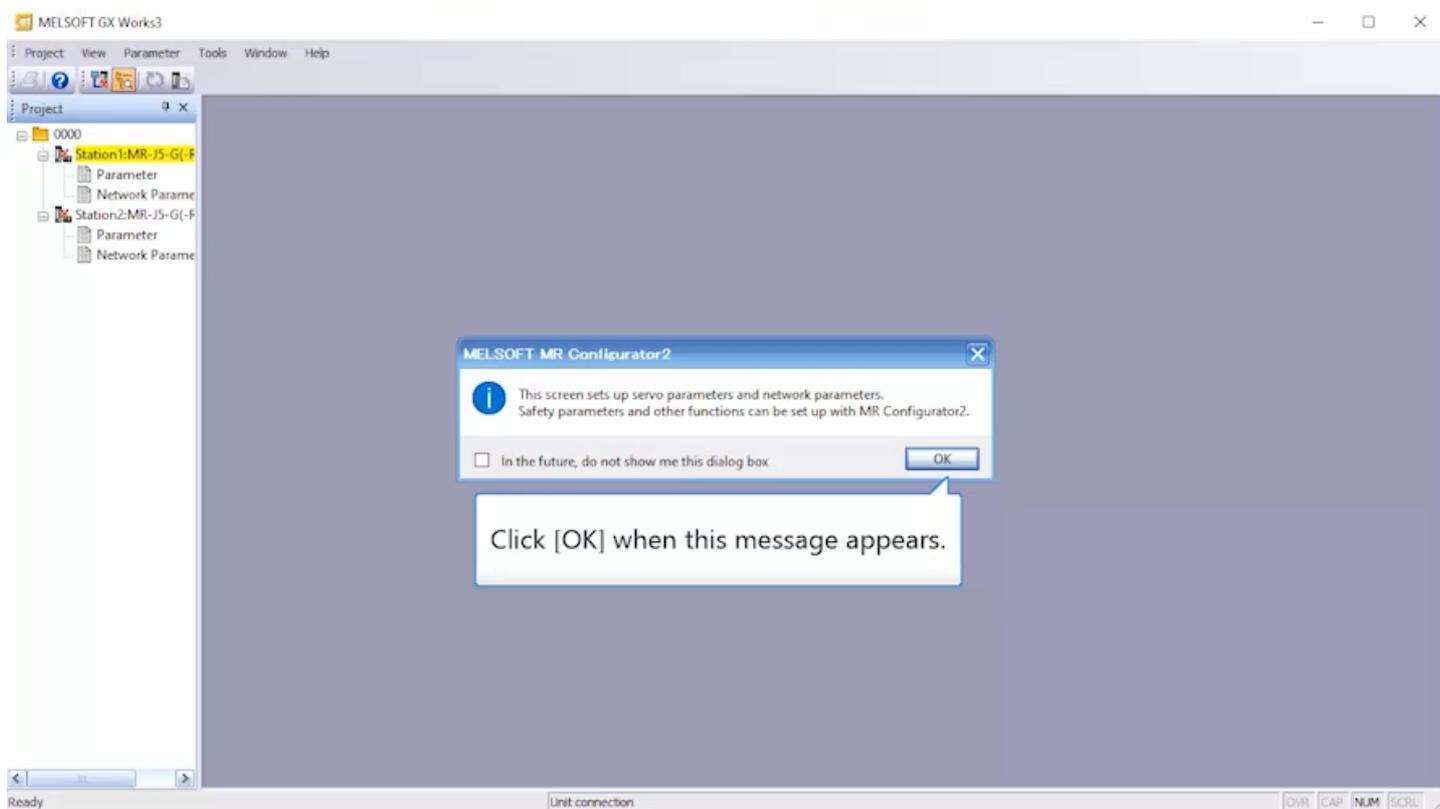
Warning The parameter of slave station is not set in module MR-J5-G where parameter automatic setting is enabled. It is necessary to set parameter in Parameter of Slave Station when using Slave Station Parameter Automatic Setting function

Warning The parameter of slave station is not set in module MR-J5-G where parameter automatic setting is enabled. It is necessary to set parameter in Parameter of Slave Station when using Slave Station Parameter Automatic Setting function

(2) Parameter settings of the servo amplifier (continued)



(2) Parameter settings of the servo amplifier (continued)



(2) Parameter settings of the servo amplifier (continued)

The screenshot shows the MELSOFT GX Works3 software interface for parameter setting. The main window displays a table of parameters for the servo amplifier. A text box in the center of the table reads: "The parameter list for the servo amplifier is displayed."

No.	Abbr.	Name	Unit	Setting range	Station1	Station2
Operation mode						
PA01.1	**	Operation mode selection		0-8	0 : Standard control	0 : Standard control
PA01.4	**	Fully closed loop operation mode selection		0-1	0 : Disabled (Semi dc)	0 : Disabled (Semi dc)
Basic						
Component parts						
					Setting	Setting
PC46.1	*	Converter stop mode selection		0-1	0 : Shut off converte	0 : Shut off converte
PC46.2	*	Protection coordination - Multiple connections select		0-1	0 : Connect converte	0 : Connect converte
PC46.3	*	Protection coordination - Final end setting		0-1	0 : End setting disabl	0 : End setting disabl
Network protocol setting						
PN13.0-3	**	Network protocol setting		0000-0004	0000 : CC-Link IE TSI	0000 : CC-Link IE TSI
Control mode						
PA01.0	**	Control mode selection		0-6	0 : Network standarc	0 : Network standarc

The docking help window at the bottom shows the following information:

[Pr. PA01_ Operation mode (**STY)]

Initial value	Setting range	Setting method	Ver.
00003000h	Refer to the relevant detail No.	Each axis	Refer to the relevant detail No.

[Pr. PA01.0_ Control mode selection]

(2) Parameter settings of the servo amplifier (continued)

The screenshot displays the MELSOFT GX Works3 Parameter Setting interface. The main window shows a parameter table for Station1. A text box is overlaid on the table with the text "Set the parameters described on the previous page." Below the table, the Docking Help window is visible, showing details for parameter [Pr. PA01_ Operation mode (**STY)] and [Pr. PA01.0_ Control mode selection].

No.	Abbr.	Name	Unit	Setting range	Station1	Station2
Operation mode						
PA01.1	**	Operation mode selection		0-8	0 : Standard control	0 : Standard control
PA01.4	**	Fully closed loop operation mode selection		0-1	0 : Disabled (Semi dc)	0 : Disabled (Semi dc)
Basic						
Component parts					Setting	Setting
PA01.0	**	Control mode selection		0-6	0 : Network standarc	0 : Network standarc

Docking Help

[Pr. PA01_ Operation mode (**STY)]

Initial value	Setting range	Setting method	Ver.
00003000h	Refer to the relevant detail No.	Each axis	Refer to the relevant detail No.

[Pr. PA01.0_ Control mode selection]

(2) Parameter settings of the servo amplifier (continued)

Parameters can be set either from Function display (List) or List display.
We use List display in this course.

No.	Abbr.	Name	Unit	Setting range	Station1	Station2
Operation mode						
Operation mode						
PA01.1	**	Operation mode selection		0-8	0 : Standard control	0 : Standard control
PA01.4	**	Fully closed loop operation mode selection		0-1	0 : Disabled (Semi dc)	0 : Disabled (Semi dc)
Basic						
Basic						
Network protocol setting						
Network protocol setting						
PN13.0-3	**	Network protocol setting		0000-0004	0000 : CC-Link IE TSI	0000 : CC-Link IE TSI
Control mode						
Control mode						
PA01.0	**	Control mode selection		0-6	0 : Network standarc	0 : Network standarc

Initial value	Setting range	Setting method	Ver.
00003000h	Refer to the relevant detail No.	Each axis	Refer to the relevant detail No.

[Pr. PA01.0_Control mode selection]

(2) Parameter settings of the servo amplifier (continued)

The screenshot shows the MELSOFT GX Works3 Parameter Setting window for Station2. The 'Basic' tab is selected, and the 'List display' option is active. The parameter table is as follows:

No.	Abbr.	Name	Unit	Setting range	Station1	Station2
PA01	**STY	Operation mode		00003000-10013086	0000 3000	0000 3000
PA02	**REG	Regenerative option		00000000-001100FF	0000 0000	0000 0000
PA03	*ABS	Absolute position detection system		00000000-00001111	0000 0000	0000 0000
PA04	*ACP1	Function selection A-1		00000000-00002100	0000 2000	0000 2000
PA05	*EBP	For manufacturer setting		10000-10000	10000	10000
PA06	*CMX	Electronic gear - Numerator		1-2147483647	16	16
PA07	*CDV	Electronic gear - Denominator		1-2147483647	1	1
PA08	ATU	Auto tuning mode		00000000-01110006	0000 0001	0000 0001
PA09	RSP	Auto tuning response		1-40	16	16
PA10	INP	In-position range		0-16777215	25600	25600
PA11	TLP	Forward rotation torque limit	%	0.0-1000.0	1000.0	1000.0
PA12	TLN	Reverse rotation torque limit	%	0.0-1000.0	1000.0	1000.0
PA13	*PLSS	For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PA14	*POL	Travel direction selection		0-1	0	0
PA15	*ENR	Encoder output pulses	pulse/rev	1-67108864	4000	4000
PA16	*ENR2	Encoder output pulses 2		1-67108864	1	1
PA17	**MSR	Servo motor series setting		00000000-0000FFFF	0000 0000	0000 0000
PA18	**MTY	Servo motor type setting		00000000-FFFFFFFF	0000 0000	0000 0000
PA19	*BLK	Parameter writing prohibited		00000000-0000FFFF	0000 00A8	0000 00A8
PA20	*TDS	Tough drive setting		00000000-00001120	0000 0000	0000 0000
PA21	*ACP3	Function selection A-3		00000000-00000001	0000 0001	0000 0001

A text box at the bottom of the window contains the instruction: "Click List display → Basic. Change PA06 to 16."

(2) Parameter settings of the servo amplifier (continued)

The screenshot shows the MELSOFT GX Works3 Parameter Setting window. The 'Extension' tab is selected, and the 'List display' button is active. The table below shows the parameters for the servo amplifier.

No.	Abbr.	Name	Unit	Setting range	Station1	Station2
PC71	INP2F	In-position 2 - Output filtering time	ms	0-65535	10	10
PC72	SA2R	Speed reached 2 - Output range	r/min mm/s	0.00-655.35	20.00	20.00
PC73	SA2F	Speed reached 2 - Output filtering time	ms	0-65535	10	10
PC74	TA2R	For manufacturer setting		10.0-10.0	10.0	10.0
PC75	TA2F	For manufacturer setting		10-10	10	10
PC76	*COPE	Function selection C-E		00000001-00001211	0000 0001	0000 0001
PC77	TL2	For manufacturer setting		1000.0-1000.0	1000.0	1000.0
PC78	**COPE	Function selection C-E		00000000-00000011	0000 0000	0000 0000
PC79	*COPG	Function selection C-G		00000000-0000007E	0000 0000	0000 0000
PC80		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PC81	**COPH	For manufacturer setting		00000000-00000020	0000 0000	0000 0000
PC82	**FSDT	For manufacturer setting		0-0	0	0
PC83	**PNDL	For manufacturer setting		0-10000	0	0
PC84		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PC85		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PC86		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PC87		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PC88		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PC89		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PC90		For manufacturer setting		00000000-00000000	0000 0000	0000 0000

Click List display → Extension.
Change PC79.0 to Eh.

(2) Parameter settings of the servo amplifier (continued)

The screenshot shows the MELSOFT GX Works3 Parameter Setting window. The 'I/O' tab is selected, and the parameter list is displayed. The parameter PD41 is highlighted with a red box. The current value for PD41 is 0000 1100. A text box below the screenshot provides instructions to change this value to 0000 1100.

No.	Abbr.	Name	Unit	Setting range	Station1	Station2
PD32	VLL	Master-slave operation - Speed limit adjusted value	c /min	0.00-21474836.47	0.00	0.00
PD33	*MD5	For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PD34	*MD6	For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PD35	*MD7	For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PD36	*MD8	For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PD37	*TPOP	For manufacturer setting		00000000-00110031	0011 0001	0011 0001
PD38	*DI4	Input device selection 4		00000000-000000FF	0000 002C	0000 002C
PD39	*DI5	Input device selection 5		00000000-000000FF	0000 002D	0000 002D
PD40	TPRT2	For manufacturer setting		-32768-32767	0	0
PD41	*DOP4	Function selection D-4		00000000-00011100	0000 1100	0000 1100
PD42		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PD43		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PD44		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PD45		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PD46		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PD47		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PD48		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PD49	TPRT1	For manufacturer setting		-32768-32767	0	0
PD50	TPRT3	For manufacturer setting		-32768-32767	0	0
PD51	*DI3W2	Input device selection 3-2		00000000-0003007F	0000 0062	0000 0062
PD52		For manufacturer setting		00000000-00000000	0000 0000	0000 0000

Click List display → I/O.
Change PD41 to 0000 1100 because PD41.2 and PD41.3 are changed to 1h.

(2) Parameter settings of the servo amplifier (continued)

The screenshot shows the MELSOFT GX Works3 Parameter Setting window. The 'List display' tree on the left is expanded to 'Positioning control'. The main table displays the following parameters:

No.	Abbr.	Name	Unit	Setting range	Station1	Station2
PT13		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT14	*BKC	For manufacturer setting		0-0	0	0
PT15	LMP	Software position limit +		47483648-2147483647	0	0
PT16		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT17	LMN	Software position limit -		47483648-2147483647	0	0
PT18		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT19	*LPP1	Position range output 1 address +		47483648-2147483647	0	0
PT20		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT21	*LNP1	Position range output 1 address -		47483648-2147483647	0	0
PT22		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT23		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT24		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT25		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT26	*TOP2	Function selection T-2		00000000-00020000	0000 0000	0000 0000
PT27	*ODM	For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT28	*TD1	For manufacturer setting		0-3	0	0
PT29	*TOP3	Function selection T-3		00000000-00000701	0000 0001	0000 0001
PT30		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT31		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT32	*TOP4	For manufacturer setting		00000100-00000100	0000 0100	0000 0100
PT33	*B9.K	For manufacturer setting		00000000-00000000	0000 0000	0000 0000

Click List display → Positioning control.
Set PT29.0 to 1h.

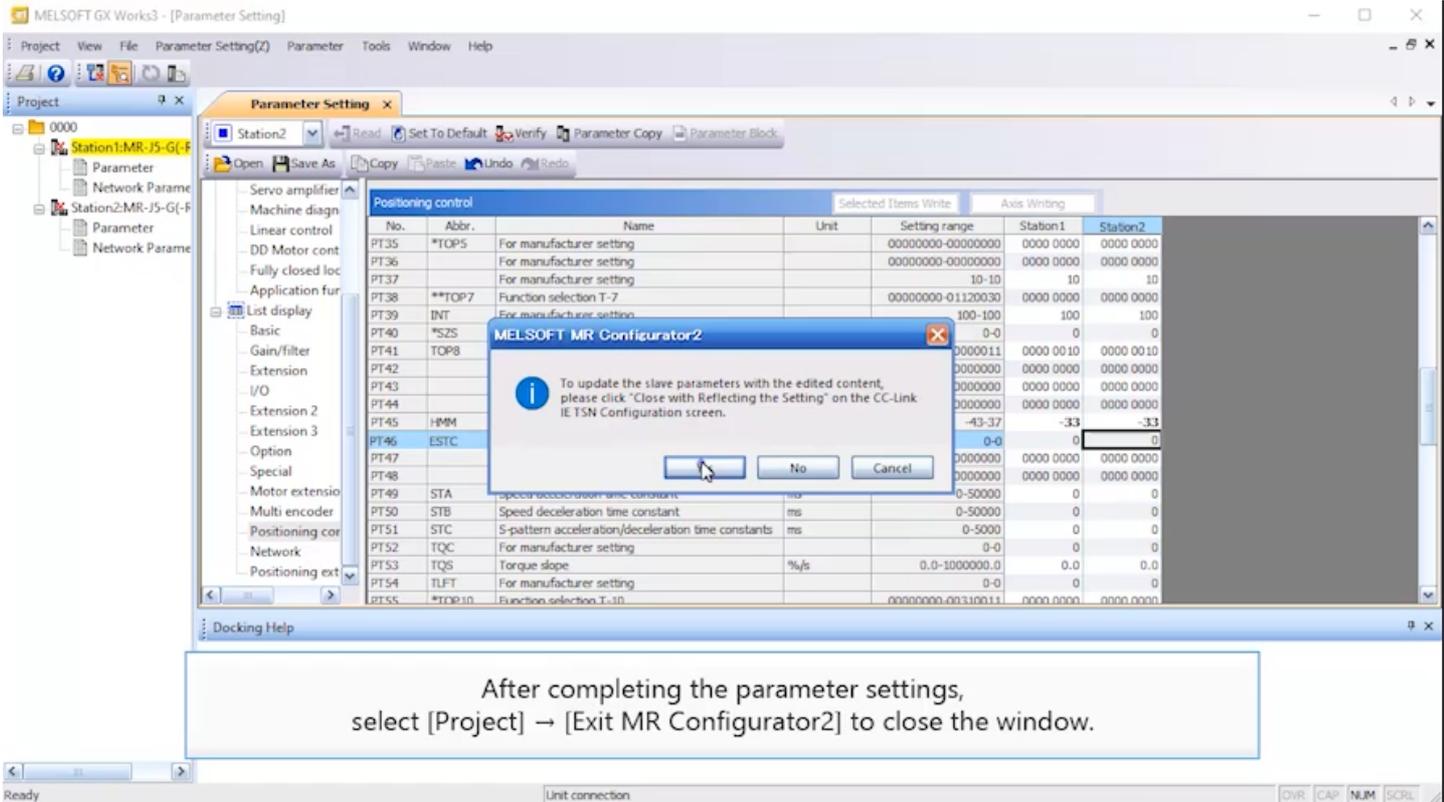
(2) Parameter settings of the servo amplifier (continued)

The screenshot shows the MELSOFT GX Works3 Parameter Setting window. The 'Positioning control' table is displayed, with the row for PT45 (Homing method) highlighted in red. The value -33 is entered in the Station2 column for PT45.

No.	Abbr.	Name	Unit	Setting range	Station1	Station2
PT35	*TOP5	For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT36		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT37		For manufacturer setting		10-10	10	10
PT38	**TOP7	Function selection T-7		00000000-01120030	0000 0000	0000 0000
PT39	INT	For manufacturer setting		100-100	100	100
PT40	*SZS	For manufacturer setting		0-0	0	0
PT41	TOP8	Function selection T-8		00000010-00000011	0000 0010	0000 0010
PT42		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT43		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT44		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT45	HMM	Homing method		-43-37	-33	-33
PT46	ESTC	For manufacturer setting		0-0	0	0
PT47		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT48		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT49	STA	Speed acceleration time constant	ms	0-50000	0	0
PT50	STB	Speed deceleration time constant	ms	0-50000	0	0
PT51	STC	S-pattern acceleration/deceleration time constants	ms	0-5000	0	0
PT52	TQC	For manufacturer setting		0-0	0	0
PT53	TQS	Torque slope	%/s	0.0-1000000.0	0.0	0.0
PT54	TLFT	For manufacturer setting		0-0	0	0
PT55	*TOP10	Function selection T-10		00000000-00310011	0000 0000	0000 0000

Set PT45 to -33.

(2) Parameter settings of the servo amplifier (continued)



After completing the parameter settings, select [Project] → [Exit MR Configurator2] to close the window.

No.	Abbr.	Name	Unit	Setting range	Station1	Station2
PT35	*TOP5	For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT36		For manufacturer setting		00000000-00000000	0000 0000	0000 0000
PT37		For manufacturer setting		10-10	10	10
PT38	**TOP7	Function selection T-7		00000000-01120030	0000 0000	0000 0000
PT39	INT	For manufacturer setting		100-100	100	100
PT40	*SZS			0-0	0	0
PT41	TOP8			00000111	0000 0010	0000 0010
PT42				00000000	0000 0000	0000 0000
PT43				00000000	0000 0000	0000 0000
PT44				00000000	0000 0000	0000 0000
PT45	HMM			-43-37	-33	-33
PT46	ESTC			0-0	0	0
PT47				00000000	0000 0000	0000 0000
PT48				00000000	0000 0000	0000 0000
PT49	STA	Speed deceleration time constant	ms	0-50000	0	0
PT50	STB	Speed deceleration time constant	ms	0-50000	0	0
PT51	STC	S-pattern acceleration/deceleration time constants	ms	0-5000	0	0
PT52	TQC	For manufacturer setting		0-0	0	0
PT53	TQS	Torque slope	%/s	0.0-1000000.0	0.0	0.0
PT54	TLFT	For manufacturer setting		0-0	0	0
PT55	*TOP10	Function selection T-10		00000000-00310011	0000 0000	0000 0000

(2) Parameter settings of the servo amplifier (continued)

CC-Link IE TSN Configuration (Start I/O: 0000)

Close with Discarding the Setting **Close with Reflecting the Setting**

Mode Setting: Online (Unicast Mode) Assignment Method: []
 Cyclic Transmission Time (Min.): 20.00 us Communication Period Interval (Min.): 250.00 us

No.	Model Name	RY Setting Points	RWr Setting Points	RWw Setting Points	Parameter Automatic Setting	PDO Mapping Setting	IP Address	bn	las
0	Host Station						192.168.3.253		
1	MR-J5-G		24	20	<input checked="" type="checkbox"/>	<Detail Setting>	192.168.3.1		
2	MR-J5-G		24	20	<input checked="" type="checkbox"/>	<Detail Setting>	192.168.3.2		

Host Station #1 STA#2

STA#0 Master Station
Total STA#:2
Line/Star

5-G MR-J5-G

When you return to the CC-Link IE TSN Configuration window, click [Close with Reflecting the Setting].

Output
Error0 Warning3

Warning Unset items exist
 Warning The parameter of
 Warning The parameter of

Module List
 CC-Link IE TSN Selection Find Module

General CC-Link IE TSN Module
 CC-Link IE TSN Module (Mitsub
 Master/Local Module
 Motion Module
 GOT2000 Series
 General-Purpose AG Servo
 MR-J5-G Single Ax
 MR-J5-G-RJ Single Ax
 MR-J5D1-G Single Ax
 MR-JET-G Single Ax
 MR-J5D2-G 2-Axis Ur
 MR-J5D2-G_B_Axis 2-Axis Ur
 MR-J5W2-G 2-Axis Ur
 MR-J5W2-G_B_Axis 2-Axis Ur
 MR-J5D3-G 3-Axis Ur
 MR-J5D3-G_BC_Axis 3-Axis Ur
 MR-J5W3-G 3-Axis Ur
 MR-J5W3-G_BC_Axis 3-Axis Ur
 General purpose Inverter
 DC Input
 Transistor Output

[Outline]
 Servo Amplifier(MELSERVO-J5 Series)
 Single Axis

[Specification]
 CC-Link IE TSN Class B

Parameter Automatic Setting func
 Parameter Automatic Setting func

(2) Parameter settings of the servo amplifier (continued)

When you return to the module parameter window of GX Works3, always click the [Apply] button.

Item	Setting
Network Configuration Settings	<Detailed Setting>
Refresh Settings	<Detailed Setting>
Network Topology	Line/Star
Communication Period Setting	
Setting in Units of Ius	Not Set
Communication Period Interval Setting (Do not Set it in Units of Ius)	1000.00 us
Communication Period Interval Setting (Set it in Units of Ius)	1000.00 us
System Reservation Time	20.00 us
Cyclic Transmission Time	500.00 us
Transient Transmission Time	450.00 us
TSN HUB Setting	Not to Use TSN HUB
Slave Station Setting	

Explanation
Set the number of device points and assignments of slave station to the master station.

Item List Find Result

Check Restore the Default Settings

Apply

(2) Parameter settings of the servo amplifier (continued)

The screenshot displays the 'Module Parameter' configuration interface for a servo amplifier. The left sidebar shows a navigation tree with 'Module Parameter' selected. The main window is divided into three panes: 'Setting Item List', 'Setting Item', and 'Element Selection'. The 'Setting Item List' pane shows a tree view with 'Network Configuration Settings' and 'Refresh Setting' checked. The 'Setting Item' pane displays a table of network parameters.

Item	Setting
Network Configuration Settings	<Detailed Setting>
Network Configuration Settings	<Detailed Setting>
Refresh Settings	<Detailed Setting>
Refresh Settings	<Detailed Setting>
Network Topology	Line/Star
Communication Period Setting	
Basic Period Setting	
Setting in Units of Ius	Not Set
Communication Period Interval Setting (Do not Set it in Units of Ius)	1000.00 us
Communication Period Interval Setting (Set it in Units of Ius)	1000.00 us
System Reservation Time	20.00 us
Cyclic Transmission Time	500.00 us
Transient Transmission Time	150.00 us
TSN HUB Setting	Not to Use TSN HUB
Slave Station Setting	

An 'Explanation' pane at the bottom provides details for the selected 'Slave Station Setting':

Explanation
Set the number of device points and assignments of slave station to the master station.

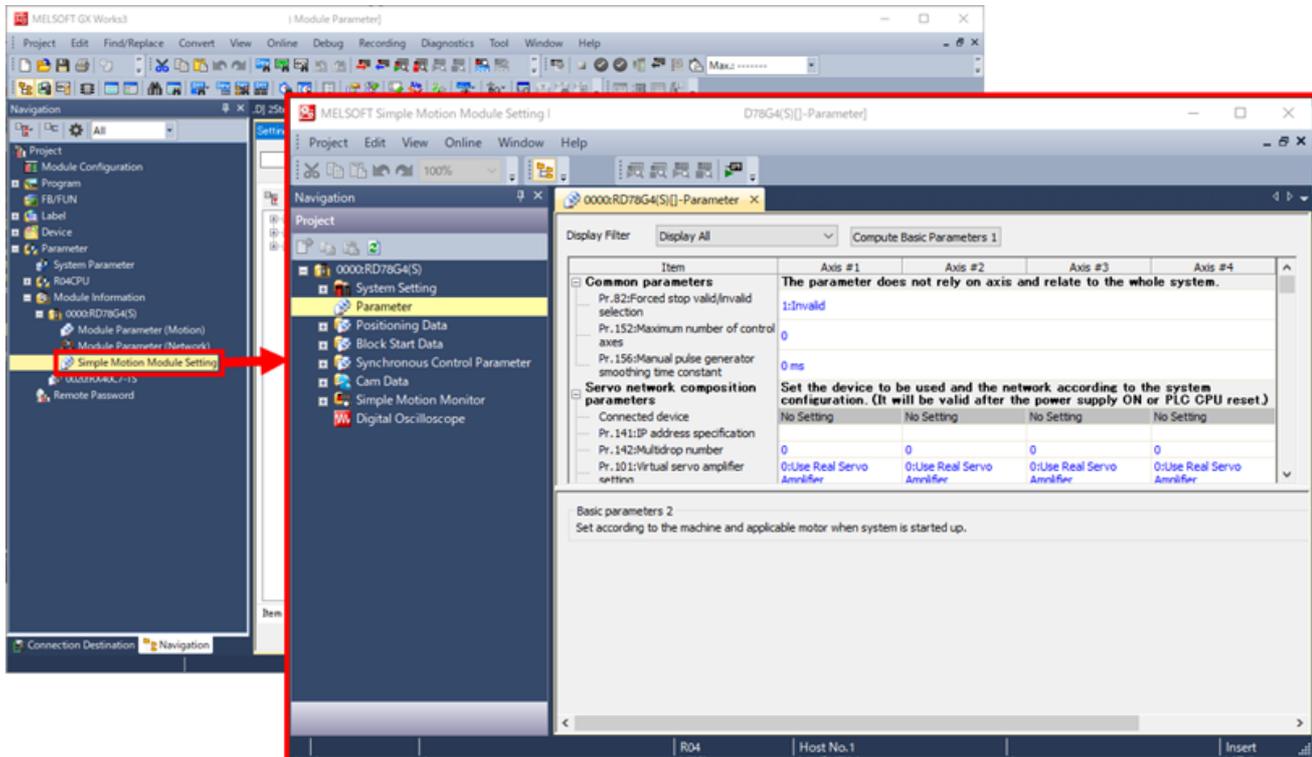
A callout box in the center of the screen reads: "This completes the parameter settings of the servo amplifier. Go to the next page." Buttons for 'Check', 'Restore the Default Settings', and 'Apply' are visible at the bottom of the interface.

3.3.3

Simple Motion module setting (Module extended parameter)

In the project tree, select [Parameter] → [Module Information] → [0000:RD78G4(S)] and double-click [Simple Motion Module Setting (Module Extended Parameter)].

The Simple Motion Module Setting Function window opens.
Configure the Simple Motion mode settings in this window.



Configure the settings in the order of the project tree in the Simple Motion Module Setting Function window. This section describes each setting from System Setting to Positioning Data in order.

MELSOFT Simple Motion Module Setting Function (Untitled Project) - [0000:RD78G4(S)] -Parameter

Project Edit View Online Window Help

Navigation 0000:RD78G4(S) -Parameter x

Project

- 0000:RD78G4(S)
 - System Setting
 - Parameter
 - Positioning Data
 - Block Start Data
 - Synchronous Control Parameter
 - Cam Data
 - Simple Motion Monitor
 - Digital Oscilloscope

Display Filter Display All Compute Basic Parameters 1

Item	Axis #1	Axis #2	Axis #3	Axis #4
Common parameters	The parameter does not rely on axis and relate to the whole system.			
Pr. 82:Forced stop valid/invalid selection	1:Invalid			
Pr. 152:Maximum number of control axes	0			
Pr. 156:Manual pulse generator smoothing time constant	0 ms			
Servo network composition parameters	Set the device to be used and the network according to the system configuration. (It will be valid after the power supply ON or PLC CPU reset.)			
Connected device	No Setting			
Pr. 141:IP address specification	0			
Pr. 142:Multidrop number	0			
Pr. 101:Virtual servo amplifier setting	0:Use Real Servo Amplifier	0:Use Real Servo Amplifier	0:Use Real Servo Amplifier	0:Use Real Servo Amplifier
Basic parameters 2				
Set according to the machine and applicable motor when system is started up.				

R04 Host No.1 Insert

Buffer memory of Simple Motion mode

The following pages contain the description of the buffer memory of Simple Motion mode.
The following provides the basic information on buffer memory such as symbols and setting methods.

(1) Type of buffer memory

There are four main types of buffer memory in Simple Motion mode.

Type	Symbol	Detail
Parameter	[Pr.XX]	Network-related parameters, axis-independent parameters related to the entire system, parameters to be set according to the machine, etc. They are mainly set by the Simple Motion Module Setting Function.
Positioning data	[Da.XX]	Data to be used for positioning control, such as the target position and target speed. They are mainly set by the Simple Motion Module Setting Function.
Control data	[Cd.XX]	Data to be manipulated when any kind of control is performed. "System control data" controls the entire system and "Axis control data" controls each axis.
Monitor data	[Md.XX]	Memory to be used when the operating status of control is monitored. "System monitor data" is used for monitoring of the entire system and "Axis monitor data" is used for monitoring of each axis.

(2) How to access buffer memory

There are two ways to access buffer memory.

One is to specify the buffer memory address directly in the program (U□\Gxxxxx) and the other is to use module labels.

This course uses module labels. The details are described in Chapter 4.

The buffer memory address is described in the following manuals.

-  MELSEC iQ-R Motion Module User's Manual (Application for Simple Motion Mode)
12.2 List of Buffer Memory Addresses
-  MELSEC iQ-F FX5 Motion Module/ Simple Motion Module User's Manual (Application)
11.2 List of Buffer Memory Addresses

3.4.1

System setting

Set [System Setting] in the project tree when using the mark detection function.
In this course, use the initial values because the mark detection function is not used.

The screenshot displays a software application window with a menu bar (Project, Edit, View, Online, Window, Help) and a toolbar. On the left, a 'Navigation' pane shows a project tree for '0000:RD78G4(S)'. The 'System Setting' folder is highlighted with a red box. The main area shows a table of settings for 'Mark detection setting'.

Item	Setting 1	Setting 2	Setting 3	Setting 4	Setting 5
Mark detection setting					
Pr.800:Mark detection signal setting	0	0	0	0	0
Pr.811:Mark detection signal detection direction setting	0:Rising detection				
Pr.801:Mark detection signal compensation time	0 μs				
Mark detection data setting					
Pr.802:Type	0:Feed Current ...				
Pr.803:Axis No.	0	0	0	0	0
Pr.804:Buffer memory No.	0	0	0	0	0
Pr.805:Latch data range upper limit value	0	0	0	0	0
Pr.806:Latch data range lower limit value	0	0	0	0	0
Mark detection mode setting					
Pr.807:Mark detection mode	Continuous Dete...				
Pr.807:Number of detections	0	0	0	0	0

At the bottom of the window, the status bar shows 'R04' and 'Host No.1'.

Common parameters

Set the parameters related to the entire system. The parameters in the red frame are described below.

Item	Axis #1	Axis #2
Common parameters	The parameter does not rely on axis and relate to the whole system.	
Pr. 82: Forced stop valid/invalid selection	1: Invalid	
Pr. 152: Maximum number of control axes	0	
Pr. 156: Manual pulse generator smoothing time constant	0 ms	

[Pr.82: Forced stop valid/invalid selection]

Set this parameter to "2: Valid (Buffer Memory)" to execute an emergency stop of all axes at once in the program. In this case, an emergency stop is executed when the buffer memory of [Cd.158: Forced stop input] is set to "0". In the sample program, it is set to "1: Invalid" since the emergency stop from the controller is not used.

[Pr.152: Maximum number of control axes]

This parameter is used to keep the operation cycle small when the number of control axes to be used is less than the maximum number of control axes for each model.

Servo network composition parameters

Set the parameters related to the network. The parameters in the red frame are described below.

Item	Axis #1	Axis #2
Servo network composition parameters	Set the device to be used and the network according to the system configuratio...	
Connected device	MR-J5-G	MR-J5-G
Pr. 141: IP address specification	192.168.3.1	192.168.3.2
Pr. 142: Multidrop number	0	0
Pr. 101: Virtual servo amplifier setting	0: Use Real Servo Amplifier	0: Use Real Servo Amplifier
Pr. 140: Driver command discard detection setting	1: Detection Valid	1: Detection Valid

[Pr.141: IP address specification], [Pr.142: Multidrop number]

Set the IP address of the servo amplifier.

For the multi-axis servo amplifier, specify the A-/B-/C-axis with the multidrop number.

[Point]

Clicking the [...] button in the [Pr.141: IP address specification] or [Pr.142: Multidrop number] field displays the list of servo amplifiers registered in the network configuration setting.

You can select the servo amplifier to be assigned to the axis from the displayed list.

The screenshot shows the 'Servo network composition parameters' configuration window. The 'Pr. 141: IP address specification' field is highlighted with a red box, and a red arrow points to the '...' button next to it. Below the main window, a 'Station Address Setting' dialog box is shown, displaying a list of servo amplifiers with their IP addresses and models.

IP Address	Model	Alias
192.168.3.1	MR-J5-G	
192.168.3.2	MR-J5-G	

[Pr.101:Virtual servo amplifier setting]

When using the servo amplifier as a virtual servo amplifier, set it to "1:Use as Virtual Servo Amplifier".

The virtual servo amplifier is a function to allow an axis (virtual servo amplifier axis) to generate only commands virtually without connecting a servo amplifier.

Operation can be performed without amplifiers during debugging.

Basic parameters 1

Set the machine specifications.

- (1) By clicking [Compute Basic parameters 1], the setup assistance window pops up.
- (2) Input the machine specifications.
- (3) By clicking the [Compute Basic parameters 1] button, basic parameters 1 are calculated.
- (4) By clicking [OK], the window is closed and the settings are applied.

Item	Axis #1	Axis #2
Basic parameters 1	Set according to the machine and applicable motor when system is started up (It w...	
Pr. 1:Unit setting	0:mm	0:mm
Pr. 2:Number of pulses per rotation	4194304 pulse	4194304 pulse
Pr. 3:Movement amount per rotation	10000.0 μm	10000.0 μm
Pr. 4:Unit magnification	1:x1 Times	1:x1 Times
Pr. 7:Bias speed at start	0.00 mm/min	0.00 mm/min

Compute Basic Parameters 1 - Axis #1

Entry

Select the machine components, and enter the machine data to automatically set the basic parameters 1 (unit setting, number of pulses per rotation, movement amount per rotation and unit magnification).

Machine Components: Ball Screw, Horizontal

Unit Setting: 0:mm

Lead of Ball Screw (PB): 10000.0 [μm]

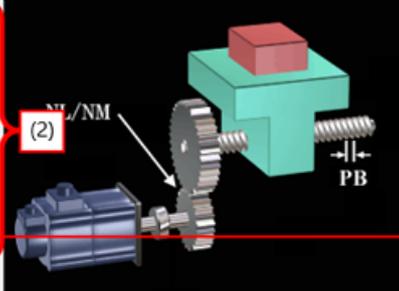
Reduction Ratio (NL/NM): = 1 / 1

Calculate reduction ratio by teeth or diameters Reduction Ratio Setting

Encoder Resolution: 4194304 [pulse/rev]

Setting Range:

When the encoder resolution is 67108864 pulses, the electronic gear (numerator / denominator) of the servo amplifier is rewritten with 16/1. Therefore, set the encoder resolution as 4194304 pulses.



Calculation Result

* Basic Parameters 1

Unit Setting	
Number of Pulses per Rotation	
Movement Amount per Rotation	
Unit Magnification	

Movement Amount per Pulse:

As a result of calculation, no error occurs in the movement amount.

Applying the calculation result above,

you want to perform is about 0.0 [μm] the error for the movement amount 0.0 [μm] Error Calculation

(4) OK Cancel

Even when using the HK series servo amplifier, set 4196304 [pulse/rev] here.

Basic parameters 2

Set the speed limit value and acceleration/deceleration time.

Item	Axis #1	Axis #2
Basic parameters 2	Set according to the machine and applicable motor when system is started up.	
Pr. 8:Speed limit value	10000.00 mm/min	10000.00 mm/min
Pr. 9:Acceleration time 0	1500 ms	1500 ms
Pr. 10:Deceleration time 0	1500 ms	1500 ms

[Pr.8:Speed limit value]

Set the maximum speed for positioning control, homing control, and speed/torque control.

[Pr.9:Acceleration time 0], [Pr.10:Deceleration time 0]

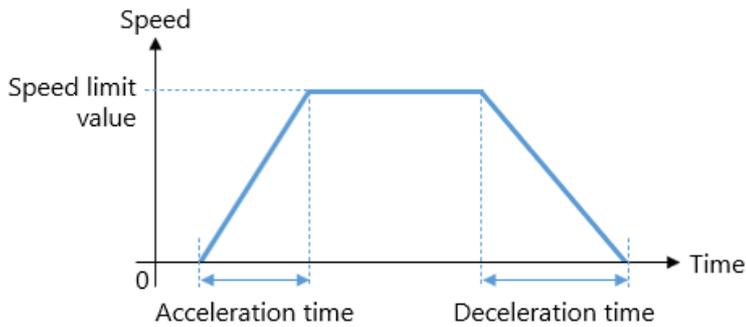
Acceleration time 0 is used to set the time required to reach [Pr.8:Speed limit value] (or [Pr.31:JOG speed limit value] in the case of JOG operation control) from speed 0.

Deceleration time 0 is used to set the time required to reach speed 0 from [Pr.8:Speed limit value] (or [Pr.31:JOG speed limit value] in the case of JOG operation control).

([Pr.31:JOG speed limit value] is set in detailed parameters 2.)

In detailed parameters 2, acceleration time 1 to 3 and deceleration time 1 to 3 can be set.

In Positioning Data (point table) setting, select acceleration/deceleration time 0 to 3.



Detailed parameters 1

These parameters are set for each axis. The parameters in the red frames are described below.

Item	Axis #1	Axis #2
Detailed parameters 1	Set according to the system configuration when the system is started up.(It will be...	
Pr. 11:Backlash compensation amount	0.0 μm	0.0 μm
Pr. 12:Software stroke limit upper limit value	155000.0 μm	15500.0 μm
Pr. 13:Software stroke limit lower limit value	-5000.0 μm	-500.0 μm
Pr. 14:Software stroke limit selection	0:Apply Software Stroke Limit on Feed Current Value	0:Apply Software Stroke Limit on Feed Current Value
Pr. 15:Software stroke limit valid/invalid setting	0:Valid	0:Valid
Pr. 16:Command in-position width	10.0 μm	10.0 μm
Pr. 17:Torque limit setting value	300.0 %	300.0 %
Pr. 18:M-code ON signal output timing	0:WITH Mode	0:WITH Mode
Pr. 19:Speed switching mode	0:Standard Speed Switching Mode	0:Standard Speed Switching Mode
Pr. 20:Interpolation speed designation method	0:Vector Speed	0:Vector Speed
Pr. 21:Feed current value during speed control	0:Not Update of Feed Current Value	0:Not Update of Feed Current Value
Pr. 22:Input signal logic selection : Lower limit	0:Negative Logic	0:Negative Logic
Pr. 22:Input signal logic selection : Upper limit	0:Negative Logic	0:Negative Logic
Pr. 22:Input signal logic selection : Stop signal	0:Negative Logic	0:Negative Logic
Pr. 22:Input signal logic selection : External c...	0:Negative Logic	0:Negative Logic
Pr. 22:Input signal logic selection : Proximity ...	0:Negative Logic	0:Negative Logic
Pr. 81:Speed-position function selection	0:Speed-position Switching Control (INC Mode)	0:Speed-position Switching Control (INC Mode)
Pr. 116:FLS signal selection : Input type	1:Servo Amplifier	1:Servo Amplifier
Pr. 117:RLS signal selection : Input type	1:Servo Amplifier	1:Servo Amplifier
Pr. 118:DOG signal selection : Input type	1:Servo Amplifier	1:Servo Amplifier
Pr. 119:STOP signal selection : Input type	2:Buffer Memory	2:Buffer Memory

(Note) They are described in 3.4.3 Positioning Data (Point table).

[Pr.12:Software stroke limit upper limit value], [Pr.13:Software stroke limit lower limit value]

Set the upper and lower limits of the machine motion range during positioning control.

[Pr.14:Software stroke limit selection]

Set whether to apply the software stroke limit to "Feed Current Value" or "Machine Feed Value".

[Pr.15:Software stroke limit valid/invalid setting]

Whether to enable or disable the software stroke limit during JOG operation , inching operation, and manual pulser operation. To disable the software stroke limit at all times, set the same value for the upper and lower limits.

[Pr.22:Input signal logic selection] (Lower limit, Upper limit, and Proximity dog signal)

Switch the logic of the external input signals (upper/lower limit signal (FLS/RLS) and Proximity dog signal (DOG)) from the servo amplifier or buffer memory.

[Point]

Positive Logic and Negative Logic are as shown below.

	Negative Logic	Positive Logic
No current flows through the input signal contact.	FLS, RLS: Limit signal ON DOG: Invalid (outside DOG)	FLS, RLS: Limit signal OFF DOG: Valid (inside DOG)
Current flows through the input signal contact.	FLS, RLS: Limit signal OFF DOG: Valid (inside DOG)	FLS, RLS: Limit signal ON DOG: Invalid (outside DOG)

[Pr.116:FLS signal selection : Input type], [Pr.117:RLS signal selection : Input type], [Pr.118:DOG signal selection : Input type] Select whether to connect each external input signal to the servo amplifier, use the buffer memory of [Cd.44:External input signal operation device], or disable them.

Detailed parameters 2

These parameters are set for each axis. The parameters in the red frame are described below.

Item	Axis #1	Axis #2
Detailed parameters 2	Set according to the system configuration when the system is started up(Set as re...	
Pr.25:Acceleration time 1	1000 ms	1000 ms
Pr.26:Acceleration time 2	1000 ms	1000 ms
Pr.27:Acceleration time 3	1000 ms	1000 ms
Pr.28:Deceleration time 1	1000 ms	1000 ms
Pr.29:Deceleration time 2	1000 ms	1000 ms
Pr.30:Deceleration time 3	1000 ms	1000 ms
Pr.31:JOG speed limit value	2000.00 mm/min	2000.00 mm/min
Pr.32:JOG operation acceleration time select...	1:1000	1:1000
Pr.33:JOG operation deceleration time selec...	1:1000	1:1000
Pr.34:Acceleration/deceleration process sele...	0:Trapezoidal Acceleration/Deceleration Process	0:Trapezoidal Acceleration/Deceleration Process
Pr.35:S-curve ratio	100 %	100 %
Pr.36:Rapid stop deceleration time	1000 ms	1000 ms
Pr.37:Stop group 1 rapid stop selection	0:Normal Deceleration Stop	0:Normal Deceleration Stop
Pr.38:Stop group 2 rapid stop selection	0:Normal Deceleration Stop	0:Normal Deceleration Stop
Pr.39:Stop group 3 rapid stop selection	0:Normal Deceleration Stop	0:Normal Deceleration Stop
Pr.40:Positioning complete signal output time	300 ms	300 ms
Pr.41:Allowable circular interpolation error w...	10.0 μm	10.0 μm
Pr.42:External command function selection	0:External Positioning Start	0:External Positioning Start
Pr.83:Speed control 10x multiplier setting fo...	0:Invalid	0:Invalid
Pr.84:Restart allowable range when servo O...	0 pulse	0 pulse
Pr.90:Operation setting for SPD-TRQ Cont. ...	0:Command Torque	0:Command Torque
Pr.90:Operation setting for SPD-TRQ Cont. ...	0:Command Speed	0:Command Speed
Pr.90:Operation setting for SPD-TRQ Cont. ...	0:Check the Switching Conditions in Simple Motion ...	0:Check the Switching Conditions in Simple Motion ...
Pr.127:Speed limit value input selection at c...	0:Input Enable	0:Input Enable
Pr.95:External command signal selection	0:Not Used	0:Not Used
Pr.112:Servo OFF command valid/invalid set...	0:Servo OFF Command Invalid	0:Servo OFF Command Invalid
Pr.122:Manual pulse generator speed limit m...	0:Do Not Execute Speed Limit	0:Do Not Execute Speed Limit
Pr.123:Manual pulse generator speed limit v...	200.00 mm/min	200.00 mm/min

Only for the iQ-R series
Motion module

[Pr.25 to Pr.27:Acceleration time 1 to 3] and [Pr.28 to Pr.30:Deceleration time 1 to 3]

Set the acceleration time and deceleration time in the same way as [Pr.9:Acceleration time 0] and [Pr.10:Deceleration time 0].

For details, refer to the items of Basic parameters 2.

In Positioning Data (point table) setting, select acceleration/deceleration time 0 to 3.

[Pr.31:JOG speed limit value]

Set the upper speed limit for JOG operation.

[Pr.32:JOG operation acceleration time selection]

Select the acceleration time for JOG operation from acceleration time 0 to 3.

[Pr.33:JOG operation deceleration time selection]

Select the deceleration time for JOG operation from deceleration time 0 to 3.

Home position return parameters

Set the parameters related to home position return. The parameters in the red frame are described below.

Item	Axis #1	Axis #2
HPR parameters	Set the parameters required for HPR, which are not set on the driver (servo amplif...	
Pr.44:HPR direction	0:Forward Direction (Address Increase Direction)	0:Forward Direction (Address Increase Direction)
Pr.45:HP address	0.0 μm	0.0 μm
Pr.46:HPR speed	0.01 mm/min	0.01 mm/min
Pr.51:HPR acceleration time selection	0:1500	0:1500
Pr.52:HPR deceleration time selection	0:1500	0:1500
Pr.55:Operation setting for incompletion of ...	0:Positioning Control is Not Executed	0:Positioning Control is Not Executed

[Pr.45:Home position address]

When the machine home position return is finished, the address of the stop position is changed to the address set here. At the same time, it is stored in [Md.20: Feed current value] and [Md.21: Machine feed value].

[Pr.46:Home position return speed]

Set the travel speed when high-speed home position return (positioning number 9002) is executed.

[Pr.51:Home position return acceleration time selection], [Pr.52:Home position return deceleration time selection]

Select the acceleration/deceleration time when high-speed home position return (positioning number 9002) is executed from acceleration time 0 to 3 and deceleration time 0 to 3.

[Point]

Use the parameters of the servo amplifier to set the homing method and direction.

[Pr.46], [Pr.51], and [Pr.52] are valid only for high-speed home position return.

Extended parameters

Configure the settings related to the desired data monitor function. Description of the settings is omitted in this course.

3.4.3 Positioning Data (Point table)

(1)

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees	Interpolation speed designation method
1	<Positioning Comment>												
2	<Positioning Comment>												

(1) Operation pattern

Select the operation pattern from 0: END / 1: CONT / 3: LOCATION.

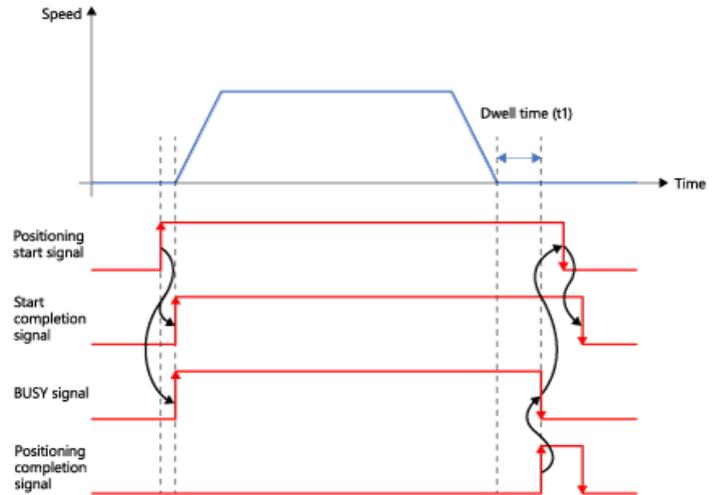
The following shows the difference of each setting when Positioning Data No. 1 is executed.

0: END

Only Positioning Data No. 1 is executed.

Processing stops at the target position.

No.	Operation pattern	Control method	...	Dwell time
1	0: END	01: ABS Linear 1		(t1)



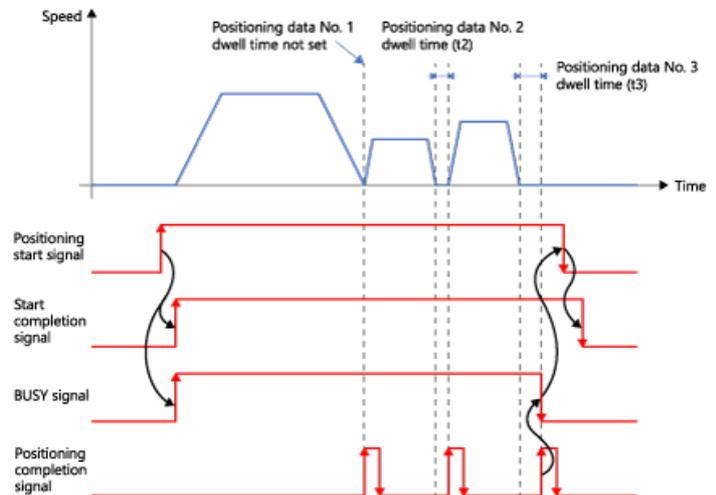
1: CONT

Positioning Data No. 1 is executed and when the machine stops at the target position, Positioning Data No. 2 is immediately executed.

Processing is repeatedly executed until the positioning data where the operation pattern is [0: END].

Processing stops at the target position.

No.	Operation pattern	Control method	...	Dwell time
1	1: CONT	01: ABS Linear 1		0
2	1: CONT	01: ABS Linear 1		(t2)
3	0: END	01: ABS Linear 1		(t3)

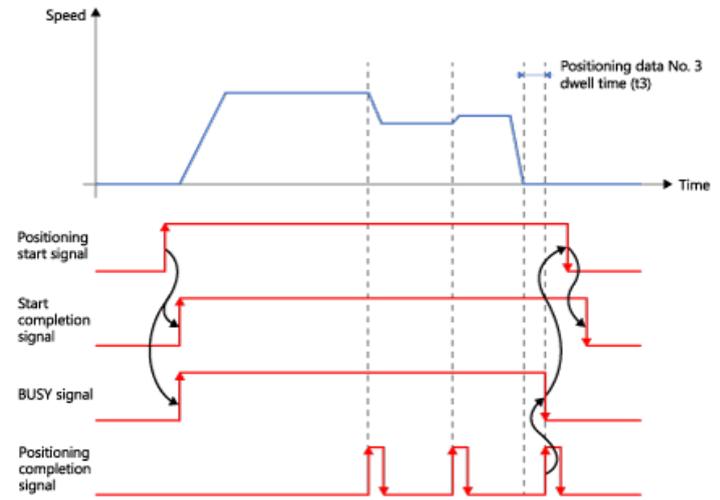


3: LOCATION

Speed is changed between the Positioning Data No. in operation and the next Positioning Data No. without deceleration stop.

Speed change is not performed when the speed is the same. Dwell time setting in the middle of the processing is ignored. Processing is repeatedly executed until the positioning data where the operation pattern is [0: END].

No.	Operation pattern	Control method	...	Dwell time
1	3: LOCATION	01: ABS Linear 1		(t1)
2	3: LOCATION	01: ABS Linear 1		(t2)
3	0: END	01: ABS Linear 1		(t3)



3.4.3

Positioning Data (Point table)

(2)

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees	Interpolation speed designation method
1	<Positioning Comment>												
2	<Positioning Comment>												

(2) Control method and axis to be interpolated

Select the control method from the following items. For the axis to be interpolated, set another axis number to be used for interpolation control.

Control method	Description
01h: ABS Linear 1	1-axis linear control (ABS)
02h: INC Linear 1	1-axis linear control (INC)
03h: Feed 1	1-axis fixed-feed control
04h: FWD V1	1-axis speed control (forward)
05h: RVS V1	1-axis speed control (reverse)
06h: FWD V/P	Speed-position switching control (forward)
07h: RVS V/P	Speed-position switching control (reverse)
08h: FWD P/V	Position-speed switching control (forward)
09h: RVS P/V	Position-speed switching control (reverse)
0Ah: ABS Linear 2	2-axis linear interpolation control (ABS)
0Bh: INC Linear 2	2-axis linear interpolation control (INC)
0Ch: Feed 2	2-axis fixed-feed control
0Dh: ABS ArcMP	Circular interpolation control with sub point designation (ABS)
0Eh: INC ArcMP	Circular interpolation control with sub point designation (INC)
0Fh: ABS ArcRGT	Circular interpolation control with center point designation (ABS, CW)
10h: ABS ArcLFT	Circular interpolation control with center point designation (ABS, CCW)
11h: INC ArcRGT	Circular interpolation control with center point designation (INC, CW)
12h: INC ArcLFT	Circular interpolation control with center point designation (ABS, CCW)
13h: FWD V2	2-axis speed control (forward)
14h: RVS V2	2-axis speed control (reverse)
15h: ABS Linear 3	3-axis linear interpolation control (ABS)
16h: INC Linear 3	3-axis linear interpolation control (INC)
17h: Feed 3	3-axis fixed-feed control
18h: FWD V3	3-axis speed control (forward)
19h: RVS V3	3-axis speed control (reverse)

1Ah: ABS Linear 4	4-axis linear interpolation control (ABS)
1Bh: INC Linear 4	4-axis linear interpolation control (INC)
1Ch: Feed 4	4-axis fixed-feed control
1Dh: FWD V4	4-axis speed control (forward)
1Eh: RVS V4	4-axis speed control (reverse)
20h: ABS HldMP	Helical interpolation control with sub point designation (ABS)
21h: INC HldMP	Helical interpolation control with sub point designation (INC)
22h: ABS HldRGT	Helical interpolation control with center point designation (ABS, CW)
23h: ABS HldLFT	Helical interpolation control with center point designation (ABS, CCW)
24h: INC HldRGT	Helical interpolation control with center point designation (INC, CW)
25h: INC HldLFT	Helical interpolation control with center point designation (INC, CCW)
80h: NOP	NOP instruction
81h: Address CHG	Current value change
82h: JUMP	JUMP instruction
83h: LOOP	Start of LOOP to LEND
84h:LEND	End of LOOP to LEND

Helical interpolation is available only for the iQ-R series Motion module.

[Point]

The interpolation control uses a set of the same number of positioning data for the reference axis and interpolation axis.

Setting examples are shown in 3.4.4.

3.4.3

Positioning Data (Point table)

No.	Operation pattern	Control method	Axis to be interpolated	(3)		(4)	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees	Interpolation speed designation method
				Acceleration time No.	Deceleration time No.	Positioning address							
1	<Positioning Comment>												
2	<Positioning Comment>												

(3) Acceleration time No. and deceleration time No.

Select the acceleration time and deceleration time from Acceleration time No. 0 to 3 and deceleration time No. 0 to 3 set with the axis parameters (refer to 3.4.2).

(4) Positioning address

Set the coordinates of the target position.

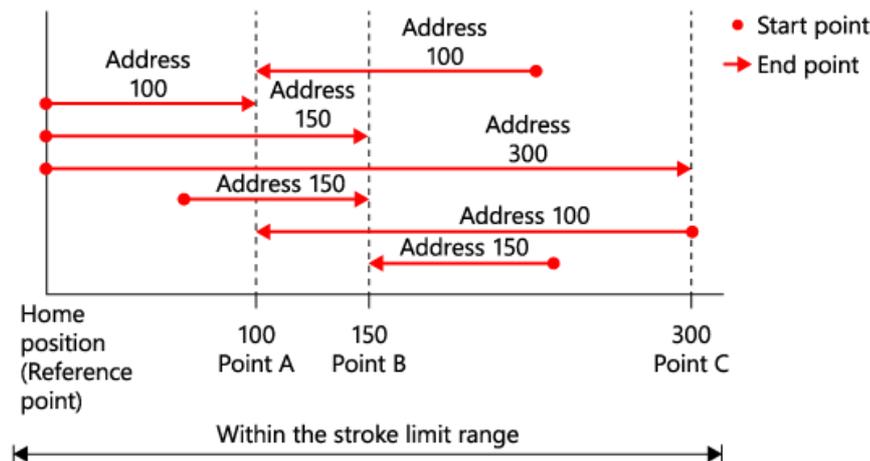
The values change depending on the absolute position specification (ABS, absolute system) and relative position specification (INC, incremental system).

Refer to the following figures.

Absolute method

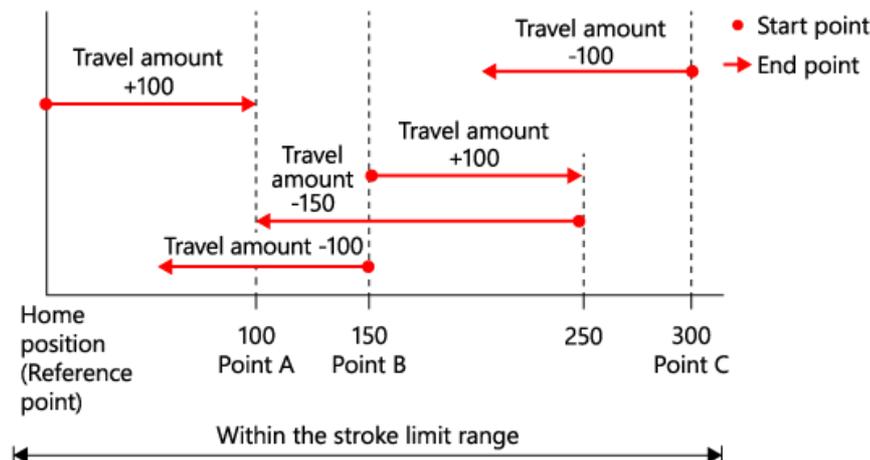
Positioning is carried out to a designated position (absolute address) with reference to the home position.

This address is regarded as the positioning address. (The start point can be anywhere.)



Incremental system

The position where the machine is currently stopped is regarded as the start point, and positioning is carried out for a designated movement amount in a designated movement direction.



3.4.3

Positioning Data (Point table)

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	(5)	(6)	(7)	M-code	M-code ON signal output timing	ABS direction in degrees	Interpolation speed designation method
							Arc address	Command speed	Dwell time				
1	<Positioning Comment>												
2	<Positioning Comment>												

(5) Arc address

The values to be input change depending on the circular interpolation method.

ArcMP Input the coordinates of the sub point.

ArcRGT/ArcLFT ... Input the coordinates of the center point.

Setting examples are shown in 3.4.4.

(6) Command speed

Set the command speed for positioning control. Input a value less than or equal to the speed limit.

(7) Dwell time

Set the dwell time (time from completion of positioning until the positioning completion signal is turned on) in milliseconds.

3.4.3

Positioning Data (Point table)

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	(8) M-code	(9) M-code ON signal output timing	ABS direction in degrees	Interpolation speed designation method
1	<Positioning Comment>												
2	<Positioning Comment>												

(8) M code

M code is a code number between 0 to 65535 that can be set for each positioning control.

It is used to command auxiliary operation such as clamping, drill rotation, and tool change related to the positioning data being executed.

M codes are read from the CPU module and used to command auxiliary operation.

(9) M code ON signal output timing (only for the iQ-R series Motion module)

The output (storage) timing of M codes can be set.

Setting value	Description	Timing chart
0: Uses the setting value of M code ON signal output timing	Follows the setting value of the axis parameter [Pr.18].	[Pr.18] is 0: WITH Mode (Initial value). [Pr.18] is 1: AFTER Mode.
1: WITH Mode	Turns on the M code ON signal at the start of positioning and stores the M code in the buffer memory.	
2: AFTER Mode	Turns on the M code ON signal at the end of positioning and stores the M code in the buffer memory.	

*1 m1 and m2 are M codes set in the positioning data.

3.4.3 Positioning Data (Point table)

(10)

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees	Interpolation speed designation method
1	<Positioning Comment>												
2	<Positioning Comment>												

(10) ABS direction in degrees (only for the iQ-R series Motion module)

Set the operation of ABS positioning when the control unit is degree and the software stroke limit is disabled.

Setting value	Description	Operation image
0: Uses the setting value of ABS direction in degrees	Uses the setting of [Cd.40].	[Cd.40] is 0: Shortcut. (Initial value) [Cd.40] is 1: ABS Clockwise. [Cd.40] is 2: ABS Counterclockwise.
1: ABS Clockwise	Always travels clockwise.	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>315° to 45°</p> </div> <div style="text-align: center;"> <p>45° to 315°</p> </div> </div>
2: ABS Counterclockwise	Always travels counterclockwise.	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>315° to 45°</p> </div> <div style="text-align: center;"> <p>45° to 315°</p> </div> </div>
3: Shortcut (Direction setting invalid)	Travels in the closest direction to the specified address.	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>315° to 45°</p> </div> <div style="text-align: center;"> <p>45° to 315°</p> </div> </div>

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees	Interpolation speed designation method
1	<Positioning Comment>												
2	<Positioning Comment>												

(11) Interpolation speed designation method (only for the iQ-R series Motion module)

Select whether to set the command speed to vector speed or reference axis (major axis) speed during interpolation control.

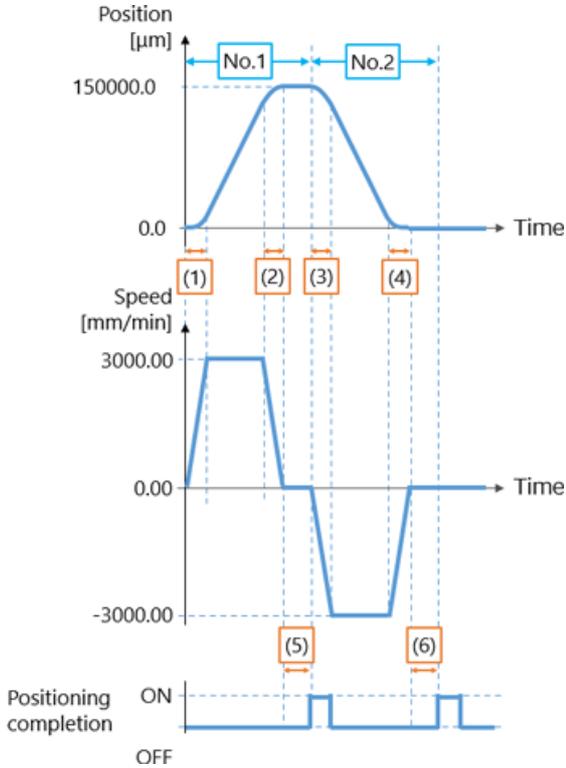
Setting value	Description	Operation image
0: Uses the setting value of Interpolation speed designation method	Follows the setting value of the axis parameter [Pr.20].	[Pr.20] is 0: Vector speed. (Initial value) [Pr.20] is 1: Reference-axis speed.
1: Vector speed	The movement speed for the control target is designated, and the speed for each axis is calculated by the Motion module.	<p>The speed of each axis is calculated by the Motion module.</p>
2: Reference-axis speed	The axis speed set for the reference axis is designated, and the speed for the other axis carrying out interpolation is calculated by the Motion module.	<p>The speed of the interpolation axis is calculated by the Motion module.</p>

3.4.4 Setting examples of positioning data

This section provides setting examples of positioning data.

(1) Single axis positioning

The following shows the setting examples for the operation pattern shown below.



Absolute position specification

For both axis 1 and axis 2, data is registered in positioning data No. 1 and 2 of the sample program.

(Note)

No.	Operation pattern	Control method	Axis to be interpolated	Accelerat on time No.	Decelerat on time No.	Positioning address	Arc address	Command speed	Dwell time
1	1:CONT	01h:ABS Linear 1	-	(1) 0:1500	(2) 0:1500	150000.0 μm	0.0 μm	3000.00 mm/min	(5) 500 ms
	<Positioning Comment>								
2	0:END	01h:ABS Linear 1	-	(3) 0:1500	(4) 0:1500	0.0 μm	0.0 μm	3000.00 mm/min	(6) 500 ms
	<Positioning Comment>								

The positioning address is specified based on the absolute position.

Relative position specification

(Note)

No.	Operation pattern	Control method	Axis to be interpolated	Accelerat on time No.	Decelerat on time No.	Positioning address	Arc address	Command speed	Dwell time
1	1:CONT	02h:INC Linear 1	-	(1) 0:1500	(2) 0:1500	150000.0 μm	0.0 μm	3000.00 mm/min	(5) 500 ms
	<Positioning Comment>								
2	0:END	02h:INC Linear 1	-	(3) 0:1500	(4) 0:1500	-150000.0 μm	0.0 μm	3000.00 mm/min	(6) 500 ms
	<Positioning Comment>								

For the positioning address, specify the travel amount from the current position in the positive/negative direction.

(Note) Acceleration time and deceleration time set here are the time required to reach the axis parameter [Pr.8:Speed limit value] from speed 0.

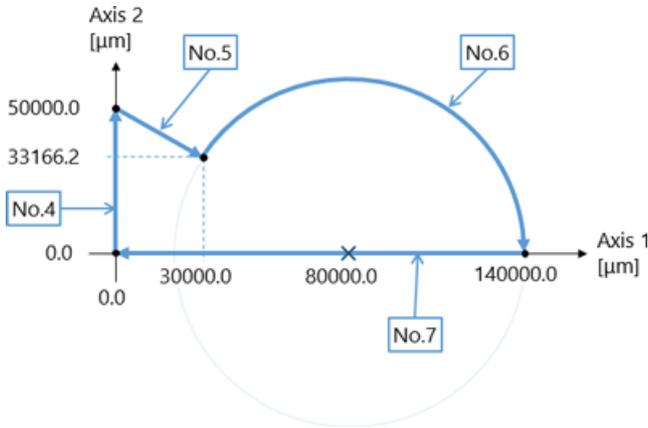
When the command speed is less than the speed limit, the actual acceleration time and deceleration time are shorter than the time set here. (Refer to 3.4.2 Axis parameters - Basic parameters 2.)

3.4.4 Setting examples of positioning data

(2) Interpolation control

The following shows the setting examples for the operation pattern shown below.

The interpolation control uses a set of the same number of positioning data for the reference axis and interpolation axis. When the interpolation control command is input to the control method for the point table of the reference axis, some fields of the same number in the point table of the interpolation axis are automatically displayed in yellow and reserved.



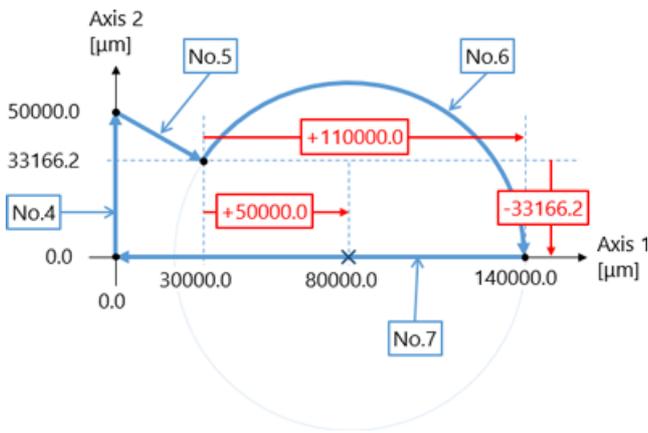
Absolute position specification

The positioning address (coordinates of the target point) and arc address (coordinates of the center point) of the circular interpolation area are as follows.

Positioning address (140000.0, 0.0), center point address (80000.0, 0.0)

In this setting example, the command speed changes depending on the setting of the axis parameter [Pr.20].

[Axis 1]	No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees	Interpolation speed designation method
	4	3:LOCATION	0Ah:ABS Linear 2	#2	0:1500	0:1500	0.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting value of M-code ON signal output timing	0:Use the setting value of ABS direction at degree	0:Use the setting value of Interpolation speed designation method
		<Positioning Comment>												
	5	3:LOCATION	0Ah:ABS Linear 2	#2	0:1500	0:1500	30000.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting value of M-code ON signal output timing	0:Use the setting value of ABS direction at degree	0:Use the setting value of Interpolation speed designation method
		<Positioning Comment>												
	6	3:LOCATION	0Fh:ABS ArcRGT	#2	0:1500	0:1500	140000.0 μm	80000.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting value of M-code ON signal output timing	0:Use the setting value of ABS direction at degree	0:Use the setting value of Interpolation speed designation method
		<Positioning Comment>												
	7	0:END	0Ah:ABS Linear 2	#2	0:1500	0:1500	0.0 μm	0.0 μm	3000.00 mm/min	500 ms	0	0:Use the setting value of M-code ON signal output timing	0:Use the setting value of ABS direction at degree	0:Use the setting value of Interpolation speed designation method
		<Positioning Comment>												
[Axis 2]	No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees	Interpolation speed designation method
	4						50000.0 μm	0.0 μm	0.00 mm/min		0			
		<Positioning Comment>												
	5						33166.2 μm	0.0 μm	0.00 mm/min		0			
		<Positioning Comment>												
	6						0.0 μm	0.0 μm	0.00 mm/min		0			
		<Positioning Comment>												
	7						0.0 μm	0.0 μm	0.00 mm/min		0			
		<Positioning Comment>												



Relative position specification

Data is registered in positioning data No. 4 to 7 of the sample program.

The positioning address (coordinates of the target point) and arc address (coordinates of the center point) of the circular interpolation area are as follows.

The coordinates of the center point are also set relative to the start point.

Positioning address (11000.0, -33166.2), arc address (50000.0, -33166.2)

In this setting example, the command speed changes depending on the setting of the axis parameter [Pr.20].

[Axis 1]	No.	Operation pattern	Control method	Axis to be interpolated	Accelerati on time No.	Decelerati on time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees	Interpolation speed designation method	
	4	3:LOCATION	08h:INC Linear 2	#2	0:1500	0:1500	0.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting value of M-code ON signal output timing	0:Use the setting value of ABS direction at degree	0:Use the setting value of Interpolation speed designation method	
		<Positioning Comment>													
	5	3:LOCATION	08h:INC Linear 2	#2	0:1500	0:1500	30000.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting value of M-code ON signal output timing	0:Use the setting value of ABS direction at degree	0:Use the setting value of Interpolation speed designation method	
		<Positioning Comment>													
	6	3:LOCATION	11h:INC ArcRGT	#2	0:1500	0:1500	110000.0 μm	50000.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting value of M-code ON signal output timing	0:Use the setting value of ABS direction at degree	0:Use the setting value of Interpolation speed designation method	
		<Positioning Comment>													
	7	0:END	08h:INC Linear 2	#2	0:1500	0:1500	-140000.0 μm	0.0 μm	3000.00 mm/min	500 ms	0	0:Use the setting value of M-code ON signal output timing	0:Use the setting value of ABS direction at degree	0:Use the setting value of Interpolation speed designation method	
		<Positioning Comment>													

[Axis 2]	No.	Operation pattern	Control method	Axis to be interpolated	Accelerati on time No.	Decelerati on time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees	Interpolation speed designation method	
	4	<Positioning Comment>						50000.0 μm	0.0 μm	0.00 mm/min	0				
		<Positioning Comment>													
	5	<Positioning Comment>						-16833.7 μm	0.0 μm	0.00 mm/min	0				
		<Positioning Comment>													
	6	<Positioning Comment>						-33166.2 μm	-33166.2 μm	0.00 mm/min	0				
		<Positioning Comment>													
	7	<Positioning Comment>						0.0 μm	0.0 μm	0.00 mm/min	0				
		<Positioning Comment>													

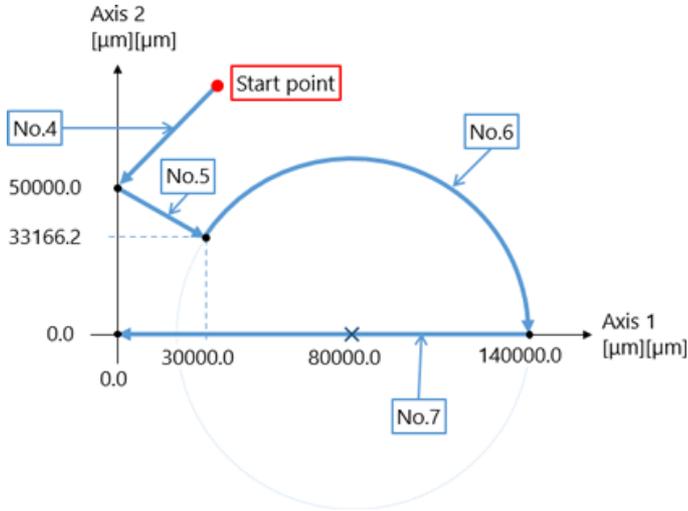
3.4.4 Setting examples of positioning data

(3) Notes on interpolation control

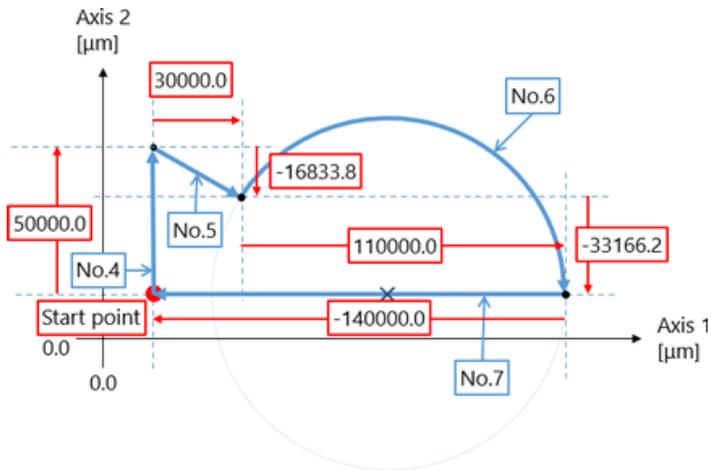
When positioning data for interpolation control is created based on the absolute position specification, the point positioned to the specified coordinates regardless of the operation start point.

Therefore, for example, when interpolation control based on the absolute position specification set on the previous page is started from a point other than the home position (0.0, 0.0), the axis is always moved to the point (0.0, 50000.0) by the first positioning (No. 4).

In this case, the path is as follows.



To plot the same path regardless of the coordinates of the start point, create positioning data based on the relative position specification.

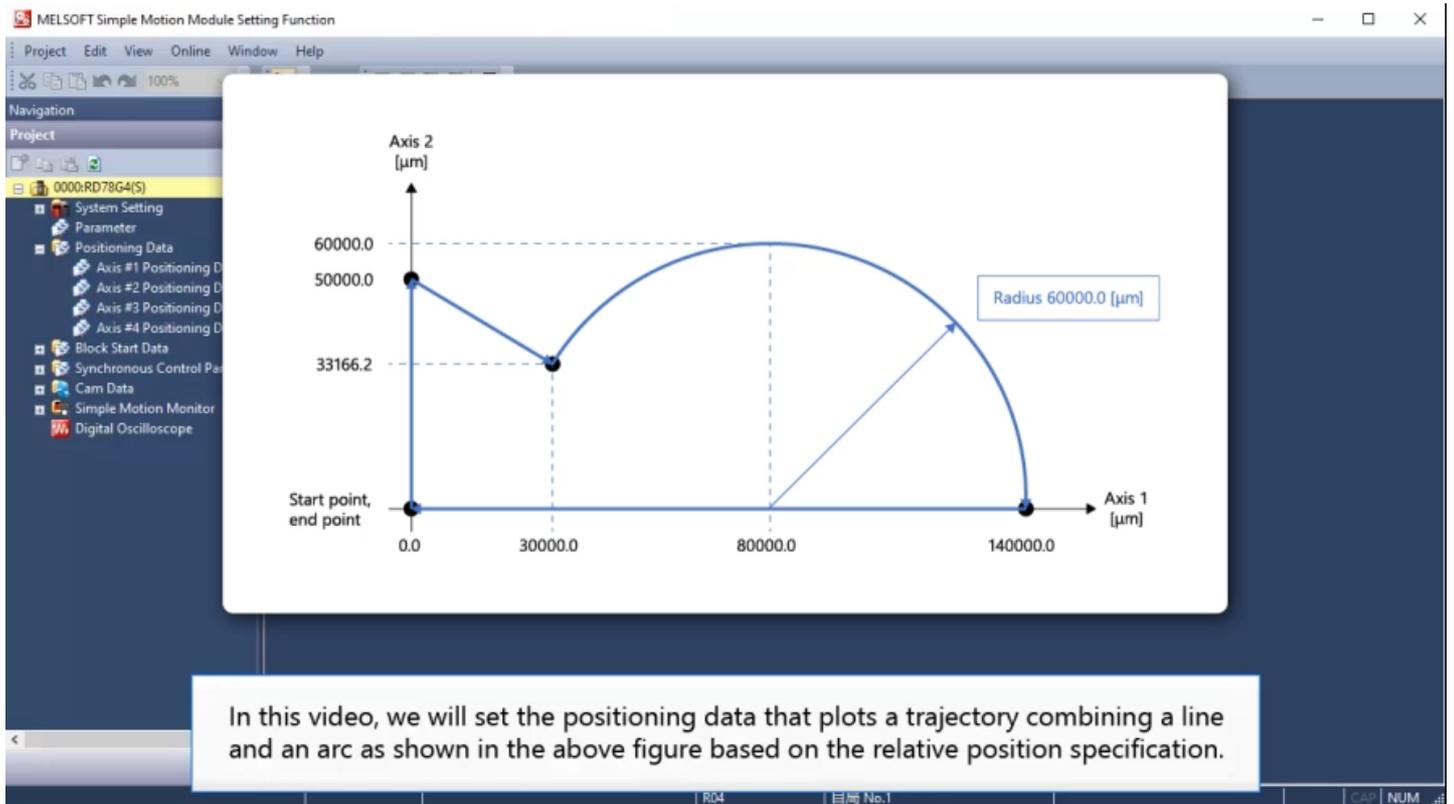


Data Setting Assistant allows the user to easily set the positioning data for interpolation control.



3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.



Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

MELSOFT Simple Motion Module Setting Function - [0000:RD78G4(S)]-Axis #1 Positioning Data

Project Edit View Online Tools Window Help

Navigation 0000:RD78G4(S)]-Axis #1 Posi...

Project

- 0000:RD78G4(S)
- System Setting
- Parameter
- Positioning Data
 - Axis #1 Positioning Data
 - Axis #2 Positioning Data
 - Axis #3 Positioning Data
 - Axis #4 Positioning Data
- Block St
- Synchr
- Cam Da
- Simple I
- Digital Oscilloscope

Display Filter Display All Data Setting Assistant Offline Simulation Automatic Command Speed Calc. Automatic Sub Arc Calc.

No.	Operation pattern	Control method	Axis to be interpolated	Accelerati on time No.	Decelerati on time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees
1	<Positioning Comment>											
2	<Positioning Comment>											
3	<Positioning Comment>											
4	<Positioning Comment>											
5	<Positioning Comment>											
6	<Positioning Comment>											
7	<Positioning Comment>											
8	<Positioning Comment>											

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

R04 目録 No.1 Insert CAP NUM

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

MELSOFT Simple Motion Module Setting Function - [0000:RD78G4(S)]-Axis #1 Positioning Data

Project Edit View Online Tools Window Help

Navigation 0000:RD78G4(S)-Axis #1 Posi... 0000:RD78G4(S)]-Axis #2 Positio...

Project

- 0000:RD78G4(S)
- System Setting
- Parameter
- Positioning Data
 - Axis #1 Positioning Data
 - Axis #2 Positioning Data
 - Axis #3 Positioning Data
 - Axis #4 Positioning Data
- Block Start Data
- Synchronous Control Paramete
- Cam Data
- Simple Motion Monitor
- Digital Oscilloscope

Display Filter Display All Data Setting Assistant Offline Simulation Automatic Command Speed Calc. Automatic Sub Arc Calc.

No.	Operation pattern	Control method	Axis to be interpolated	Accelerati on time No.	Decelerati on time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees
1	<Positioning Comment>											
2	<Positioning Comment>											
3	<Positioning Comment>											
4	<Positioning Comment>											
5	<Positioning Comment>											
6	<Post											
7	<Post											
8	<Post											
9	<Post											

Return to the positioning data setting window for axis 1 and select a number where both positioning data for axis 1 and axis 2 are blank. In this example, select No. 4.

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

R04 目録 No.1 Insert CAP NUM

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

Click the [Data Setting Assistant] button.

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Velocity	ABS direction in degrees
1	<Positioning Comment>					
2	<Positioning Comment>					
3	<Positioning Comment>					
4	<Positioning Comment>					
5	<Positioning Comment>					
6	<Positioning Comment>					
7	<Positioning Comment>					
8	<Positioning Comment>					

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function interface. The main window is titled "[0000:RD78G4(S)]-Axis #1 Positioning Data". The left sidebar shows a project tree with "Axis #1 Positioning Data" selected. The central area shows the "Data Setting Assistant" dialog box, which is titled "Set the Positioning Data".

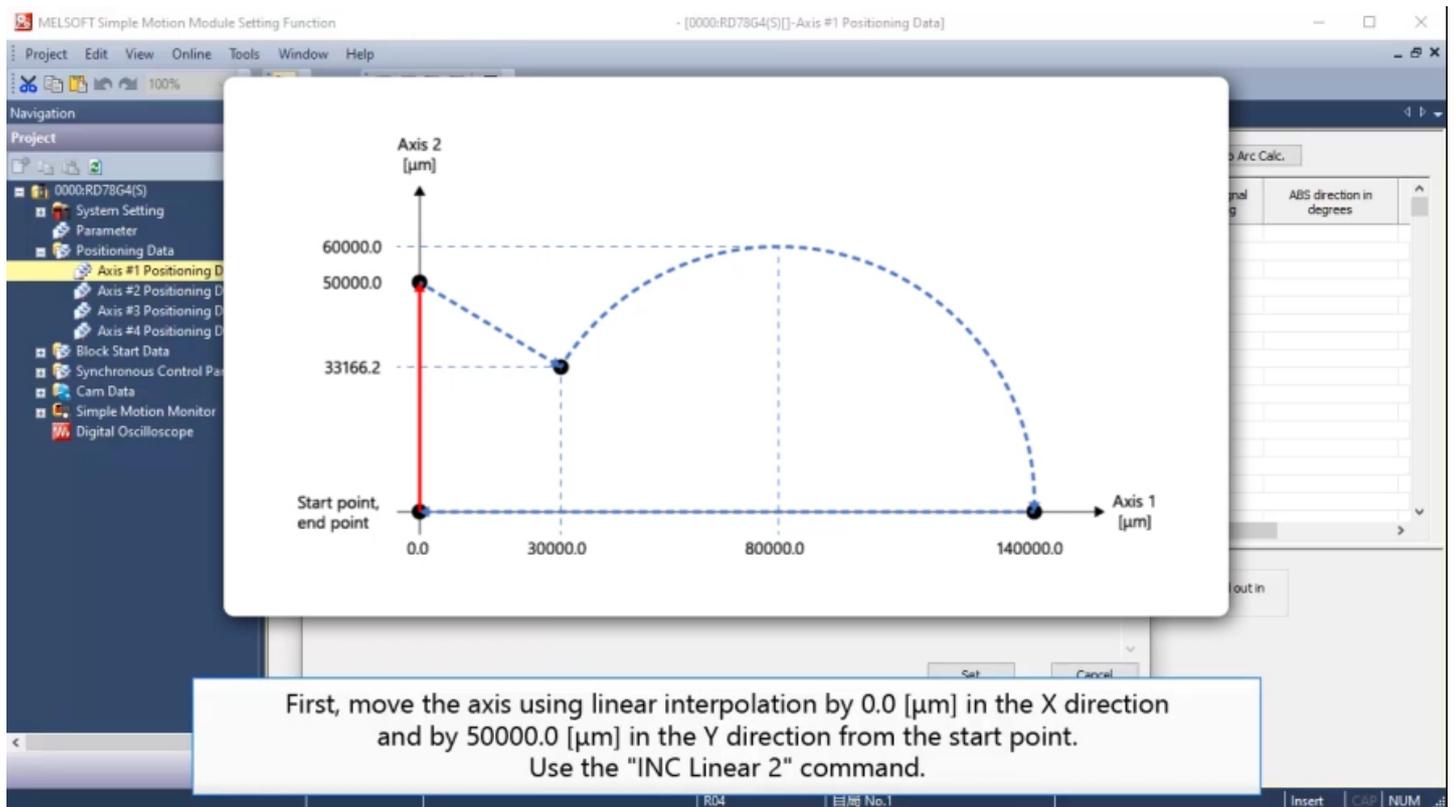
The dialog box contains a list of positioning control methods on the left and a table of settings on the right. The table is as follows:

Item	Setting Value
Positioning data No.	4
Axis selection	
Reference axis	Axis #1
Interpolation axis #1	
Interpolation axis #2	
Interpolation axis #3	
Positioning address	
Reference axis	0.0 μm
Interpolation axis	
Axis #1 to be interpolated	
Axis #2 to be interpolated	
Axis #3 to be interpolated	
Command speed	
Reference axis	0.00 mm/min
Interpolation axis	
Axis #1 to be interpolated	

Below the table, there is a note: "One motor is used to carry out position control in a set axis direction." A callout box points to the dialog box with the text: "The Data Setting Assistant window opens." The "Cancel" button is visible at the bottom right of the dialog box.

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.



Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function software. The main window title is "[0000:RD78G4(S)]-Axis #1 Positioning Data". The interface includes a menu bar (Project, Edit, View, Online, Tools, Window, Help), a toolbar, and a navigation pane on the left. The navigation pane shows a project tree with the following items: 0000:RD78G4(S), System Setting, Parameter, Positioning Data, Axis #1 Positioning Data (selected), Axis #2 Positioning Data, Axis #3 Positioning Data, Axis #4 Positioning Data, Block Start Data, Synchronous Control Parameter, Cam Data, Simple Motion Monitor, and Digital Oscilloscope.

The "Data Setting Assistant" dialog box is open, titled "Set the Positioning Data". It contains two main sections:

- Positioning control method:** A list of options including 1-axis linear control (ABS), 1-axis linear control (INC), 1-axis fixed-pitch feed control, 1-axis speed control (FWD), 1-axis speed control (RVS), Speed-position switching control (FWD), Speed-position switching control (RVS), Position-speed switching control (FWD), Position-speed switching control (RVS), 2-axis linear interpolation (ABS), **2-axis linear interpolation (INC)** (highlighted with a red box), 2-axis fixed-pitch feed control, and Circular interpolation control with a fixed feed rate (ABS).
- Positioning data table:** A table with columns "Item" and "Setting Value".

The "Positioning data table" contains the following data:

Item	Setting Value
Positioning data No.	4
Axis selection	
Reference axis	Axis #1
Interpolation axis #1	
Interpolation axis #2	
Interpolation axis #3	
Positioning address	
Reference axis	0.0 μ m
Interpolation axis	
Axis #1 to be interpolated	
Axis #2 to be interpolated	
Axis #3 to be interpolated	
Command speed	
Reference axis	0.00 mm/min
Interpolation axis	

A callout box with a blue border and white background points to the "2-axis linear interpolation (INC)" option in the list. The text inside the callout box reads: "Select 2-axis linear interpolation (INC) from Positioning control method." The dialog box has "Set" and "Cancel" buttons at the bottom right.

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function interface. The main window is titled "[0000:RD78G4(S)]-Axis #1 Positioning Data". The left sidebar shows the project tree with "Axis #1 Positioning Data" selected. The "Data Setting Assistant" dialog box is open, titled "Set the Positioning Data".

The dialog box contains a list of positioning control methods on the left and a table of settings on the right. The "Interpolation axis #1" setting is highlighted with a red box, and a callout box points to it with the text: "Check that Interpolation axis #1 is set to 'Axis #2'."

Item	Setting Value
Positioning data No.	4
Axis selection	
Reference axis	Axis #1
Interpolation axis #1	Axis #2
Interpolation axis #2	
Interpolation axis #3	
Positioning address	
Reference axis	
Interpolation axis	
Axis #1 to be interpolated	
Axis #2 to be interpolated	
Axis #3 to be interpolated	
Command speed	
Reference axis	0.00 mm/min
Interpolation axis	
Axis #1 to be interpolated	

Two motors are used to carry out position control in a linear path while carrying out interpolation for the axis directions set in each axis.

Buttons: Set, Cancel

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function interface. The main window title is "[0000:RD78G4(S)]-Axis #1 Positioning Data". The "Data Setting Assistant" dialog box is open, titled "Set the Positioning Data".

Positioning control method

- 1-axis linear control (ABS)
- 1-axis linear control (INC)
- 1-axis fixed-pitch feed control
- 1-axis speed control (FWD)
- 1-axis speed control (RVS)
- Speed-position switching control (FWD)
- Speed-position switching control (RVS)
- Position-speed switching control (FWD)
- Position-speed switching control (RVS)
- 2-axis linear interpolation (ABS)
- 2-axis linear interpolation (INC)
- 2-axis fixed-pitch feed control
- Circular interpolation control with auxiliary point (ABS)
- Circular interpolation control with auxiliary point (INC)
- Circular interpolation control with center point (ABS (CM))

Positioning data table:

Item	Setting Value
Positioning data No.	4
Axis selection	
Reference axis	Axis #1
Interpolation axis #1	Axis #2
Interpolation axis #2	
Interpolation axis #3	
Positioning address	
Reference axis	0.0 μm
Interpolation axis	
Axis #1 to be interpolated	0.0 μm
Axis #2 to be interpolated	
Axis #3 to be interpolated	
Command speed	
Reference axis	
Interpolation axis	
Axis #1 to be interpolated	
Axis #2 to be interpolated	
Axis #3 to be interpolated	

Two motors are used to carry out position control in a linear path while carrying out interpolation for the a

Under Positioning address, enter the target value of axis 1 for Reference axis and target value of axis 2 for Axis #1 to be interpolated.

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot shows the MELSOFT Simple Motion Module Setting Function software interface. The main window displays the 'Data Setting Assistant' dialog box for 'Axis #1 Positioning Data'. The dialog box is titled 'Set the Positioning Data' and contains a list of positioning control methods on the left and a table of settings on the right. The 'Command speed' section is highlighted with a red box, and a callout box points to the 'Reference axis' field, instructing the user to enter the command speed in that field.

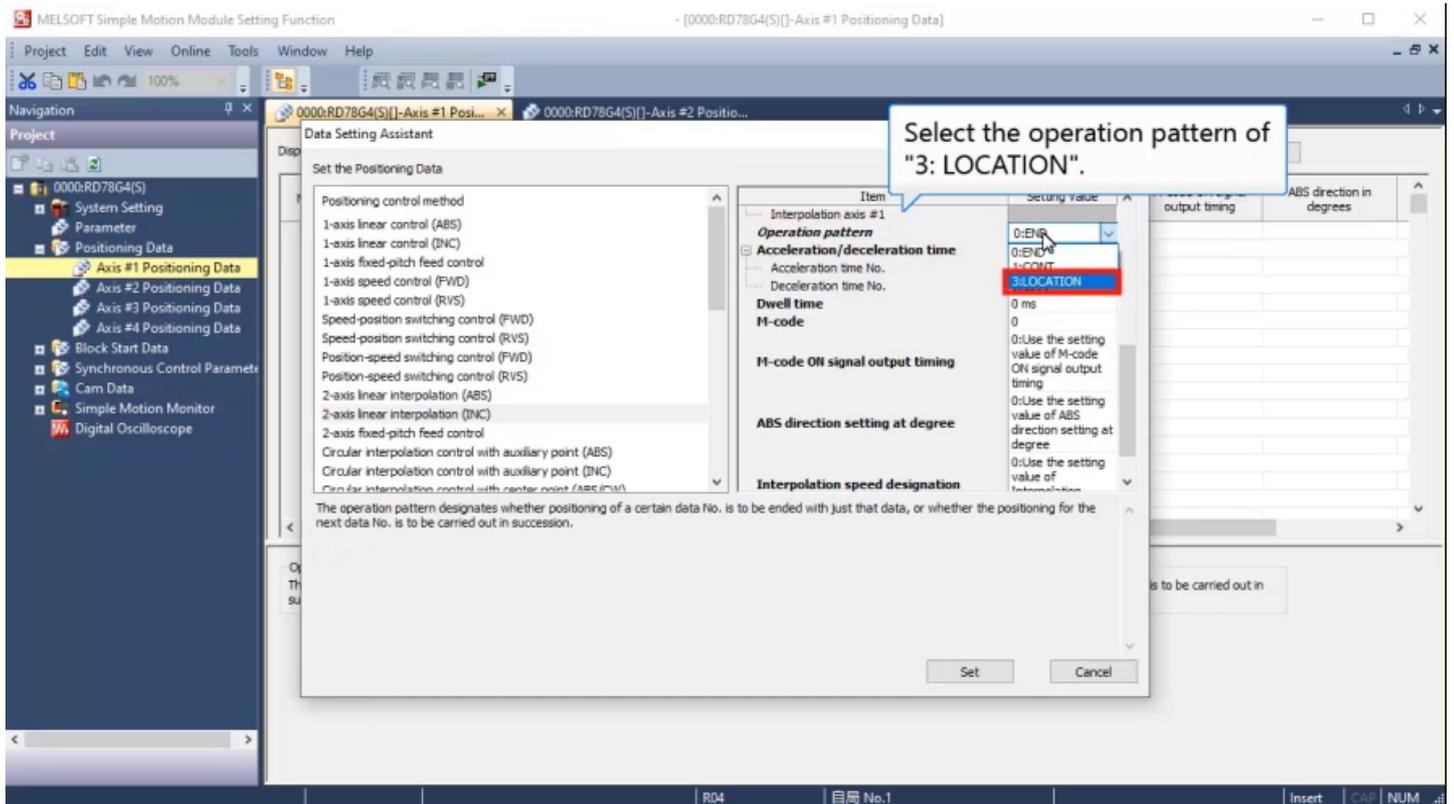
Item	Setting Value
Positioning data No.	4
Axis selection	
Reference axis	Axis #1
Interpolation axis #1	Axis #2
Interpolation axis #2	
Interpolation axis #3	
Positioning address	
Reference axis	0.0 μm
Interpolation axis	
Axis #1 to be interpolated	50000.0 μm
Axis #2 to be interpolated	
Axis #3 to be interpolated	
Command speed	
Reference axis	0.00 mm/min
Interpolation axis	
Axis #1 to be interpolated	

Set the address to be used as the target value for positioning control.
Setting Range : -214748364.8 to 214748364.7 μm

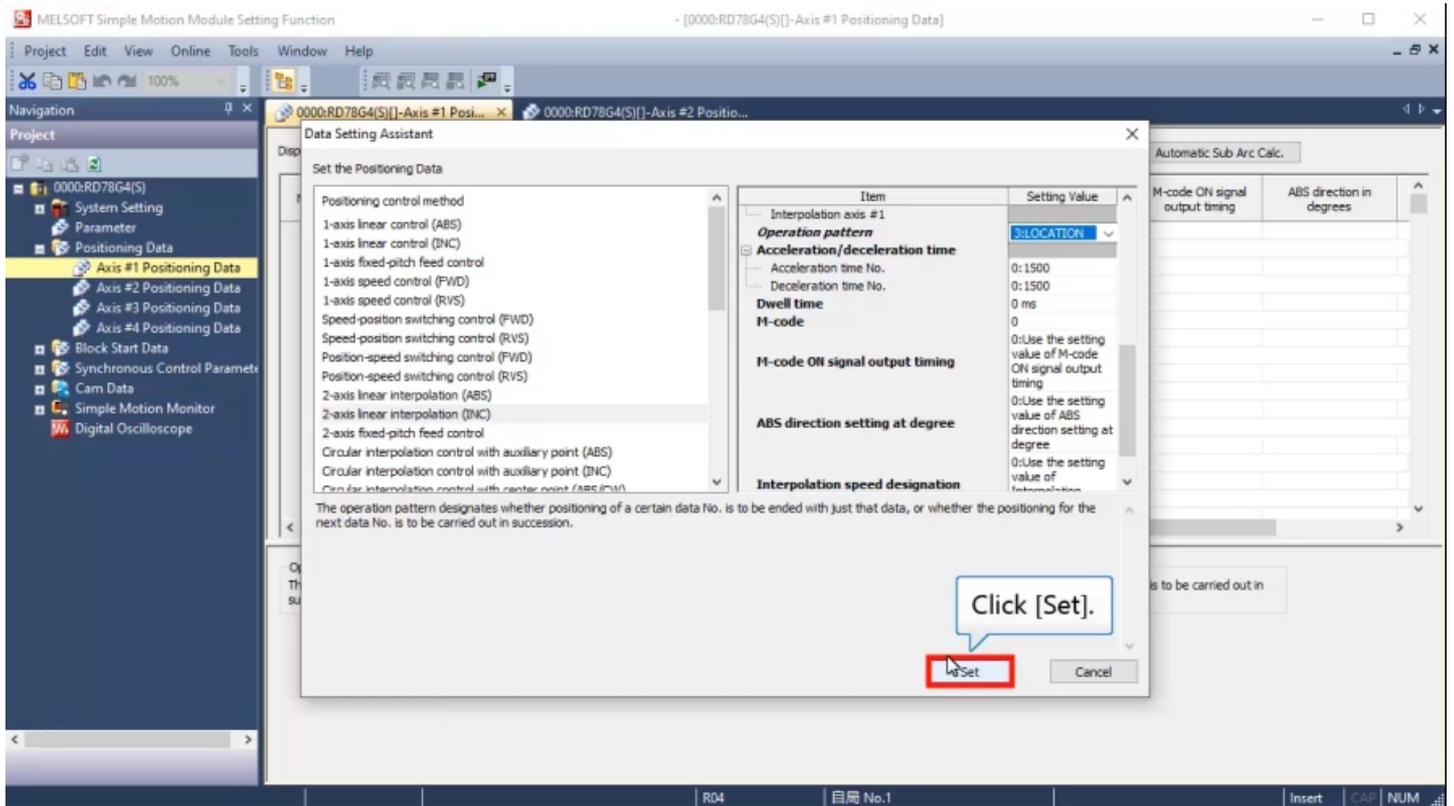
Enter the command speed in the field of Reference axis.

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.



Data Setting Assistant allows the user to easily set the positioning data for interpolation control.



3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

MELSOFT Simple Motion Module Setting Function - [0000:RD78G4(S)]-Axis #1 Positioning Data

Project Edit View Online Tools Window Help

Navigation 0000:RD78G4(S) 0000:RD78G4(S)]-Axis #1 Posi... 0000:RD78G4(S)]-Axis #2 Positio...

Display Filter Display All Data Setting Assistant Offline Simulation Automatic Command Speed Calc. Automatic Sub Arc Calc.

No.	Operation pattern	Control method	Axis to be interpolated	Accelerati on time No.	Decelerati on time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees
1	<Positioning Comment>											
2	<Positioning Comment>											
3	<Positioning Comment>											
4	2:LOCATION	0Bh:INC Linear 2	#2	0:1500	0:1500	0.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
5	<Positioning Comment>											
6	<Positioning Comment>											
7	<Positioning Comment>											
8	<Positioning Comment>											

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

Return to the Positioning data window.
The positioning data for "INC Linear 2" is registered in No. 4.

R04 目録 No.1 Insert CAP NUM

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

MELSOFT Simple Motion Module Setting Function - [0000:RD78G4(S)]-Axis #2 Positioning Data

Project Edit View Online Tools Window Help

Navigation 0000:RD78G4(S)-Axis #1 Positio... 0000:RD78G4(S)-Axis #2 Posi... x

Project

- 0000:RD78G4(S)
- System Setting
- Parameter
- Positioning Data
 - Axis #1 Positioning Data
 - Axis #2 Positioning Data
 - Axis #3 Positioning Data
 - Axis #4 Positioning Data
- Block Start Data
- Synchronous Control Paramete
- Cam Data
- Simple Motion Monitor
- Digital Oscilloscope

Display Filter Display All Data Setting Assistant Offline Simulation Automatic Command Speed Calc. Automatic Sub Arc Calc.

No.	Operation pattern	Control method	Axis to be interpolated	Accelerati on time No.	Decelerati on time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees
1	<Positioning Comment>											
2	<Positioning Comment>											
3	<Positioning Comment>											
4	<Positioning Comment>			50000.0 μm	0.0 μm	0.00 mm/min	0					
5	<Positioning Comment>											
6	<Positioning Comment>											
7	<Positioning Comment>											
8	<Positioning Comment>											
9	<Positioning Comment>											

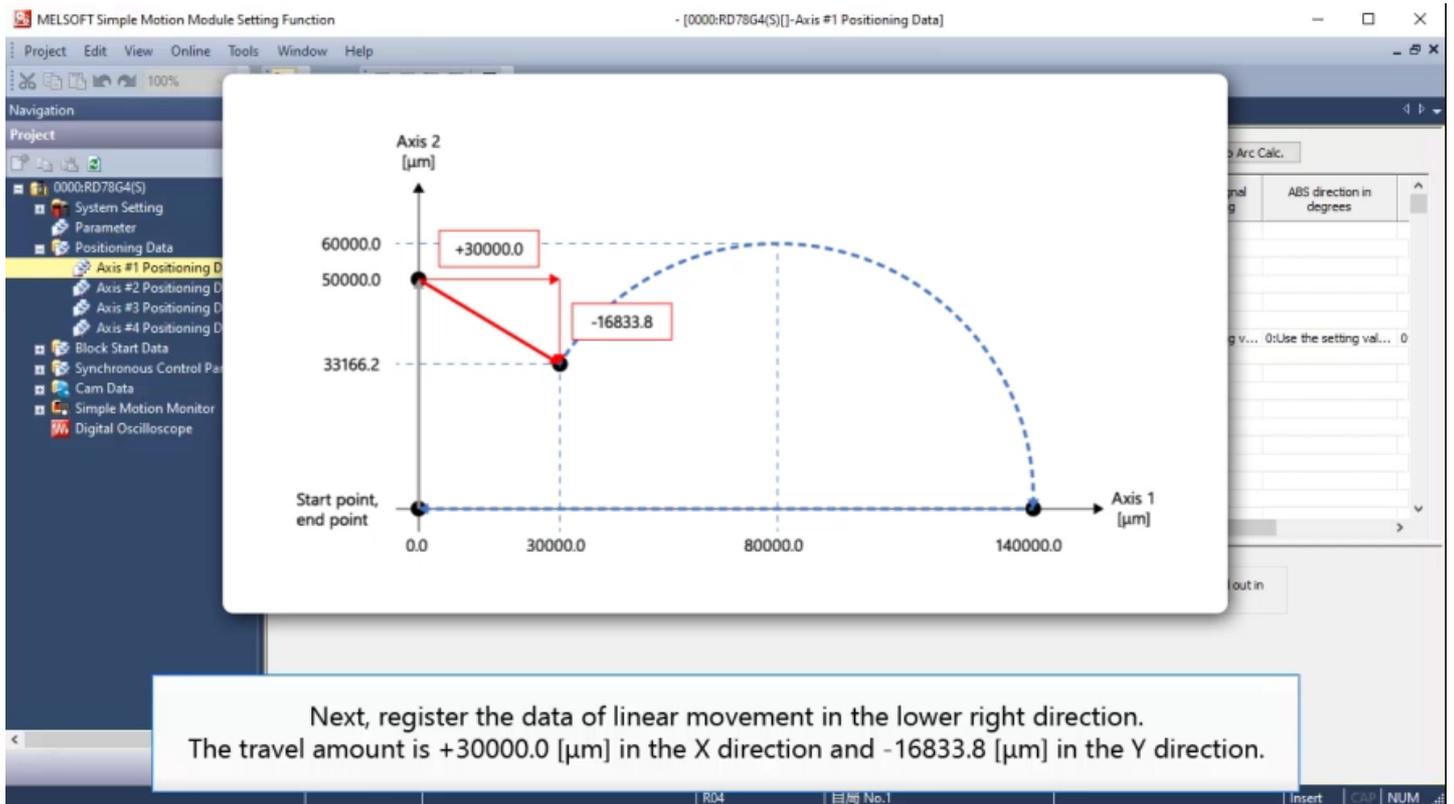
Check the positioning data of axis 2.
The positioning data registered for the interpolation axis of "INC Linear 2" is registered in No. 4.

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

R04 目録 No.1 Insert CAP NUM

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.



Next, register the data of linear movement in the lower right direction.
The travel amount is +30000.0 [μm] in the X direction and -16833.8 [μm] in the Y direction.

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

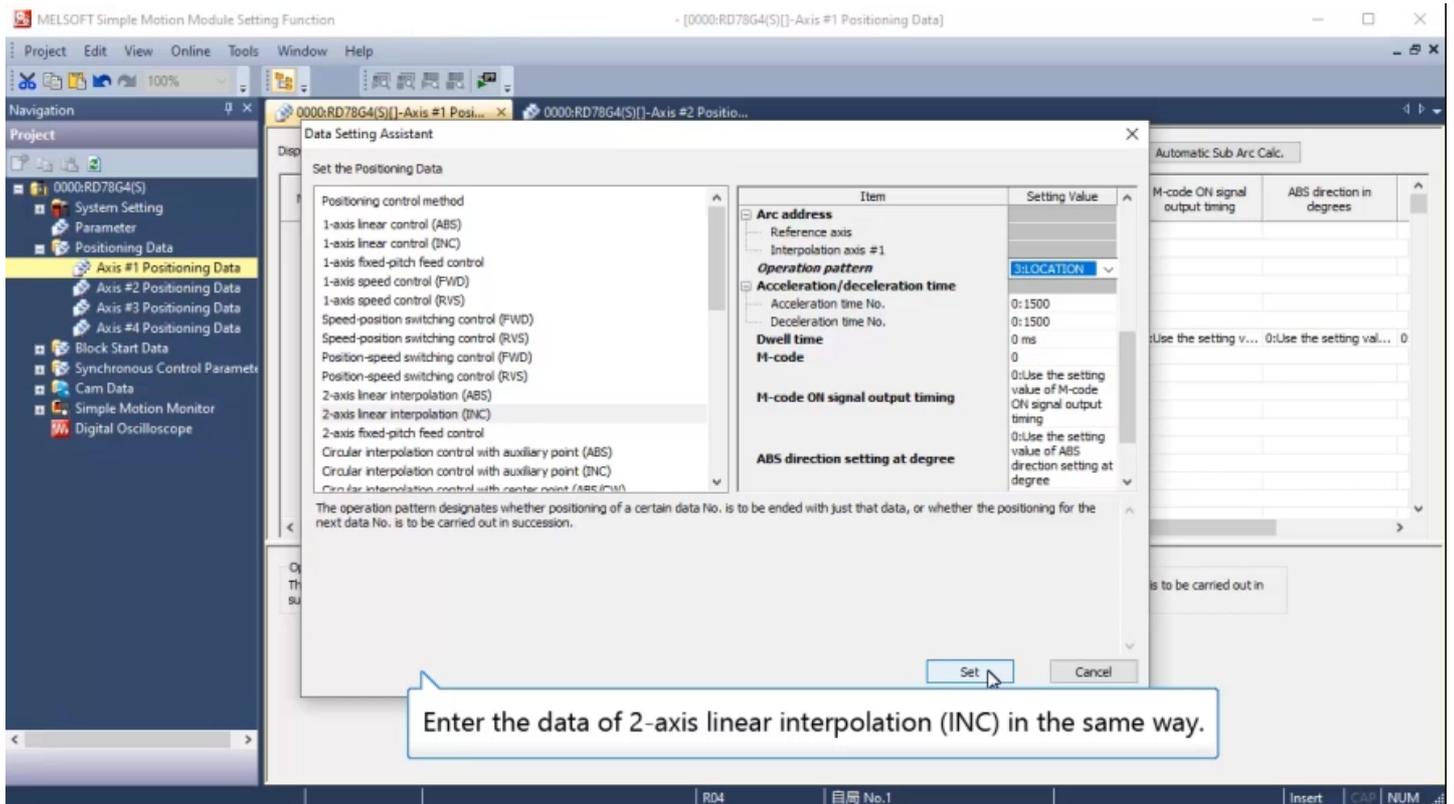
The screenshot displays the MELSOFT Simple Motion Module Setting Function software interface. The main window title is "[0000:RD78G4(S)]-Axis #1 Positioning Data". The interface includes a menu bar (Project, Edit, View, Online, Tools, Window, Help), a toolbar, and a navigation pane on the left. The navigation pane shows a project tree with "0000:RD78G4(S)" expanded to "Positioning Data", where "Axis #1 Positioning Data" is selected. The main workspace shows a table of positioning data with columns: No., Operation pattern, Control method, Axis to be interpolated, Acceleration time No., and ABS direction in degrees. Row 4 is highlighted, showing "3:LOCATION 0Bh:INC Linear 2 #2" with various parameters. A red box highlights the "Data Setting Assistant" button in the top toolbar, with a callout box pointing to it that says "Select No. 5 and click the [Data Setting Assistant] button again." Below the table, there is a section for "Operation pattern" with a descriptive text box.

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	ABS direction in degrees
1	<Positioning Comment>				
2	<Positioning Comment>				
3	<Positioning Comment>				
4	3:LOCATION 0Bh:INC Linear 2 #2			0:1500 0:1500 0.0 μm 0.0 μm 3000.00 mm/min 0 ms 0 0:Use the setting v... 0:Use the setting val... 0	
5	<Positioning Comment>				
6	<Positioning Comment>				
7	<Positioning Comment>				
8	<Positioning Comment>				

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.



The screenshot shows the MELSOFT Simple Motion Module Setting Function software interface. The main window is titled "[0000:RD78G4(S)]-Axis #1 Positioning Data". The "Data Setting Assistant" dialog box is open, displaying a list of positioning control methods. The "2-axis linear interpolation (INC)" method is selected. The "Operation pattern" is set to "3:LOCATION". The "Set" button is highlighted with a callout box.

Set the Positioning Data

Item	Setting Value
Arc address	
Reference axis	
Interpolation axis #1	
Operation pattern	3:LOCATION
Acceleration/deceleration time	
Acceleration time No.	0: 1500
Deceleration time No.	0: 1500
Dwell time	0 ms
M-code	0
M-code Off signal output timing	0: Use the setting value of M-code ON signal output timing
ABS direction setting at degree	0: Use the setting value of ABS direction setting at degree

The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

Set **Cancel**

Enter the data of 2-axis linear interpolation (INC) in the same way.

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

MELSOFT Simple Motion Module Setting Function - [0000:RD78G4(S)]-Axis #1 Positioning Data

Project Edit View Online Tools Window Help

Navigation 0000:RD78G4(S)[]-Axis #1 Posi... 0000:RD78G4(S)[]-Axis #2 Positio...

Project

- 0000:RD78G4(S)
- System Setting
- Parameter
- Positioning Data
 - Axis #1 Positioning Data
 - Axis #2 Positioning Data
 - Axis #3 Positioning Data
 - Axis #4 Positioning Data
- Block Start Data
- Synchronous Control Parameter
- Cam Data
- Simple Motion Monitor
- Digital Oscilloscope

Display Filter Display All Data Setting Assistant Offline Simulation Automatic Command Speed Calc. Automatic Sub Arc Calc.

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees
1	<Positioning Comment>											
2	<Positioning Comment>											
3	<Positioning Comment>											
4	3:LOCATION 0Bh:INC Linear 2	#2		0:1500	0:1500	0.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
5	3:LOCATION 0Bh:INC Linear 2	#2		0:1500	0:1500	30000.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
6	<Positioning Comment>											
7	<Positioning Comment>											
8	<Positioning Comment>											
9	<Positioning Comment>											

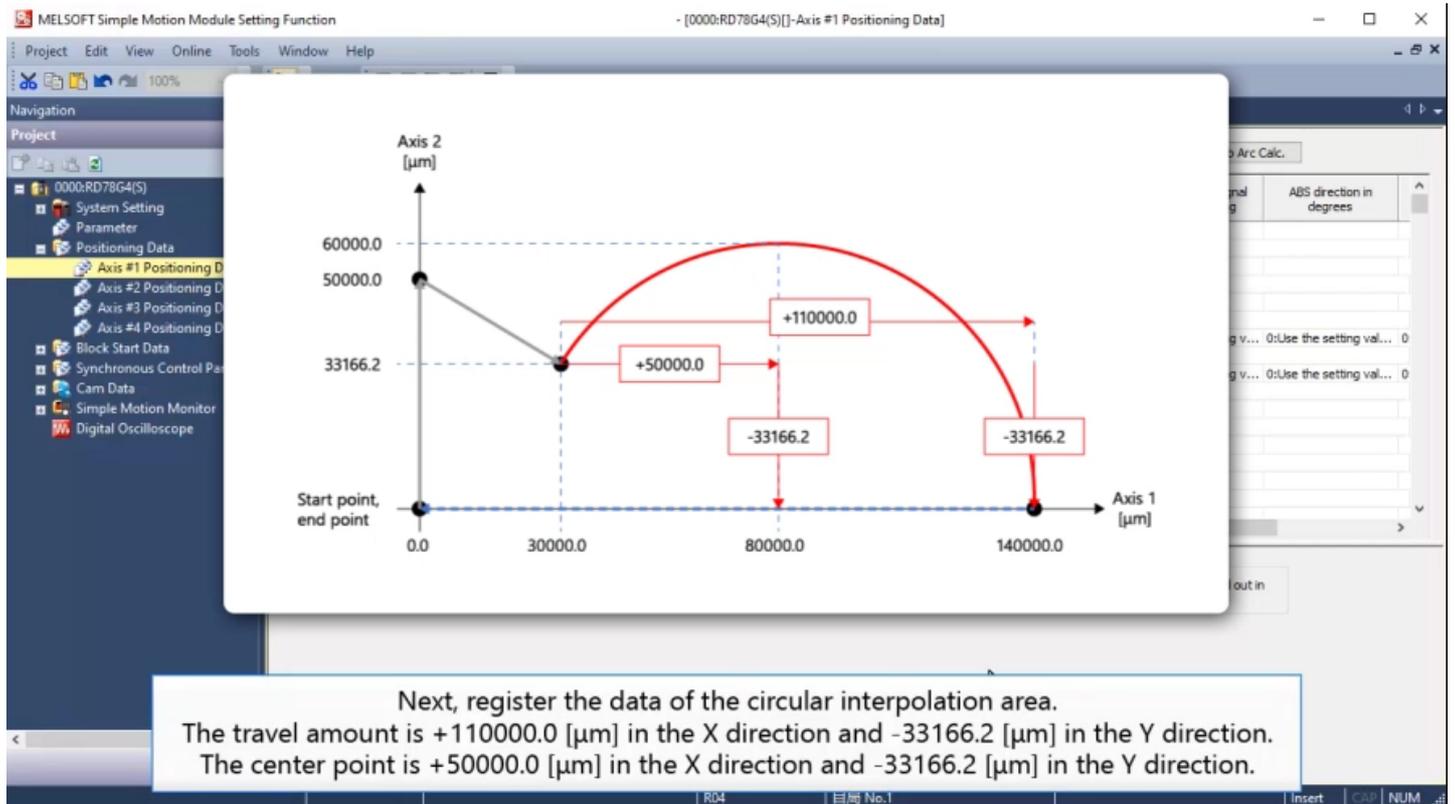
The positioning data for "INC Linear 2" is registered in No. 5.

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

R04 目録 No.1 Insert CAP NUM

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.



3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function software interface. The main window is titled "[0000:RD78G4(S)]-Axis #1 Positioning Data". The interface includes a navigation pane on the left, a menu bar (Project, Edit, View, Online, Tools, Window, Help), and a toolbar. The "Data Setting Assistant" button is highlighted with a red box. A callout box with a blue border and white background contains the text: "Select No. 6 and click the [Data Setting Assistant] button again." The main area shows a table with the following columns: No., Operation pattern, Control method, Axis to be interpolated, Acceleration time No., and ABS direction in degrees. The table contains data for rows 4 and 5, and row 6 is selected. Below the table, there is a section for "Operation pattern" with a descriptive text box.

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	ABS direction in degrees						
1	<Positioning Comment>										
2	<Positioning Comment>										
3	<Positioning Comment>										
4	3:LOCATION 0Bh:INC Linear 2	#2	0:1500	0:1500	0.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
5	3:LOCATION 0Bh:INC Linear 2	#2	0:1500	0:1500	30000.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
6	<Positioning Comment>										
7	<Positioning Comment>										
8	<Positioning Comment>										
9	<Positioning Comment>										

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function software. The main window title is "[0000:RD78G4(S)]-Axis #1 Positioning Data". The interface includes a navigation pane on the left, a main workspace, and a "Data Setting Assistant" dialog box.

The "Data Setting Assistant" dialog box is titled "Set the Positioning Data" and contains a list of positioning control methods. The method "Circular interpolation control with center point (INC/CW)" is highlighted with a red box. A callout box points to this method with the text: "Select Circular interpolation control with center point designation (INC/CW) from Positioning control method."

The dialog box also contains a table of settings for the selected method:

Item	Setting Value
Positioning data No.	6
Axis selection	
Reference axis	Axis #1
Interpolation axis #1	
Interpolation axis #2	
Interpolation axis #3	
Positioning address	
Reference axis	0.0 μm
Interpolation axis	
Axis #1 to be interpolated	
Axis #2 to be interpolated	
Axis #3 to be interpolated	
Command speed	
Reference axis	0.00 mm/min
Interpolation axis	

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function software. The main window is titled "[0000:RD78G4(S)]-Axis #1 Positioning Data". The "Data Setting Assistant" dialog box is open, showing the "Set the Positioning Data" screen. The "Positioning control method" list on the left includes "Circular interpolation control with center point (INC/CW)", which is currently selected. The "Setting Value" table on the right is as follows:

Item	Setting Value
Positioning data No.	6
Axis selection	
Reference axis	Axis #1
Interpolation axis #1	Axis #2
Interpolation axis #2	
Interpolation axis #3	
Positioning address	
Reference axis	
Interpolation axis	
Axis #1 to be interpolated	
Axis #2 to be interpolated	
Axis #3 to be interpolated	
Command speed	
Reference axis	0.00 mm/min
Interpolation axis	
Axis #1 to be interpolated	

A callout box with a blue border and white background points to the "Interpolation axis #1" setting, containing the text: "Check that Interpolation axis #1 is set to 'Axis #2'." The background software interface shows a project tree on the left with "Axis #1 Positioning Data" selected, and various other settings panels on the right.

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function interface. The main window is titled "[0000:RD78G4(S)]-Axis #1 Positioning Data". The left sidebar shows a project tree with "Axis #1 Positioning Data" selected. The central dialog box, "Data Setting Assistant", is open, showing a list of positioning methods on the left and a table of settings on the right. A red box highlights the "Positioning address" section, which includes "Reference axis" (set to 110000.0 μm) and "Interpolation axis" (set to 0.0 μm). A callout box points to these values with the text: "Under Positioning address, enter the target value of axis 1 for Reference axis and target value of axis 2 for Axis #1 to be interpolated." The dialog box also includes a "Setting Range" field and "Set" and "Cancel" buttons.

Item	Setting Value
Positioning data No.	6
Axis selection	
Reference axis	Axis #1
Interpolation axis #1	Axis #2
Interpolation axis #2	
Interpolation axis #3	
Positioning address	
Reference axis	110000.0 μm
Interpolation axis	0.0 μm
Axis #1 to be interpolated	
Axis #2 to be interpolated	
Axis #3 to be interpolated	
Command speed	
Reference axis	
Interpolation axis	
Axis #1 to be interpolated	
Axis #2 to be interpolated	
Axis #3 to be interpolated	

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the 'Data Setting Assistant' dialog box within the MELSOFT Simple Motion Module Setting Function. The dialog is titled 'Set the Positioning Data' and contains a list of control methods on the left and a table of settings on the right. The 'Arc address' section is highlighted with a red box, showing the following settings:

Item	Setting Value
Interpolation axis	
Axis #1 to be interpolated	
Axis #2 to be interpolated	
Axis #3 to be interpolated	
Arc address	
Reference axis	50000.0 μm
Interpolation axis #1	0.0 μm
Operation pattern	0:END
Acceleration/deceleration time	
Acceleration time No.	
Deceleration time No.	
Dwell time	
M-code	
M-code ON signal output timing	value of M-code ON signal output timing

A callout box points to the 'Reference axis' value with the text: 'Enter the address of the center point in Arc address.'

The dialog also includes a 'Setting Range' of -214748364.8 to 214748364.7 μm and 'Set' and 'Cancel' buttons at the bottom.

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot shows the MELSOFT Simple Motion Module Setting Function software interface. The main window is titled "[0000:RD78G4(S)]-Axis #1 Positioning Data". The left sidebar shows a project tree with "Axis #1 Positioning Data" selected. The main area displays the "Data Setting Assistant" dialog box, which is titled "Set the Positioning Data".

The dialog box contains a list of positioning control methods on the left and a table of settings on the right. The "Operation pattern" dropdown menu is highlighted with a red box, and a callout box points to it with the text "Select the operation pattern of '3: LOCATION'".

Item	Setting Value
Interpolation axis	
Axis #1 to be interpolated	
Axis #2 to be interpolated	
Axis #3 to be interpolated	
Arc address	
Reference axis	
Interpolation axis #1	-33166.2 μm
Operation pattern	0:END
Acceleration/deceleration time	0:END
Acceleration time No.	3:LOCATION
Deceleration time No.	0
Dwell time	0 ms
M-code	0
M-code ON signal output timing	0:Use the setting value of M-code ON signal output

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot shows the MELSOFT Simple Motion Module Setting Function software interface. The main window displays the 'Data Setting Assistant' dialog box for '0000:RD78G4(S)[]-Axis #1 Positioning Data'. The dialog box is titled 'Set the Positioning Data' and contains a list of positioning methods on the left and a table of settings on the right. A callout box points to the 'Set' button.

Positioning control method

- Speed-position switching control (FWD)
- Speed-position switching control (RVS)
- Position-speed switching control (FWD)
- Position-speed switching control (RVS)
- 2-axis linear interpolation (ABS)
- 2-axis linear interpolation (INC)
- 2-axis fixed-pitch feed control
- Circular interpolation control with auxiliary point (ABS)
- Circular interpolation control with auxiliary point (INC)
- Circular interpolation control with center point (ABS/CW)
- Circular interpolation control with center point (ABS/CCW)
- Circular interpolation control with center point (INC/CW)
- Circular interpolation control with center point (INC/CCW)
- 2-axis speed control (FWD)
- 2-axis speed control (RVS)

Item

Item	Setting Value
Interpolation axis	
Axis #1 to be interpolated	
Axis #2 to be interpolated	
Axis #3 to be interpolated	
Arc address	
Reference axis	50000.0 μm
Interpolation axis #1	-33166.2 μm
Operation pattern	
Acceleration/deceleration time	
Acceleration time No.	0: 1500
Deceleration time No.	0: 1500
Dwell time	
M-code	0
M-code ON signal output timing	
M-code ON signal output timing	0: Use the setting value of M-code ON signal output timing

The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

Click [Set].

Set Cancel

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

MELSOFT Simple Motion Module Setting Function - [0000:RD78G4(S)]-Axis #1 Positioning Data

Project Edit View Online Tools Window Help

Navigation 0000:RD78G4(S)]-Axis #1 Posi... 0000:RD78G4(S)]-Axis #2 Positio...

Project

- 0000:RD78G4(S)
- System Setting
- Parameter
- Positioning Data
 - Axis #1 Positioning Data
 - Axis #2 Positioning Data
 - Axis #3 Positioning Data
 - Axis #4 Positioning Data
- Block Start Data
- Synchronous Control Parameter
- Cam Data
- Simple Motion Monitor
- Digital Oscilloscope

Display Filter Display All Data Setting Assistant Offline Simulation Automatic Command Speed Calc. Automatic Sub Arc Calc.

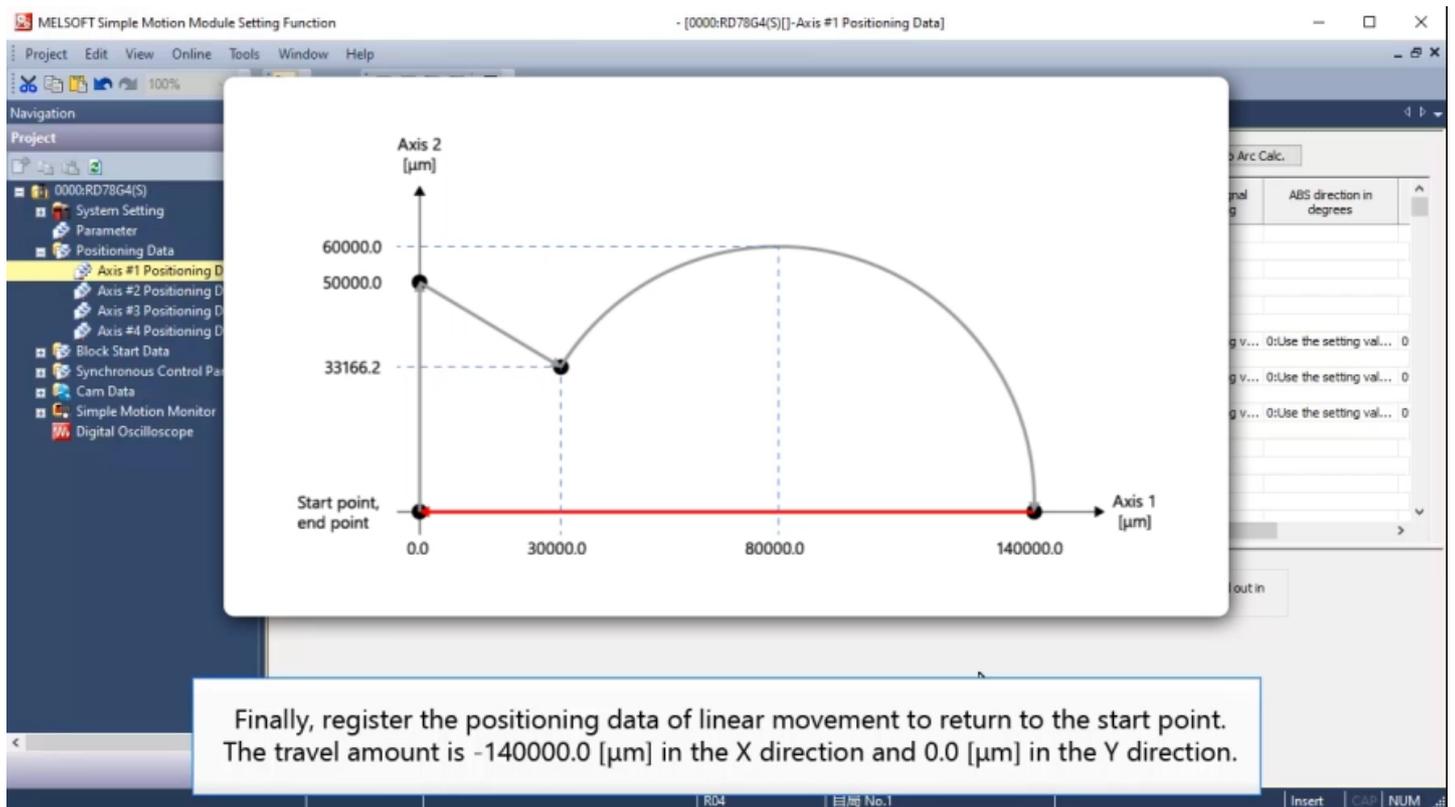
No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees
1	<Positioning Comment>											
2	<Positioning Comment>											
3	<Positioning Comment>											
4	3:LOCATION	08h:INC Linear 2	#2	0:1500	0:1500	0.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
5	<Positioning Comment>											
6	3:LOCATION	11h:INC ArcRGT	#2	0:1500	0:1500	30000.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
7	<Positioning Comment>											
8	<Positioning Comment>											
9	<Positioning Comment>											

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

R04 目録 No.1 Insert CAP NUM

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.



3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function software interface. The main window is titled "[0000:RD78G4(S)]-Axis #1 Positioning Data". The interface includes a menu bar (Project, Edit, View, Online, Tools, Window, Help), a toolbar, and a navigation pane on the left. The navigation pane shows a project tree with "0000:RD78G4(S)" expanded to "Positioning Data", where "Axis #1 Positioning Data" is selected. The main area shows a table of positioning data with columns: No., Operation pattern, Control method, Axis to be interpolated, Acceleration time No., and ABS direction in degrees. A callout box points to row 7 with the text: "Select No. 7 and click the [Data Setting Assistant] button again." Below the table, there is a section for "Operation pattern" with a description: "The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession." The status bar at the bottom shows "R04", "目録 No.1", and "Insert CAP NUM".

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	ABS direction in degrees						
1	<Positioning Comment>										
2	<Positioning Comment>										
3	<Positioning Comment>										
4	3:LOCATION 08h:INC Linear 2	#2	0:1500	0:1500	0.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
5	<Positioning Comment>										
6	3:LOCATION 08h:INC Linear 2	#2	0:1500	0:1500	30000.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
7	3:LOCATION 11h:INC ArcRGT	#2	0:1500	0:1500	110000.0 μm	50000.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
8	<Positioning Comment>										
9	<Positioning Comment>										

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function interface. The main window is titled "[0000:RD78G4(S)]-Axis #1 Positioning Data". The "Data Setting Assistant" dialog box is open, showing the "Set the Positioning Data" section. The "Positioning control method" list on the left includes "2-axis linear interpolation (INC)". The "Arc address" table on the right shows the following settings:

Item	Setting Value
Arc address	
Reference axis	
Interpolation axis #1	
Operation pattern	0:END
Acceleration/deceleration time	
Acceleration time No.	0:1500
Deceleration time No.	0:1500
Dwell time	0 ms
M-code	0
M-code Off signal output timing	
Acceleration time No.	0:Use the setting value of M-code ON signal output timing
Deceleration time No.	0:Use the setting value of M-code ON signal output timing
ABS direction setting at degree	
Acceleration time No.	0:Use the setting value of ABS direction setting at degree
Deceleration time No.	0:Use the setting value of ABS direction setting at degree

Below the table, the "Set the command speed for positioning" section shows a "Setting Range : 0.01 to 10000.00 mm/min" and a note: "If '-1' is set for the command speed, the current speed (speed set for previous positioning data No.) will be used for positioning control." The "Set" button is highlighted with a mouse cursor.

Enter the data of 2-axis linear interpolation (INC) in the same way.
Select the operation pattern of "0: END".

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function software interface. The main window is titled "[0000:RD78G4(S)]-Axis #1 Positioning Data". The interface includes a menu bar (Project, Edit, View, Online, Tools, Window, Help), a toolbar, and a navigation pane on the left. The navigation pane shows a project tree with "Axis #1 Positioning Data" selected. The main area contains a "Data Setting Assistant" window with a "Display Filter" set to "Display All". The "Offline Simulation" button is highlighted with a red box. Below the table, there is an "Operation pattern" section with a descriptive text box.

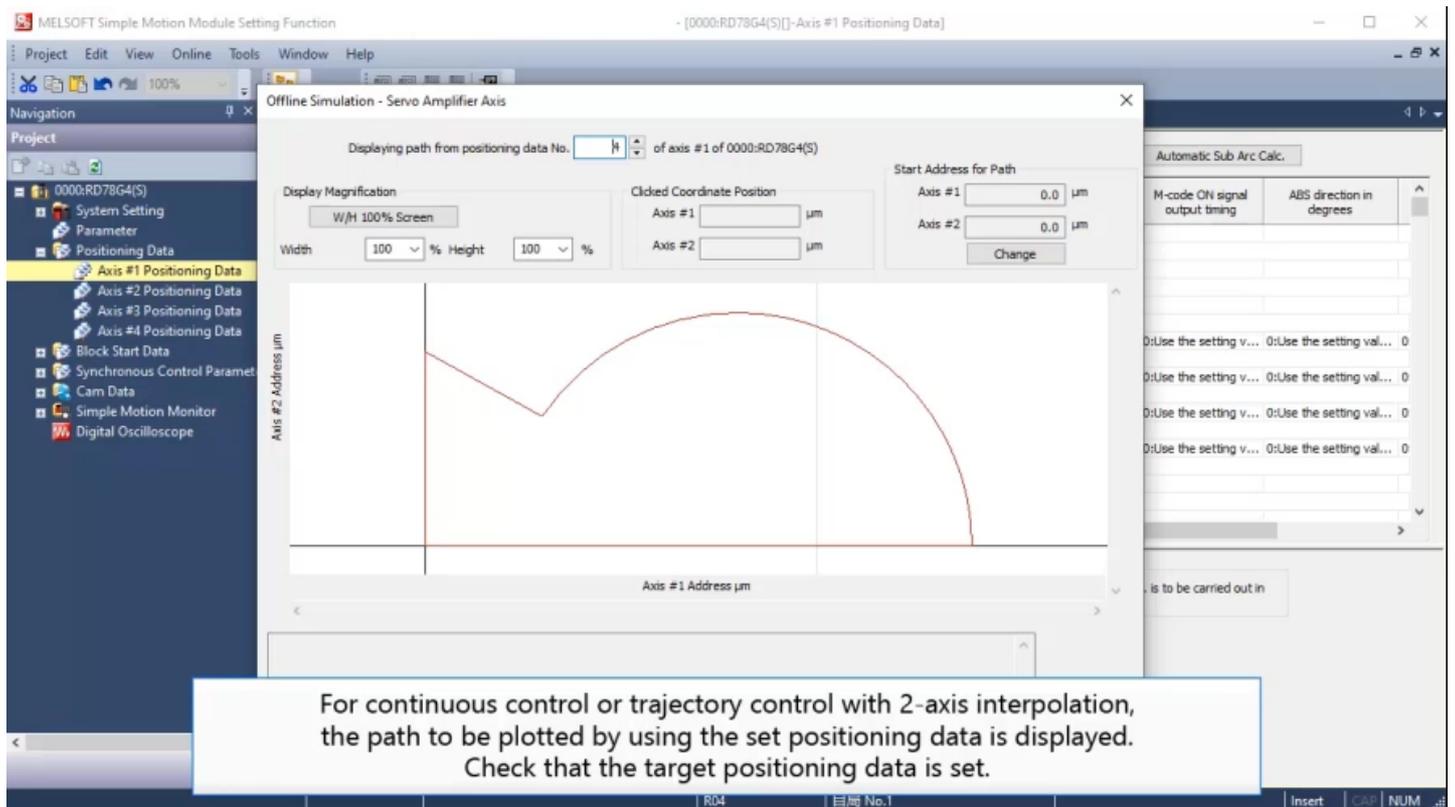
No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees
1	<Positioning Comment>											
2	<Positioning Comment>											
3	<Positioning Comment>											
4	3i:LOCATION 0Bh:INC Linear 2	#2	0:1500	0:1500	0.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...	
5	3i:LOCATION 0Bh:INC Linear 2	#2	0:1500	0:1500	30000.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...	
6	3i:LOCATION 11h:INC ArcRGT	#2	0:1500	0:1500	110000.0 μm	50000.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...	
7	0:END 0Bh:INC Linear 2	#2	0:1500	0:1500	-140000.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...	
8	<Positioning Comment>											
9	<Positioning Comment>											

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

Check that a set of positioning data is correctly set.
Select No. 4, the start point of trajectory control, and click [Offline Simulation].

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.



For continuous control or trajectory control with 2-axis interpolation, the path to be plotted by using the set positioning data is displayed. Check that the target positioning data is set.

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot shows the 'Offline Simulation - Servo Amplifier Axis' window. The title bar indicates it is for 'axis #1 of 0000:RD78G4(S)'. The window contains several control panels: 'Display Magnification' with a 'W/H 100% Screen' button and 'Width'/'Height' set to 100%; 'Clicked Coordinate Position' with input fields for 'Axis #1' and 'Axis #2' in µm; and 'Start Address for Path' with input fields for 'Axis #1' and 'Axis #2' in µm, both set to 0.0, and a 'Change' button. The main area is a coordinate grid with 'Axis #2 Address µm' on the vertical axis and 'Axis #1 Address µm' on the horizontal axis. A red line is plotted, starting from the origin and extending into the first quadrant. At the bottom of the window, a message box reads: 'The simulation was canceled because the distance between the arc center point and start point is different from the distance between the arc center point and end point in the circular interpolation of positioning data No.6.' A 'Close' button is located at the bottom right of this message box. A callout box at the bottom of the image contains the text: 'If the circular interpolation setting is incorrect, the path is not correctly plotted. Correct the positioning data of circular interpolation.'

3.4.5 Data Setting Assistant

Data Setting Assistant allows the user to easily set the positioning data for interpolation control.

The screenshot displays the MELSOFT Simple Motion Module Setting Function software interface. The main window is titled "[0000:RD78G4(S)]-Axis #1 Positioning Data". The interface includes a navigation pane on the left with a tree view showing the project structure, including "System Setting", "Parameter", "Positioning Data", and "Axis #1 Positioning Data". The main area shows a table for setting positioning data, with columns for No., Operation pattern, Control method, Axis to be interpolated, Acceleration time No., Deceleration time No., Positioning address, Arc address, Command speed, Dwell time, M-code, M-code ON signal output timing, and ABS direction in degrees. The table contains several rows, including positioning comments and specific data entries for linear and arc movements. Below the table, there is a section for "Operation pattern" with a descriptive text box.

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M-code	M-code ON signal output timing	ABS direction in degrees
1	<Positioning Comment>											
2	<Positioning Comment>											
3	<Positioning Comment>											
4	3:LOCATION 0Bh:INC Linear 2	#2		0:1500	0:1500	0.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
5	3:LOCATION 0Bh:INC Linear 2	#2		0:1500	0:1500	30000.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
6	3:LOCATION 11h:INC ArcRGT	#2		0:1500	0:1500	110000.0 μm	50000.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
7	0:END 0Bh:INC Linear 2	#2		0:1500	0:1500	-140000.0 μm	0.0 μm	3000.00 mm/min	0 ms	0	0:Use the setting v...	0:Use the setting val...
8	<Positioning Comment>											
9	<Positioning Comment>											

Operation pattern
The operation pattern designates whether positioning of a certain data No. is to be ended with just that data, or whether the positioning for the next data No. is to be carried out in succession.

This completes the positioning data setting using Data Setting Assistant.
Go to the next page.

In this chapter, you have learned:

- Creating a new project
- PLC CPU setting
- Motion module setting
- Simple Motion mode setting

Point

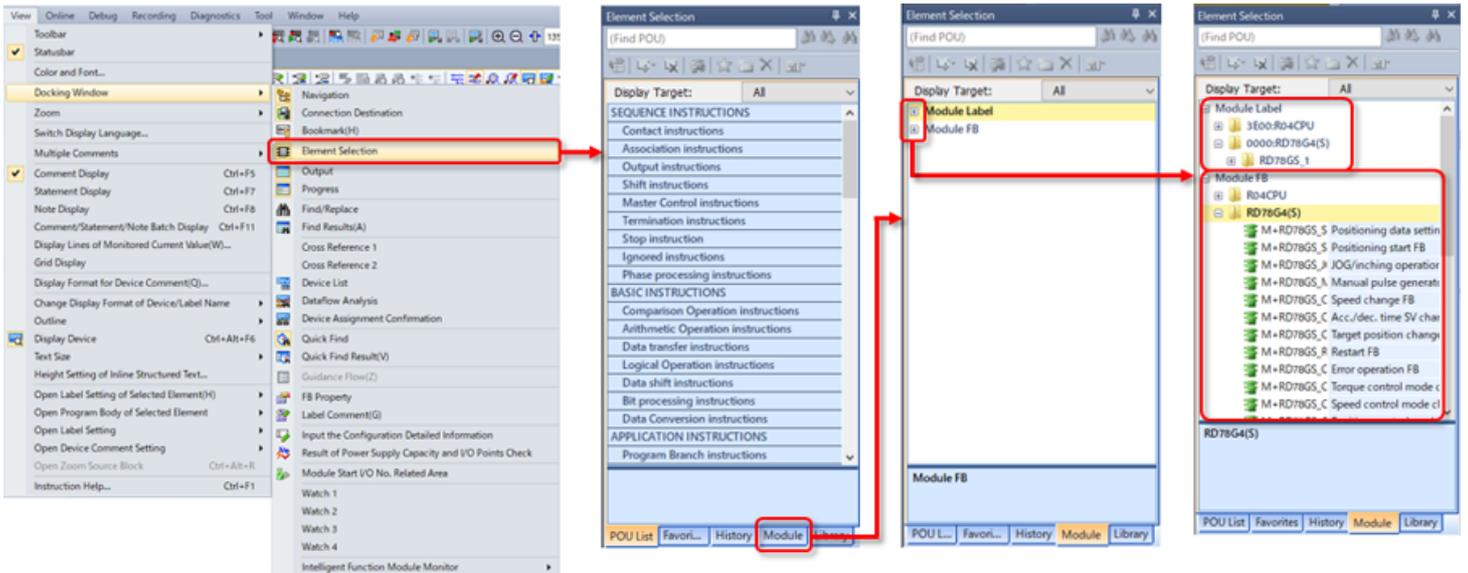
Creating a new project	<ul style="list-style-type: none"> • Create a new GX Works3 project and module configuration diagram. Simple Motion mode is available by registering the Motion module with (S) in the module configuration diagram.
PLC CPU setting	<ul style="list-style-type: none"> • Only for the iQ-R series, change Link Direct Device Setting to Extended Mode (iQ-R Series Mode).
Motion module setting	<ul style="list-style-type: none"> • Open the network configuration window from the module parameter (network) window. • In the network configuration window, register the servo amplifier to be connected to the Internet and set the IP address. PDO mapping is not performed in Simple Motion mode. • To write the parameters of the servo amplifier from the controller, select the [Parameter Automatic Setting] checkbox of the remote station. • Some servo parameters must be set in Simple Motion mode. Incorrect setting values will cause "Servo parameter invalid" and write correct parameters automatically when the power is turned on again.
Simple Motion mode setting	<ul style="list-style-type: none"> • Set the motion-related parameters in the Simple Motion Module Setting Function window. • Set the operation pattern in the point table. Data Setting Assistant helps you register operation patterns of interpolation control using multiple axes.

Chapter 4 Positioning Control and Interpolation Control Program

This chapter describes the program for operating the initial setting (all axis servo ON), JOG operation, and the positioning data set in the previous chapters.

4.1 Module label and module FB

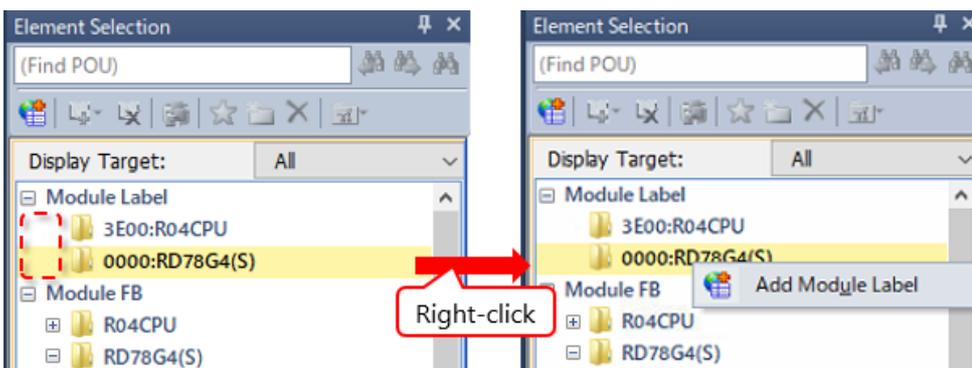
The sample program in this course uses module labels and module FBs. From the menu, select [View] → [Docking Window] → [Element Selection] to display the Element Selection window. Select [Module] in the Element Selection window to display the module labels and module FBs.



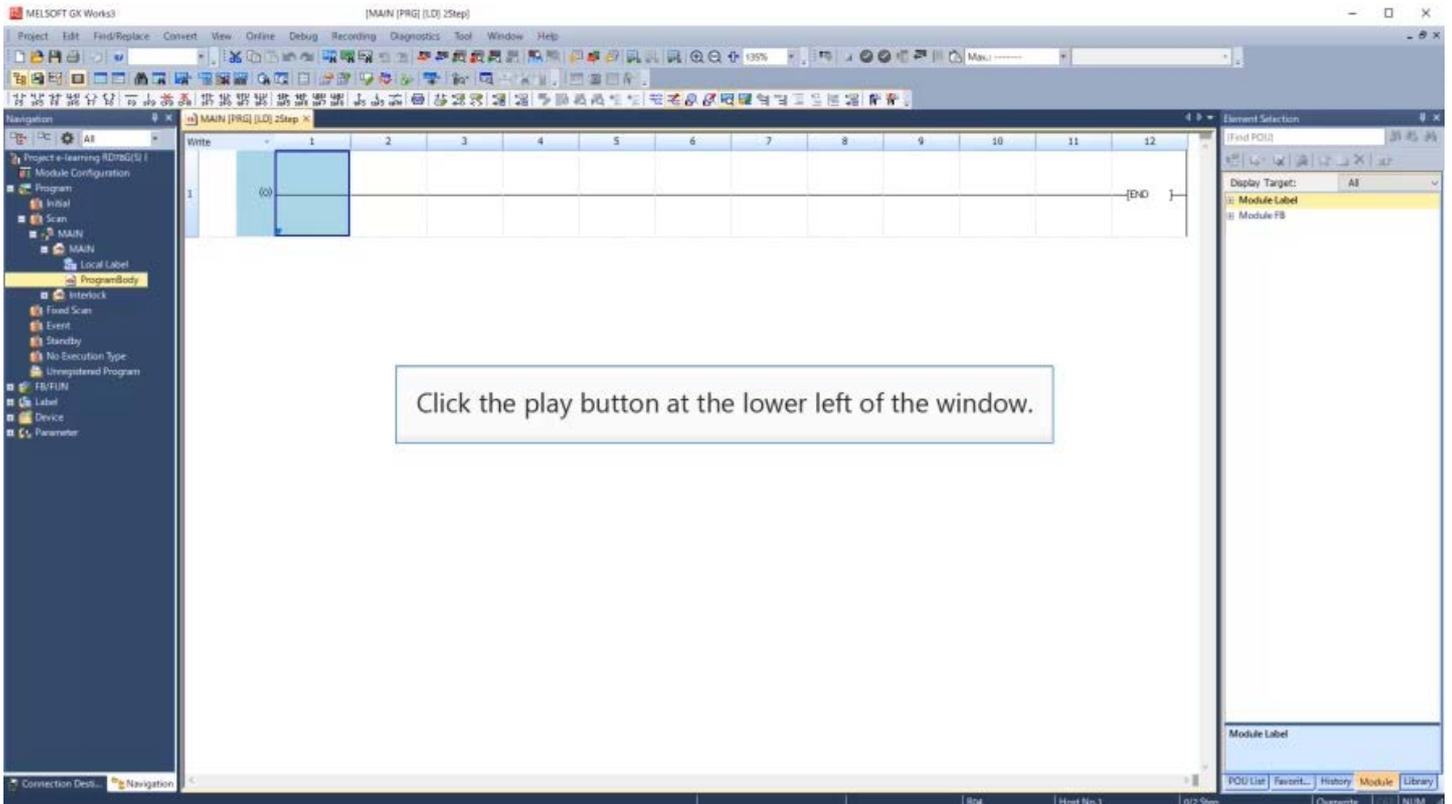
[Point]

Module labels are not displayed if Module Label is set to "Not use" when the project is created (refer to 3.1 (2)) and module configuration diagram is created (refer to 3.1 (3)). (The + mark is not displayed.)

In this case, right-click a module label folder and select [Add Module Label] to add a module label.



This video explains how to add module labels and module FBs.

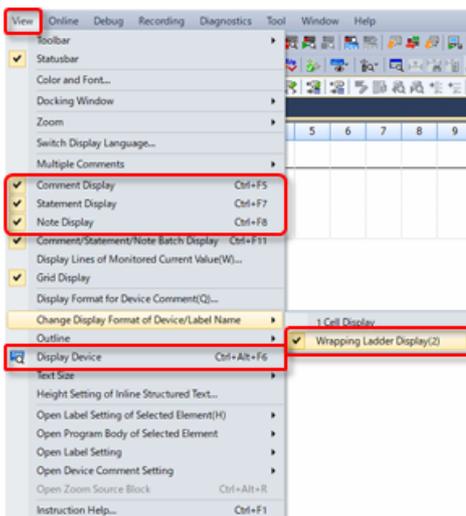


[Point]

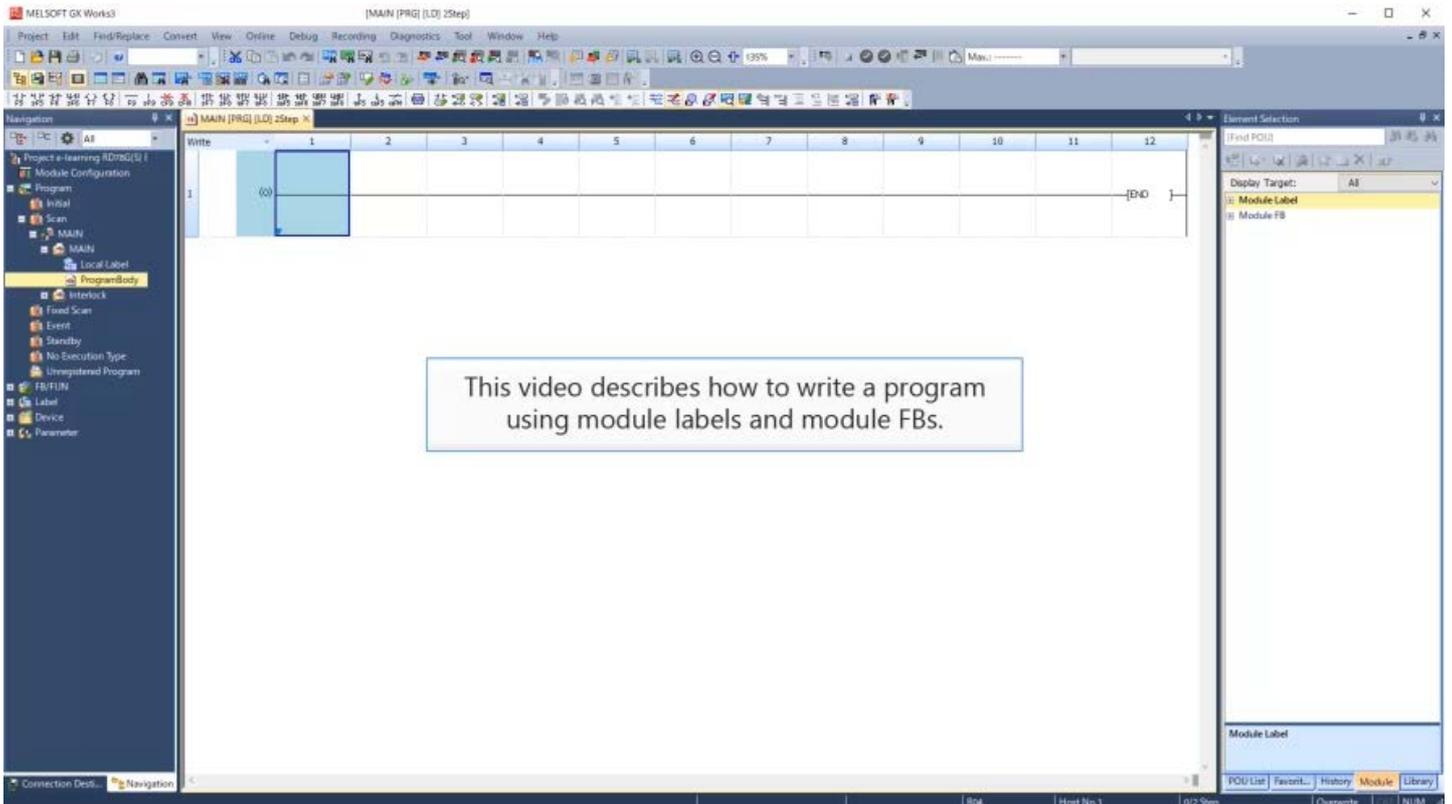
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



This video explains how to add module labels and module FBs.

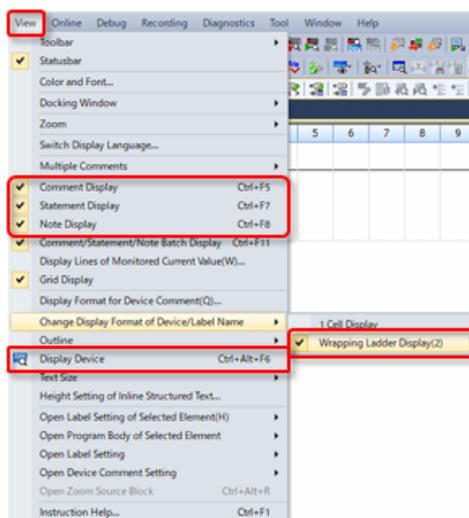


[Point]

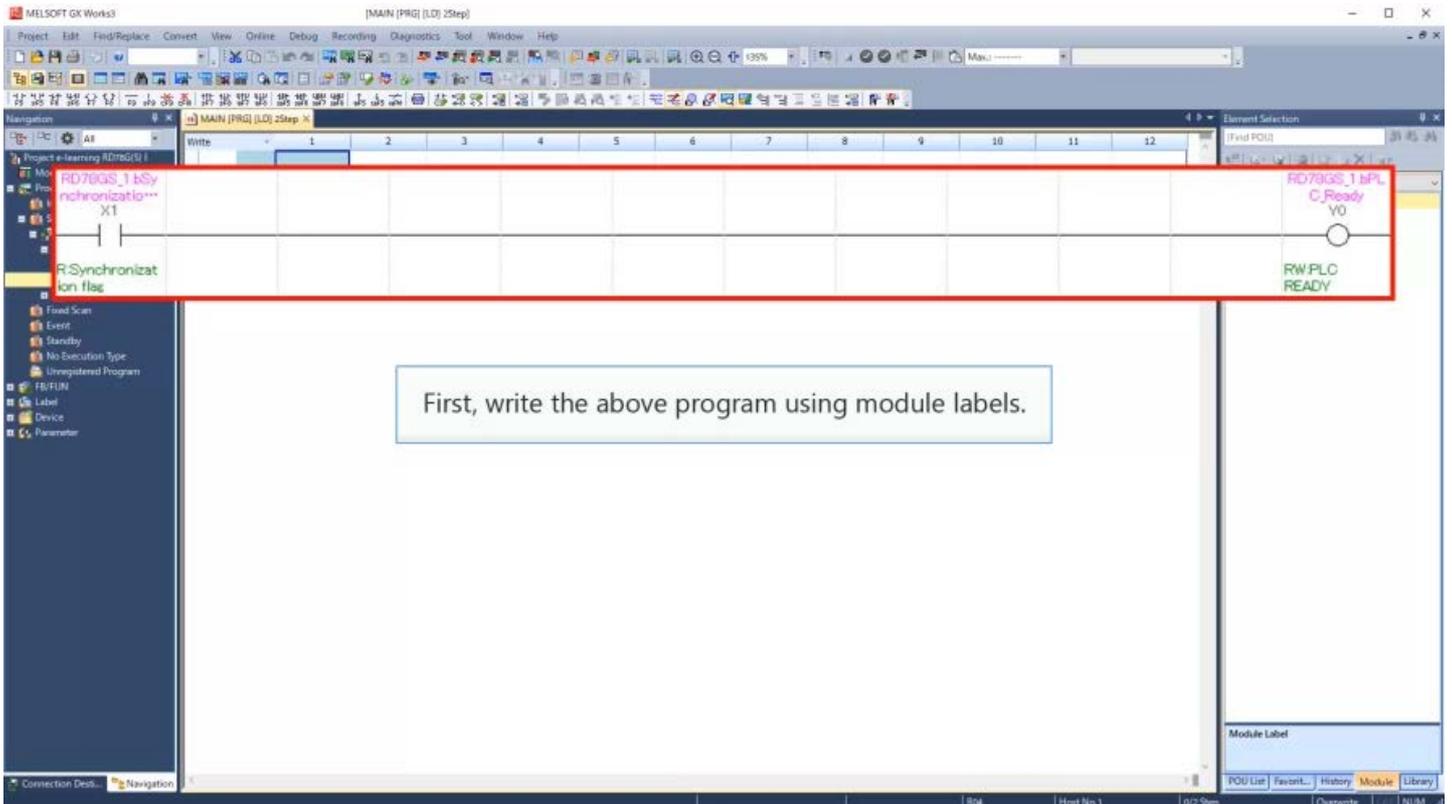
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



This video explains how to add module labels and module FBs.

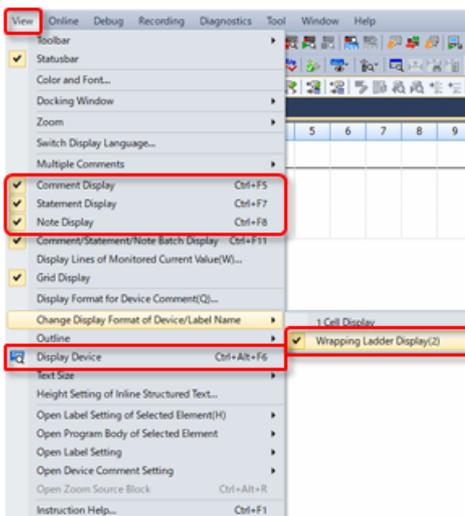


[Point]

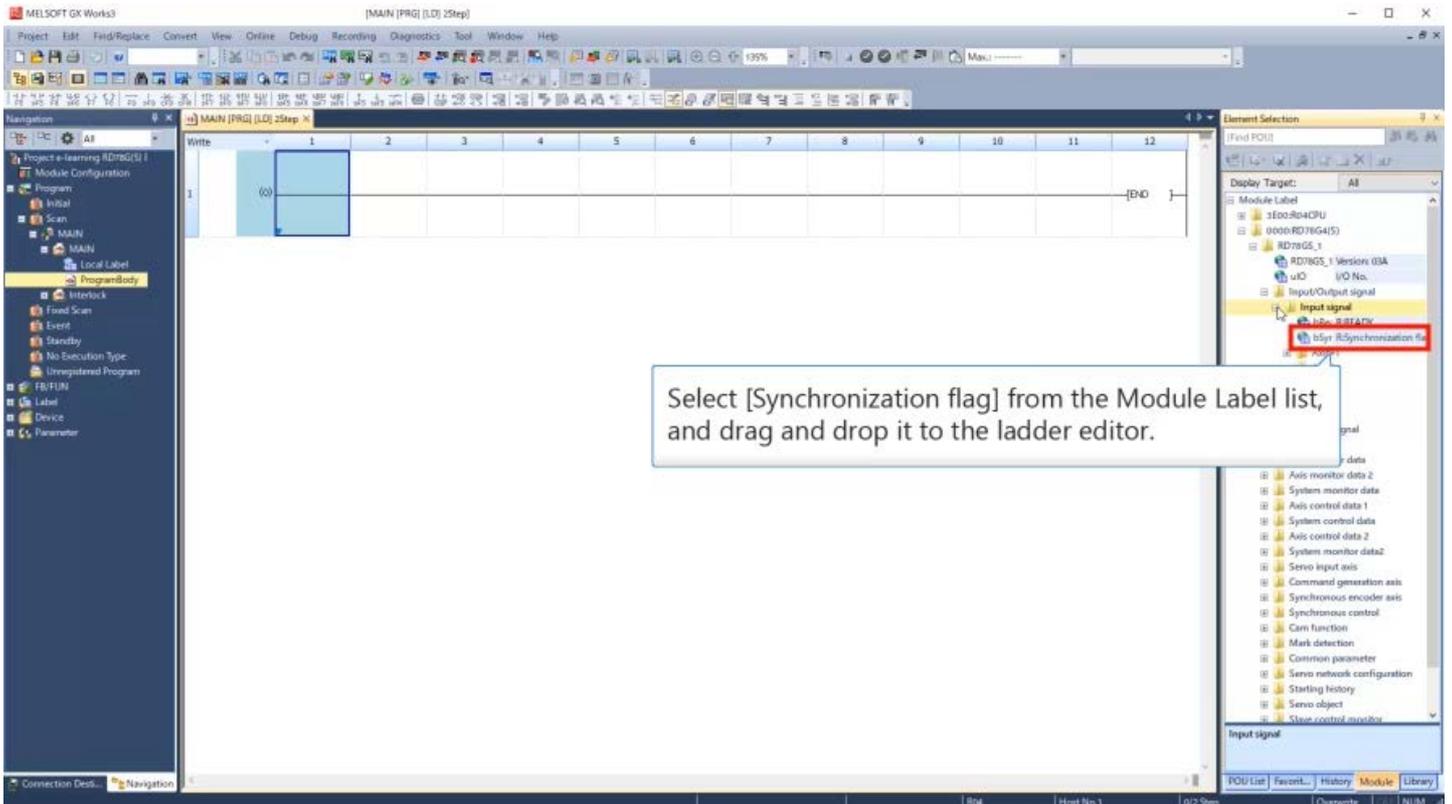
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



This video Label explains how to add module labels and module FBs.

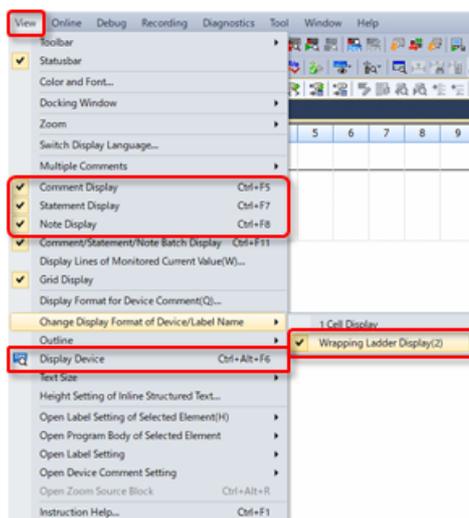


[Point]

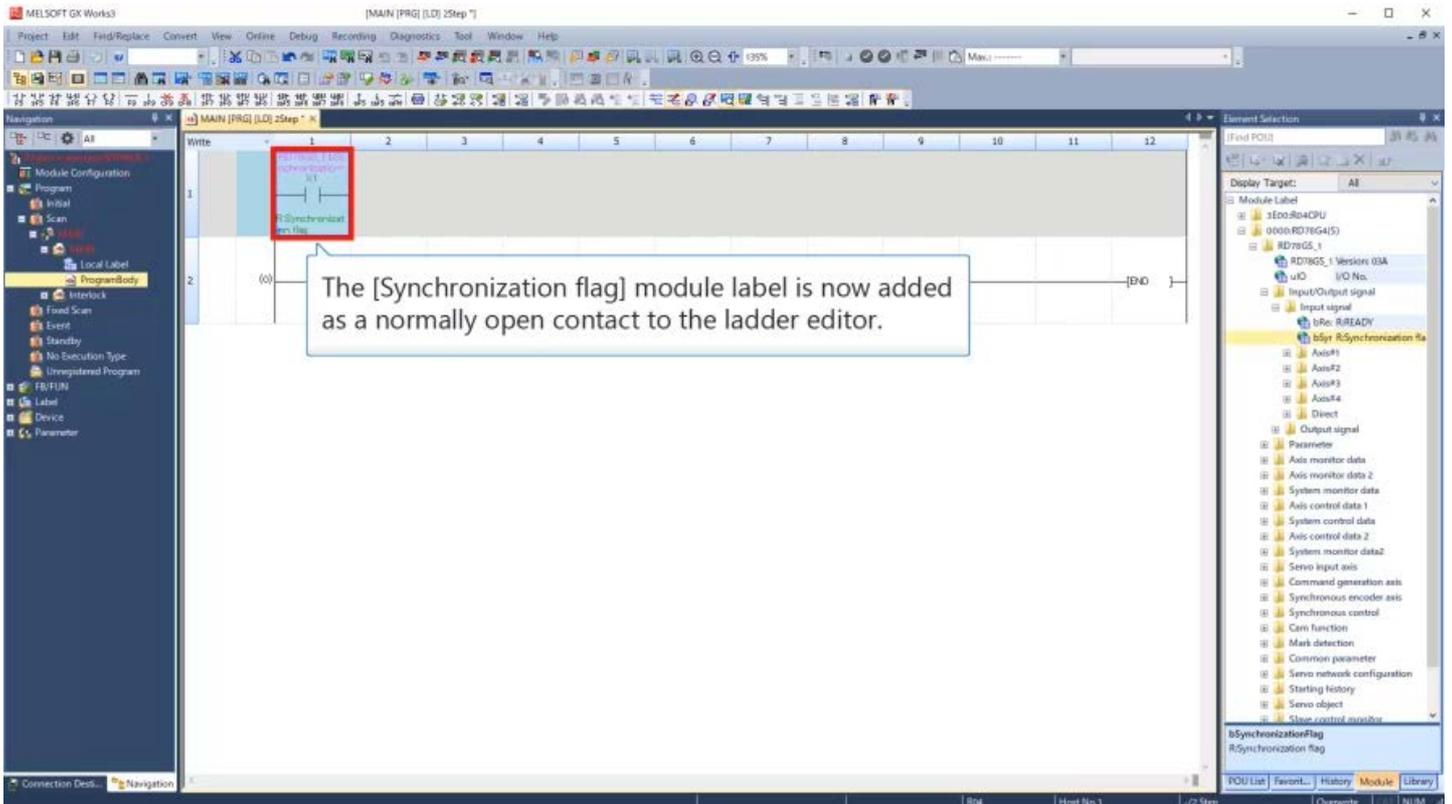
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

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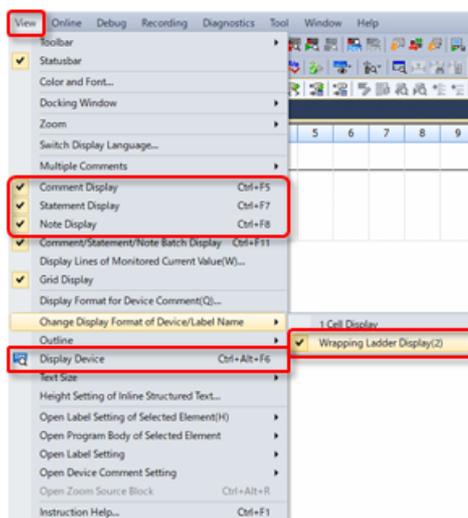


[Point]

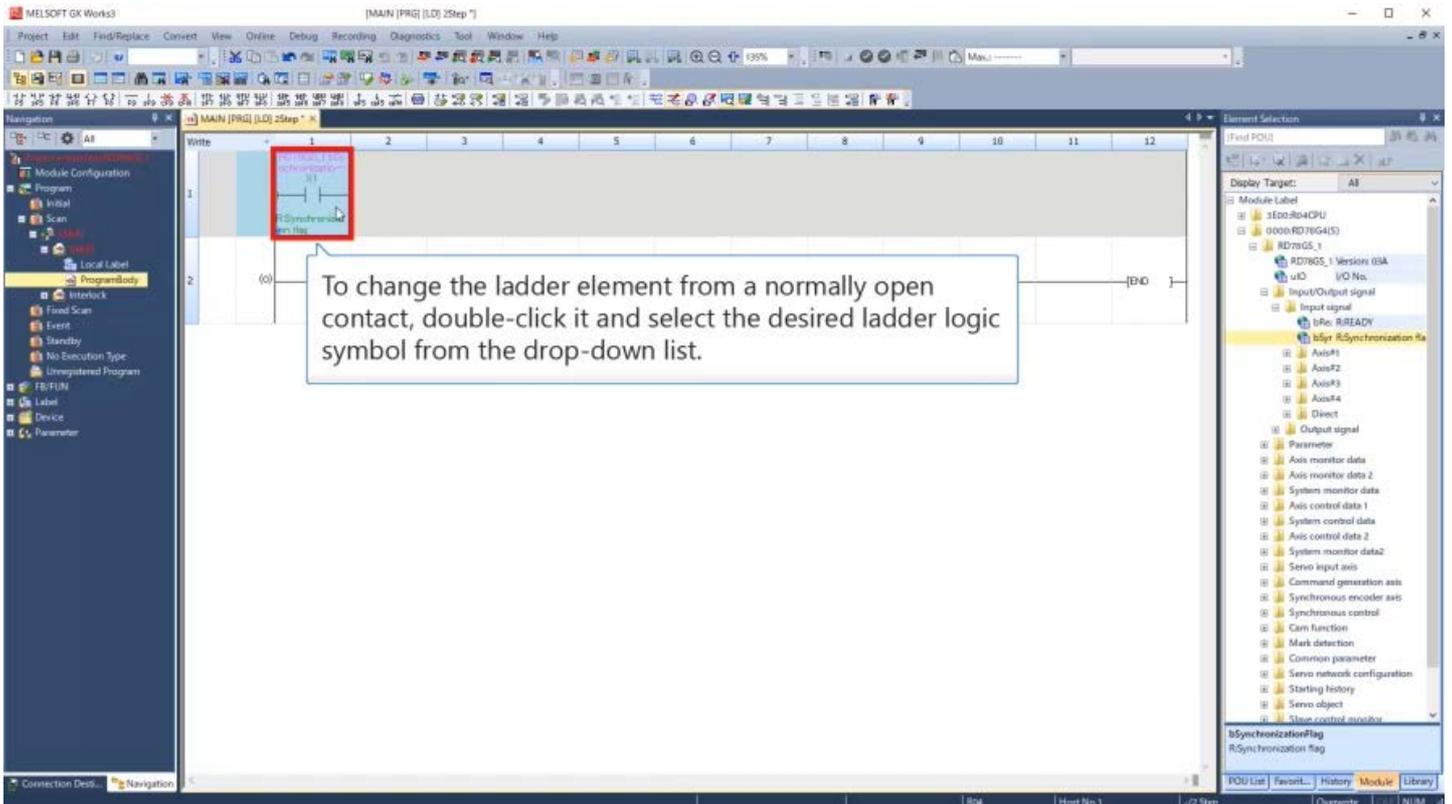
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

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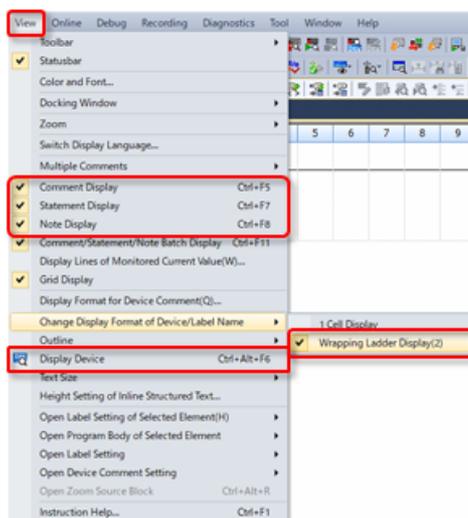


[Point]

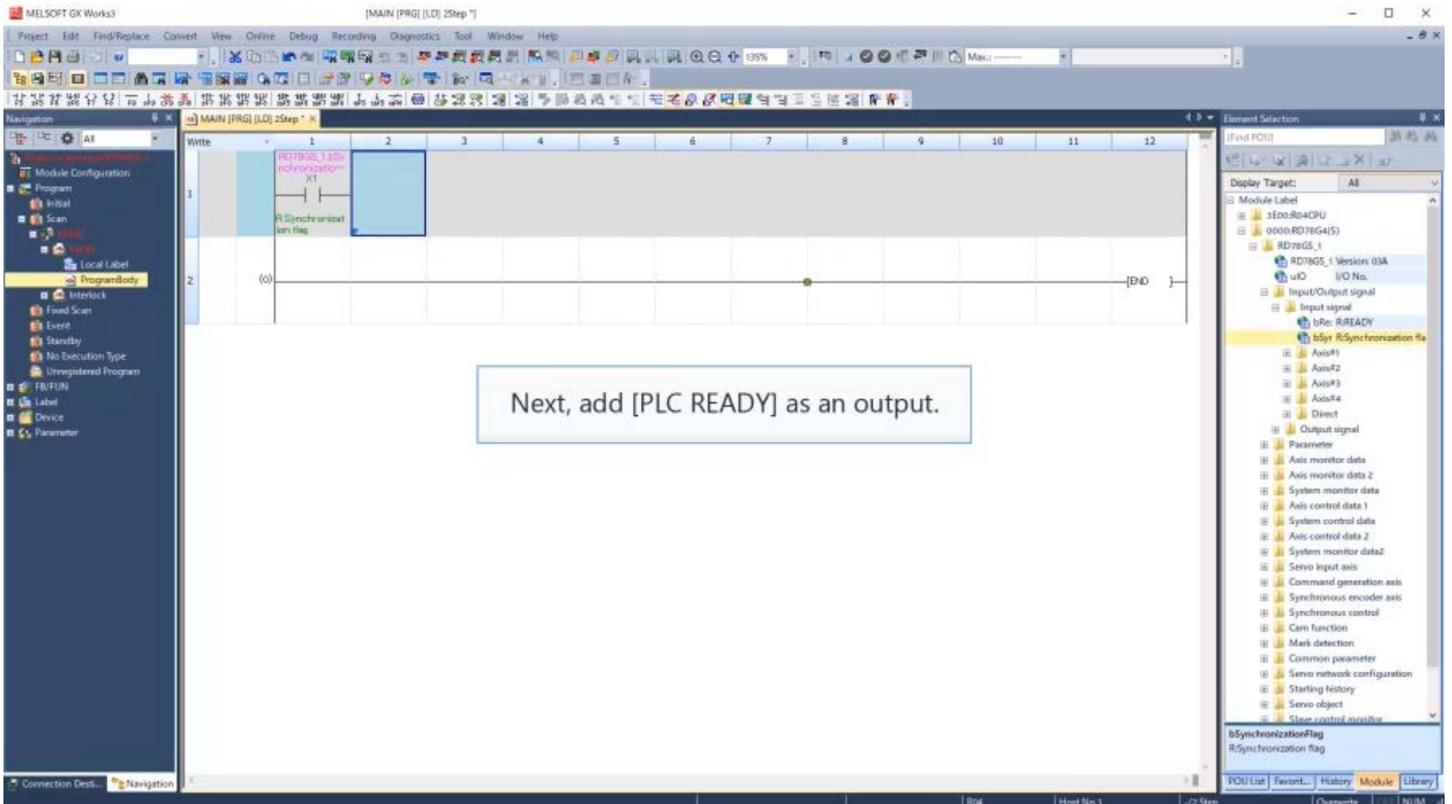
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

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Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



This video explains how to add module labels and module FBs.

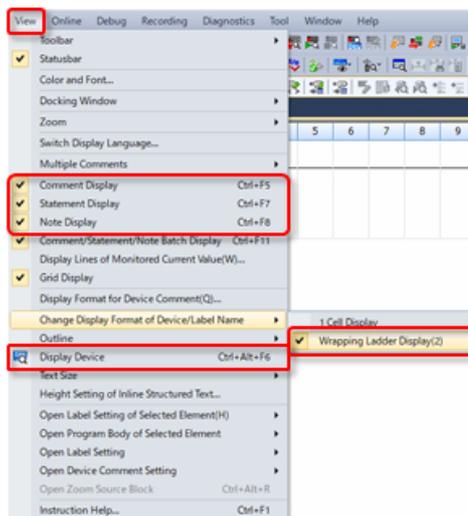


[Point]

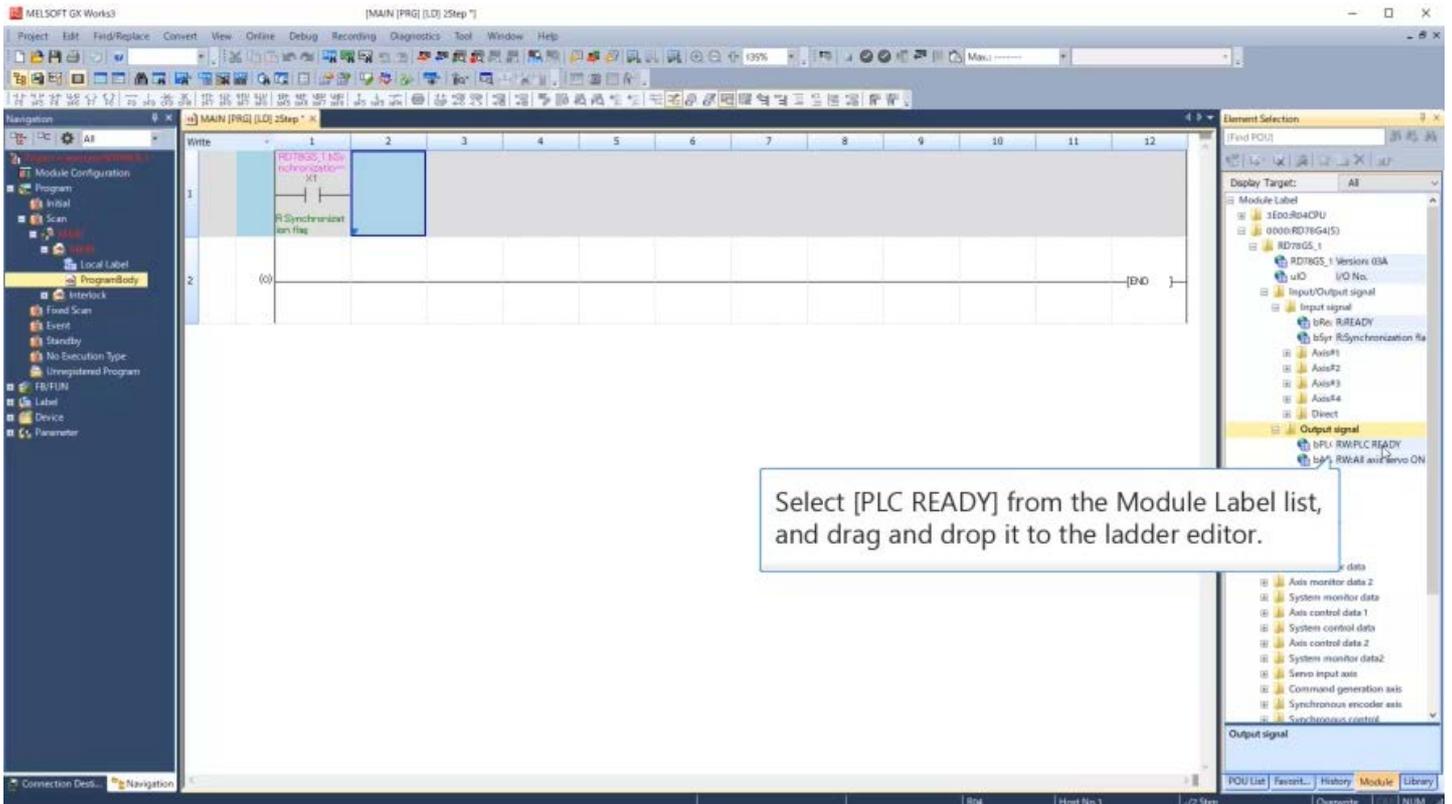
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

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This video explains how to add module labels and module FBs.

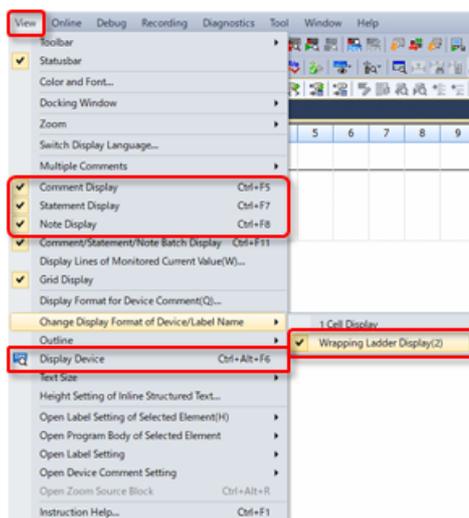


[Point]

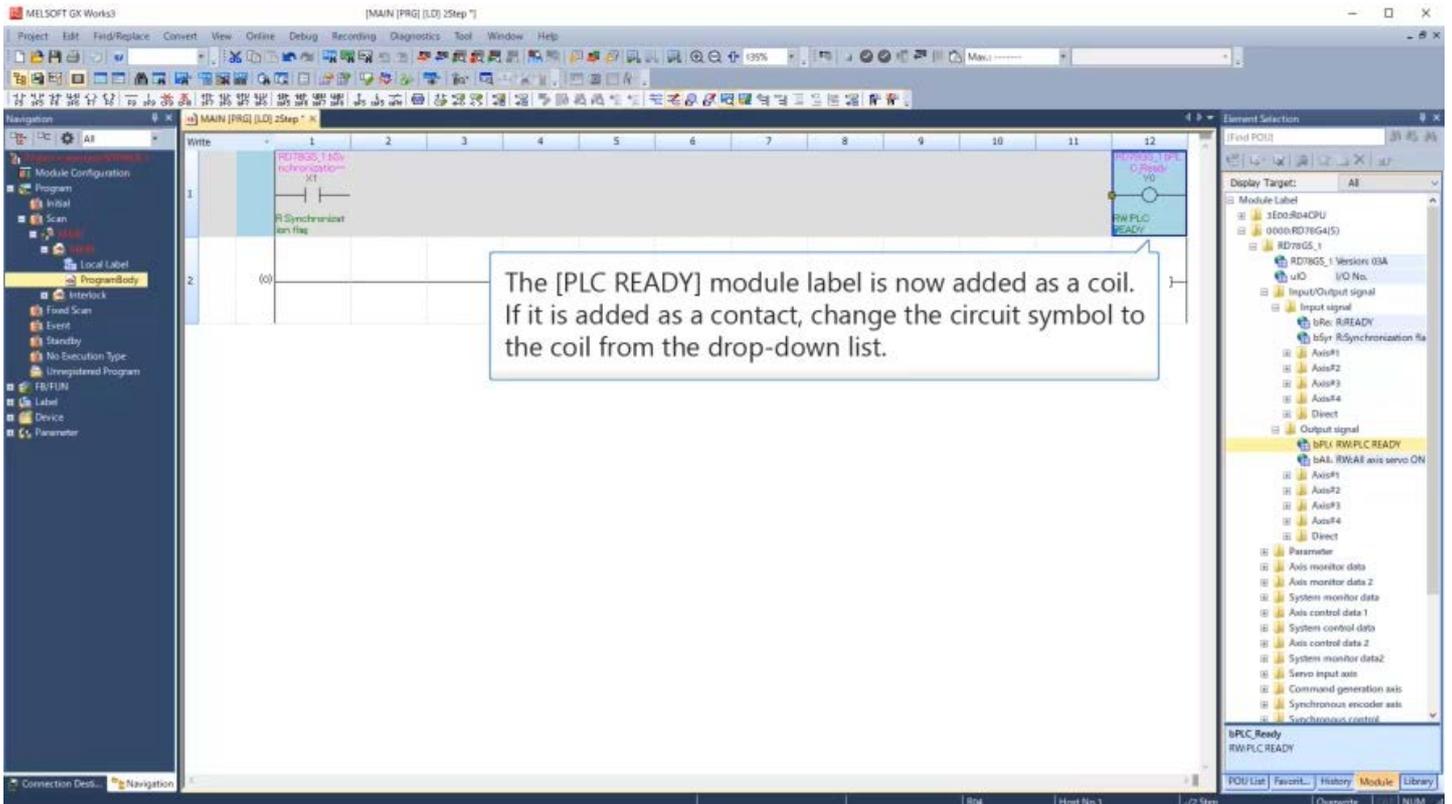
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

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Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



This video explains how to add module labels and module FBs.

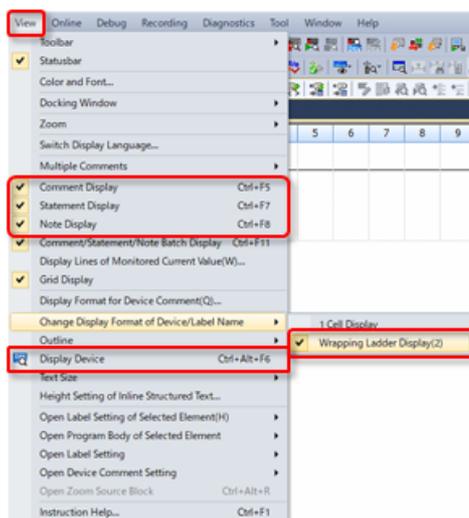


[Point]

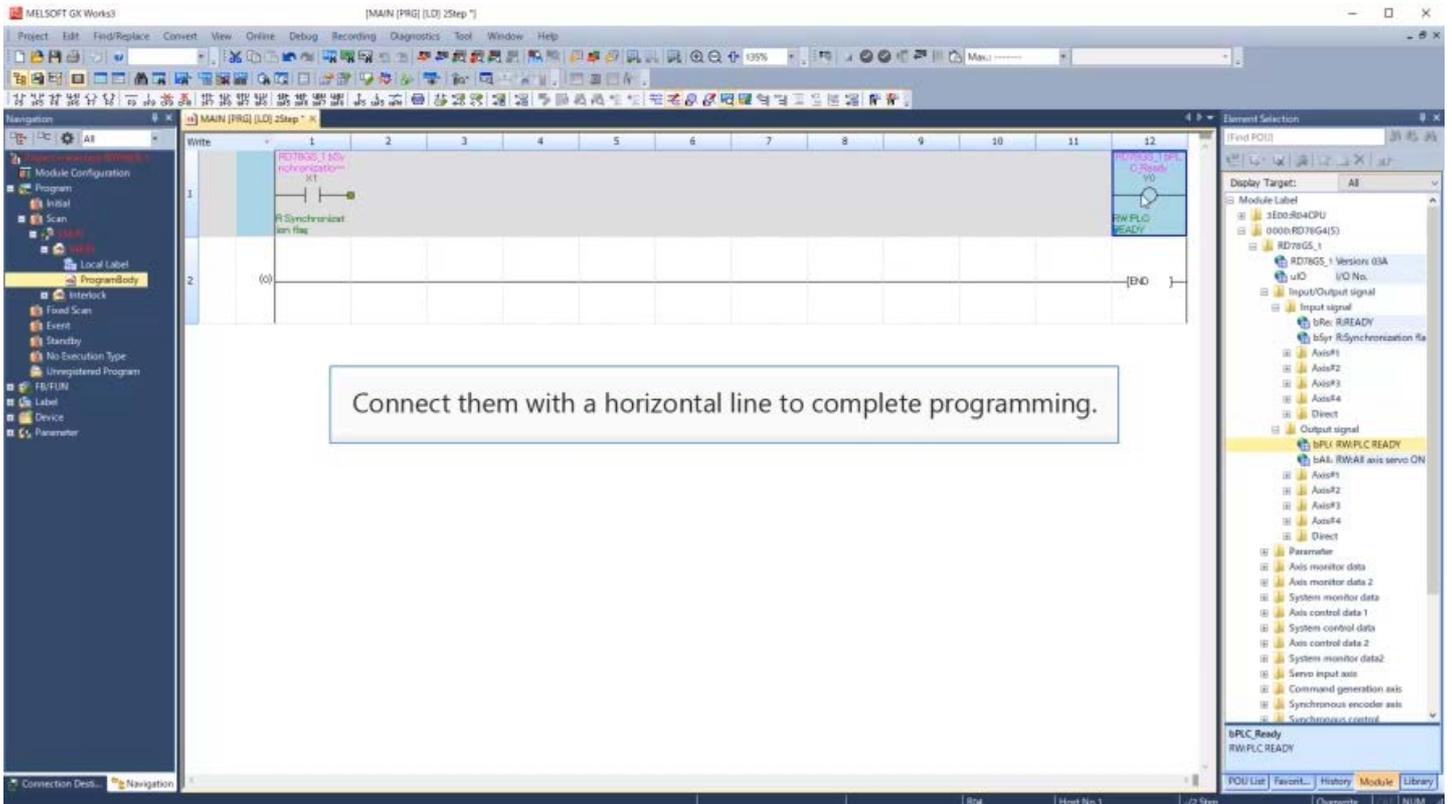
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

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This video explains how to add module labels and module FBs.

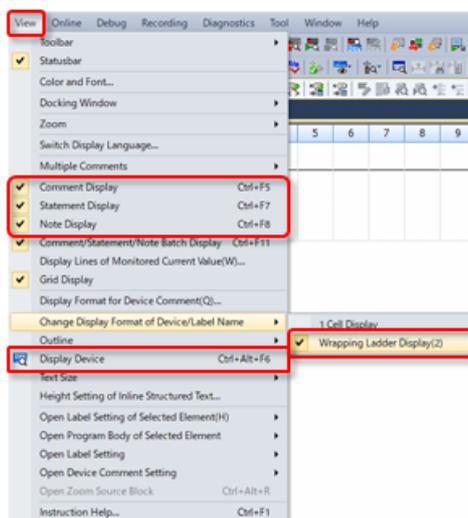


[Point]

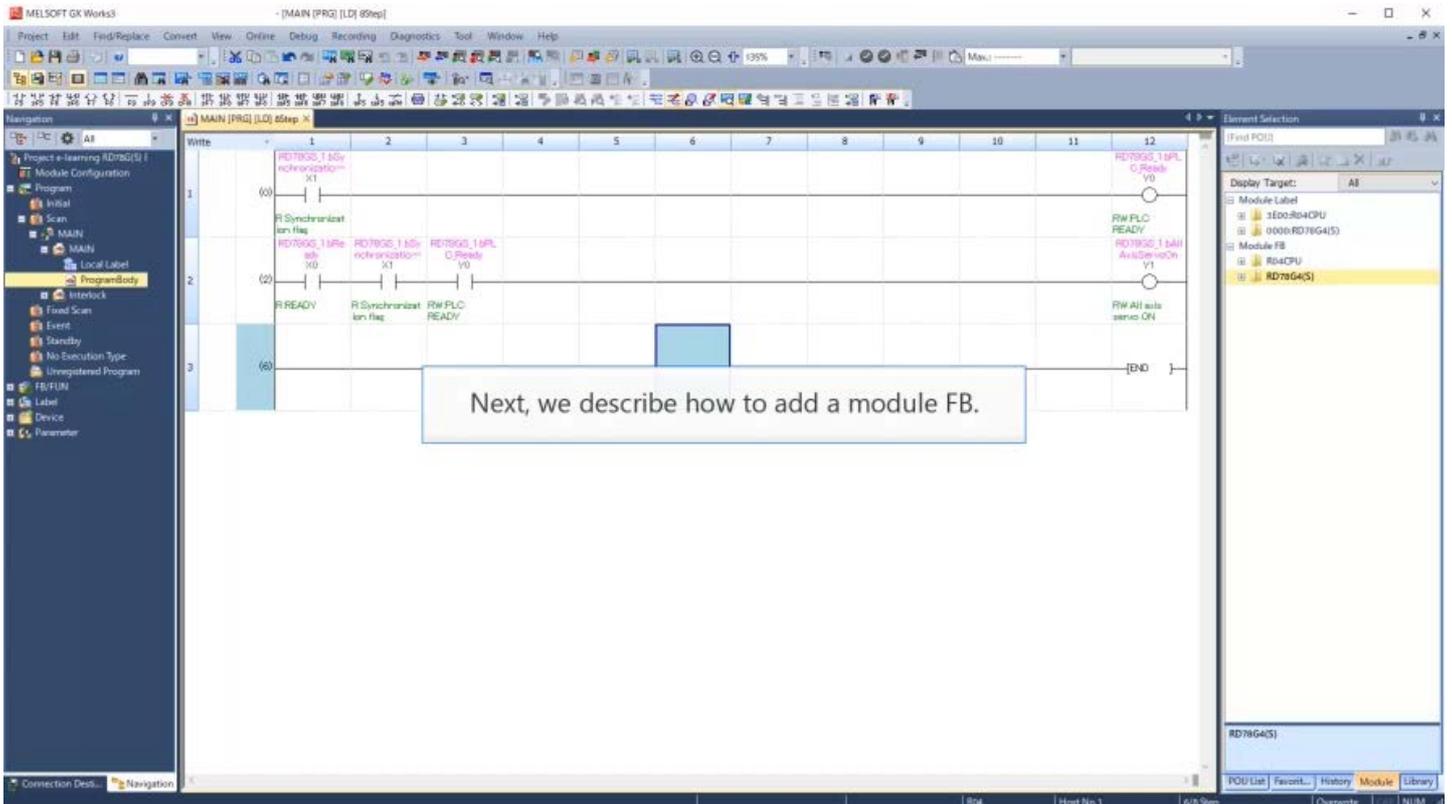
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



This video explains how to add module labels and module FBs.

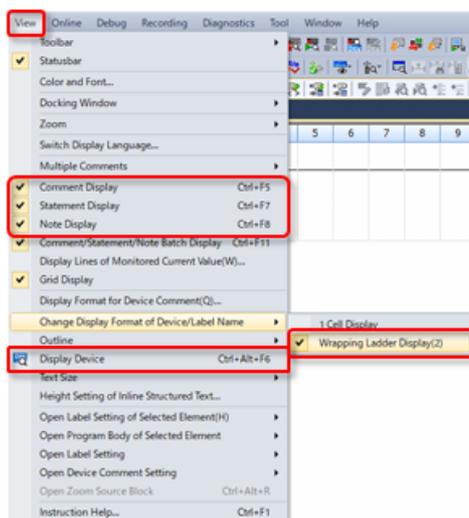


[Point]

To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



This video explains how to add module labels and module FBs.

The screenshot shows the MELSOFT GX Works3 interface. The main window displays a ladder logic program with several rungs. A red rectangular box highlights the program area, which includes:

- Rung 3: A normally open contact labeled 'oJsv1 JogEnable' leading to a coil labeled 'oJsv1 Jog Enable'.
- Rung 4: A coil labeled 'oJsv1 Jog Enable' leading to a coil labeled 'oJsv1 Jog Enable'.
- Rung 5: A coil labeled 'oJsv1 Jog Enable' leading to a coil labeled 'oJsv1 Jog Enable'.
- Rung 6: A coil labeled 'oJsv1 Jog Enable' leading to a coil labeled 'oJsv1 Jog Enable'.
- Rung 7: A coil labeled 'oJsv1 Jog Enable' leading to a coil labeled 'oJsv1 Jog Enable'.
- Rung 8: A coil labeled 'oJsv1 Jog Enable' leading to a coil labeled 'oJsv1 Jog Enable'.
- Rung 9: A coil labeled 'oJsv1 Jog Enable' leading to a coil labeled 'oJsv1 Jog Enable'.
- Rung 10: A coil labeled 'oJsv1 Jog Enable' leading to a coil labeled 'oJsv1 Jog Enable'.
- Rung 11: A coil labeled 'oJsv1 Jog Enable' leading to a coil labeled 'oJsv1 Jog Enable'.
- Rung 12: A coil labeled 'oJsv1 Jog Enable' leading to a coil labeled 'oJsv1 Jog Enable'.

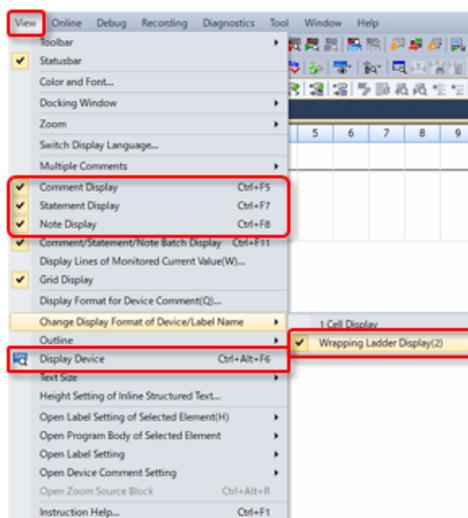
 The right side of the interface shows the 'Element Selection' window with 'Module Label' selected. A text box at the bottom of the screenshot reads: "We will create a program using the module FB for JOG operation as shown above."

[Point]

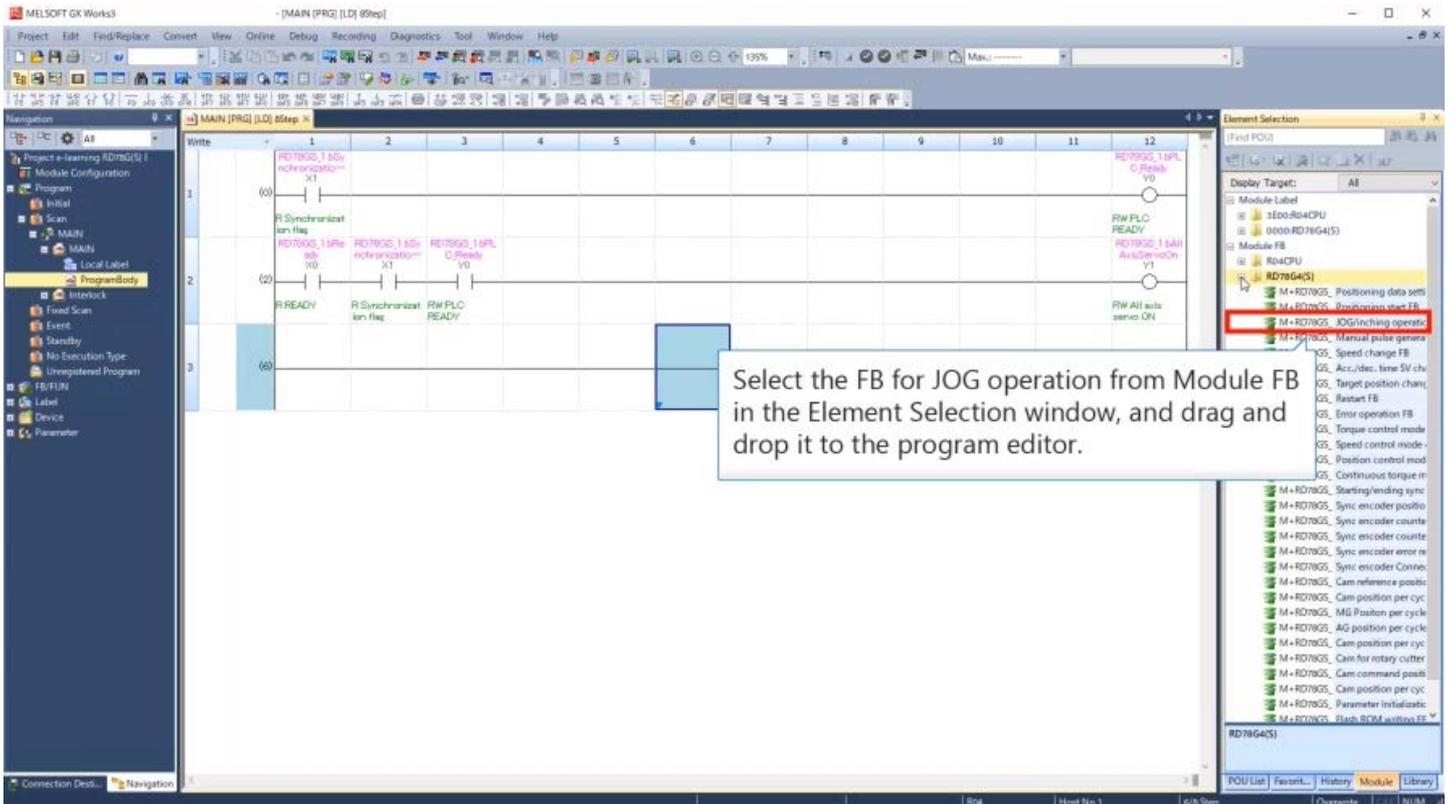
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



This video explains how to add module labels and module FBs.

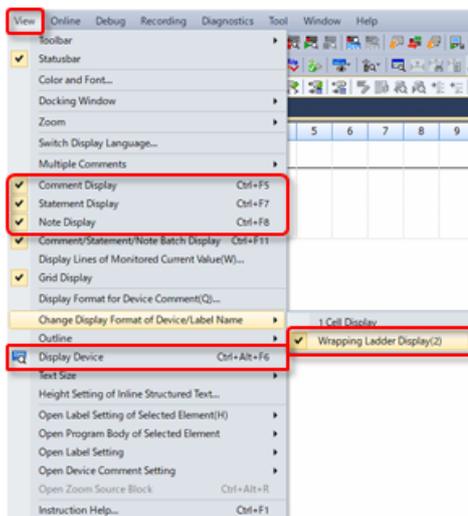


[Point]

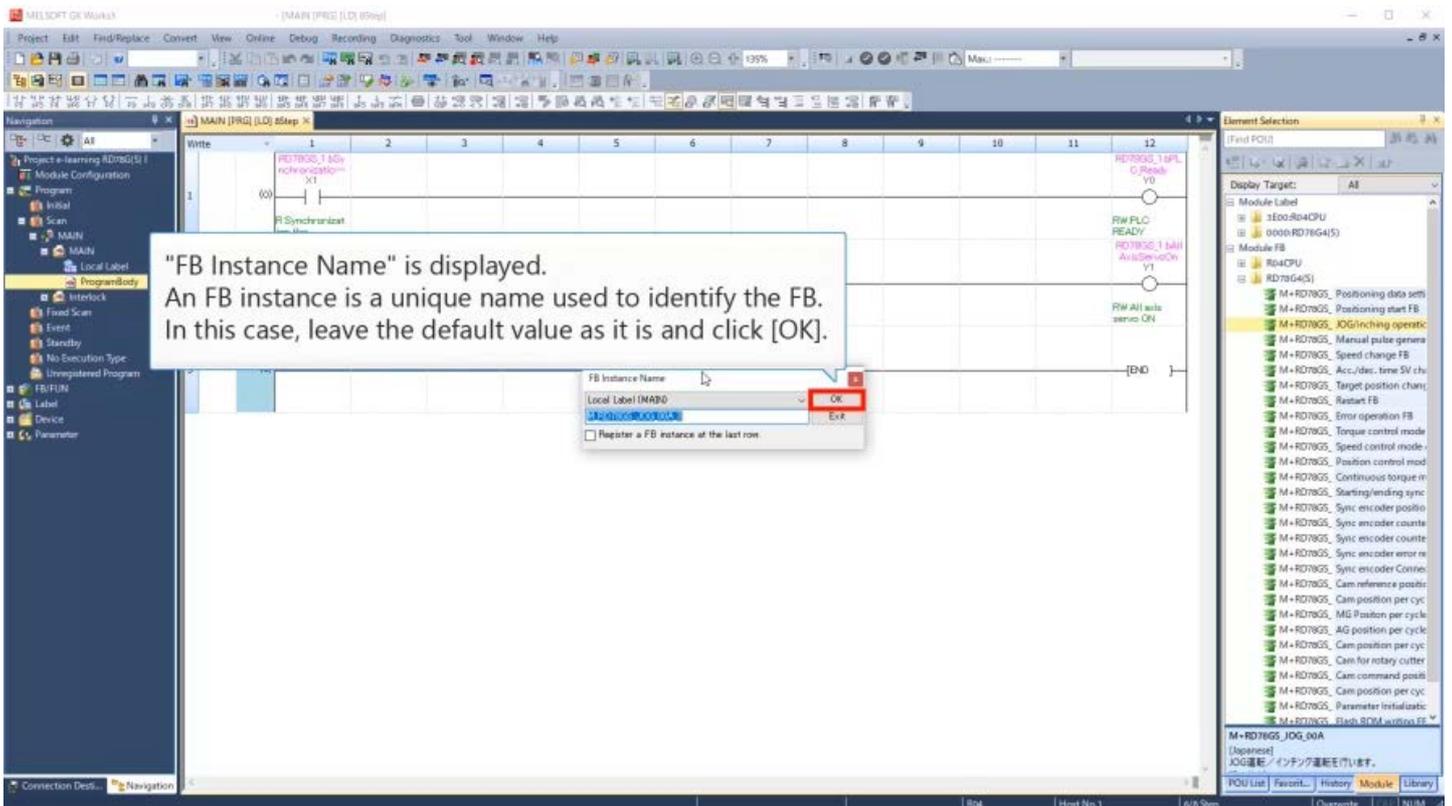
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



This video explains how to add module labels and module FBs.

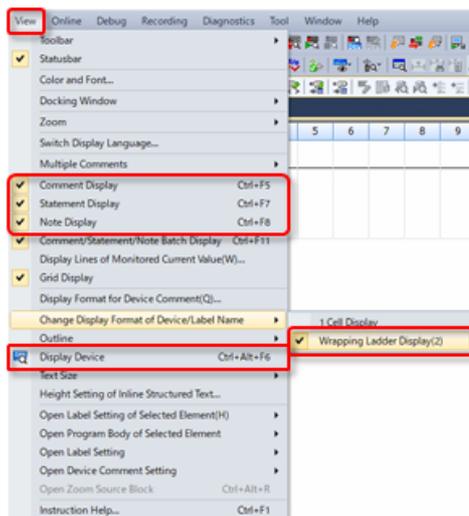


[Point]

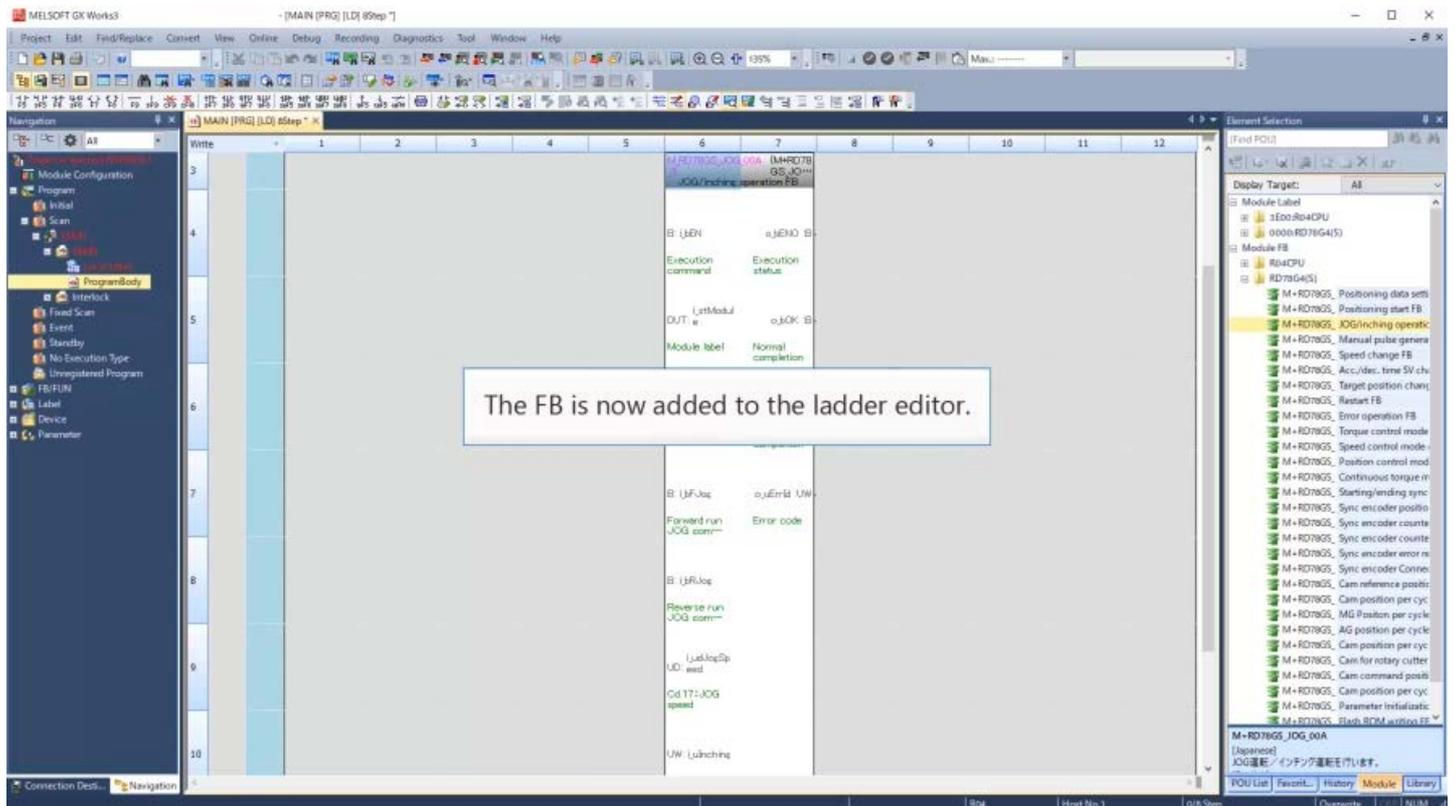
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

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This video explains how to add module labels and module FBs.

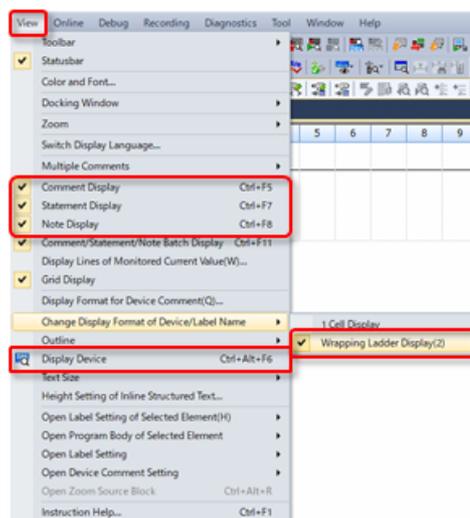


[Point]

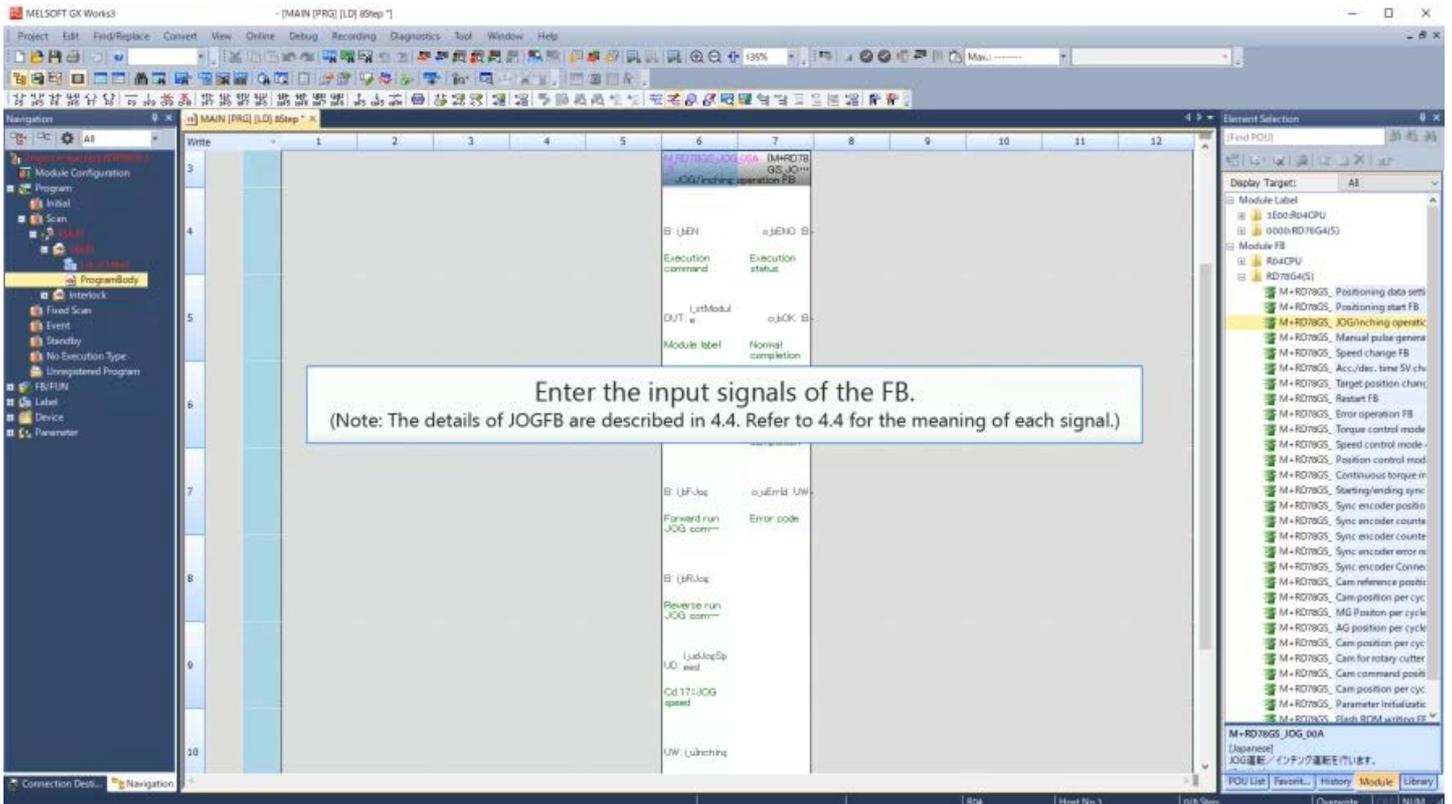
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

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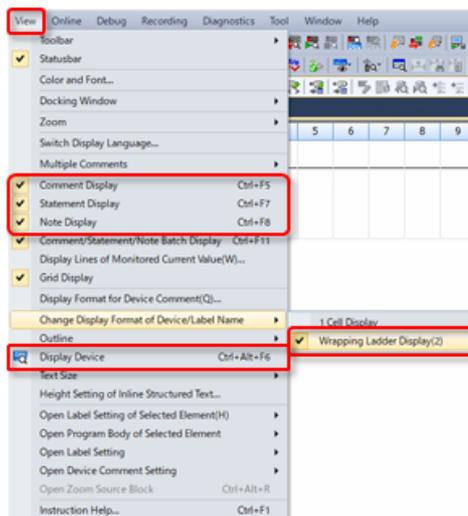


[Point]

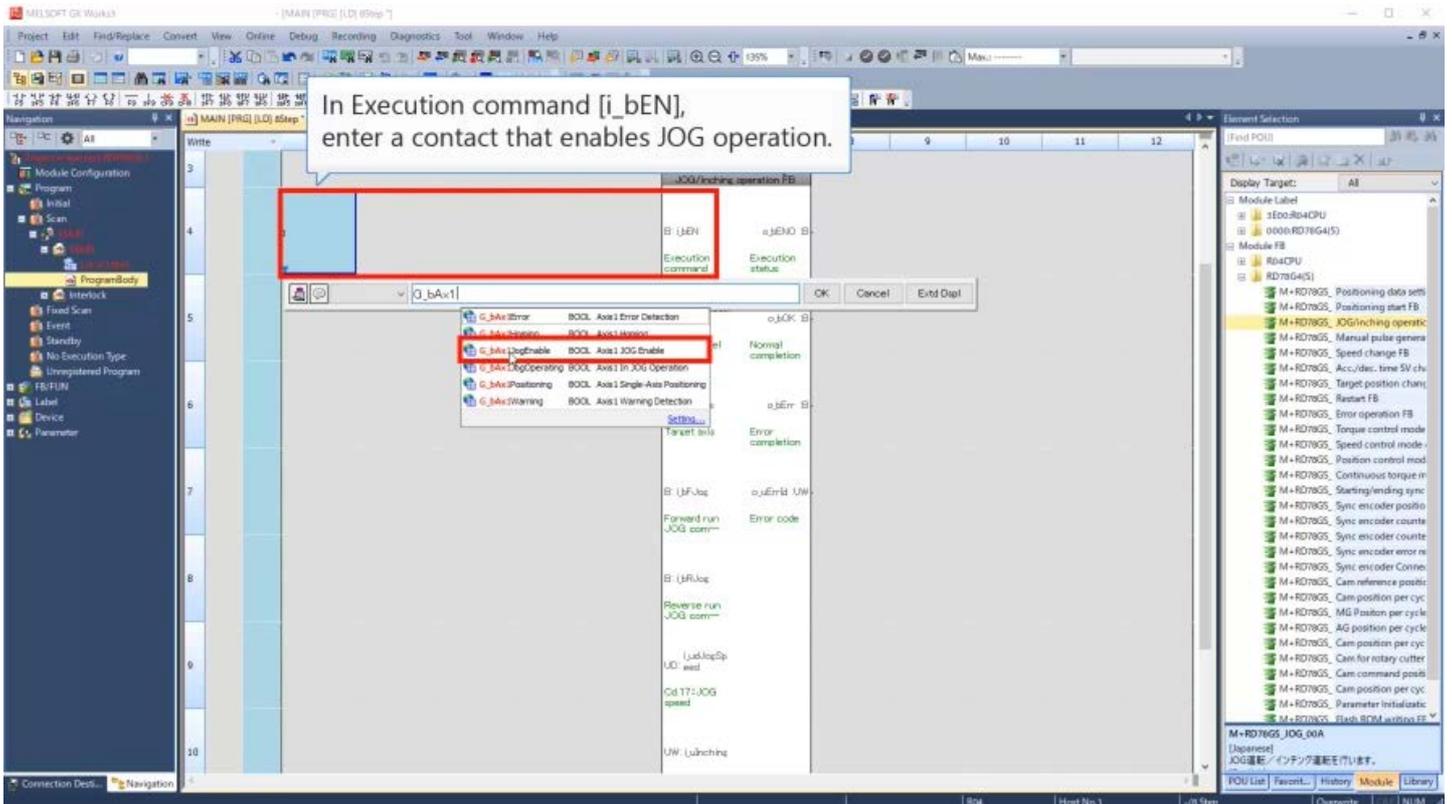
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

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This video explains how to add module labels and module FBs.

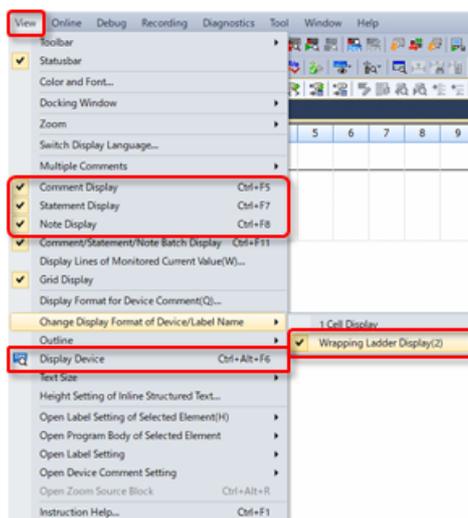


[Point]

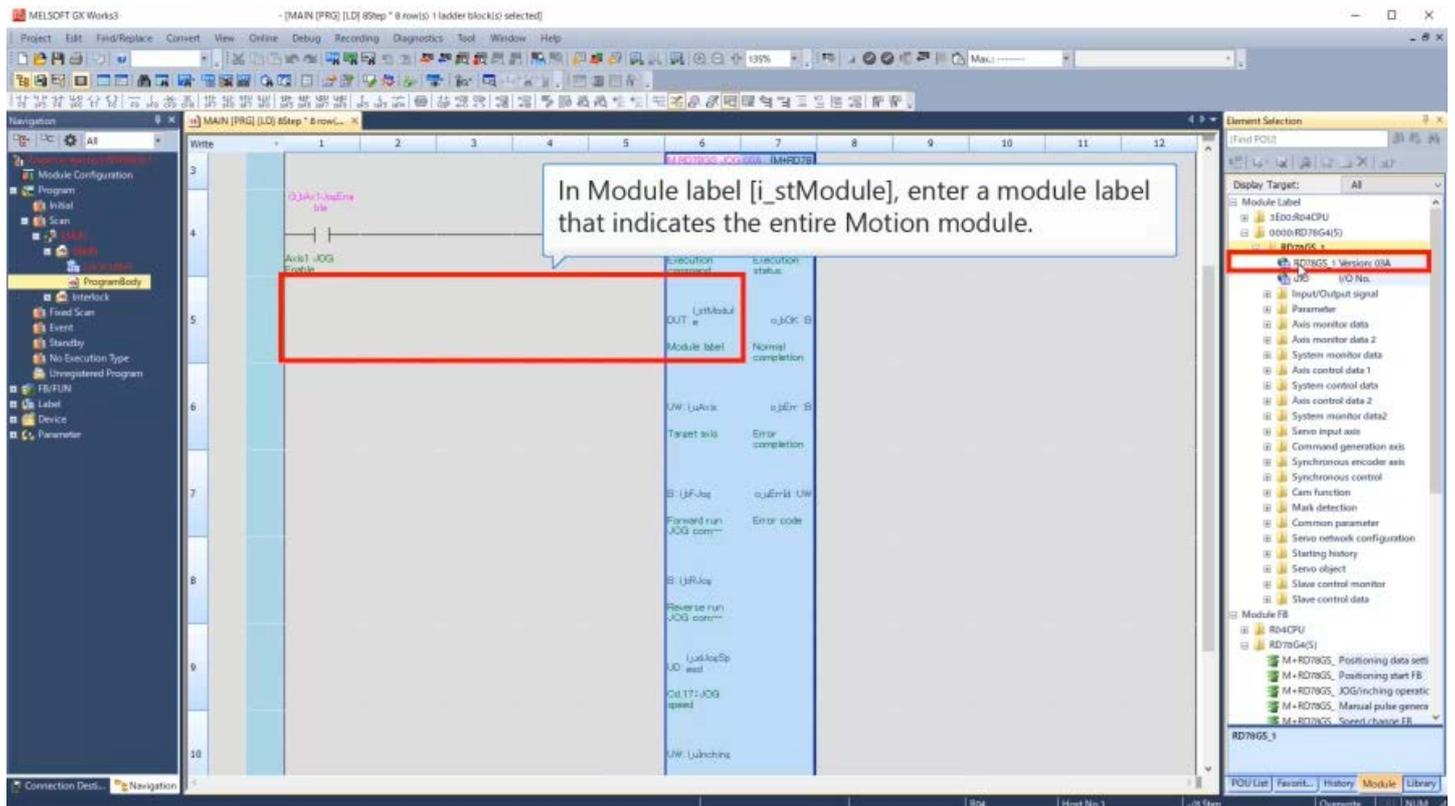
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

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This video explains how to add module labels and module FBs.

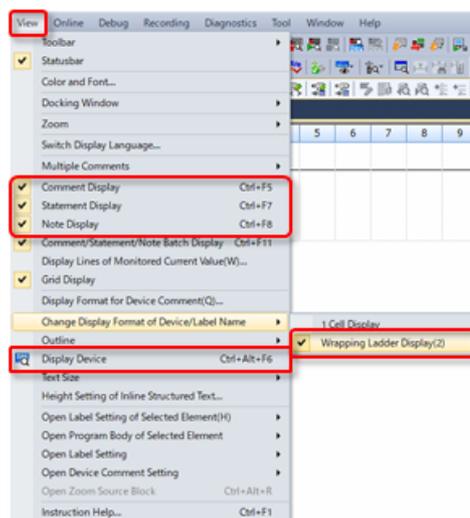


[Point]

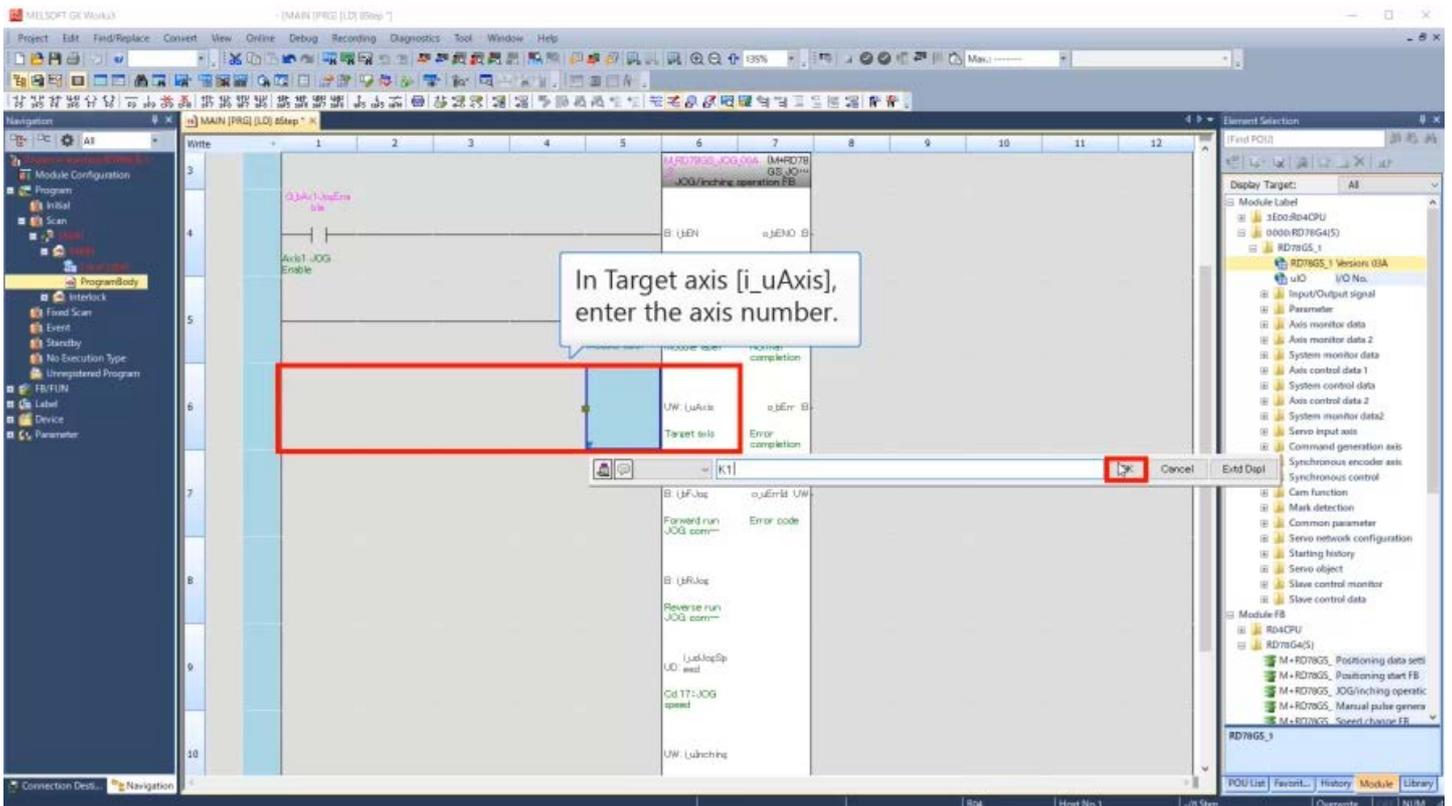
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

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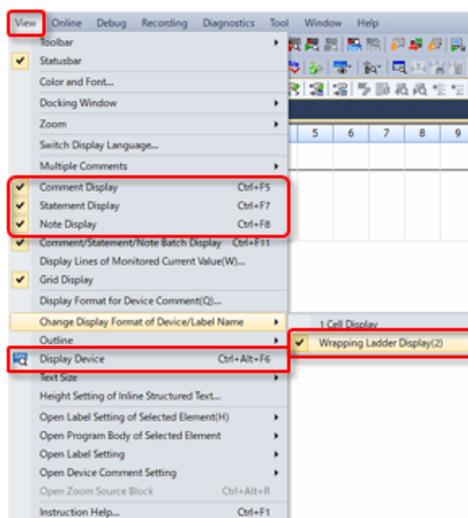


[Point]

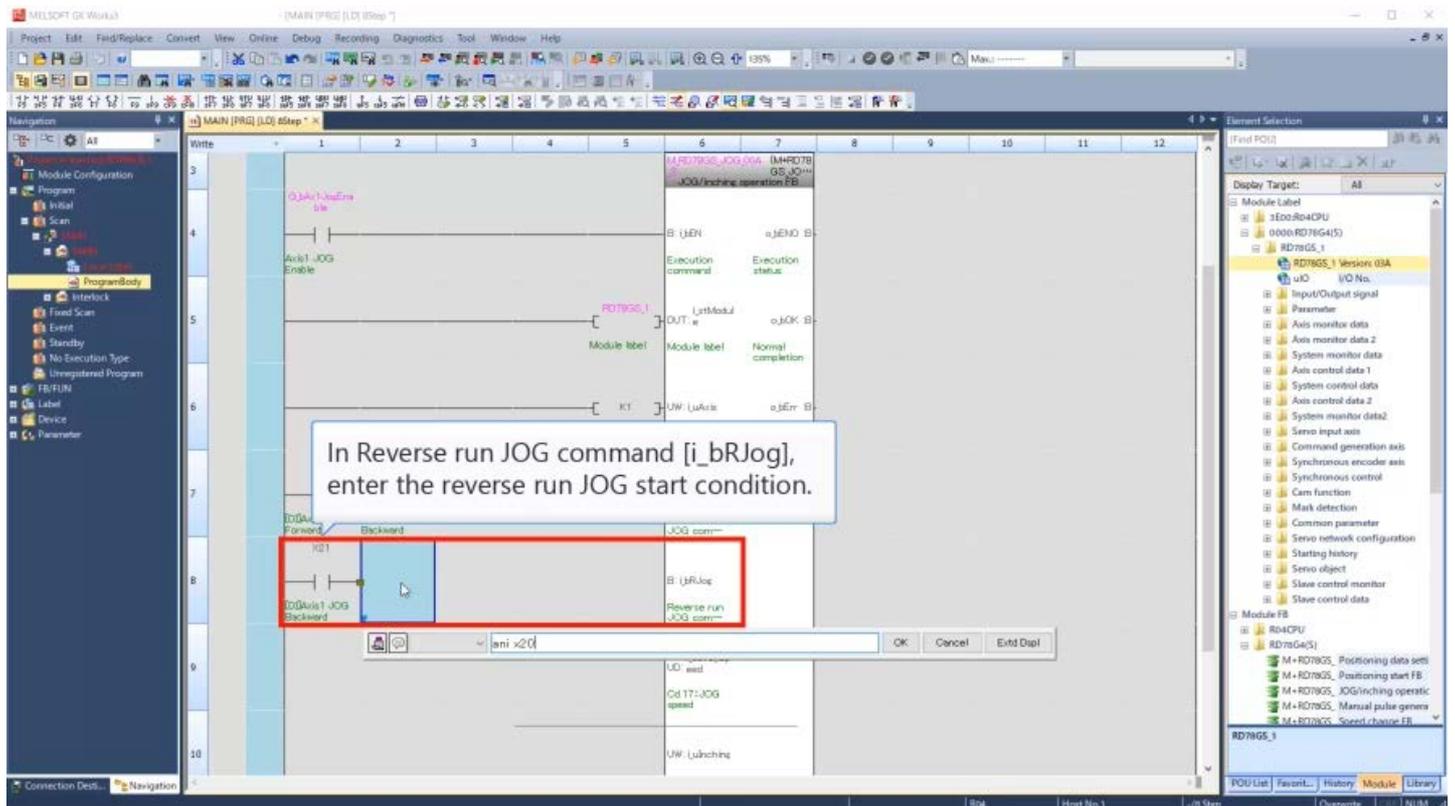
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

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This video explains how to add module labels and module FBs.

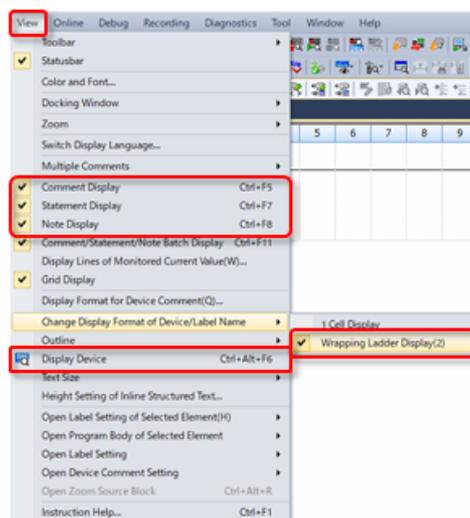


[Point]

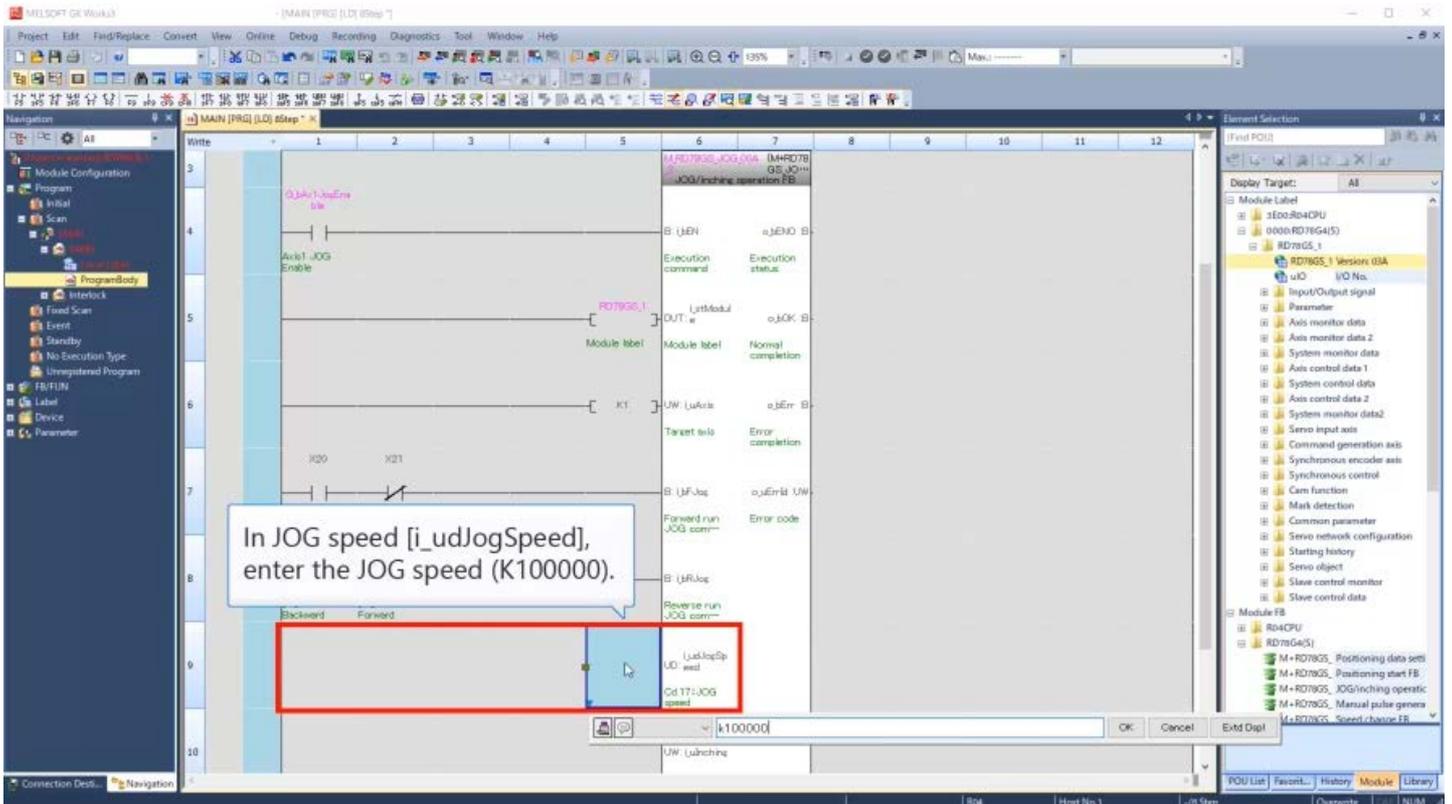
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

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This video explains how to add module labels and module FBs.

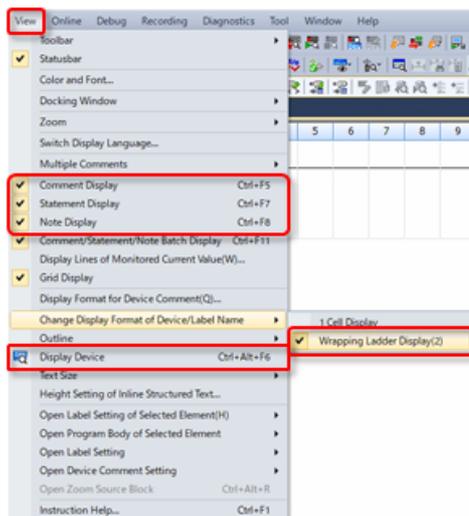


[Point]

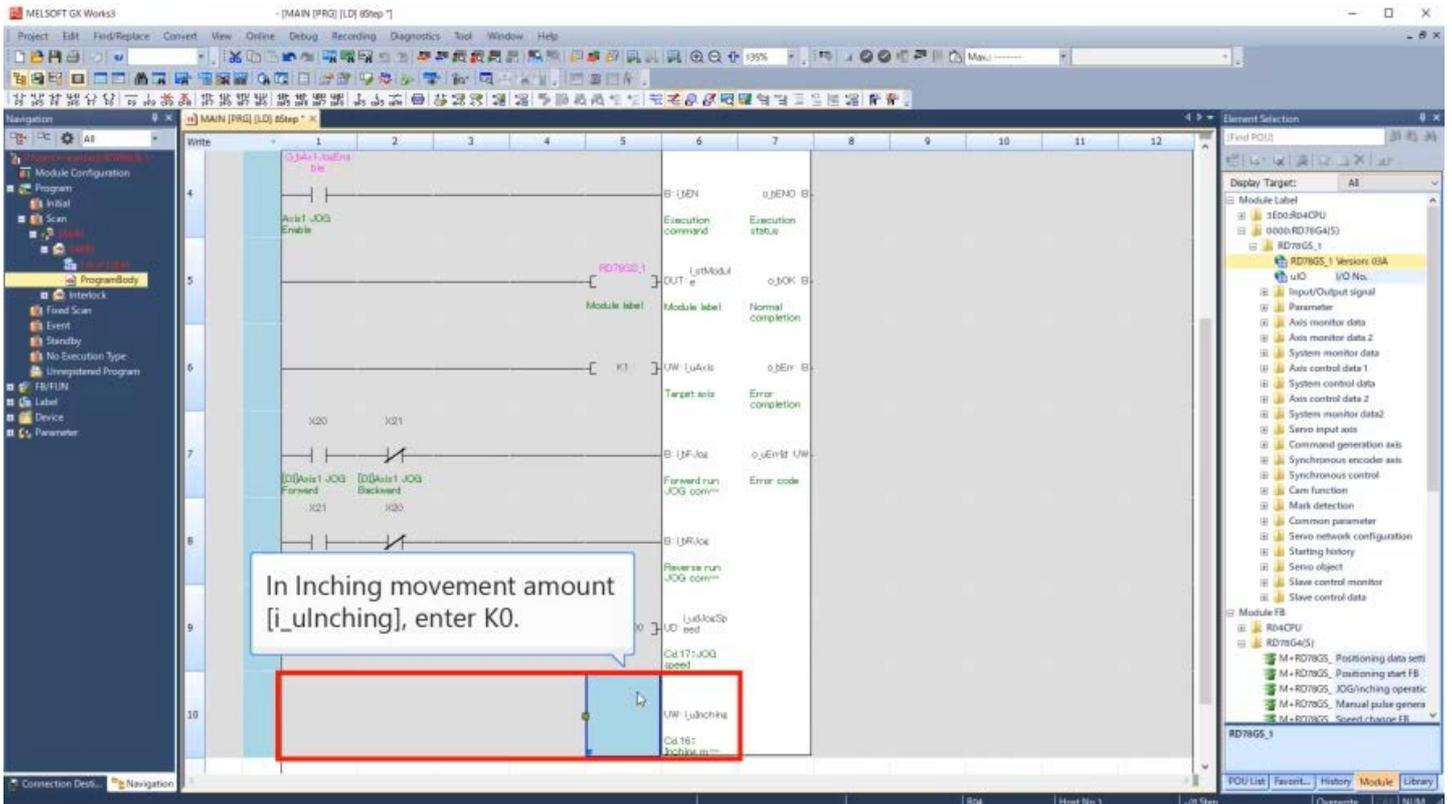
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

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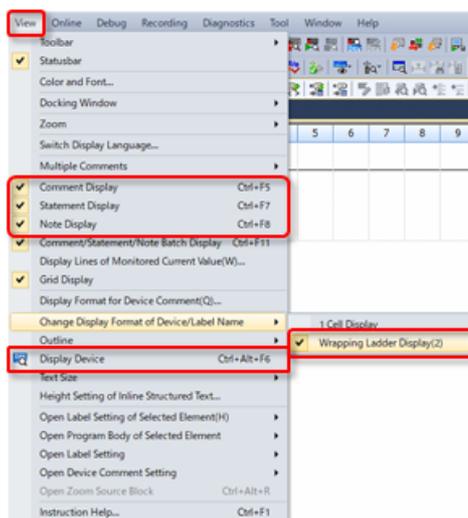


[Point]

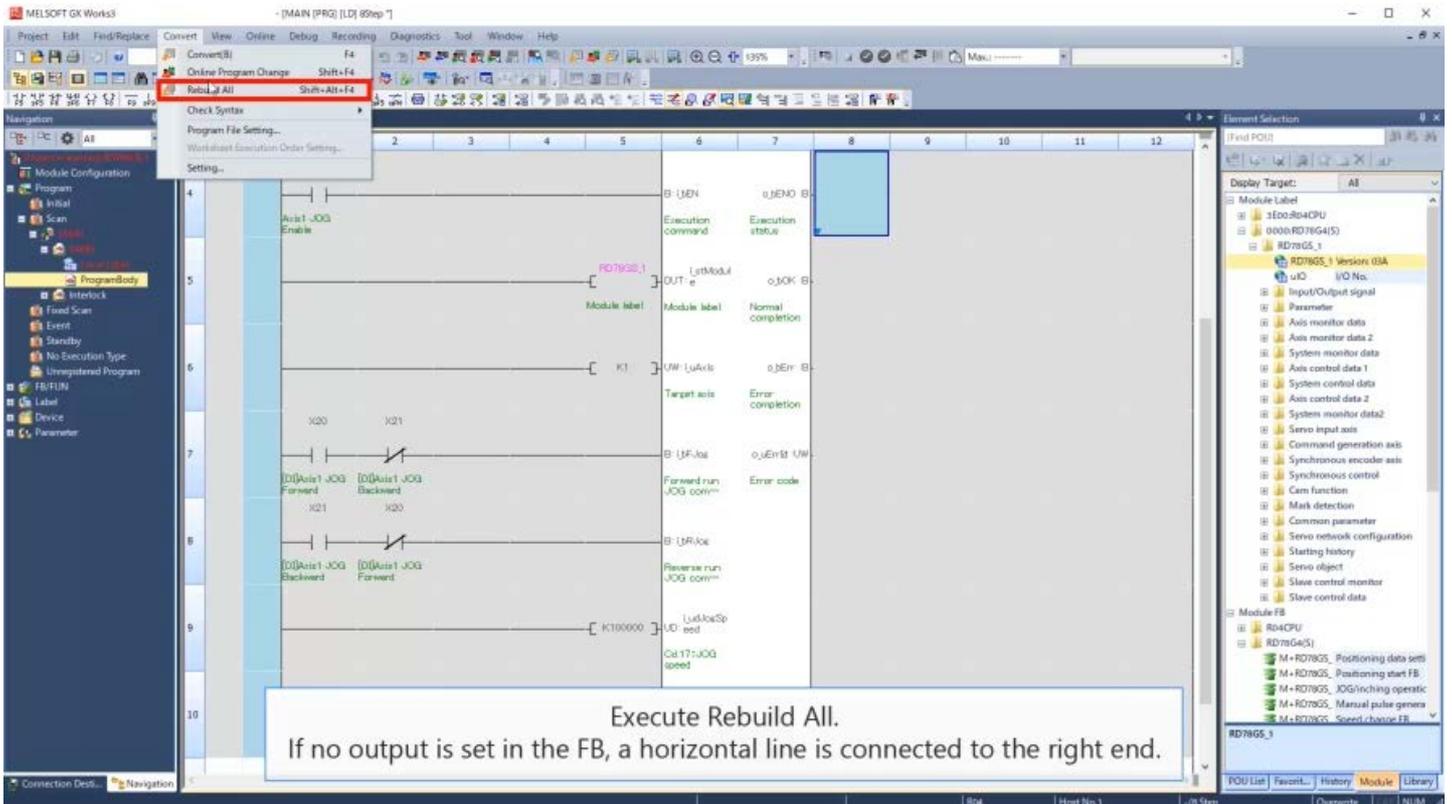
To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



This video explains how to add module labels and module FBs.



The screenshot shows the MELSOFT GX Works2 interface. The 'Rebuild All' menu option is highlighted in the 'Convert' menu. The main workspace displays a ladder logic diagram with various components like 'Axis1-JOG Enable', 'Module label', and 'Forward run JOG conv...'. A text box at the bottom of the workspace contains the following text:

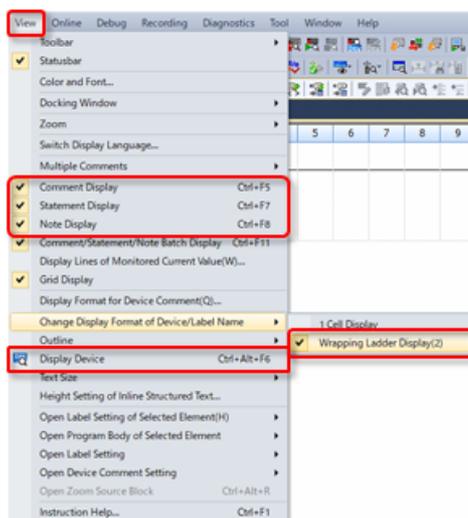
Execute Rebuild All.
If no output is set in the FB, a horizontal line is connected to the right end.

[Point]

To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

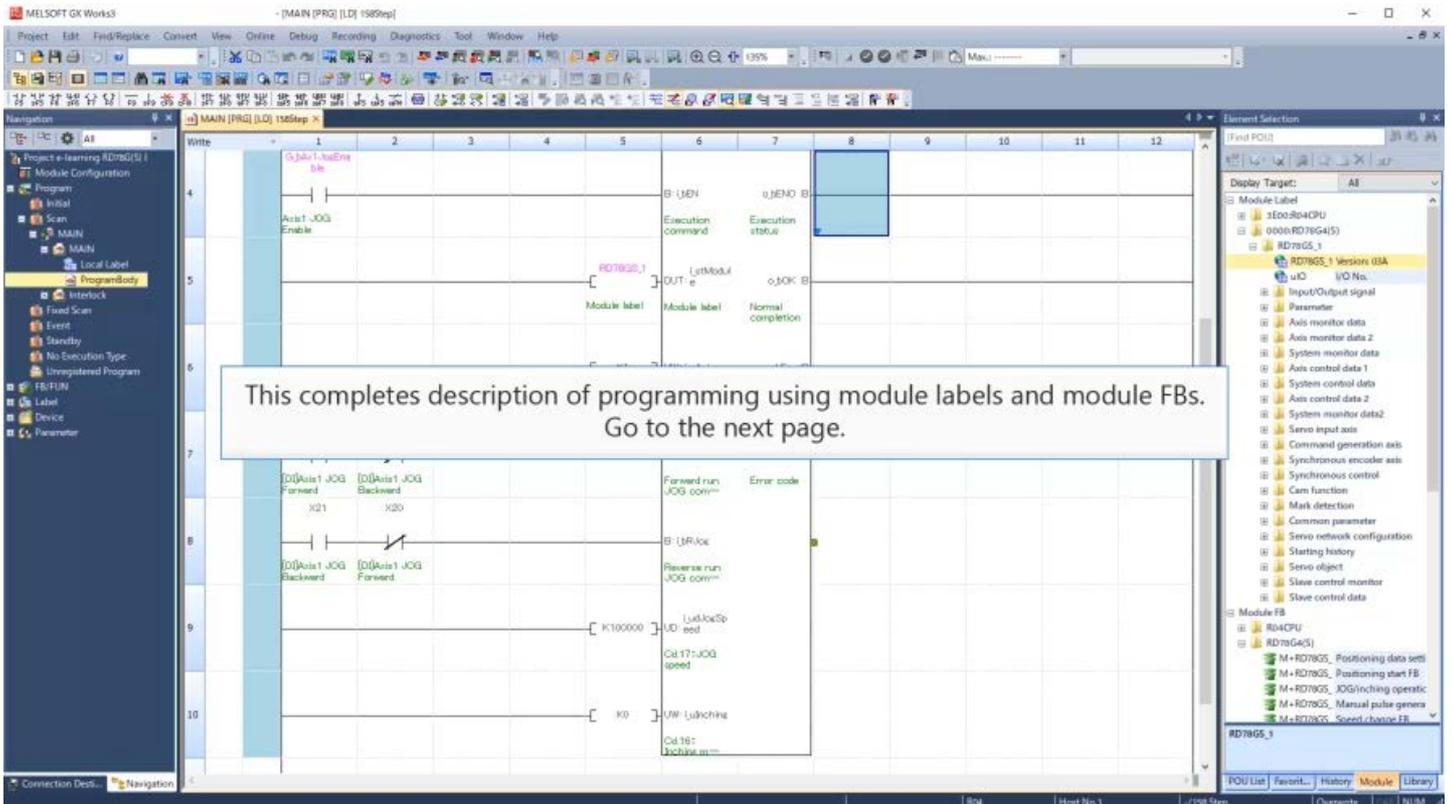
Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



The screenshot shows the 'View' menu in MELSOFT GX Works2. The following options are checked and highlighted with red boxes:

- Comment Display (Ctrl+F5)
- Statement Display (Ctrl+F7)
- Note Display (Ctrl+F8)
- Change Display Format of Device/Label Name (1 Cell Display)
- Wrapping Ladder Display(2)
- Display Device (Ctrl+Alt+F6)

This video explains how to add module labels and module FBs.

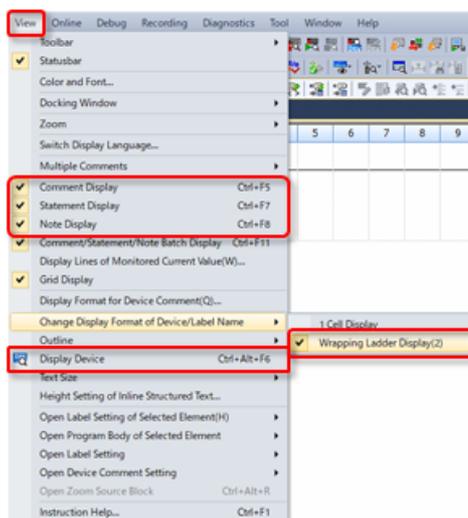


[Point]

To wrap the label name as shown in the video, select [View] → [Change Display Format of Device/Label Name] from the menu bar and select [Wrapping Ladder Display].

In the program display in this course, Comment Display, Statement Display, Note Display, and Display Device are enabled for explanatory purposes.

Select [View] from the menu bar and select [Comment Display], [Statement Display], [Note Display], and [Display Device] checkboxes.



To use Simple Motion mode of the Motion module, always create a program as shown below.

After the programmable controller enters the RUN state, [Synchronization flag] turns ON when the buffer memory becomes accessible.

↓

Turn ON [PLC READY].

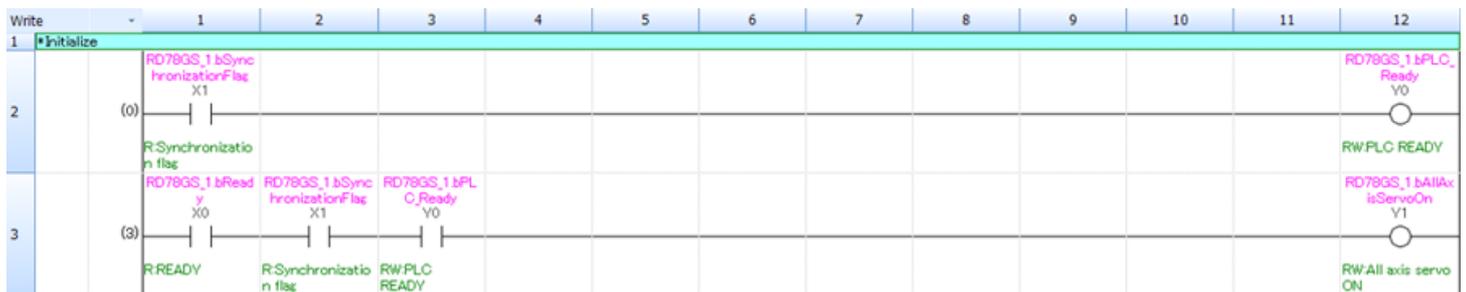
↓

[READY] turns ON.

↓

Turn ON [All axis servo ON].

[Program example]

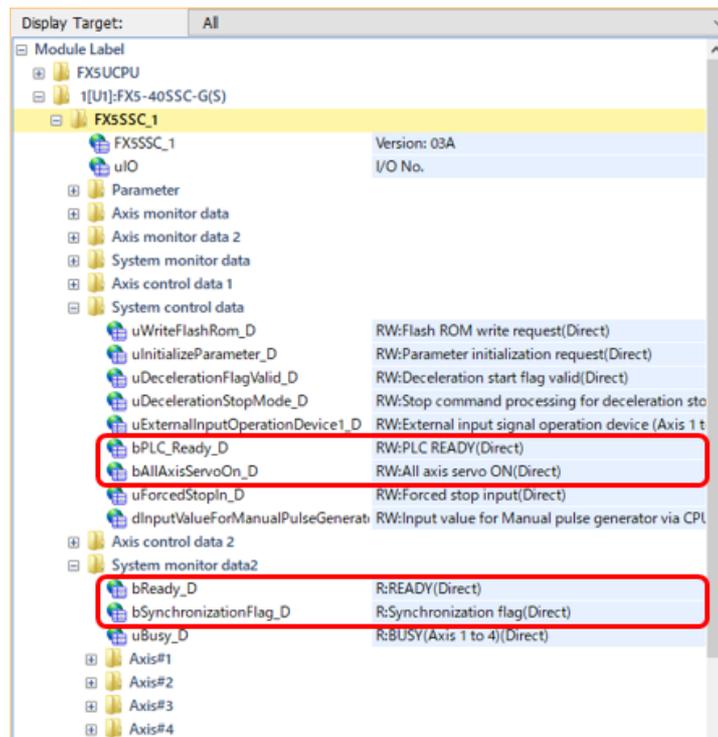
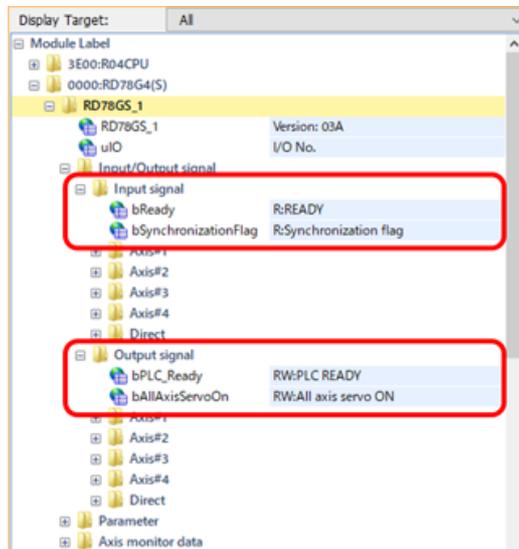


[Point]

The module label of each signal is located as shown below.

(iQ-R)

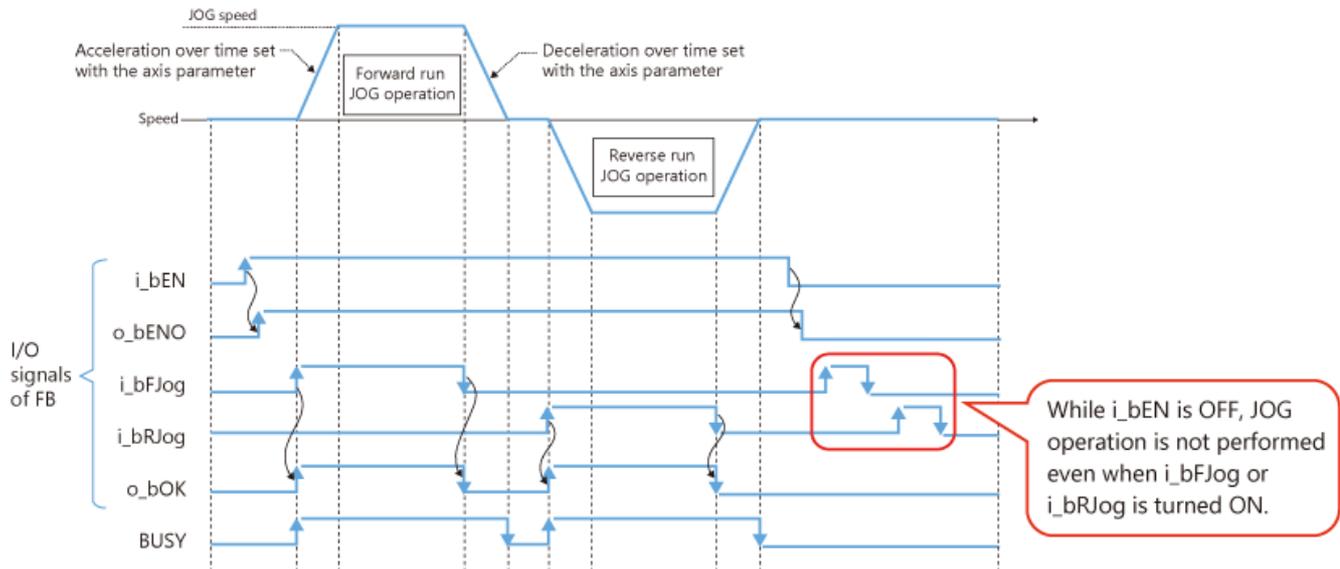
(iQ-F)



The sample program in this course uses the module FB "(Model)_JOG_(Version)" (hereafter referred to as JOGFB) for JOG operation.

JOGFB is enabled while the input signal *i_bEN* is ON.

By turning ON the input signal *i_bFJog* or *i_bRJog*, commands are output from the Motion module to the servo amplifier and the workpiece is moved in the specified direction while the signal is ON.



Pay attention to the following when using JOGFB.

- Since [Cd.181:Forward run JOG start] and [Cd.182:Reverse run JOG start] are turned ON/OFF by JOGFB, do not turn ON/OFF [Cd.181:Forward run JOG start] or [Cd.182:Reverse run JOG start] outside the FB while the FB is running.
- When using multiple JOGFBs, be careful not to use the same target axis.

For other precautions, refer to the following manuals.

MELSEC iQ-R Motion Module (Simple Motion Mode) Function Block Reference
2 Motion Module FB
2.3 M+RD78GS_JOG

MELSEC iQ-R Simple Motion Module Function Block Reference
2 Simple Motion Module FB/Motion Module FB
2.3 M+FX5SSC_JOG

[Point]

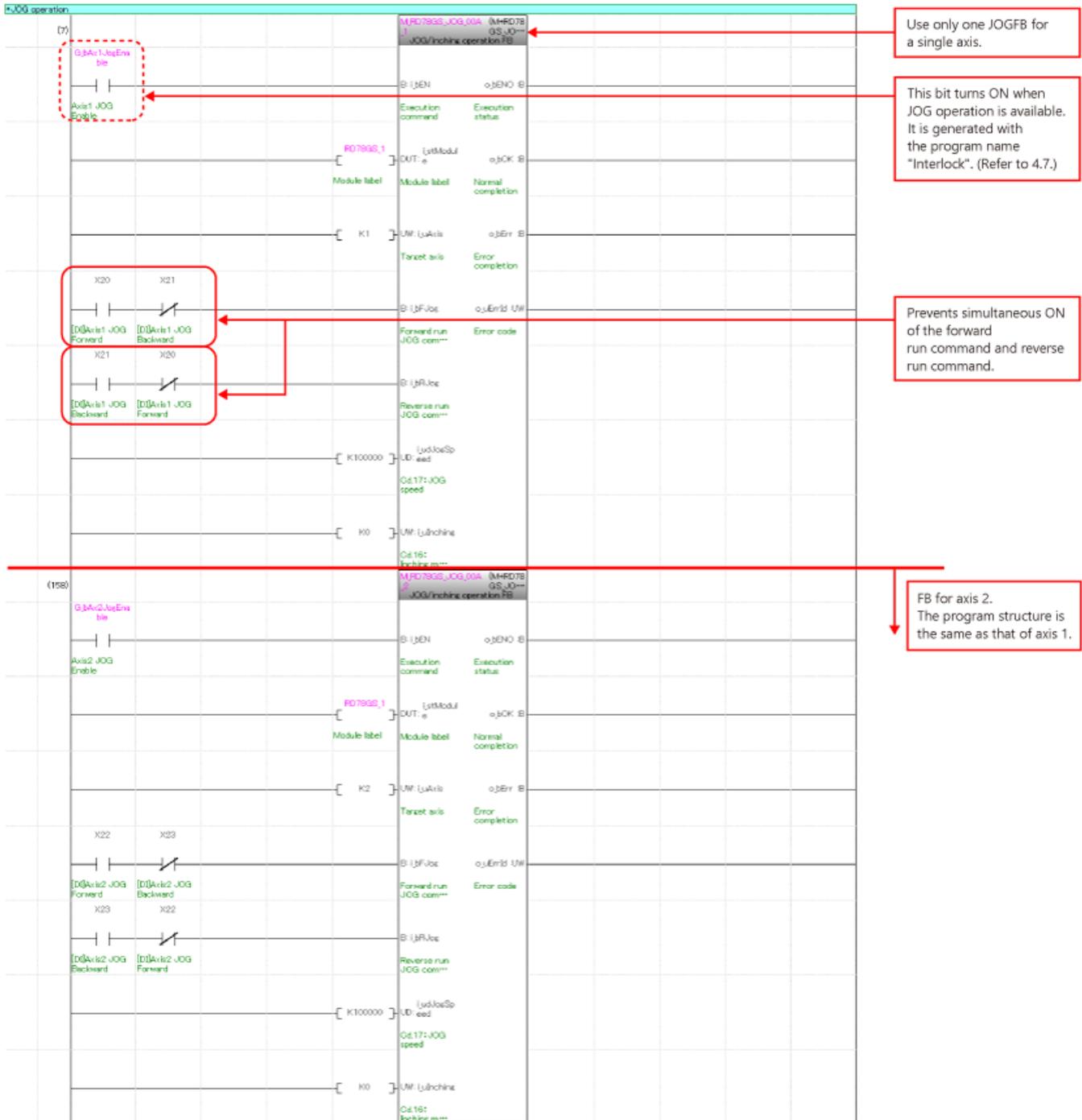
Inching operation is performed when a value other than "0" is input to the FB input *i_ulnching*.

For inching operation, refer to the following manuals.

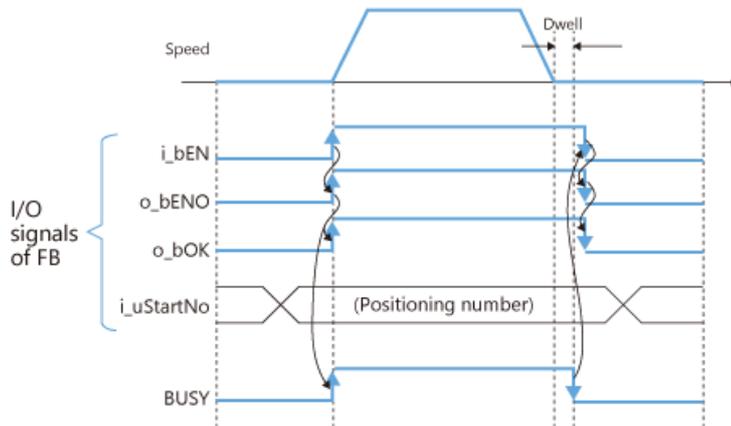
MELSEC iQ-R Motion Module User's Manual (Application for Simple Motion Mode)
5 MANUAL CONTROL
5.3 Inching Operation

MELSEC iQ-F FX5 Motion Module/ Simple Motion Module User's Manual (Application)
5 MANUAL CONTROL
5.3 Inching Operation

[Program example]



The sample program in this course uses the module FB "(Model)_StartPositioning_(Version)" (hereafter referred to as StartPositioningFB) to execute home position return and positioning start. To execute home position return, enter "9001" as the positioning number and execute the FB. To start positioning, enter the number of the positioning data (point table) as the positioning number and execute the FB. In the case of interpolation control, execute positioning of the reference axis.



Pay attention to the following when using StartPositioningFB.

- Since the positioning start signals (Y10 to Y1F) are turned ON/OFF by StartPositioningFB, do not turn ON/OFF them outside the FB while StartPositioningFB is running.
- When using multiple StartPositioningFBs or when using an FB that operates the same Y signals as those operated by StartPositioningFB together, provide an interlock to prevent the FBs from being executed at the same time.
- When using multiple StartPositioningFBs, be careful not to use the same target axis.

For other precautions, refer to the following manuals.

 MELSEC iQ-R Motion Module (Simple Motion Mode) Function Block Reference

2 Motion Module FB

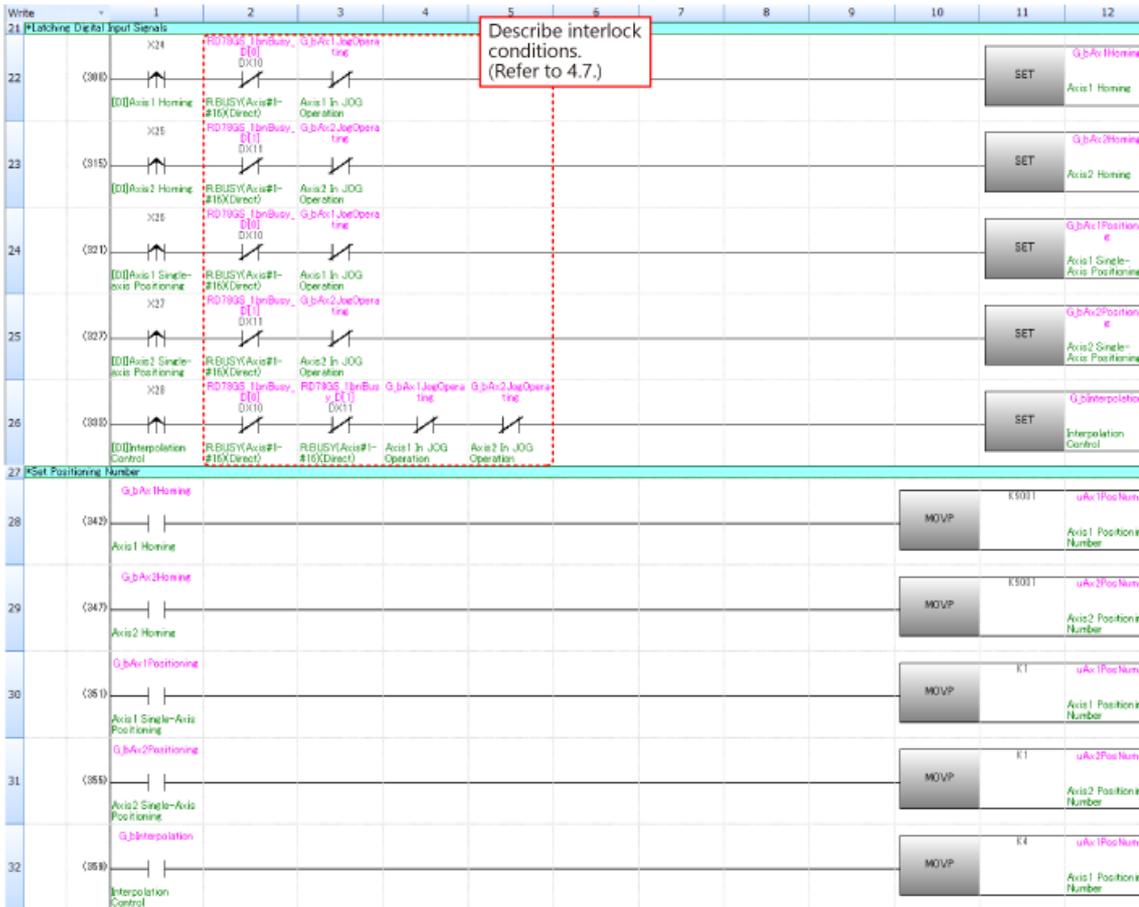
2.2 M+RD78GS_StartPositioning

 MELSEC iQ-R Simple Motion Module Function Block Reference

2 Simple Motion Module FB/Motion Module FB

2.2 M+FX5SSC_StartPositioning

[Program example (1/3)]

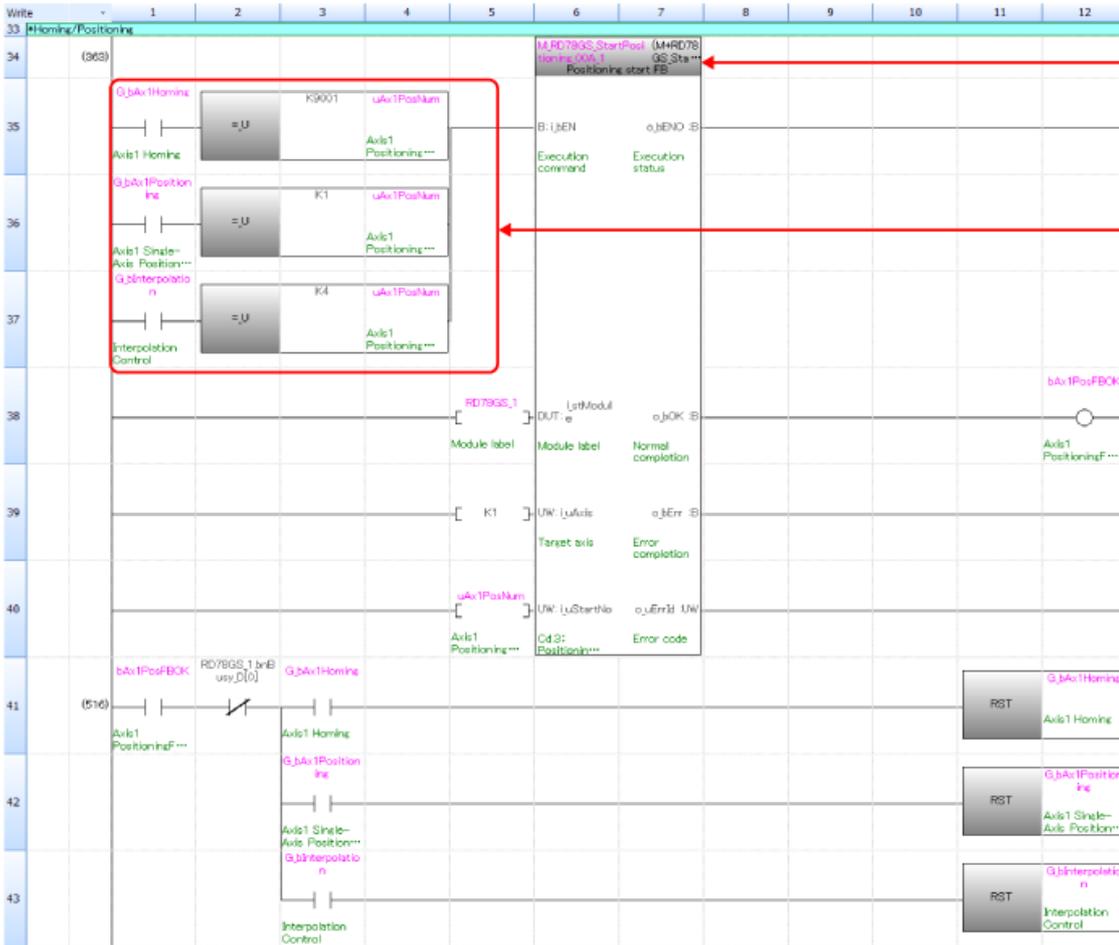


The global label (bit), which is the start signal of the FB, holds the information that each external input signal has been turned ON. Provide an interlock so that the start signal does not turn ON during execution of other programs or JOG operation.

Store the positioning number to the local label (unsigned word).

In the case of interpolation control, set the positioning number of axis 1 because positioning is required only for the reference axis.

[Program example (2/3)]



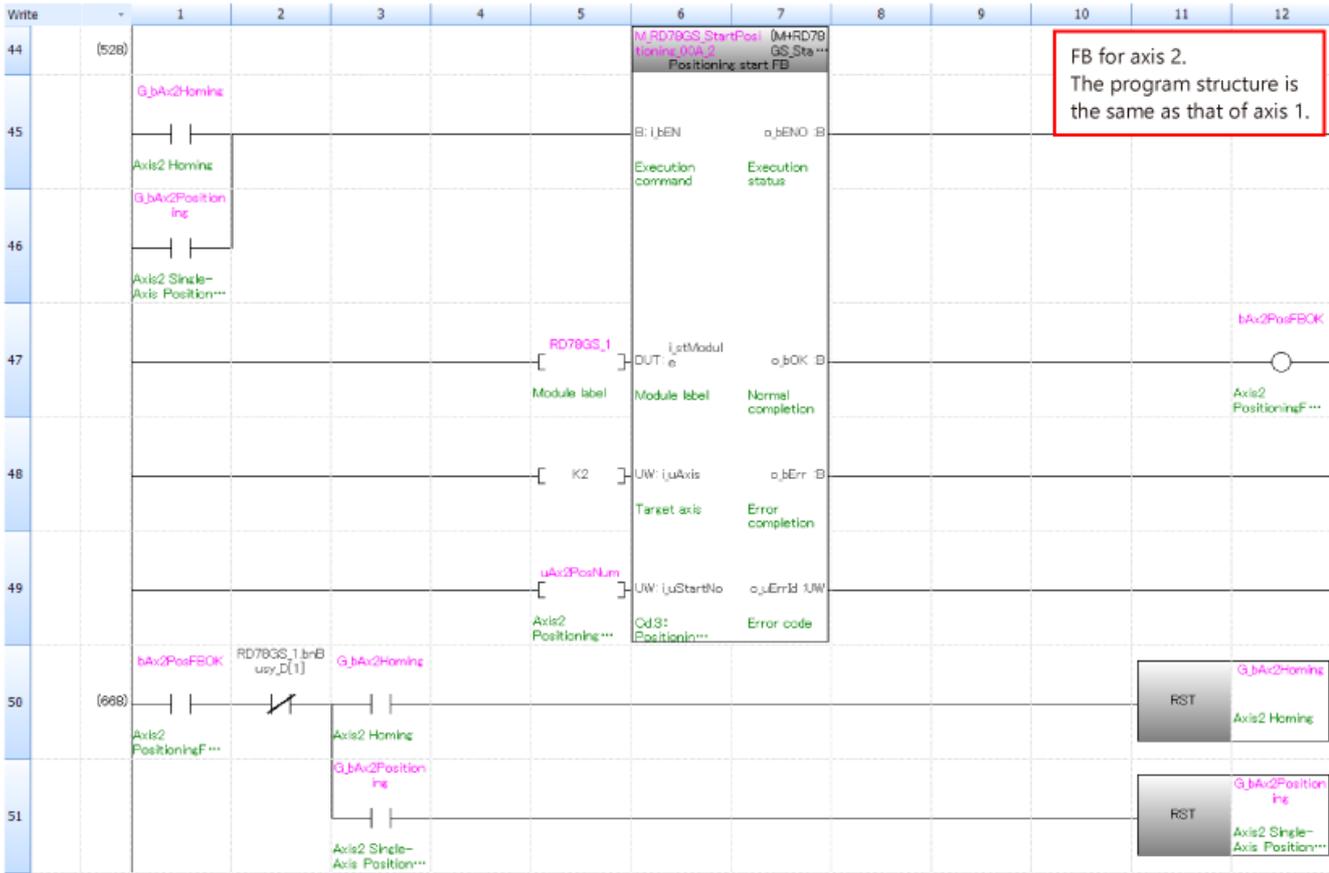
Use only one StartPositioningFB for a single axis.

The FB is executed when the start signal turns ON and the positioning number is stored.

Rows can be added even in the middle of the FB by clicking [Edit] → [Insert Row].

When positioning is complete (BUSY signal turns OFF), the global label (bit) that contains the start signal is reset.

[Program example (3/3)]

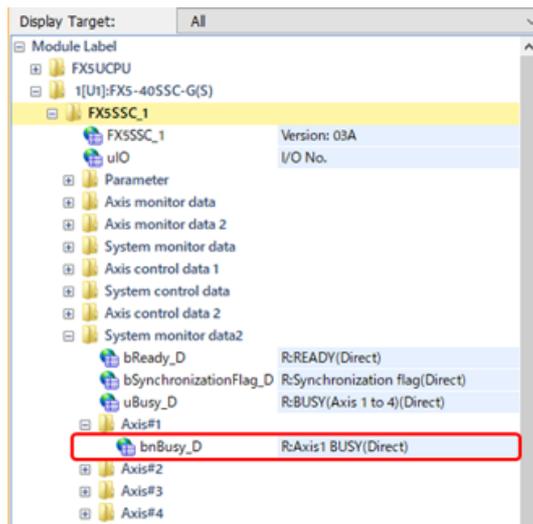
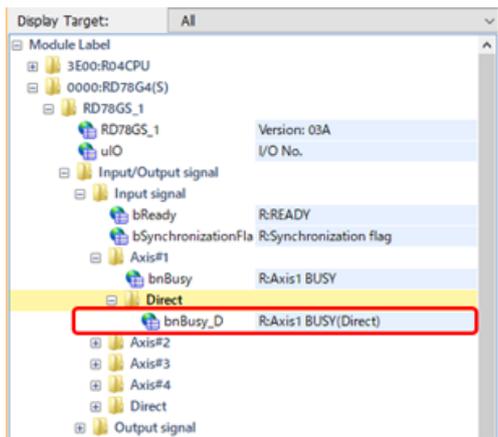


[Point]

The module label of the BUSY signal (direct input) for each axis is located as shown below.

(iQ-R)

(iQ-F)



[Operation patterns in the sample program]

Operation	Start signal	Operation pattern
Axis 1 single positioning	For iQ-R: X26 For iQ-F: X6	<p>Position [μm]</p> <p>150000.0</p> <p>0.0</p> <p>Time</p>
Axis 2 single positioning	For iQ-R: X27 For iQ-F: X7	<p>Speed [mm/min]</p> <p>3000.00</p> <p>0.00</p> <p>-3000.00</p> <p>Time</p>
Interpolation control	For iQ-R: X28 For iQ-F: X10	<p>Axis 2 [μm]</p> <p>50000.0</p> <p>33166.2</p> <p>0.0</p> <p>0.0</p> <p>30000.0</p> <p>80000.0</p> <p>140000.0</p> <p>Axis 1 [μm]</p>

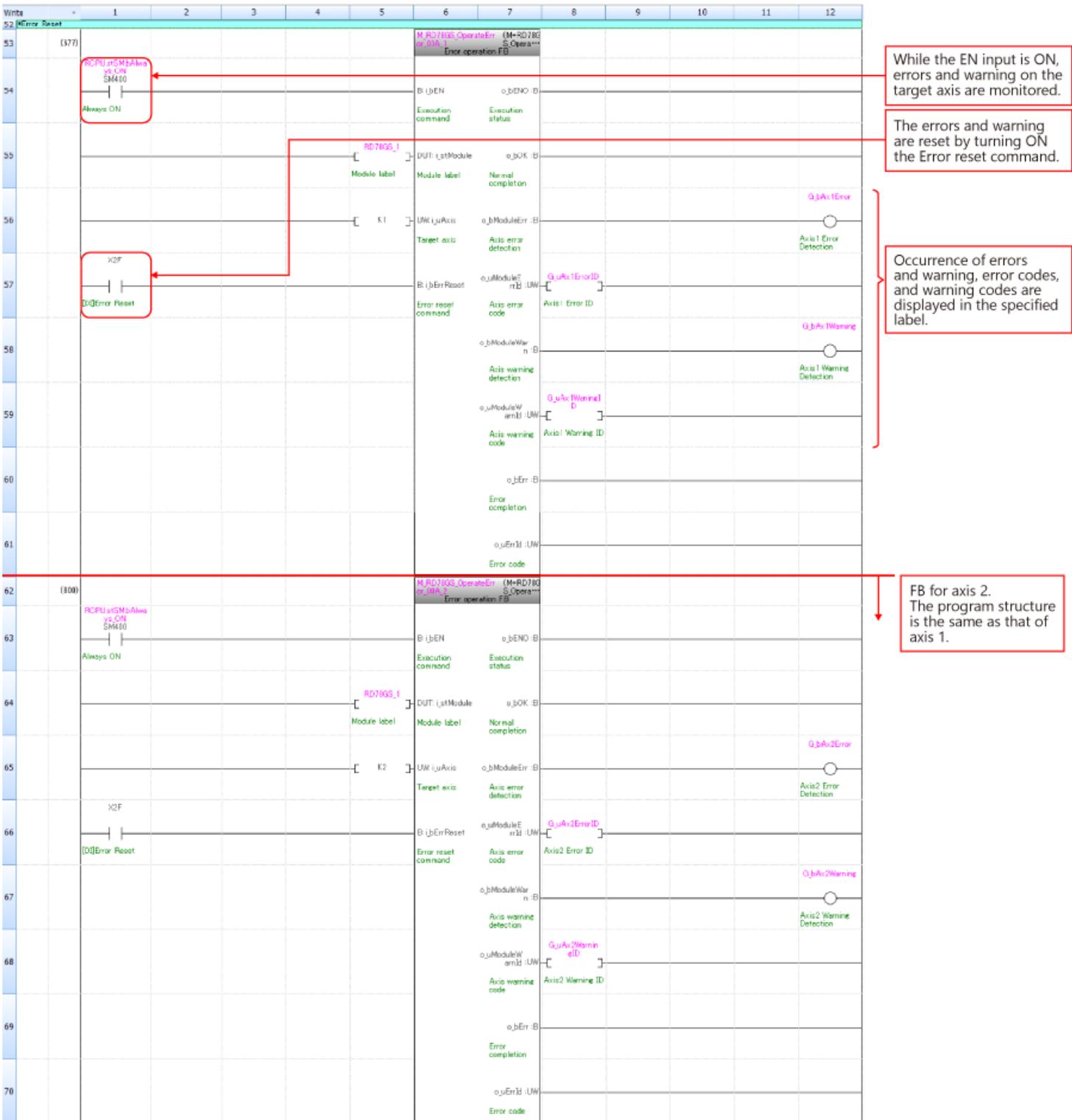
Errors and warnings can be monitored and errors can be reset by using the module FB "(Model)_OperateError_(Version)" (hereafter referred to as ErrorFB).

For details of ErrorFB, refer to the following manual.

- 
 MELSEC iQ-R Motion Module (Simple Motion Mode) Function Block Reference
 - 2 Motion Module FB
 - 2.9 M+RD78GS_OperateError

- 
 MELSEC iQ-R Simple Motion Module Function Block Reference
 - 2 Simple Motion Module FB/Motion Module FB
 - 2.9 M+FX5SSC_OperateError

[Program example]

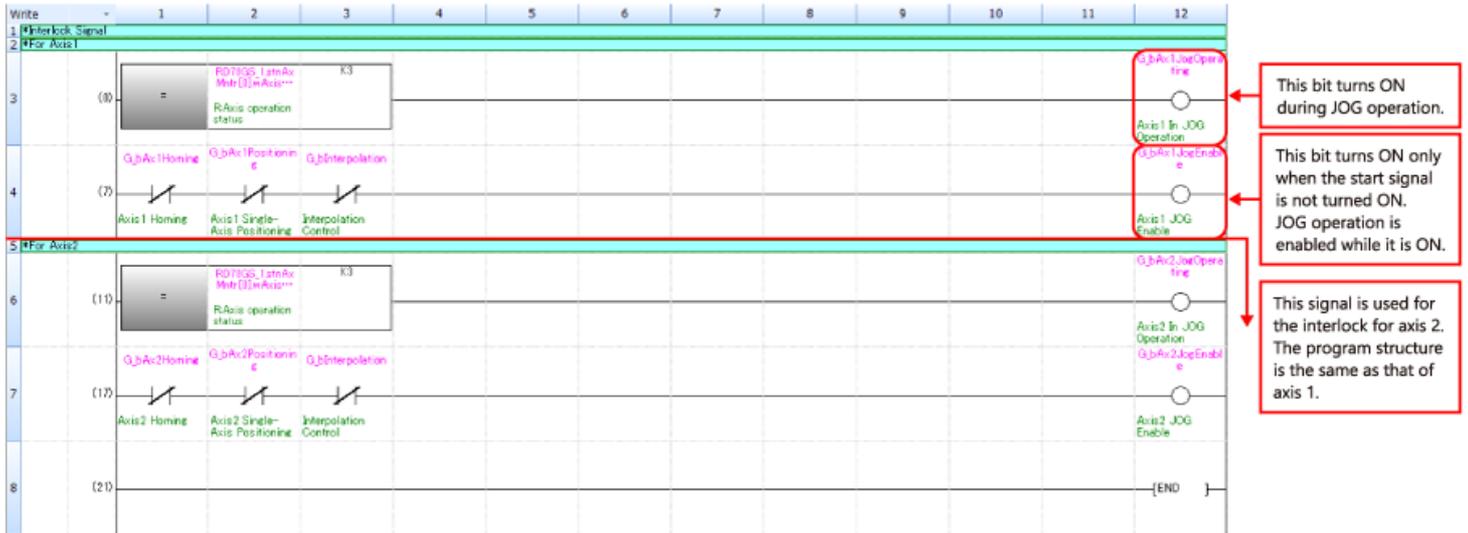


In the sample program, an interlock is provided to ensure the following:

- JOG operation is not performed during positioning operation.
- A positioning start signal is not turned ON during JOG operation or positioning operation.

This interlock condition is an example. Change the condition to suit your system when using the sample program.

[Program example (In the sample program, the program name is Interlock)]

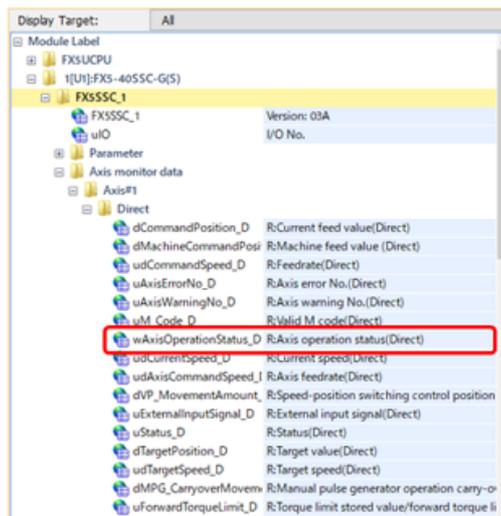
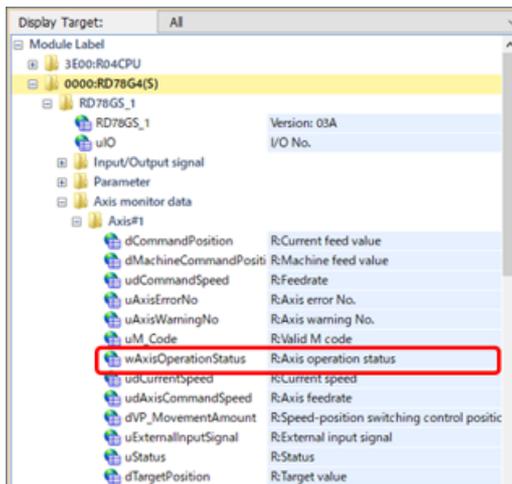


[Point]

The module label [Md.26:Axis operation status] of each axis is located as shown below.

(iQ-R)

(iQ-F)



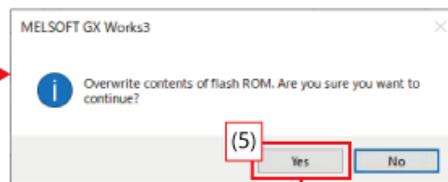
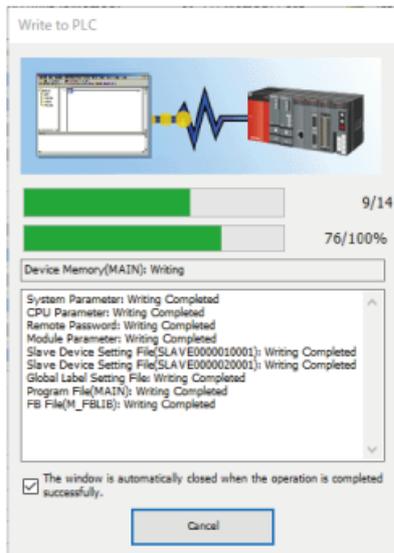
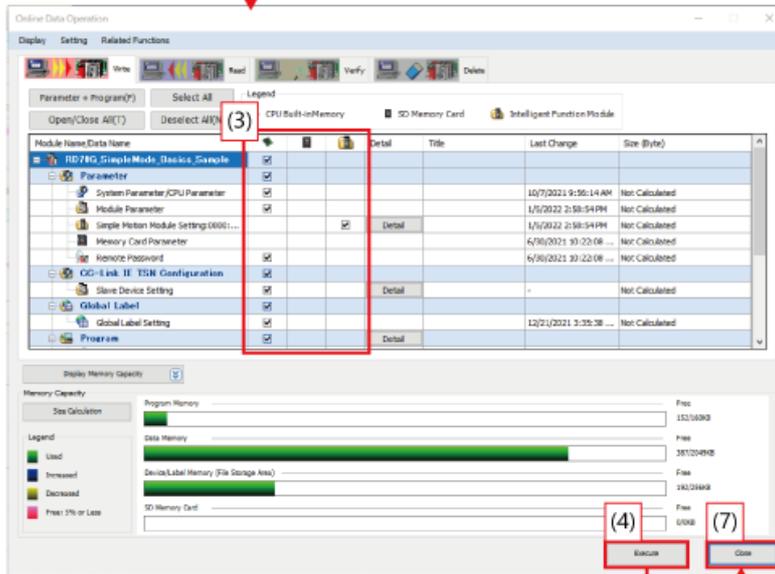
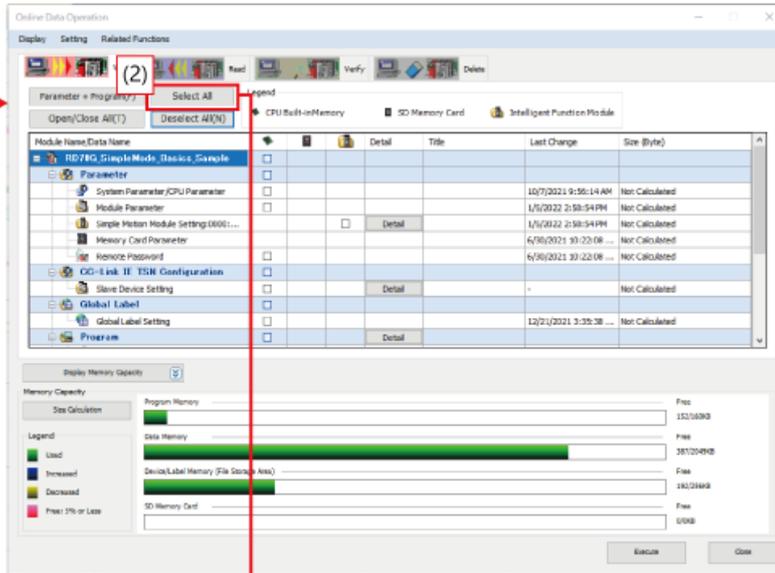
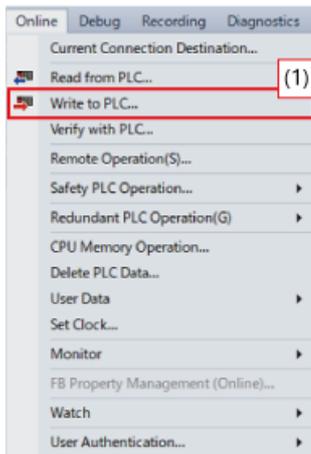
Write the sample program to the programmable controller and check the operation.

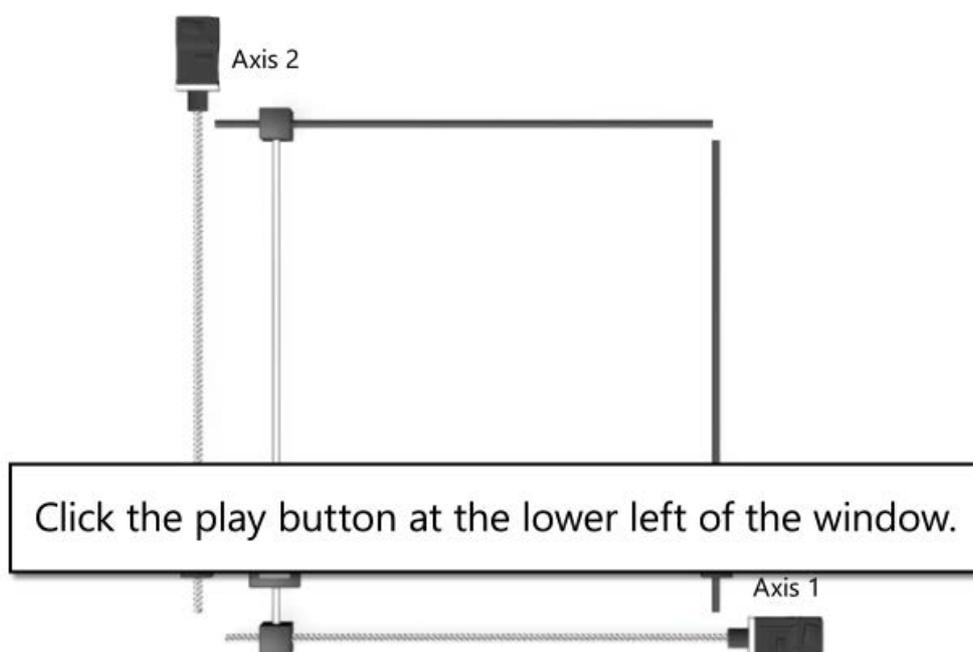
For how to connect a personal computer and programmable controller and how to set the connection destination, check the e-learning course for each programmable controller.

After the rebuild all process of the program, follow the steps below to write the program to the programmable controller.

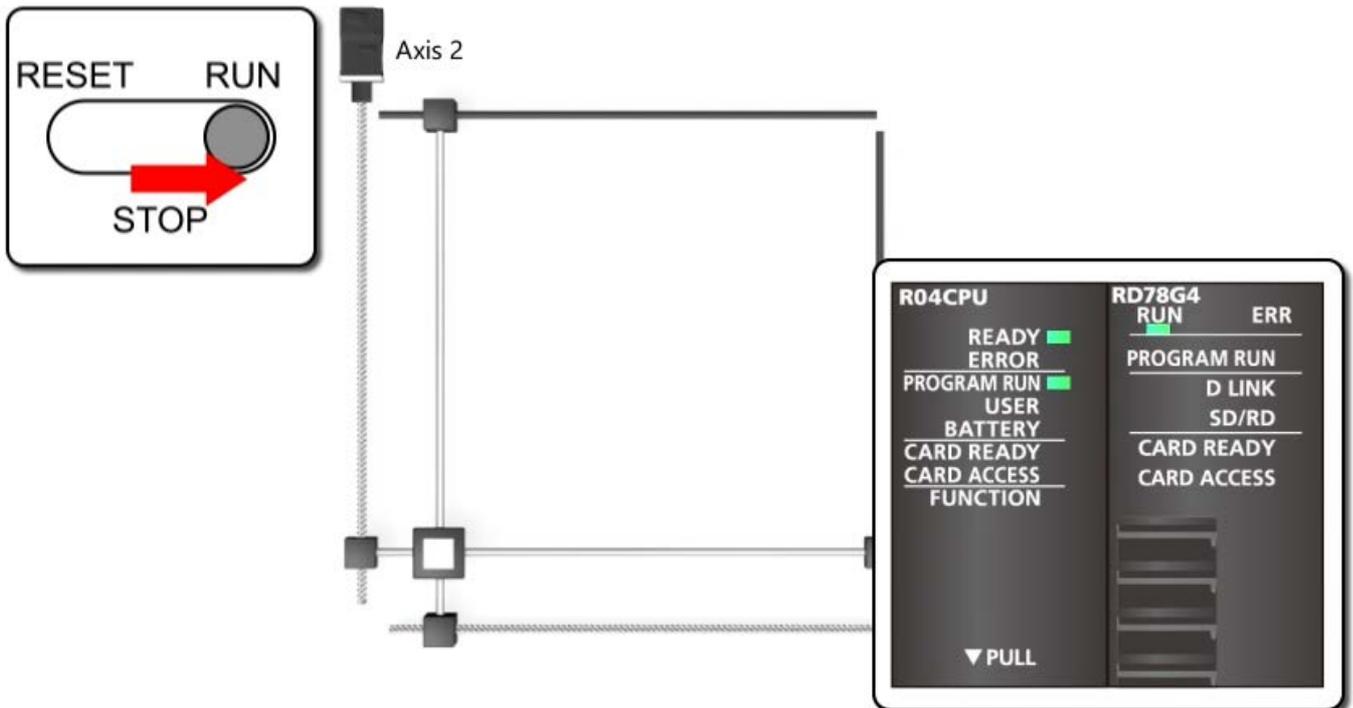
- (1) From the GX Works3 menu bar, select [Online] → [Write to PLC] to display the Online Data Operation window.
- (2) Click [Select All].
- (3) All checkboxes are selected.
- (4) Click [Execute] to start writing.
- (5) As the writing process proceeds, a message appears to confirm flash ROM writing. Click [Yes].
- (6) After writing the program, click [OK] to close the window.
- (7) Back to the Online Data Operation window and click [Close] to close the window.

This completes writing the program. Cycle the power of the programmable controller.

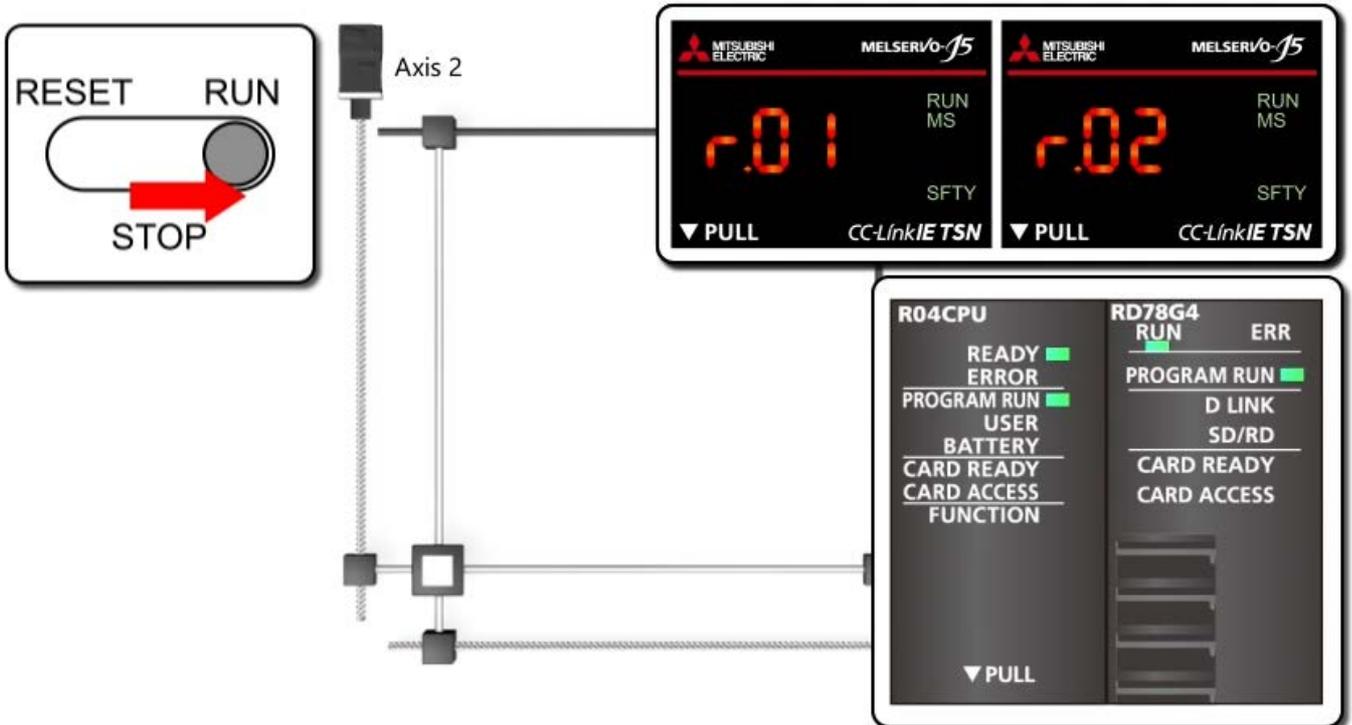




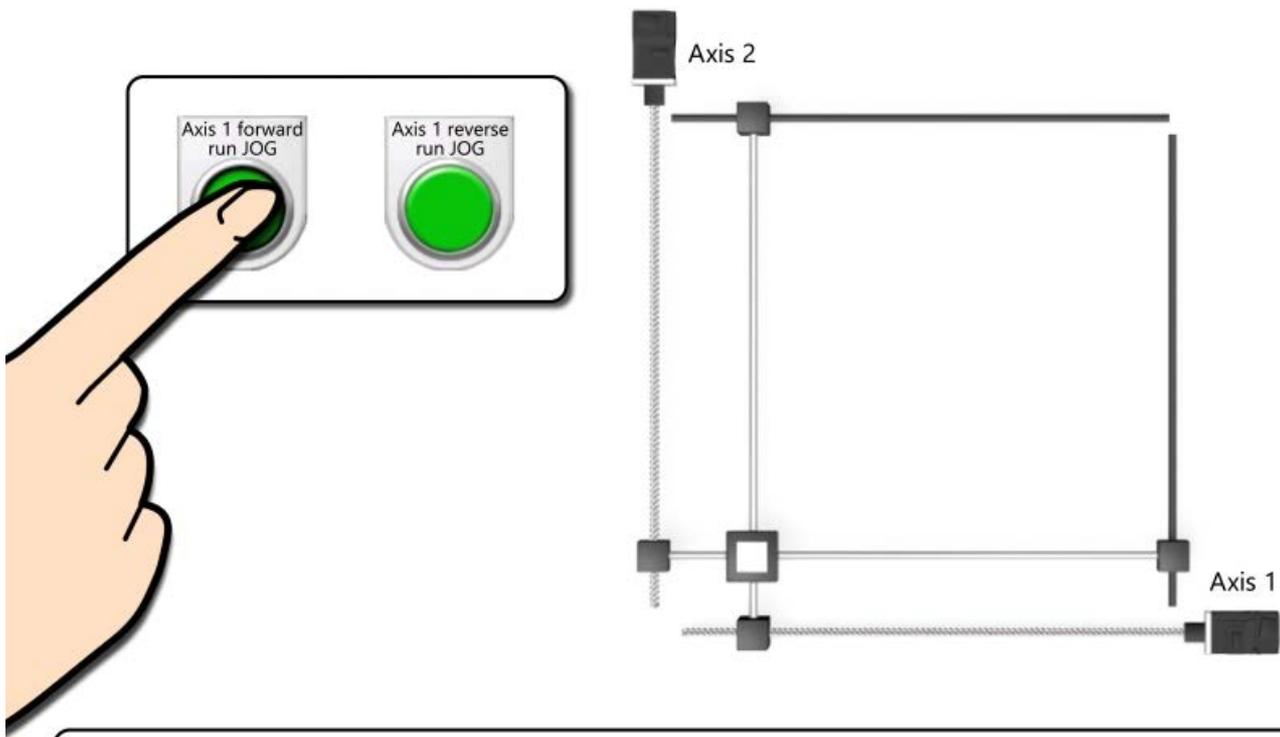
Check the sample program operation.
Before starting operation, make sure that the program is written
to the PLC CPU.



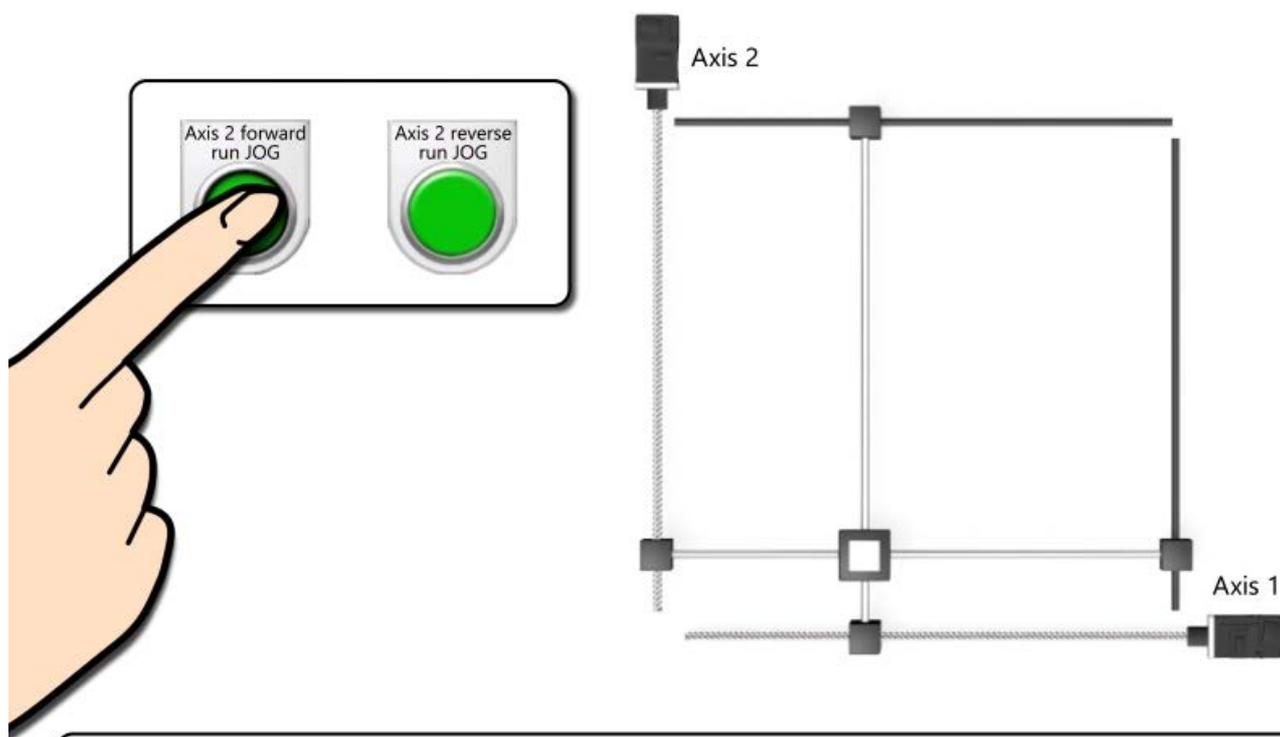
Set the RUN/STOP/RESET switch of the PLC CPU to RUN.
READY lamp and PROGRAM RUN lamp of the programmable controller
turn on.
RUN lamp of the Motion module turns on.



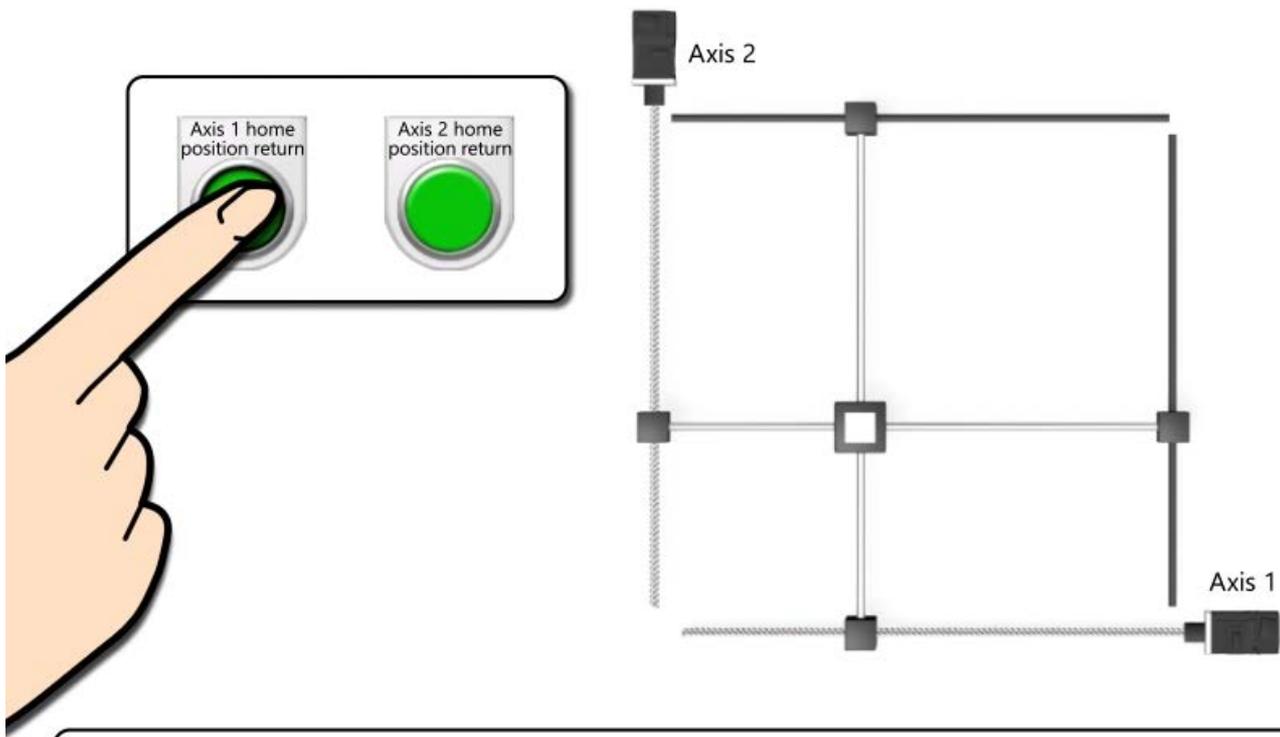
Wait until the PROGRAM RUN lamp of the Motion module turns on.
 "r.01" and "r.02" are displayed on the servo amplifier. (The dots are lit.)
 The servo motor enters the servo ON state.



Turning ON the external input signal [Axis 1 forward run JOG] moves the axis in the direction of increasing address, and turning OFF the signal stops the axis. Turning ON the external input signal [Axis 1 reverse run JOG] moves the axis in the direction of decreasing address, and turning OFF the signal stops the axis.

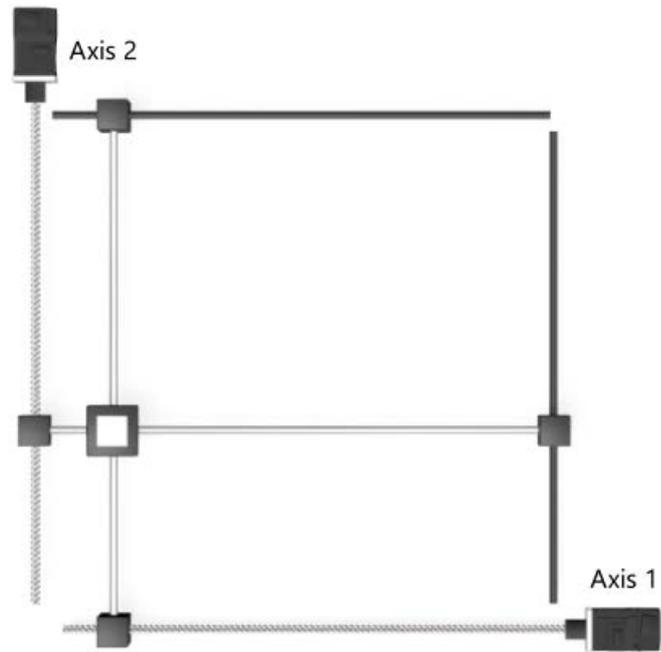
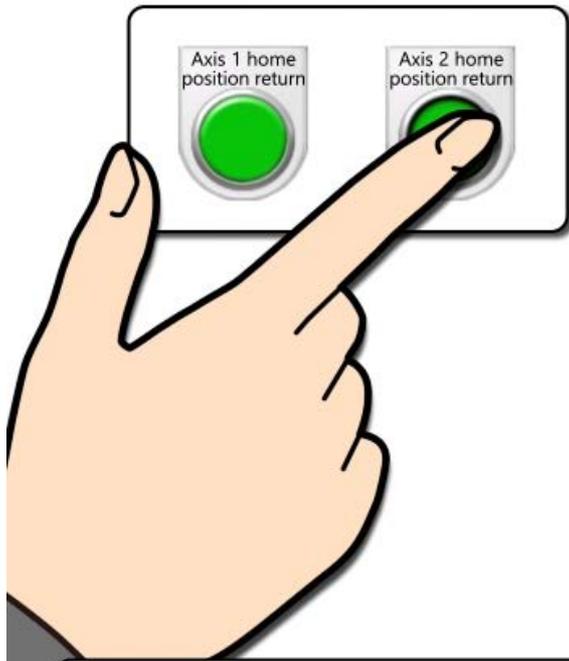


Turning ON the external input signal [Axis 2 forward run JOG] moves the axis in the direction of increasing address, and turning OFF the signal stops the axis. Turning ON the external input signal [Axis 2 reverse run JOG] moves the axis in the direction of decreasing address, and turning OFF the signal stops the axis.

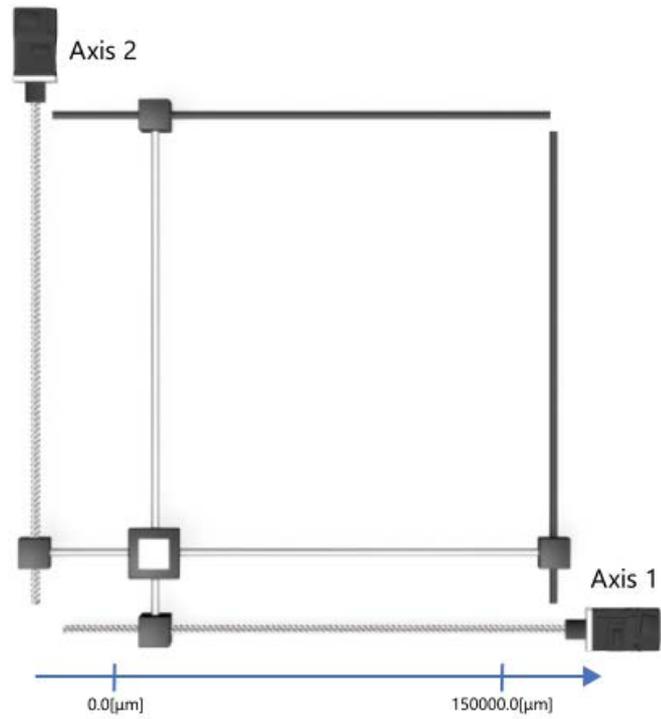
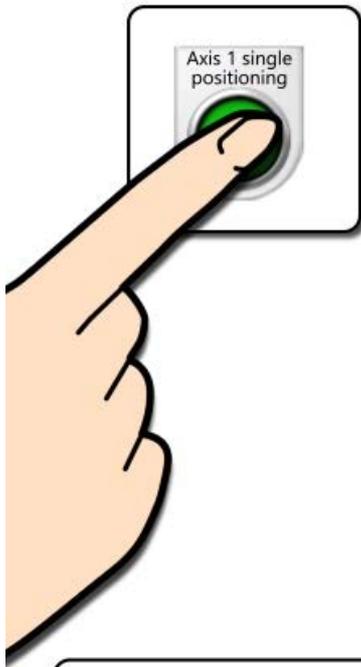


Turning ON the external input signal [Axis 1 home position return] starts home position return of axis 1.

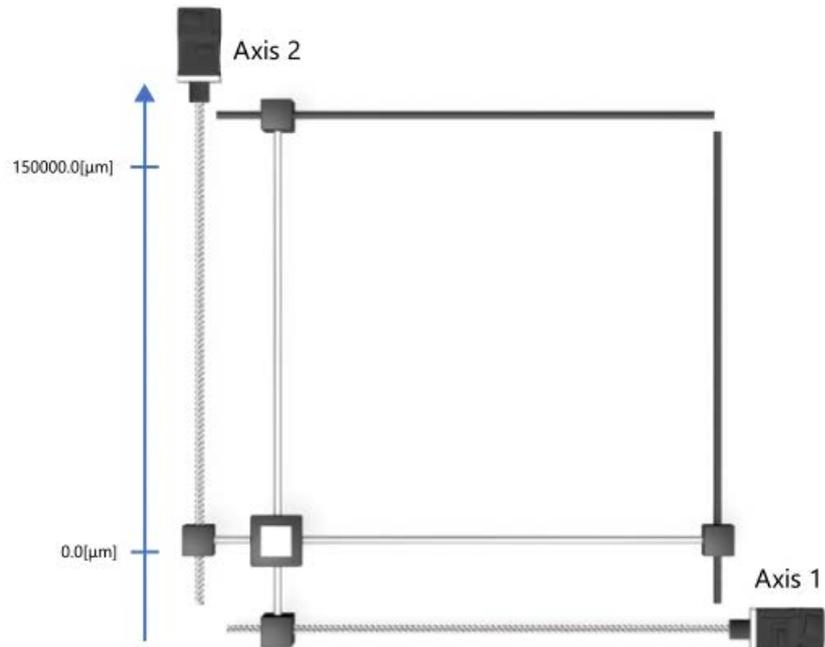
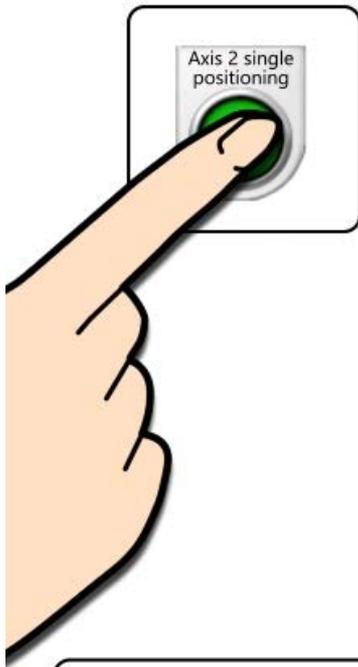
Execute the home position return of the proximity dog type (Pr.PT45 = -33). The axis stops at the point where the Z-phase of the encoder is first detected after passing through the dog, and that point is regarded as the home position.



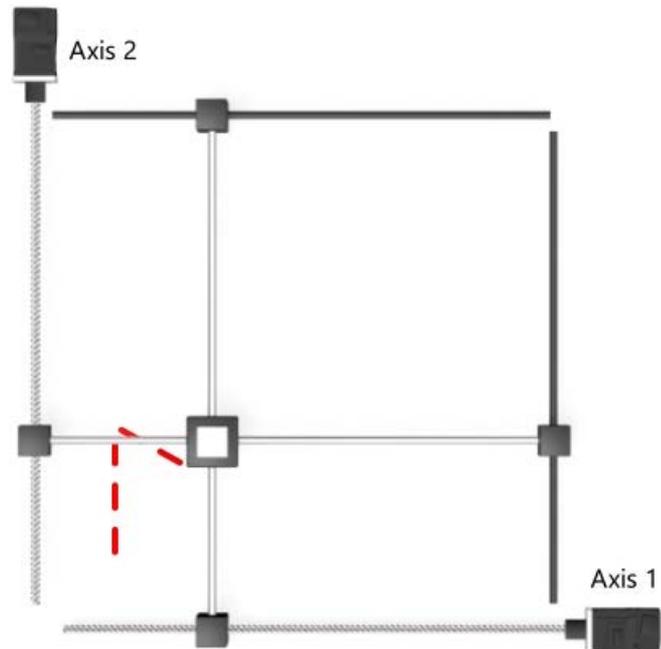
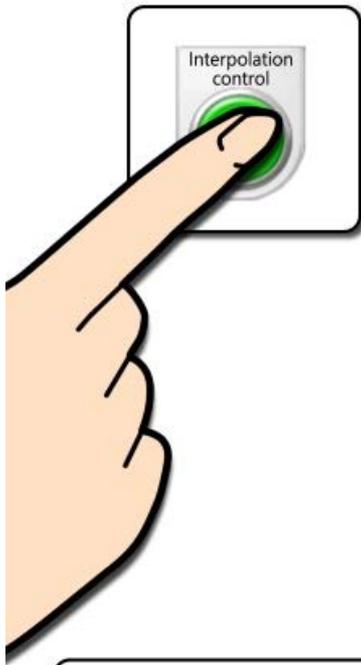
In the same way, turning ON the external input signal [Axis 2 home position return] starts home position return of axis 2.



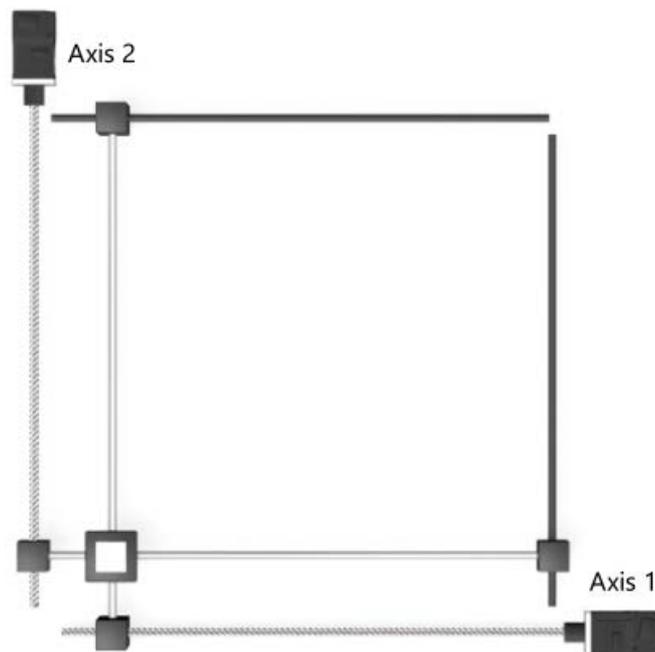
When the external input signal [Axis 1 single positioning] is turned ON, axis 1 starts reciprocating motion.



When the external input signal [Axis 2 single positioning] is turned ON, axis 2 starts reciprocating motion.



Turning ON the external input signal [Interpolation control] executes interpolation control using axis 1 and axis 2.
Plot a combined path of linear interpolation and circular interpolation described in 3.4.



This completes the operation check.
Go to the next page.

In this chapter, you have learned:

- Module label and module FB
- How to add module labels and module FBs
- From the initial setting to all axis servo ON
- JOG operation
- Home position return, single positioning, and interpolation control
- Error reset
- Interlock
- Operation check

Point

Module label and module FB	<ul style="list-style-type: none"> • The sample program uses module labels and module FBs.
How to add module labels and module FBs	<ul style="list-style-type: none"> • Input a module label or module FB by dragging and dropping it from the Element Selection window to the program editor.
From the initial setting to all axis servo ON	<ul style="list-style-type: none"> • When using Simple Motion mode, always turn ON [PLC READY] and then turn ON [All axis servo ON].
JOG operation	<ul style="list-style-type: none"> • The sample program uses a module FB to execute JOG operation. • If the EN input of the FB is OFF, JOG operation is not performed even when the forward/reverse run JOG start is turned ON.
Home position return, single positioning, and interpolation control	<ul style="list-style-type: none"> • The sample program uses a module FB to execute positioning start and home position return. • Home position return is executed by entering 9001 as a positioning number. • When a point table number is entered as a positioning number, positioning is performed according to the positioning pattern set in the corresponding point table. • In the case of interpolation control, positioning is performed only for the reference axis.
Error reset	<ul style="list-style-type: none"> • The sample program uses a module FB to monitor alarms and warnings and execute error reset.
Interlock	<ul style="list-style-type: none"> • The interlock condition of the sample program is an example. Provide an appropriate interlock for your system.
Operation check	<ul style="list-style-type: none"> • You have checked the operation of the sample program in the video.

Chapter 5 Digital Oscilloscope

This chapter describes how to check the operation of the sample program by using a digital oscilloscope.

5.1 Digital oscilloscope

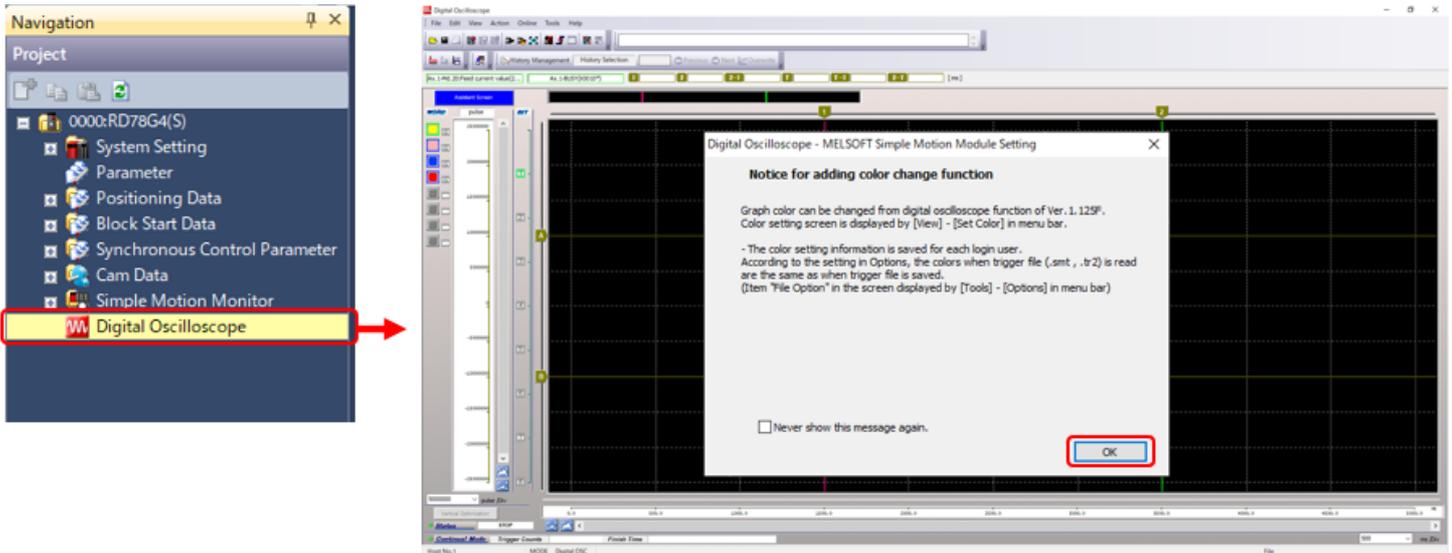
A digital oscilloscope has a function to measure and record the I/O signals (X and Y) of the Motion module (Simple Motion mode) and buffer memory values.

The following data (number of channels) can be measured at the same time.

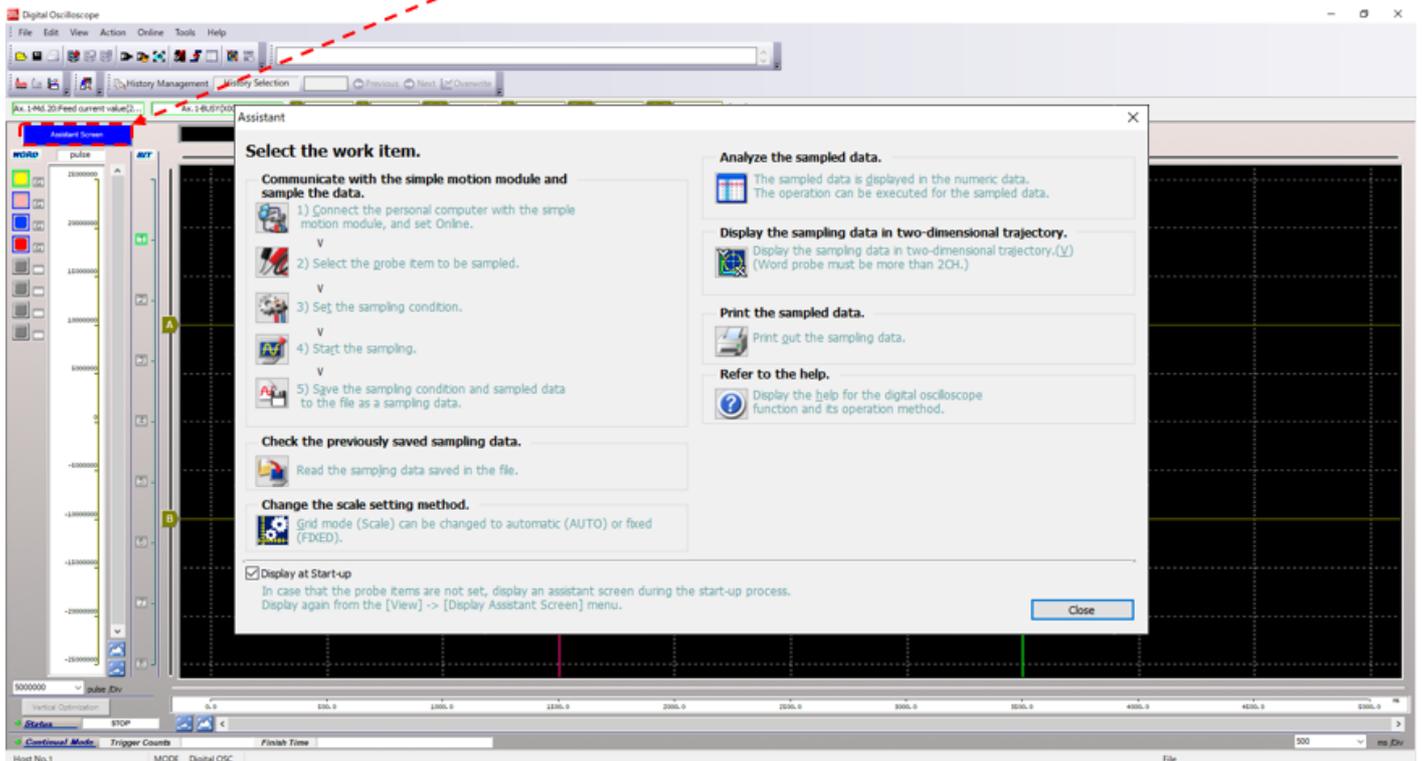
- Word data: 16 channels
- Bit data: 16 channels

Note that the maximum number of channels that can be simultaneously displayed as waveform is 8 for both word data and bit data.

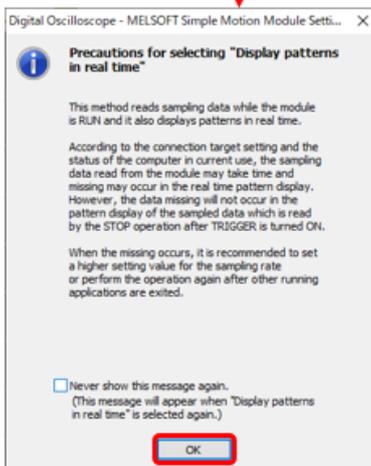
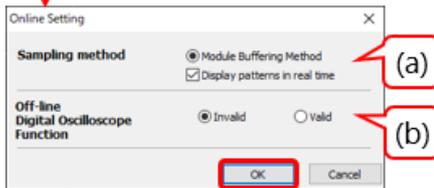
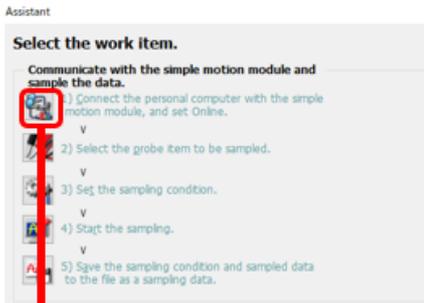
[Digital Oscilloscope] is located at the bottom of the project tree in the Simple Motion setup tool. Double-click it to open the Digital Oscilloscope window.



When "Notice for adding color change function" appears, click [OK] to close the window. After that, the Assistant window appears. In this course, we will configure the digital oscilloscope settings in this window. If the Assistant window does not appear, click [Assistant Screen] on the window.



(1) Online Setting



Click the  icon on the Assistant window to open the Online Setting window. Set as follows in this window.

No.	Description
(a)	To display real-time waveform during measurement, select "Display patterns in real time".
(b)	Set whether to continue measurement if the personal computer and Motion module is disconnected. Select "Valid" to continue measurement even if the connection is interrupted.

In this course, select "Display patterns in real time" and set Digital Oscilloscope to "Invalid".

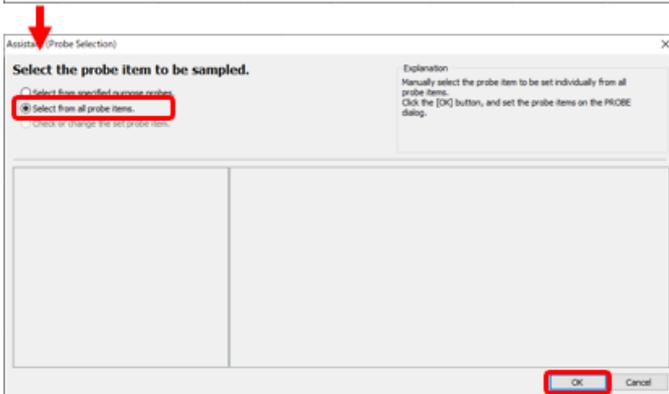
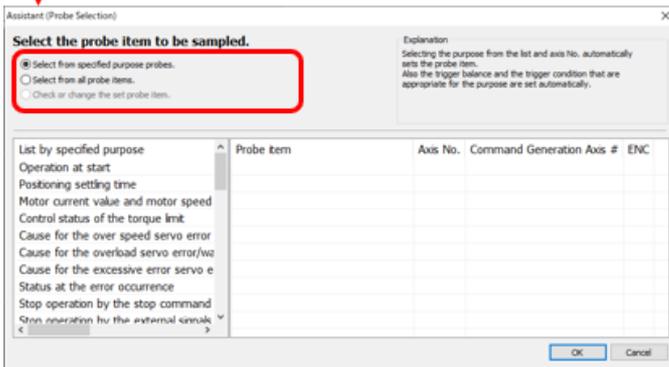
After completing the settings, click [OK] to close the window.

When "Display patterns in real time" is selected, precautions are displayed. Check the precautions, and click [OK] to close the window.

* The Online Setting window can also be opened by selecting [Online] → [Online Setting] from the tool bar.

(2) Probe Selection

Assistant



Click the  icon on the Assistant window to open the Probe Selection window.

Set the data to be measured in this window.

The Probe Selection window can also be opened by selecting [Edit] → [Probe Selection] from the tool bar or clicking the  icon on the tool bar.

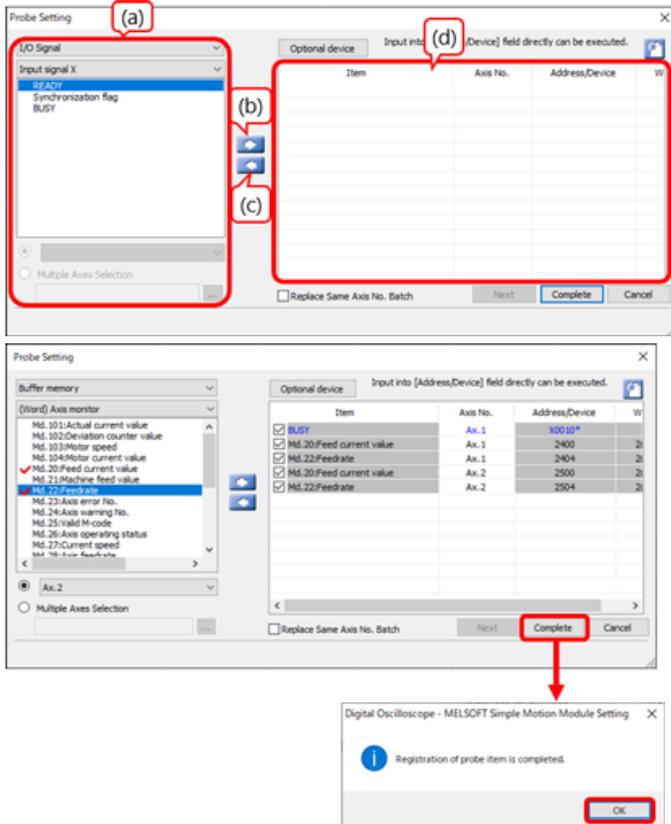
Next, select the probe setting method.

Option	Description
Select from specified purpose probes.	When the measurement purpose is selected from List by specified purpose at the bottom of the window, the required probes are automatically set.
Select from all probes.	Select this option to manually set the items to be measured.
Check or change the set probe item.	Select this option to check or change the probes that have already been set. It cannot be selected if no probe is registered.

This course explains how to manually set probes. Select "Select from all probes." and click [OK].

(2) Probe Selection (continued)

The Probe Selection window changes. Register the items to be measured in this window.



No.	Description
(a)	Select "I/O Signal" or "Buffer memory" from the upper drop-down box and select the category from the lower drop-down box. Then, select the item to be measured from the list under the drop-down box and add the item to the field (d). In the case of data for multiple axes (such as Feed current value), select the data of the axis to be measured from the drop-down menu under the list.
(b)	The items selected in the field (a) are added to the probe.
(c)	The data added to the probe is deleted.
(d)	A list of selected probes is displayed.

Register the following items in this course.

- BUSY signal of Ax.1
- Feed current value of Ax.1
- Feedrate of Ax.1
- Feed current value of Ax.2
- Feedrate of Ax.2

After registration, click [OK].

"Registration of probe item is completed." is displayed. Click [OK] to close the window.

(3) Sampling condition setting

Set the sampling interval or total sampling time and trigger balance.

Click the  icon on the Assistant window to open the Sampling Condition window.

Set the sampling interval and trigger balance in the "Input" field.

Assistant

Select the work item.

Communicate with the simple motion module and sample the data.

- 1) Connect the personal computer with the simple motion module, and set Online.
- 2) Select the probe item to be sampled.
- 3) Set the sampling condition.
- 4) Start the sampling.
- 5) Save the sampling condition and sampled data to the file as a sampling data.

Assistant (Sampling Condition)

Set the sampling condition.

Set the input item and press the [Calculation] button.
Calculates the sampling condition and performs the setting automatically.

Input

Set from the sampling rate.

Sampling Rate (ms) 1.000 x 1 (1 - 5000)

Set from the total sampling time.
(Recommend it when being two-dimensional trajectory display)

Total Sampling Time (s) 16.3 (0.1 - 655360.0) Calc. >

Rate of Sampling Time after Trigger

Trigger Balance (%) 99.99 (0.01 - 100.00)

Sampling Condition

Sampling Rate (ms) 1.000 x 1 (1 - 5000)

Sampling Size (point) 16384 (10 - 131072)

Actual total sampling time (ms) 16384.0

After the trigger

Sampling Size (point) 16384

Sampling Time (ms) 16384.0

Check all sampling conditions after the calculation result is reflected.

Pressing the [OK] button reflects the calculation result. OK Cancel

Assistant (Sampling Condition)

Set the sampling condition.

Set the input item and press the [Calculation] button.
Calculates the sampling condition and performs the setting automatically.

Input

Set from the sampling rate.

Sampling Rate (ms) 1.000 x 1 (1 - 5000)

Set from the total sampling time.
(Recommend it when being two-dimensional trajectory display)

Total Sampling Time (s) 9.0 (0.1 - 655360.0) Calc. >

Rate of Sampling Time after Trigger

Trigger Balance (%) 99.00 (0.01 - 100.00)

Sampling Condition

Sampling Rate (ms) 1.000 x 1 (1 - 5000)

Sampling Size (point) 9000 (10 - 131072)

Actual total sampling time (ms) 9000.0

After the trigger

Sampling Size (point) 8910

Sampling Time (ms) 8910.0

Check all sampling conditions after the calculation result is reflected.

Pressing the [OK] button reflects the calculation result. OK Cancel

Option	Description
Set from the sampling rate.	Set the sampling rate at intervals of N times the minimum operation cycle. The default number of sampling points is 16384 for the iQ-R series and 8192 for the iQ-F series. (Note)
Set from the total sampling time.	Set this item to specify the sampling time.
Trigger Balance	Set the measurement rate before and after a trigger occurs. Change the trigger balance mainly depending on whether you want to measure the waveform before or after a trigger occurs. For example, if a start signal is a trigger, increase the number of points after the trigger and if an alarm signal is a trigger, increase the number of points before the trigger.

(Note) To change the number of sampling points, use the Initial Setting tab in the Sampling Setting window to be opened on the next page.

In this course, configure the settings as follows.

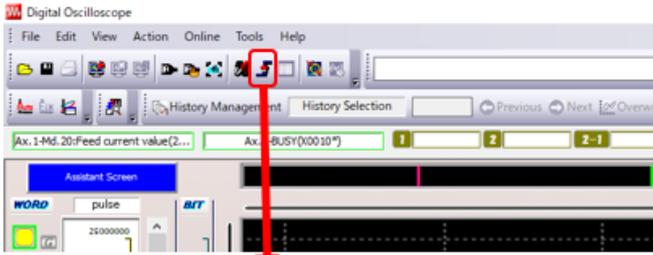
- Set from the total sampling time. → 9.0 [s]
- Trigger Balance 99.0%

Click [Calc.>] and confirm the number of sampling points and sampling time.

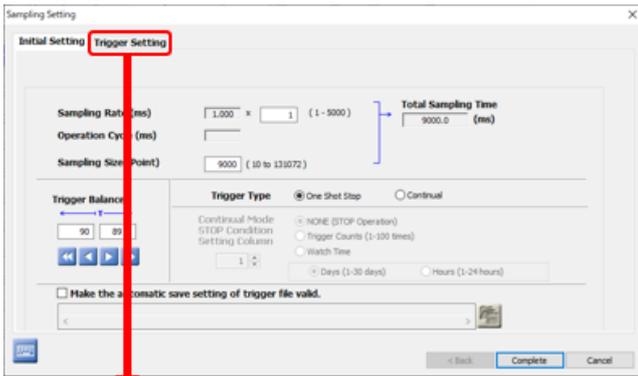
Click [OK] to close the window.

(4) Trigger setting

The trigger setting cannot be opened from the Assistant window. Close the Assistant window.

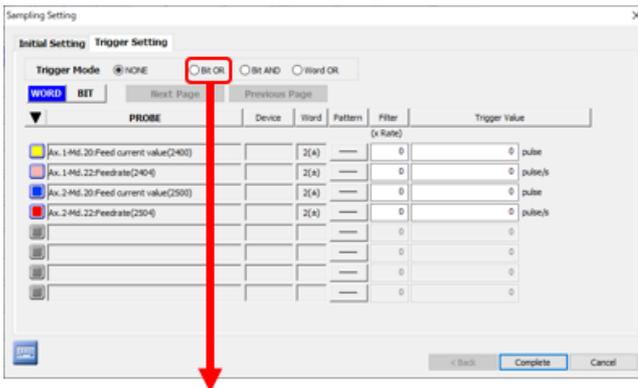


Click the  icon on the tool bar in the Digital Oscilloscope window or click [Edit] → [Sampling Setting].



A different Sampling Setting window from (3) will open. The items set in (3) are displayed in the [Initial Setting] tab.

Select the [Trigger Setting] tab.



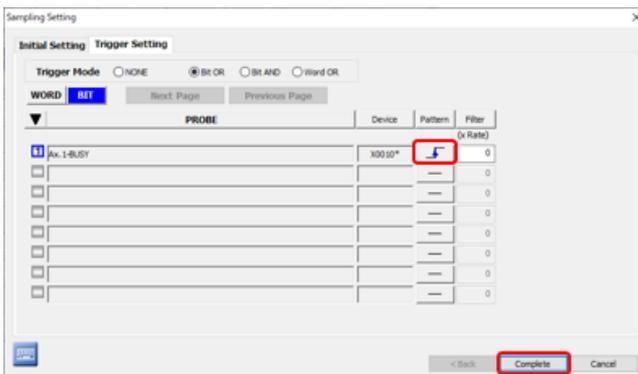
In the trigger setting, select the channel to be used as a trigger from the probes that have been set.

In this course, set the rising BUSY signal of Ax.1 as a trigger.

For Trigger Mode, select "Bit OR".

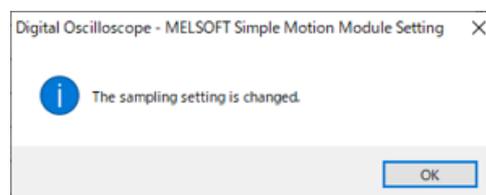
[BIT] under Trigger Mode turns blue and the BIT probe that has been set (only the BUSY signal of Ax.1 in this example) is registered in the probe list.

Click the pattern several times to set  (rising).



After completing the settings, click [Complete].

When "The sampling setting is changed." is displayed, click [OK] to close the window.



After the sampling setting, probe selection, and trigger setting, operate the machine to perform measurement.

Assistant

Select the work item.

Communicate with the simple motion module and sample the data.

1) Connect the personal computer with the simple motion module, and set Online.

v

2) Select the probe item to be sampled.

v

3) Set the sampling condition.

v

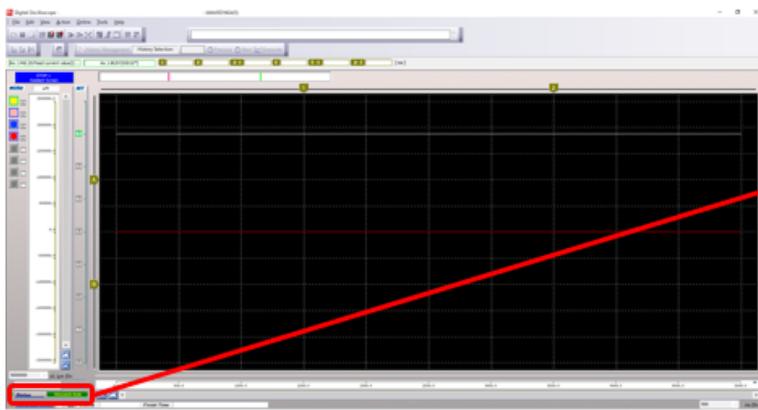
4) Start the sampling.

v

5) Save the sampling condition and sampled data to the file as a sampling data.

Start sampling by following one of the steps below.

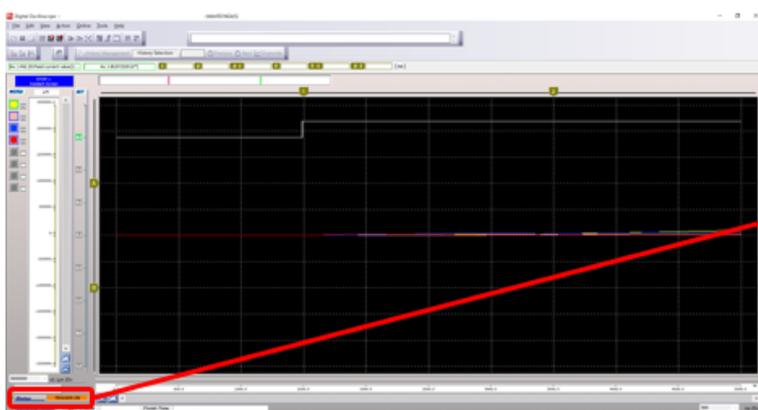
- Display the Assistant window again and click the  icon.
- Click the  icon on the tool bar in the Digital Oscilloscope window.
- Click [Action] → [Run].



When the measurement starts, the program enters the trigger waiting state.

Status at the left corner of the window changes to [TRIGGER RUN].





In this case, execute "Interpolation control" in the sample program.

When the trigger condition is satisfied, Status at the bottom left corner of the window changes to [TRIGGER ON].

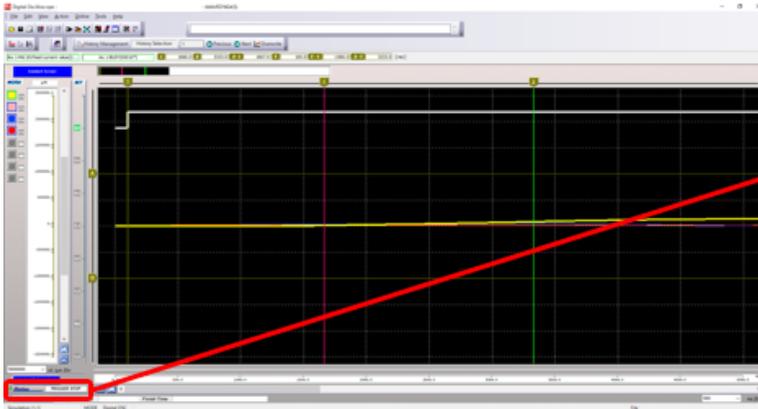


Digital Oscilloscope - MELSOFT Simple ...

Sampling data reading...



Cancel



When the set measurement time (9 [s] before and after the trigger in this example) elapses, measurement is finished and sampling data is read. After the data is read, the display becomes as shown on the left.

Status at the bottom left corner of the window changes to [TRIGGER STOP].

Status TRIGGER STOP

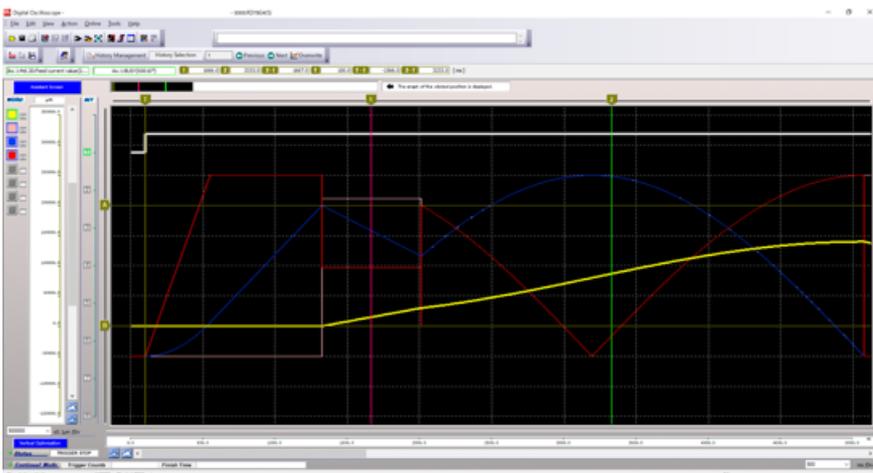
(1) Description of the window

The following describes the function of each part of the measurement result window.



No.	Description
(a-1)	The vertical axis of word data. Click a colored box on the left to make the line of the measured word data thicker. Click [Vertical Optimization] at the bottom to automatically adjust Division on the vertical axis so that the selected word waveform fits within the window.
(a-2)	The name of the selected word data is displayed.
(b-1)	The vertical axis of bit data. Click a number enclosed in a box to make the line of the measured bit data thicker.
(b-2)	The name of the selected bit data is displayed.
(c)	Zoom in/out buttons for the vertical axis.
(d)	Zoom in/out buttons for the horizontal axis.
(e)	The position (time) of the horizontal cursors 1 and 2 and a trigger cursor 3, and the time between each cursor are displayed. The cursors 1 and 2 at the top can be dragged to move their positions.

Clicking [Vertical Optimization] for the word data (4ch) of the measurement result of "Interpolation control" displays the following window.



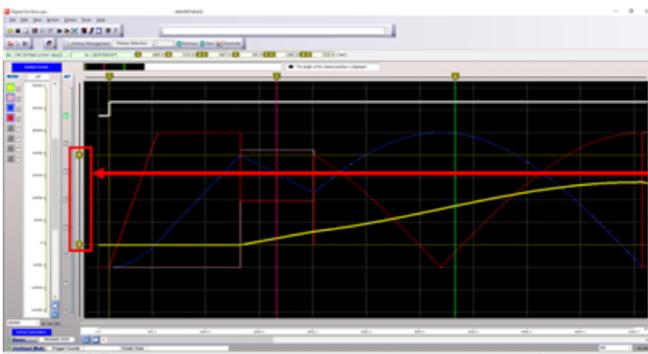
[Point]

Click the  icon on the tool bar or select [View] → [Grid Mode] from the menu bar and select AUTO Grid to automatically adjust the vertical axis and horizontal axis for the measurement data at once.

- (2) How to check the values
1) Checking on the graph

The values on the graph can be checked by displaying the cursor window.
Select [View] → [Cursor] from the tool bar to display the cursor window.

	Unit	Div	A	B	A - B	1
<input checked="" type="checkbox"/> Ax. 1-Md. 20:Feed current value(2400)	x0.1 μ m	5000000	1400000	600000	800000	812552
<input checked="" type="checkbox"/> Ax. 1-Md. 28:Axis feedrate(2412)	x0.01mm/min	5000000	210000	90000	120000	299937
<input checked="" type="checkbox"/> Ax. 2-Md. 20:Feed current value(2500)	x0.1 μ m	5000000	420000	180000	240000	599868
<input checked="" type="checkbox"/> Ax. 2-Md. 28:Axis feedrate(2512)	x0.01mm/min	5000000	210000	90000	120000	6151
<input checked="" type="checkbox"/> Ax. 1-BUSY(X0010*)						1



The values at the point where the graph intersects the vertical axis cursors **A** and **B**, the value between A and B, and the value at the point where the graph intersects the horizontal axis cursor **1** are displayed.

The vertical axis cursors **A** **B** can be dragged to move their positions.

- 2) Checking on Displaying dump



Open the Displaying dump window by following one of the steps below.

- Display the Assistant window again and click the  icon.
- Click the  icon on the tool bar in the Digital Oscilloscope window.
- Click [Edit] → [DUMP].

Point No.	Ax. 1-Md. 20:Feed current value (x0.1 μ m)	Ax. 1-Md. 28:Axis feedrate (x0.01mm/min)	Ax. 2-Md. 20:Feed current value (x0.1 μ m)	Ax. 2-Md. 28:Axis feedrate (x0.01mm/min)	1
83	0	0	0	0	0
84	0	0	0	0	0
85	0	0	0	0	0
86	0	0	0	0	0
87	0	0	0	0	0
88	0	0	0	0	0
89	0	0	0	0	0
90	0	0	0	0	0
91	0	0	16	50000	1
92	0	0	50	20000	1
93	0	0	390	30000	1
94	0	0	386	40000	1
95	0	0	250	50000	1
96	0	0	330	60000	1
97	0	0	466	70000	1

The values of all sampling data are displayed.

The positions of the horizontal axis cursors **1** **2** and trigger cursor **1** can be displayed as well as the positions of the maximum value and minimum value before/after the selected point.

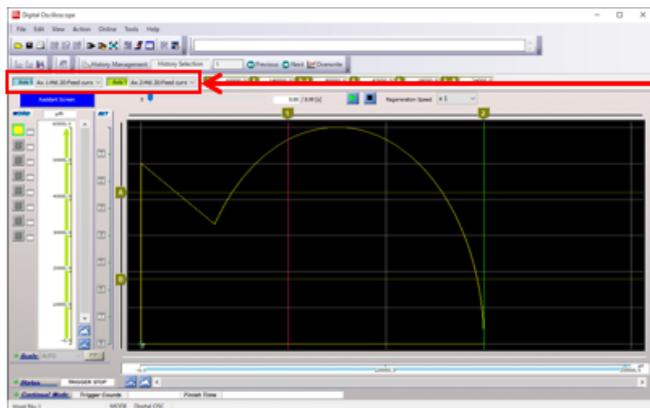
(3) Two-dimensional trajectory display

Probes can be assigned to the horizontal direction (X direction) and vertical direction (Y direction) of the graph to display a two-dimensional graph (trajectory) using the X-/Y-axes.

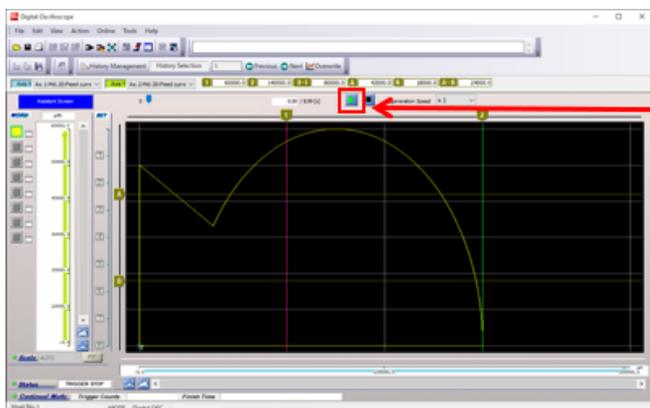


Open the Displaying dump window by following one of the steps below.

- Display the Assistant window again and click the  icon.
- Click the  icon on the tool bar.
- Click [View] → [Two-dimensional Trajectory Display] from the menu bar.



Select the data to be assigned to the X-axis and Y-axis. In this example, select Ax.1 Feed current value for the X-axis and Ax.2 Feed current value for the Y-axis.



Now you can display the trajectory of the machine moved by the interpolation control program.

Click the  icon to replay the changes in the two-dimensional trajectory over time.

The measurement result can be saved as a file.

Assistant

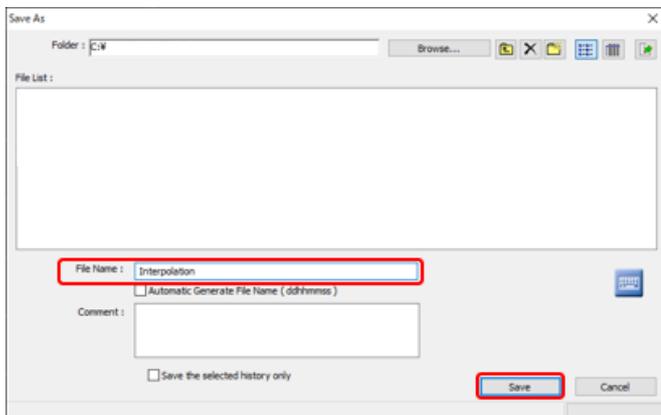
Select the work item.

Communicate with the simple motion module and sample the data.

- 1) Connect the personal computer with the simple motion module, and set Online. ✓
- 2) Select the probe item to be sampled. ✓
- 3) Set the sampling condition. ✓
- 4) Start the sampling. ✓
- 5) Save the sampling condition and sampled data to the file as a sampling data. 

Save a file by following one of the steps below.

- Display the Assistant window again and click the  icon.
- Click the  icon on the tool bar in the Digital Oscilloscope window.
- Click [File] → [Save] from the tool bar.

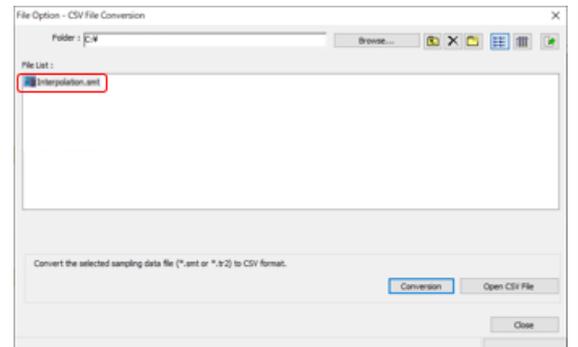


Enter the file name and click [Save].

[Point]

The saved file (.smt) can be converted to the CSV format.

Open [File] → [File Option] from the tool bar, select the saved file (.smt), and click [Conversion].



In this chapter, you have learned:

- Digital oscilloscope
- Starting a digital oscilloscope
- Digital oscilloscope settings
- Measurement method
- Checking the measurement result
- Saving the measurement result

Point

Digital oscilloscope	<ul style="list-style-type: none"> • A digital oscilloscope has a function to measure and record the I/O signals (X and Y) of the Motion module (Simple Motion mode) and buffer memory values. • For both bit data and word data, 16 channels can be measured at the same time. The maximum number of channels that can be simultaneously displayed as waveform is 8 for both word data and bit data.
Starting a digital oscilloscope	<ul style="list-style-type: none"> • Double-click "Digital Oscilloscope" in the project tree in the Simple Motion setup tool to start it.
Digital oscilloscope settings	<ul style="list-style-type: none"> • Online Setting: Set whether to display real-time waveform and whether to enable offline data measurement. • Probe Selection: Set the data to be measured. • Sampling Condition Setting: Set the sampling interval or total sampling time and trigger balance. • Trigger Setting: Set the trigger as the condition for measuring data.
Measurement method	<ul style="list-style-type: none"> • After completing the settings, operate the machine and execute [Run]. • When the trigger condition has been set, data before and after the trigger occurs is measured according to the set trigger balance.
Checking the measurement result	<ul style="list-style-type: none"> • Waveform of each type of data can be checked by displaying a graph. • The value at a specific time can be checked by operating the cursor on the graph or displaying dump. • A two-dimensional trajectory can be displayed to check the X-axis travel amount and Y-axis travel amount.
Saving the measurement result	<ul style="list-style-type: none"> • The measurement result can be saved as a file (smt). • The smt file can be converted to the CSV format.

Now that you have completed all of the lessons of the **MELSEC iQ-R/iQ-F Series Motion Module Basics (Simple Motion Mode)** Course, you are ready to take the final test. If you are unclear on any of the topics covered, please take this opportunity to review those topics.

There are a total of 5 questions (19 items) in this Final Test.

You can take the final test as many times as you like.

Score results

The number of correct answers, the number of questions, the percentage of correct answers, and the pass/fail result will appear on the score page.

		1	2	3	4	5	6	7	8	9	10	
Retry	Final Test 1	✓	✓	✓	✗							Total questions: 28 Correct answers: 23 Percentage: 82 %
	Final Test 2	✓	✓	✓	✓							
	Final Test 3	✓										
	Final Test 4	✓	✓									
	Final Test 5	✓	✓									
Retry	Final Test 6	✓	✗	✗	✗							Total questions: 28 Correct answers: 23 Percentage: 82 %
	Final Test 7	✓	✓	✓	✓							
	Final Test 8	✓	✓	✓	✓	✓						
	Final Test 9	✓										
Retry	Final Test 10	✗										

To pass the test, **60%** of correct answers is required.

Select the correct sentence(s) to describe the specifications of Simple Motion mode of the Motion module.

- Simple Motion mode and PLCopen[®] motion control FB mode can be used for each axis in a single Motion module.
- In Simple Motion mode, only the PLC CPU should be programmed.
- Simple Motion mode is available in all Motion modules (RD78G(H)□ and FX5-□SSC-G).
- For positioning, Simple Motion mode uses the same point table method as the one used by the Simple Motion module.
- Since the Motion module has no external input (manual pulser input), prepare a high-speed counter module separately to use a manual pulser.

Select the correct word to fill in the blank () to complete the sentences below.

- To execute test operation, change (Q1) of the servo amplifier and turn on the power supply.
- Check the rotation direction of the servo motor with the test operation function of (Q2).
- Set the (Q3) with the rotary switch on the servo amplifier.

Q1

Select the appropriate answer.



Q2

Select the appropriate answer.



Q3

Select the appropriate answer.



Q1: 1 : DIP switch
2 : Rotary switch
3 : Command switch

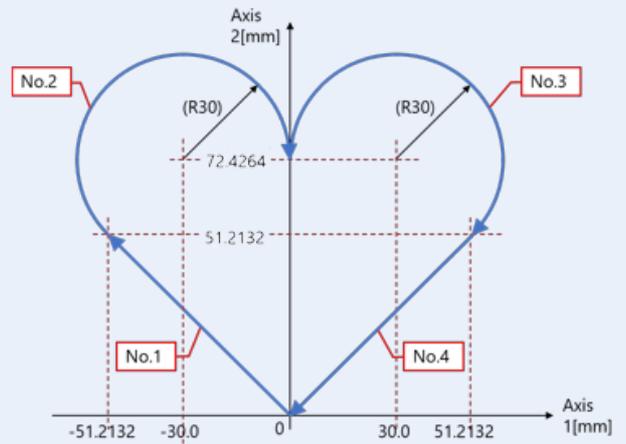
Q2: 1 : GX Works3
2 : MR Configurator2
3 : Motion Control Setting Function

Q3: 1 : IP address
2 : Station number

Select the correct sentence(s) to describe the settings of Simple Motion mode.

- Simple Motion mode is available by registering the Motion module with (S) in the module configuration diagram.
- After registering the servo amplifier in the network configuration window, perform PDO mapping.
- To configure Simple Motion mode, use the same window (Motion Control Setting Function) as the one used for the Motion module.
- Set the acceleration time to the time required to reach the speed limit from speed 0 and deceleration time to the time required to reach speed 0 from the speed limit.
- To plot the same trajectory regardless of the start point of operation during interpolation control, create positioning data based on the relative position specification.

Complete the following point tables to plot a trajectory as shown on the right figure.
 Circular interpolation with center point designation is used for arcs.
 The addresses are specified by the absolute position specification.



[Axis 1]

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M code
1	LOCATION	ABS Linear 2	2	0:1000	0:1000	-51213.2 μ m		3000.00mm/min	0 ms	0
2	CONT	(Q1)	2	0:1000	0:1000	(Q2) μ m	(Q3) μ m	3000.00mm/min	100 ms	0
3	LOCATION	(Q4)	2	0:1000	0:1000	(Q5) μ m	(Q6) μ m	3000.00mm/min	0 ms	0
4	END	ABS Linear 2	2	0:1000	0:1000	0.0 μ m		3000.00mm/min	500 ms	0

[Axis 2]

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M code
1						51213.2 μ m				
2						(Q7) μ m	(Q8) μ m			
3						(Q9) μ m	(Q10) μ m			
4						0.0 μ m				

Q1

Q2

Q3

Q4

Q5

Q6

Q7

Q8

Q9

Q10

Q1: • ABS ArcMP
• ABS ArcRGT
• ABS ArcLFT

Q2: • -51213.2
• 0.0
• 51213.2
• 72426.4

Q3: • -51213.2
• -30000.0
• 30000.0
• 51213.2
• 72426.4

Q4: • ABS ArcMP
• ABS ArcRGT
• ABS ArcLFT

Q5: • -51213.2
• 0.0
• 51213.2
• 72426.4

Q6: • -51213.2
• -30000.0
• 30000.0
• 51213.2
• 72426.4

Q7: • -51213.2
• 0.0
• 51213.2
• 72426.4

Q8: • -51213.2
• -30000.0
• 30000.0
• 51213.2
• 72426.4

Q9: • -51213.2
• 0.0
• 51213.2
• 72426.4

Q10: • -51213.2
• -30000.0
• 30000.0
• 51213.2
• 72426.4

Select the correct sentence to describe each setting item for the Digital Oscilloscope function.

- Q1 Online Setting
- Q2 Probe Selection
- Q3 Sampling Setting
- Q4 Trigger Setting

Q1

Select the appropriate answer.



Q2

Select the appropriate answer.



Q3

Select the appropriate answer.



Q4

Select the appropriate answer.



- Q1: 1 : Set the measurement time and sampling interval.
2 : Set the conditions to start and end measurement.
3 : Select whether to display waveform in real-time during measurement and whether to continue measurement if the connection with the personal computer is interrupted.
4 : Set the I/O signal to be measured and buffer memory.
- Q2: 1 : Set the measurement time and sampling interval.
2 : Set the conditions to start and end measurement.
3 : Select whether to display waveform in real-time during measurement and whether to continue measurement if the connection with the personal computer is interrupted.
4 : Set the I/O signal to be measured and buffer memory.
- Q3: 1 : Set the measurement time and sampling interval.
2 : Set the conditions to start and end measurement.
3 : Select whether to display waveform in real-time during measurement and whether to continue measurement if the connection with the personal computer is interrupted.
4 : Set the I/O signal to be measured and buffer memory.
- Q4: 1 : Set the measurement time and sampling interval.
2 : Set the conditions to start and end measurement.
3 : Select whether to display waveform in real-time during measurement and whether to continue measurement if the connection with the personal computer is interrupted.
4 : Set the I/O signal to be measured and buffer memory.

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Select the correct word to fill in the blank () to complete the sentences below.

- To execute test operation, change (Q1) of the servo amplifier and turn on the power supply.
- Check the rotation direction of the servo motor with the test operation function of (Q2).
- Set the (Q3) with the rotary switch on the servo amplifier.

Q1

1: DIP switch



Q2

2 : MR Configurator2



Q3

1: IP address



Q1: 1 : DIP switch
2 : Rotary switch
3 : Command switch

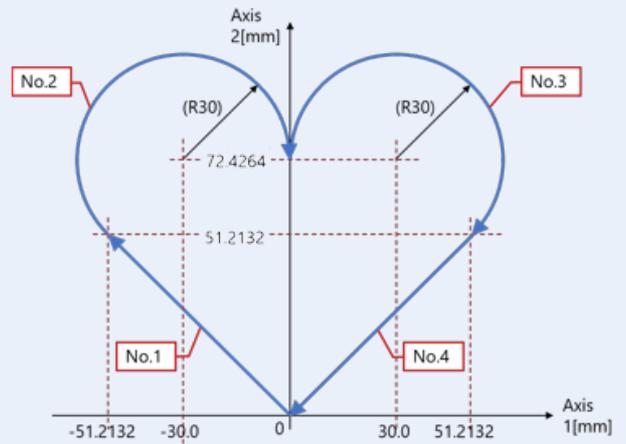
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2	CONT	(Q1)	2	0:1000	0:1000	(Q2) μm	(Q3) μm	3000.00mm/min	100 ms	0
3	LOCATION	(Q4)	2	0:1000	0:1000	(Q5) μm	(Q6) μm	3000.00mm/min	0 ms	0
4	END	ABS Linear 2	2	0:1000	0:1000	0.0 μm		3000.00mm/min	500 ms	0

[Axis 2]

No.	Operation pattern	Control method	Axis to be interpolated	Acceleration time No.	Deceleration time No.	Positioning address	Arc address	Command speed	Dwell time	M code
1						51213.2μm				
2						(Q7) μm	(Q8) μm			
3						(Q9) μm	(Q10) μm			
4						0.0 μm				

Q1

Q2

Q3

Q4

Q5

Q6

Q7

Q8

Q9

Q10

Q1: • ABS ArcMP
• ABS ArcRGT
• ABS ArcLFT

Q2: • -51213.2
• 0.0
• 51213.2
• 72426.4

Q3: • -51213.2
• -30000.0
• 30000.0
• 51213.2
• 72426.4

Q4: • ABS ArcMP
• ABS ArcRGT
• ABS ArcLFT

Q5: • -51213.2
• 0.0
• 51213.2
• 72426.4

Q6: • -51213.2
• -30000.0
• 30000.0
• 51213.2
• 72426.4

Q7: • -51213.2
• 0.0
• 51213.2
• 72426.4

Q8: • -51213.2
• -30000.0
• 30000.0
• 51213.2
• 72426.4

Q9: • -51213.2
• 0.0
• 51213.2
• 72426.4

Q10: • -51213.2
• -30000.0
• 30000.0
• 51213.2
• 72426.4

Select the correct sentence to describe each setting item for the Digital Oscilloscope function.

- Q1 Online Setting
- Q2 Probe Selection
- Q3 Sampling Setting
- Q4 Trigger Setting

Q1 Select whether to display waveform in real-time during measurement and whether to continu...

Q2 Set the I/O signal to be measured and buffer memory.

Q3 Set the measurement time and sampling interval.

Q4 Set the conditions to start and end measurement.

Q1: 1 : GYh\Y'a YUgi fYa Ybhi]a Y'UbX'gla d']b['j]bHYfj U"
 & : GYh\Y'VebX]h]cbg]hc'g]Ufh]UbX'YbX'a YUgi fYa Ybh'
 ' : GY'VMik \Yh\Yf'hc'X]gd'Umk Uj YZcfa 'j]b'fYU!h]a Y'Xi f]b['a YUgi fYa Ybh]UbX'k \Yh\Yf'hc'.....
 Veb]bi Y'a YUgi fYa Ybh]Z]h\Y'VebbYV]cb'k]h' h\Y'dYfgcbU'Ve'a di hYf']g']bhYffi dhYX"
 (: GYh\Y'#C'g]l[bU'hc'VY'a YUgi fYX'UbX'Vi ZYf'a Ya cfn'

Q2: %: GYh\Y'a YUgi fYa Ybhi]a Y'UbX'gla d']b['j]bHYfj U"
 & : GYh\Y'VebX]h]cbg]hc'g]Ufh]UbX'YbX'a YUgi fYa Ybh'
 ' : GY'VMik \Yh\Yf'hc'X]gd'Umk Uj YZcfa 'j]b'fYU!h]a Y'Xi f]b['a YUgi fYa Ybh]UbX'k \Yh\Yf'hc'.....
 Veb]bi Y'a YUgi fYa Ybh]Z]h\Y'VebbYV]cb'k]h' h\Y'dYfgcbU'Ve'a di hYf']g']bhYffi dhYX"
 (: GYh\Y'#C'g]l[bU'hc'VY'a YUgi fYX'UbX'Vi ZYf'a Ya cfn'

Q3: %: GYh\Y'a YUgi fYa Ybhi]a Y'UbX'gla d']b['j]bHYfj U"
 & : GYh\Y'VebX]h]cbg]hc'g]Ufh]UbX'YbX'a YUgi fYa Ybh'
 ' : GY'VMik \Yh\Yf'hc'X]gd'Umk Uj YZcfa 'j]b'fYU!h]a Y'Xi f]b['a YUgi fYa Ybh]UbX'k \Yh\Yf'hc'.....
 Veb]bi Y'a YUgi fYa Ybh]Z]h\Y'VebbYV]cb'k]h' h\Y'dYfgcbU'Ve'a di hYf']g']bhYffi dhYX"
 (: GYh\Y'#C'g]l[bU'hc'VY'a YUgi fYX'UbX'Vi ZYf'a Ya cfn'

Q4: %: GYh\Y'a YUgi fYa Ybhi]a Y'UbX'gla d']b['j]bHYfj U"
 & : GYh\Y'VebX]h]cbg]hc'g]Ufh]UbX'YbX'a YUgi fYa Ybh'
 ' : GY'VMik \Yh\Yf'hc'X]gd'Umk Uj YZcfa 'j]b'fYU!h]a Y'Xi f]b['a YUgi fYa Ybh]UbX'k \Yh\Yf'hc'.....
 Veb]bi Y'a YUgi fYa Ybh]Z]h\Y'VebbYV]cb'k]h' h\Y'dYfgcbU'Ve'a di hYf']g']bhYffi dhYX"
 (: GYh\Y'#C'g]l[bU'hc'VY'a YUgi fYX'UbX'Vi ZYf'a Ya cfn'

You have completed the Final Test. Your results area as follows.
To end the Final Test, proceed to the next page.

	1	2	3	4	5	6	7	8	9	10
Final Test 1	✓									
Final Test 2	✓	✓	✓							
Final Test 3	✓									
Final Test 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Final Test 5	✓	✓	✓	✓						

Total questions: **19**

Correct answers: **19**

Percentage: **100 %**

Clear

You have completed the "MELSEC iQ-R/iQ-F Series Motion Module Basics (Simple Motion Mode)" Course.

Thank you for taking this course.

We hope you enjoyed the lessons and the information you acquired in this course is useful for configuring systems in the future.

You can review the course as many times as you want.

Review

Close