MELSOFT

MITSUBISHI ELECTRIC
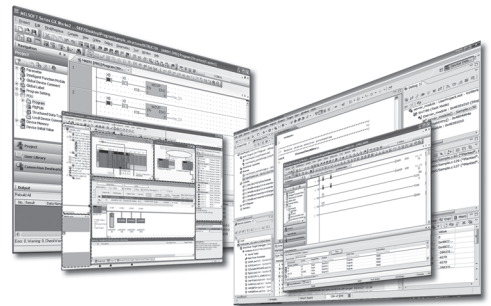
Engineering Software

Predefined Protocol Support Tool For Positioning Operating Manual

-SW1DNN-SCMPTP-E
-SW1DNN-SCPMRP-E

SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.

The precautions given in this manual are concerned with this product only. For the safety precautions for the programmable controller system, refer to the user's manual for the CPU module used and MELSEC iQ-R Module Configuration Manual.

In this manual, the safety precautions are classified into two levels: "⚠ WARNING" and "⚠ CAUTION."

⚠ **WARNING**	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ **CAUTION**	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠WARNING

● To perform an operation, such as data change or operating status change, to running devices, such as a programmable controller, servo, robot, or server, from a personal computer equipped with this product, configure an interlock circuit outside of the devices so that the entire system always operates to the safety side. Additionally, read this manual carefully and ensure the safety before operations. Especially, in the above mentioned operations that are performed from external devices through network, any problems on devices may not be dealt with promptly due to an abnormal data communication.

● Configure a safety circuit outside of the personal computer equipped with this product so that the entire system operates to the safely side even when a fault occurs in the personal computer. Failure to do so may result in an accident due to an incorrect output or malfunction.

[Design Precautions]

⚠CAUTION

● During application of each setting, do not perform the operation that forcibly turns the personal computer equipped with this product OFF. Otherwise, the data will be undefined and resetting and re-registering data will be required. Additionally, doing so may cause the malfunction of this product.

[Security Precautions]

⚠WARNING

- To maintain the security (confidentiality, integrity, and availability) of the programmable controller and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

[Startup and Maintenance Precautions]

⚠CAUTION

- The online operations performed from a personal computer to a running CPU module (operations for a serial communication module) have to be executed after the manual has been carefully read and the safety has been ensured.
- The positioning test functions such as positioning start, home position return, JOG, inching, or positioning data test must be executed with the CPU module set to STOP after the manual has been carefully read and the safety has been ensured.
  Specially when executing the function on the network system, ensure the safety thoroughly since the machinery whose operation cannot be checked by an operator may be activated. The operation failure may cause the injury or machine damage.
- Before testing the operation, set a low speed for the positioning data so that the operation can be stopped immediately upon occurrence of a hazardous condition.
- Confirm and adjust the program and each parameter before operation. Unpredictable movements may occur depending on the machine.

[Operating Precautions]

⚠CAUTION

- Do not go near the machine during operations such as the positioning test. Doing so may lead to injuries.

CONDITIONS OF USE FOR THE PRODUCT

(1) This software shall be used under the following conditions:

    i) that any failure occurred in this software, if any, shall not lead to any serious accident.

    ii) that the backup and/or fail-safe functions are systematically performed outside the devices in the cases of any failure occurred in this software.

(2) Mitsubishi Electric assumes no responsibility and liability (including but not limited to, default liability, defect liability, quality assurance responsibility, tort liability, product liability) for the quality, performance, and safety of both this software and products using this software.

(3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INTRODUCTION

Thank you for your patronage. We appreciate your purchase of the engineering software, MELSOFT series.

This manual describes the system configuration and functions to use Predefined Protocol Support Tool For Positioning.

Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of Predefined Protocol Support Tool For Positioning to handle it correctly.

Note that the menu names and operating procedures may differ depending on an operating system in use and its version.

When reading this manual, replace the names and procedures with the applicable ones as necessary.

CONTENTS

RELEVANT MANUALS

Manual name [manual number]	Description	Available form
Predefined Protocol Support Tool For Positioning Operating Manual [SH-082176ENG] (this manual)	System configuration, operation methods for each function, and troubleshooting in Predefined Protocol Support Tool For Positioning	e-Manual PDF
GX Works3 Operating Manual [SH-081215ENG]	System configurations, parameter settings, and operation methods for the online function in GX Works3	e-Manual PDF
GX Works2 Version 1 Operating Manual (Common) [SH-080779ENG]	System configuration of GX Works2 and functions common to Simple project and Structured project such as parameter settings and operation methods for the online function	Print book
		PDF
GX Works2 Version 1 Operating Manual (Intelligent Function Module) [SH-080984ENG]	Operation methods for an intelligent function module such as parameter settings, monitoring, and predefined protocol support functions in GX Works2	Print book
		PDF
Predefined Protocol Support For Positioning Function Block Library Reference (IAI Corporation) [BCN-P5999-1179]	Specifications, functions, and input/output labels of IAI controller function blocks	e-Manual PDF
Predefined Protocol Support For Positioning Function Block Library Reference (ORIENTAL MOTOR CO., LTD.) [BCN-P5999-1371]	Specifications, functions, and input/output labels of function blocks for controllers manufactured by Oriental Motor Co., Ltd.	e-Manual PDF
Predefined Protocol Support For Positioning Function Block Library Reference (SMC Corporation) [BCN-P5999-1373]	Specifications, functions, and input/output labels of SMC controller function blocks	e-Manual PDF

Point

e-Manual refers to the Mitsubishi Electric FA electronic book manuals that can be browsed using a dedicated tool.

e-Manual has the following features:

 • Required information can be cross-searched in multiple manuals.
 • Other manuals can be accessed from the links in the manual.
 • Hardware specifications of each part can be found from the product figures.
 • Pages that users often browse can be bookmarked.
 • Sample programs can be copied to an engineering tool.

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Device	A memory of a CPU module to store data. Devices such as X, Y, M, D, and others are provided depending on the intended use.
Engineering tool	A tool used for setting up programmable controllers, programming, debugging, and maintenance.
Intelligent function module	A module that has functions other than an input or output, such as an A/D converter module and D/A converter module.
Process CPU	A CPU module that executes process control and sequential control. Process control function blocks and the online module change function can be executed. This module is used with a redundant function module to configure a redundant system.
Process CPU (process mode)	A Process CPU that operates in the process mode. Process control function blocks and the online module change function can be executed.

GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual uses the following generic terms and abbreviations.

Term	Description
GX Works2 compatible support tool	A Predefined Protocol Support Tool For Positioning (Q/L).
GX Works3 compatible support tool	A Predefined Protocol Support Tool For Positioning.
Support Tool	A Predefined Protocol Support Tool For Positioning and Predefined Protocol Support Tool For Positioning (Q/L).

1 BEFORE USING THIS PRODUCT

This product is a tool for setting and debugging positioning control of an electric actuator via the MELSEC programmable controller.

It supports early startup of the positioning control system with an electric actuator and reduction of the design man-hours for the system.

1.1 Features

This section shows the features of Support Tool.

Easy system startup without concerning a predefined protocol

By simply selecting a connected model, its protocol for communication is automatically set.

All the man-hours required for the conventional protocol design can be saved since there is no need to confirm the protocol specifications for each device.

Positioning and JOG operations without a program

Operations such as positioning and JOG can be performed with simple operations of the tool.

The system can be started up early since positioning control can be debugged without creating a program.

Operation check without a program

The positioning control status or an occurring alarm can be checked without concerning about sending/receiving communication commands.

A dedicated display device or program is not required.

The device operating status can be visualized in the screen of the tool and that significantly improves the debugging efficiency.

1.2 Help

The operation methods, specifications, and software version of Support Tool can be checked with the Help function.

Displaying the manual

Open the manual for Support Tool.

Operating procedure

Select [Help] ⇨ [Open Manual] (❓).
e-Manual Viewer starts and the manual appears.

Connecting to MITSUBISHI ELECTRIC FA Global Website

Open the MITSUBISHI ELECTRIC FA Global Website in a web browser.
Make sure your personal computer connects to the Internet in advance.

Operating procedure

Select [Help] ⇨ [Connection to MITSUBISHI ELECTRIC FA Global Website].

Checking the version

Display information such as the software version.

Operating procedure

Select [Help] ⇨ [Version information].

2 SYSTEM CONFIGURATION

This chapter explains the system configuration of Support Tool.

2.1 Overall System Configuration

This section shows the overall system configuration for using Support Tool.

• MELSEC iQ-R, MELSEC-Q, and MELSEC-L
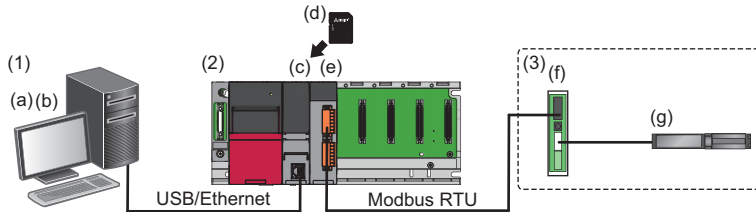
• MELSEC iQ-F
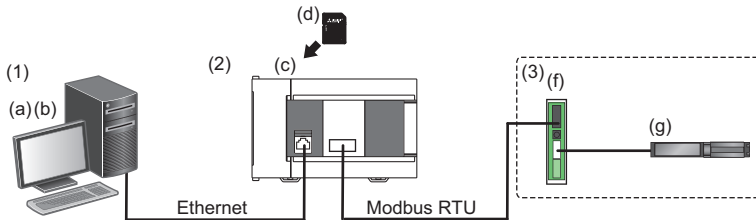
System configuration				Cable/network
(1)	Personal computer	(a)	Support Tool	USB Ethernet
		(b)	GX Works3 or GX Works2	
(2)	MELSEC programmable controller	(c)	CPU module or remote head module	
		(d)	SD memory card	
		(e)	Serial communication module	Serial communication (Modbus RTU)
(3)	Electric actuator products	(f)	Electric actuator controller	
		(g)	Electric actuator	—

Software packages

The following shows the software packages supported by Support Tool.

Support Tool

Use either of the following Support Tool depending on the programmable controller series.

Product name	Model name	Supported programmable controller series
Predefined Protocol Support Tool For Positioning	SW1DNN-SCMPTP	• MELSEC iQ-R • MELSEC iQ-F
Predefined Protocol Support Tool For Positioning (Q/L)	SW1DNN-SCPMRP	• MELSEC-Q • MELSEC-L

Other software packages

Support Tool is compatible with the following software packages.

Software package	Description
GX Works3	An engineering tool for setting, programming, debugging, and maintaining programmable controllers.
GX Works2	
GX LogViewer	Software to display data collected by data logging.

The following shows available software package versions that can be used in each Support Tool.

—: Combination not possible

Support Tool		Available version of software package		
Model name	Version	GX Works3	GX Works2	GX LogViewer
SW1DNN-SCMPTP	1.000A to 1.001B	Version 1.055H to 1.063R	—	Version 1.100E or later
	1.002C to 1.004E	Version 1.055H to 1.097B		
	1.005F or later	Version 1.055H or later		
SW1DNN-SCPMRP	1.000A or later	Version 1.065T or later	Version 1.24A or later	—

For the versions of GX Works3 which are supported by each version of Support Tool in which supported models are added, refer to the following:

> **Point**
>
> • To install SW1DNN-SCMPTP, GX Works3 must be installed in advance.
> • To install SW1DNN-SCPMRP, GX Works2 must be installed in advance.
> • To use the realtime monitor function, GX LogViewer must be installed in advance.

Modules

Support Tool is supported by the following Mitsubishi Electric MELSEC modules.

Modules which can be specified for the connection route from the personal computer on which Support Tool runs are in accordance with the specifications of an engineering tool (GX Works3 or GX Works2) which sets the connection route.

For the mountability of an SD memory card and available SD cards, refer to the user's manual for the module used.

MELSEC iQ-R

■CPU module or remote head module

Product name	Generic term	Model name
PLC CPU	RnCPU	R00CPU, R01CPU, R02CPU, R04CPU, R08CPU, R16CPU, R32CPU, R120CPU
	RnENCPU	R04ENCPU, R08ENCPU, R16ENCPU, R32ENCPU, R120ENCPU
Process CPU (process mode)	RnPCPU	R08PCPU, R16PCPU, R32PCPU, R120PCPU
Remote head module	—	RJ72GF15-T2, RJ72GF15-T2(SR), RJ72GF15-T2(LR)

For CPU modules that can be used with a serial communication module, refer to the following:

📖MELSEC iQ-R Module Configuration Manual

■Serial communication module

This tool supports the serial communication using the following modules.

- RJ71C24
- RJ71C24-R2
- RJ71C24-R4

MELSEC iQ-F

■CPU module

This tool supports the serial communication using the following CPU modules.

Product name	Generic term	Model name
FX5U CPU module	FX5UCPU	FX5U-32MR/DS, FX5U-32MR/ES, FX5U-32MT/DS, FX5U-32MT/DSS, FX5U-32MT/ES, FX5U-32MT/ESS, FX5U-64MR/DS, FX5U-64MR/ES, FX5U-64MT/DS, FX5U-64MT/DSS, FX5U-64MT/ES, FX5U-64MT/ESS, FX5U-80MR/DS, FX5U-80MR/ES, FX5U-80MT/DS, FX5U-80MT/DSS, FX5U-80MT/ES, FX5U-80MT/ESS
FX5UC CPU module	FX5UCCPU	FX5UC-32MR/DS-TS, FX5UC-32MT/D, FX5UC-32MT/DS-TS, FX5UC-32MT/DSS, FX5UC-32MT/DSS-TS, FX5UC-64MT/D, FX5UC-64MT/DSS, FX5UC-96MT/D, FX5UC-96MT/DSS

CPU modules the firmware versions of which are 1.200 or later are available.

For the versions of GX Works3, refer to the following:

■Expansion boards and expansion adapters

Communication boards and communication adapters can be used.

For available communication boards and adapters, refer to the user's manual for the CPU module being used.

MELSEC-Q

■CPU module

Product name	Generic term	Model name
Universal model QCPU	QnU(D)(H)CPU	Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU
	QnUDVCPU	Q03UDVCPU, Q04UDVCPU, Q06UDVCPU, Q13UDVCPU, Q26UDVCPU
	QnUDE(H)CPU	Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU, Q50UDEHCPU, Q100UDEHCPU
	QnUDPVCPU	Q04UDPVCPU, Q06UDPVCPU, Q13UDPVCPU, Q26UDPVCPU
Process CPU	QnPHCPU	Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU

■Serial communication module

This tool supports the serial communication using the following modules.

- QJ71C24N
- QJ71C24N-R2
- QJ71C24N-R4

Modules whose first five digits of the serial number are '11062' and function version is B or later are supported.

MELSEC-L

■CPU module or head module

Product name	Generic term	Model name
PLC CPU	LCPU	L02SCPU, L02SCPU-P, L02CPU, L02CPU-P, L06CPU, L06CPU-P, L26CPU, L26CPU-P L26CPU-BT, L26CPU-PBT
Head module	—	LJ72GF15-T2

■Serial communication module

This tool supports the serial communication using the following modules.

- LJ71C24
- LJ71C24-R2

Connection configuration between a CPU module and a personal computer

The following shows configurations to connect a CPU module to a personal computer.

Available connection routes differ depending on the series of the CPU module.

○: Available, —: Not available

Connection route		MELSEC iQ-R	MELSEC iQ-F	MELSEC-Q, MELSEC-L
USB		○	—	○
Ethernet	Direct connection	○	○	○
	Connection through an Ethernet port	○	○	○

Connection through a USB port

Connect a CPU module to a personal computer with a USB cable.

For available cables, refer to the user's manual for the module used.

> **Point**
>
> When using a USB cable for the first time, install the USB driver.
>
> ☞ Page 72 USB Driver Installation Procedure

Connection through an Ethernet port

Connect a CPU module to a personal computer with an Ethernet board that is built-in to the personal computer or commercially available.

For an RnENCPU, use the Ethernet port of the CPU part to connect to the personal computer. An Ethernet port of the network part cannot be used for this connection.

■Direct connection

A CPU module can be directly connected to a personal computer on a 1:1 basis with an Ethernet cable without a hub.

Specifying the IP address of the CPU module is not required.

> **Point**
>
> Do not communicate by connecting to LAN line directly. This may increase the line load and affect the communications of other devices.

■Connection through an Ethernet port

A CPU module can also be connected to a personal computer via a hub on the same local network.

The IP address of the CPU module needs to be specified. In addition, set the same network address as the CPU module in the network settings of the personal computer.

> **Point**
>
> • Connection can be established with a LAN cable only. Connection via the Internet is not available.
> • Do not configure the direct connection settings when connecting a CPU module to a personal computer on a 1:1 basis.

Connection configuration between a CPU module and electric actuator products

Up to two communication channels can be set to connect a CPU module to electric actuator products.

Available channels differ depending on the series of the CPU module.

For the MELSEC iQ-R series, the channels of a mounted communication module can be used.

For the MELSEC iQ-F series, the channels of a CPU module, communication board, or communication adapter can be used.

○: Available, —: Not available

Connection route	MELSEC iQ-R	MELSEC iQ-F	MELSEC-Q, MELSEC-L
CH1	○ (Serial communication module)	○ (CPU module built-in RS-485 port)	—
CH2	○ (Serial communication module)	○ (Communication board)	○ (Serial communication module)
CH3	—	○ (Communication adapter)	—
CH4	—	○ (Communication adapter)	—

Serial communication (Modbus RTU) is used to communicate from each channel to electric actuator controllers.

2.2 Supported Manufacturers and Models

This section shows supported products.

For the product availability, please contact the manufacturer.

Electric actuator controller

Manufacturer	Type	Series	Type and model
IAI Corporation	Built-in Controller Type Actuator	RCP6S	RCP6S[*1]
		ERC3	ERC3
		ERC2	ERC2(SE)
	Controller	PCON	PCON-CA/CB/CFA/CFB PCON-C/SE PCON-CF PCON-CY PCON-CYB
		DCON	DCON-CA/CB DCON-CYB
		ACON	ACON-CA/CB ACON-C/SE ACON-CY ACON-CYB
		SCON	SCON-CA/CAL/CB SCON-CB-F[*1*2] SCON-C
ORIENTAL MOTOR CO.,LTD.	αSTEP driver	AR	ARD-AD/CD/KD
		AZ	AZD-AD/CD/KD
	Stepper motor driver	RKII	RKSD503-AD/CD RKSD507-AD/CD
SMC Corporation	Controller/Step data input type	LECP6 LECA6	LECP6/LECA6
		JXC51/61	JXC51/JXC61

*1 Positioning data cannot be read from or written to this model with Support Tool. In addition, teaching cannot be performed with the positioning test function.
Use Teaching Pendant or PC Software manufactured by IAI Corporation.

*2 The positioning start operation cannot be performed with the positioning test function of Support Tool.
Use Teaching Pendant or PC Software manufactured by IAI Corporation.

2.3　Considerations For Use

This section explains considerations for constructing and operating a system.

Considerations for communication delay and emergency stop

Positioning control by Support Tool may be substantially delayed if the communication band is narrow or connection distance is long. Configure an external emergency stop to stop the system safely in an emergency.
To stop positioning control in an emergency, the external emergency stop must be used.

Considerations for setting values specific to each model type

At the positioning data or JOG/Inching setting, to configure different setting range values by an electric actuator, check the specifications of the electric actuator being used and then set the value. Despite inputting out-of-range values, an error cannot be checked for model-type specific specifications by Support Tool.
For specifications of an electric actuator being used, refer to manuals and catalogs provided by each manufacturer.

Considerations for using other engineering software

If online operations are performed simultaneously with another MELSOFT series engineering tool (including GX Works3 and GX Works2), an error may occur in a communication driver.
It is recommended not to perform online operations simultaneously with other engineering software.

Considerations for using products for setting a controller of each manufacturer

Do not connect a data setting device, teaching box, and PC software of each manufacturer to a controller simultaneously to change data while using Support Tool. Failure to do so may cause malfunctions due to data inconsistency.
When setting or changing parameters of a controller by using the products, ensure that the following functions are not being used in Support Tool.
- Positioning data operation (writing/reading positioning data)
- Positioning test

Considerations for using Oriental Motor products

■Checking the type of a connection destination model
When "Oriental Motor" is set for "Select Manufacturer" in Support Tool, the tool cannot automatically determine whether the module type selected in a project is matched with that of the actual connection destination. Thoroughly check that both model types are matched, and then perform online operations. Otherwise, unintended operation may occur.

■End numbers of positioning data
Positioning data with the following numbers is used by a Support Tool system. It cannot be set or used by users.
- AR Series, RKⅡ Series: 63 (Available data range: No.0 to No.62)
- AZ Series: 255 (Available data range: No.0 to No.63)

In the following settings, a value which exceeds the available data range will be automatically converted within the available range when writing positioning data to a controller.

Series	No.	Item	Setting value	Value to be written into controller
AR Series RKⅡ Series	62	Operation function	1: Link, 2: Link 2, or 3: Push	0: Single-motion
		Sequential positioning operation	1: Enable	0: Disable
AZ Series	62	Next data number	-2: ↓↓(+2)	-256: Stop
	63	Next data number	-2: ↓↓(+2) or -1: ↓(+1)	

■Current position display during a positioning test
When an electric actuator that is controlled by a connection destination controller does not have an encoder, the current position value is always displayed as '0' while using the positioning test function. The value does not match with the actual position of the actuator.

Considerations for using SMC products

■Checking the type of a connection destination model

When "SMC" is set for "Select Manufacturer" in Support Tool, the tool cannot automatically determine whether the module type selected in a project is matched with that of the actual connection destination. Thoroughly check that both model types are matched, and then perform online operations. Otherwise, unintended operation may occur.

2.4 Operating Environment

For the operating environment for Support Tool, refer to the following:

📖Predefined Protocol Support Tool For Positioning Installation Instructions

3 PROCEDURES TO START SUPPORT TOOL

This chapter explains the procedures from obtaining Support Tool to starting it.

Connecting via MELSEC iQ-R or MELSEC iQ-F series module

Use the GX Works3 compatible support tool.

Procedure overview	Reference
1. Install GX Works3.	GX Works3 Installation Instructions
2. Install the GX Works3 compatible support tool (SW1DNN-SCMPTP).	Page 21 How to Obtain Support Tool Predefined Protocol Support Tool For Positioning Installation Instructions
3. Start GX Works3.	Page 21 Settings in GX Works3 Page 24 Display Language Switching
4. Set a connection destination and parameters in GX Works3.	
5. Start the support tool from the menu of GX Works3.	Page 25 Start and End

Connecting via MELSEC-Q or MELSEC-L series module

Use the GX Works2 compatible support tool.

Procedure overview	Reference
1. Install GX Works2.	GX Works2 Installation Instructions
2. Install the GX Works2 compatible support tool (SW1DNN-SCPMRP).	Page 21 How to Obtain Support Tool Predefined Protocol Support Tool For Positioning Installation Instructions
3. Start GX Works2.	Page 23 Settings in GX Works2
4. Set a connection destination and parameters in GX Works2.	
5. End GX Works2.	
6. Start the support tool from the Windows® start menu.	Page 25 Start and End Page 24 Display Language Switching

3.1 How to Obtain Support Tool

For information on how to obtain Support Tool, please consult your local Mitsubishi representative.

3.2 Installation and Uninstallation

For installing and uninstalling Support Tool, refer to the following:

📖Predefined Protocol Support Tool For Positioning Installation Instructions

3.3 Settings in GX Works3

This section shows required operations in GX Works3 before starting the GX Works3 compatible support tool.

Operating procedure

1. Start GX Works3.

2. Set parameters.

3. Set a connection destination.

4. Write the parameters to the connection destination module.

> *Point*
>
> For details on the operations of GX Works3, refer to the following:
> 📖GX Works3 Operating Manual

Parameter setting items

Before starting the GX Works3 compatible support tool, set the following parameters in GX Works3 and write them to the module.

■MELSEC iQ-R

Set the module parameters of a serial communication module.

"Parameter" ⇨ "Module Information" ⇨ "(module name)" ⇨ "Module Parameter" in the Navigation window

Setting data

Item		Setting value	
		IAI, SMC	**Oriental Motor**
Communication protocol setting		Predefined protocol	
Communication speed setting		Set the value according to the setting of an electric actuator controller to be used.	
Transmission setting	Data bit	8	
	Parity bit	None	Yes
	Odd/even parity	— (Setting not required)	Even
	Stop bit	1	
Communication control specification	Echo back enable/prohibit specification	Echo back prohibit	

> *Point*
>
> For a setting example, refer to the following:
> ☞ Page 73 Setting Example

■MELSEC iQ-F

1. Specify the detailed model name of a CPU module in the system parameters.

"Parameter" ⇨ "System Parameter" ⇨ "I/O Assignment Setting" in the Navigation window

2. Set the module parameters of a CPU module or a communication adapter.

• Built-in RS-485 port (CH1)

"Parameter" ⇨ "FX5UCPU" ⇨ "Module Parameter" ⇨ "485 Serial Port" in the Navigation window

• Communication board (CH2)

"Parameter" ⇨ "FX5UCPU" ⇨ "Module Parameter" ⇨ "Expansion Board" in the Navigation window

• Communication adapter (CH3/CH4)

"Parameter" ⇨ "Module Information" ⇨ ADP1 to ADP6 (communication adapter) ⇨ "Module Parameter" in the Navigation window

Setting data

Item		Setting value	
		IAI, SMC	Oriental Motor
Communication Protocol Type		Predefined Protocol Support Function	
Advanced Settings	Data Length	8bit	
	Parity Bit	None	Even
	Stop Bit	1bit	
	Baud Rate	Set the value according to the setting of an electric actuator controller to be used.	

3.4 Settings in GX Works2

This section shows required operations in GX Works2 before starting the GX Works2 compatible support tool.

Operating procedure

1. Start GX Works2.

2. Set PLC parameters and data of the intelligent function module.

3. Set a connection destination.

4. Write PLC parameters and data of the intelligent function module to the connection destination module.

5. End GX Works2.

> **Point**
>
> For details on operation methods of GX Works2, refer to the following:
> 📖GX Works2 Version 1 Operating Manual (Common)
> 📖GX Works2 Version 1 Operating Manual (Intelligent Function Module)

Parameter setting items

Before starting the GX Works2 compatible support tool, set PLC parameters and the following data in GX Works2, and write them to the module.

■MELSEC-Q and MELSEC-L

Set data of the serial communication module.

"Intelligent Function Module" in the Project view ⇨ "(module)" ⇨ "Switch Setting" and "Various Control Specification"

> **Point**
>
> For setting methods for intelligent function module data, refer to the following:
> 📖GX Works2 Version 1 Operating Manual (Intelligent Function Module)

Setting data

Set the following items in CH2.

Item		Setting value	
		IAI, SMC	Oriental Motor
Communication protocol setting		Predefined protocol	
Communication rate setting		Set the value according to the setting of an electric actuator controller to be used.	
Transmission Setting	Data Bit	8	
	Parity Bit	None	Exist
	Even/odd parity	— (Setting not required)	Even
	Stop bit	1	
For communication control specification	Echo back permit/prohibit specification	Prohibited	

3.5 Display Language Switching

Support Tool supports multiple languages; therefore, the display language such as one on the menu can be switched on a personal computer.

Precautions

- If the display language differs from the one for the operating system, texts may not displayed properly in the screen. (Displayed texts may get cut.)
- When switching the display language in Windows 10 or later, supplemental fonts of the target language are required. The fonts can be added by the following operation:

Select [Apps] ⇨ [Apps & features] ⇨ [Optional features] ⇨ [Add a feature] in Windows settings.

GX Works3 compatible support tool

The display language of the tool follows the one set in GX Works3.

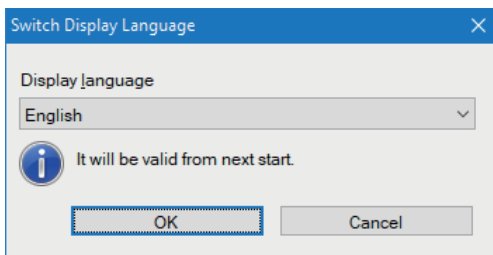For the method to switch the display language of GX Works3, refer to the following:

📖 GX Works3 Operating Manual

GX Works2 compatible support tool

A display language can be switched from the menu.

Window

[View] ⇨ [Switch Display Language]

Precautions

- Even if the display language is set to Chinese in the support tool, when Chinese version of GX Works2 is not used, a part of an error message may appear in English when a communication error occurs between a module and the support tool.

3.6 Start and End

This section shows the procedures for starting and ending Support Tool.

Start

■GX Works3 compatible support tool

Start the support tool from the menu of GX Works3.

Operating procedure

1. Select [Tool] ⇨ [Module Tool List] from the menu of GX Works3.
The "Module Tool List" screen appears.

2. Select a series for "Module Series Selection" in the screen.

3. Select "Predefined Protocol Support Tool For Positioning."

4. Click the [OK] button.

> *Point* 🔎
>
> Multiple pieces of Support Tool cannot be started at the same time.

■GX Works2 compatible support tool

Start the support tool from the Windows start menu.

Operating procedure

1. Select "SCPMRP" from "MELSOFT" in Windows Start.
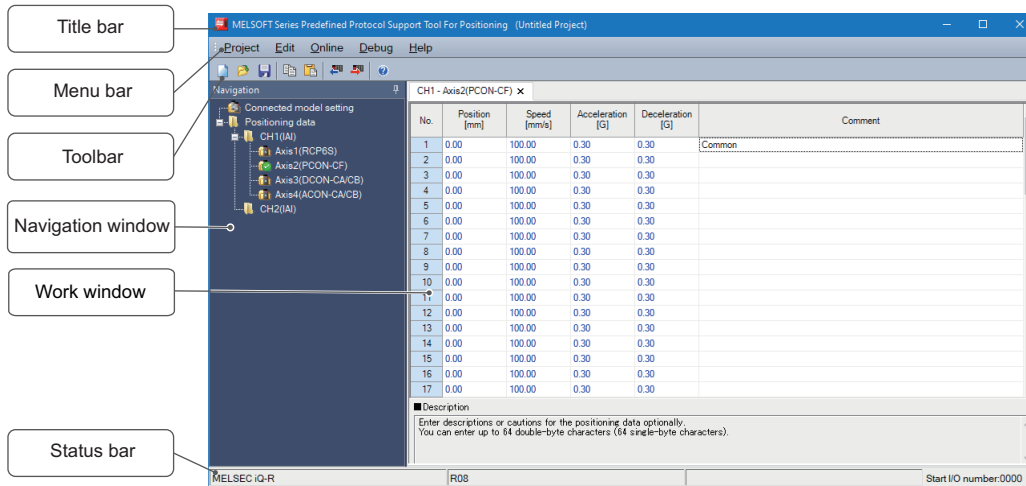
End

Operating procedure

1. Select [Project] ⇨ [Exit].

4 SCREEN CONFIGURATION

This chapter explains the screen configuration of Support Tool.

4.1 Main frame

This section shows the main frame configuration.

Name	Description	Reference
Title bar	To display the tool name and a project file name.	—
Menu bar	To display menus.	Page 27 Menu List
Toolbar	To display tool icons.	—
Navigation window	To display contents of a project in a tree format.	Page 28 PROJECT MANAGEMENT
Work window	A main screen used for setting.	—
Status bar	To display information about a connection destination.	Page 26 Status bar

Status bar

Information on a connection destination is displayed.
The information is about settings that have been set in an engineering tool (GX Works3 or GX Works2) before starting Support Tool.
Only the start I/O number can be changed in Support Tool.

Displayed items

Item	Description
Series	To display the series name of a project. It corresponds to the series of a project set in an engineering tool.
CPU	To display the CPU module of a connection destination. The "Type" or "PLC Type" of a project that is set in an engineering tool is displayed.
Connection route	To display a connection route (USB or Ethernet) between a personal computer and CPU module.
Start I/O number	To display the start I/O number of a connection target module. (Page 34 Setting a Start I/O Number) For MELSEC iQ-F series, the start I/O number is not displayed as the setting is not required.

4.2 Menu List

This section shows the menu configuration of Support Tool.

The abbreviations in the table indicate the series type of a project.

- R: MELSEC iQ-R series
- F: MELSEC iQ-F series
- Q/L: MELSEC-Q series, MELSEC-L series

○: Available, —: Unavailable

[Project]	R	F	Q/L	Reference
⇨ [New]	○	○	○	Page 29 Creating a project
⇨ [Open]	○	○	○	Page 29 Opening a project
⇨ [Close]	○	○	○	—
⇨ [Save]	○	○	○	Page 30 Saving a project
⇨ [Save As]				
⇨ [Exit]	○	○	○	Page 25 End

[Edit]	R	F	Q/L	Reference
⇨ [Copy]	○	○	○	Page 39 Copying/pasting data
⇨ [Paste]				
⇨ [Change Channel]	○	○	—	Page 39 Changing channels
⇨ [Change Edit Format] ⇨ [Simple]	○	○	○	Page 38 Switching the simple and detailed display formats
⇨ [Change Edit Format] ⇨ [Detail]				

[View]	R	F	Q/L	Reference
⇨ [Switch Display Language]	—	—	○	Page 24 Display Language Switching

[Online]	R	F	Q/L	Reference
⇨ [Start I/O number setting]	○	—	○	Page 34 Setting a Start I/O Number
⇨ [Write the Predefined Protocol Information]	○	○	○	Page 35 Writing Predefined Protocol Information
⇨ [Read Positioning Data]	○	○	○	Page 42 Reading Positioning Data
⇨ [Write Positioning Data]	○	○	○	Page 40 Writing Positioning Data

[Debug]	R	F	Q/L	Reference
⇨ [Positioning Test]	○	○	○	Page 43 POSITIONING TEST

[Help]	R	F	Q/L	Reference
⇨ [Open Manual]	○	○	○	Page 11 Displaying the manual
⇨ [Connection to MITSUBISHI ELECTRIC FA Global Website]	○	○	○	Page 11 Connecting to MITSUBISHI ELECTRIC FA Global Website
⇨ [Version information]	○	○	○	Page 11 Checking the version

5 PROJECT MANAGEMENT

This chapter explains basic operations and management of a project.

5.1 Project File and Data Configuration

Support Tool regards positioning data settings for one serial communication module or MELSEC iQ-F series CPU module as one project.

Created projects are saved in their respective files.

For considerations to use a file created in a different version of Support Tool, refer to the following:

☞ Page 71 Using a Project in a Different Version

Data to be created in a project is displayed in the Navigation window.

Data configuration

The following shows data displayed in a tree. (Default data names are used.)
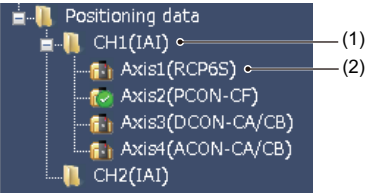
Data displayed in the Navigation window

■Connected model setting

Creation method: ☞ Page 33 Setting a Connected Model

Figure	Item	Description
Connected model setting	Connected model setting	Data to set values required for a connection destination model and for sending/receiving its predefined protocol.

■Positioning data

Creation method: ☞ Page 36 POSITIONING DATA SETTINGS

| Figure	Item	Description
Positioning data CH1(IAI) — (1) Axis1(RCP6S) — (2) Axis2(PCON-CF) Axis3(DCON-CA/CB) Axis4(ACON-CA/CB) CH2(IAI)	(1) CH number (manufacturer name)	The channel number of a module to be used and the manufacturer name of a connected model set to the channel are displayed. ☞ Page 32 Selecting a Manufacturer
	(2) Axis number (connected model)	Axis numbers and their respective connected models configured in the "Connected model setting" screen are displayed. By double-clicking each item, a screen to set positioning data for the axis appears. ☞ Page 37 Setting and Editing Positioning Data The icon indicates a positioning data status. • : Initial value or unedited • : Edited (no error) • : Error

5.2 Creating a Project File

This section explains the methods for creating, opening, and saving a project.

Creating a project

Select the manufacturer of a connected model and the channel of a module to be used to create a new project.

Window

[Project] ⇨ [New] (🗋)
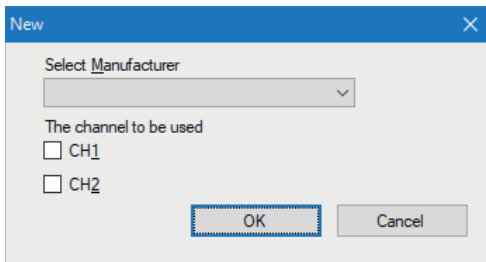
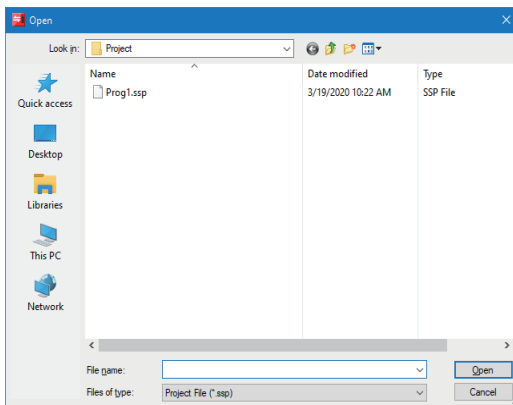For the operations in the "New" screen, refer to the following:

☞Page 32 Selecting a Manufacturer

Opening a project

Read a project saved on a personal computer or another data storage device.

Window

[Project] ⇨ [Open] (📂)

Operating procedure

Set each item and click the [Open] button.

Precautions

- Projects of the MELSEC series different from a project opened in the start source GX Works3 cannot be opened.
- For considerations to open a project in a version different from the one in which the project was created, refer to the following:
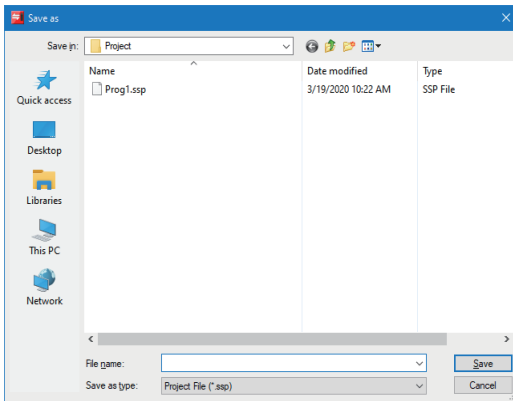
☞Page 71 Using a Project in a Different Version

Saving a project

Save a project on the personal computer or another data storage device.

Saving projects under the specified name

Window

[Project] ⇨ [Save As]

Operating procedure

Set each item and click the [Save] button.

Precautions

For the unusable character strings for a project or path name, refer to the following:

☞ Page 70 Unusable Character String (Reserved Word)

Overwriting a project

Operating procedure

Select [Project] ⇨ [Save] ( ).

6 SYSTEM SETTINGS

Data communication can be performed with Support Tool by setting items for the system configuration.

The following table shows the items to be set.

Item	MELSEC iQ-R	MELSEC iQ-F	MELSEC-Q, MELSEC-L	Reference
Settings for connecting a personal computer to the programmable controller system	Connection Destination Specification			Page 21 Settings in GX Works3 Page 23 Settings in GX Works2
	Start I/O number of a serial communication module	—	Start I/O number of a serial communication module	Page 34 Setting a Start I/O Number
Settings for communicating from a programmable controller system to a supported product	Module parameters • Communication protocol setting • Communication speed setting • Transmission setting • Communication control specification	Module parameters • Communication Protocol Type • Advanced Settings	Intelligent function module parameters • Communication protocol setting • Communication rate setting • Transmission setting • Communication control specification	Page 21 Settings in GX Works3 Page 23 Settings in GX Works2
	Channel (CH1, CH2) of the serial communication module	Up to two channels from the following options: • CPU module (CH1) • Communication board (CH2) • Communication adapter (CH3, CH4)	Channel (CH2) of the serial communication module	Page 32 Selecting a Manufacturer
	Manufacturer name			Page 32 Selecting a Manufacturer
	Connected model			Page 33 Setting a Connected Model
	Module and memory where protocol setting data is to be written			Page 35 Writing Predefined Protocol Information

Set the items by the following procedure.
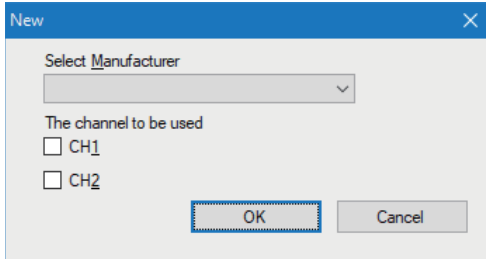
Operating procedure

1. Set parameters and a connection destination in an engineering tool. (☞ Page 21 Settings in GX Works3, Page 23 Settings in GX Works2)

2. Start Support Tool. (☞ Page 25 Start)

3. Select a manufacturer and create a new project. (☞ Page 32 Selecting a Manufacturer)

4. Set a connected model. (☞ Page 33 Setting a Connected Model)

5. When using a serial communication module, set the start I/O number. (☞ Page 34 Setting a Start I/O Number)

6. Write protocol setting data for a predefined protocol. (☞ Page 35 Writing Predefined Protocol Information)

6.1 Selecting a Manufacturer

Set the manufacturer of a connected model.

Window

[Project] ⇨ [New] ( )

Operating procedure

1. Select the manufacturer name of a connected model.

2. Select the checkbox of the channel to be used.

For the MELSEC iQ-F series, up to two channels can be selected from CH1 to CH4.

For the MELSEC-Q/L series, only CH2 is available; therefore, channel selection is not required.

3. Click the [OK] button.

Precautions

Channels which are not implemented to a module can also be selected. (Example: CH2 can be selected for an FX5UC.)
Make sure that the set channel can be used before starting the communication by checking the parameter settings in an engineering tool and the installation statuses of a communication board and communication adapter.

6.2 Setting a Connected Model

Set a model to be connected and items for sending/receiving its protocol.

Window

"Connected model setting" in the Navigation window

Operating procedure

Set each item and click the [Apply] button.

Axes to which models are set are displayed in the Navigation window.

Connected Model Setting

Select a controller type to be connected for the axis number to be used.

Setting data

Item	Description
End axis No.	Enter the last axis number to be checked. For the later axis numbers, whether or not an error exists in their set contents will not be checked when the settings are applied.
Axis1Model to Axis32Model	Select a model to be connected. The settable maximum number of axes varies depending on manufacturers. • IAI: 16 • Oriental Motor: 31 • SMC: 32

Protocol send/receive setting

Setting data

Item		Description	Setting range	Initial value
Receive settings	Clear OS area (receive data area) before protocol execution	Select whether to clear the OS area (receive data area) of the module before the protocol execution. For the MELSEC iQ-F series, this item cannot be selected. (Fixed to "Yes")	• No • Yes	Yes
	Receive Wait Time	Set waiting time after the module turns to the 'waiting for reception' status.	9 to 60	30
Send settings	Number of Send Retries	Set the number of times the module retries to send when the sending from the module has not been completed within the set time of "Send Monitoring Time."	0 to 10	3
	Send Retry Interval	Set the interval between the failure of sending from the module and the retry when the sending from the module has not been completed within the set time of "Send Monitoring Time."	0 to 500	100
	Send Standby Time	Set standby time between when a protocol set to the module turns to the execution status and when it actually sends the data. By setting this item, the send timing of the module can be adjusted to readiness of target devices to receive data.	0 to 500	0
	Send Monitoring Time	Set waiting time between when the module turns to the 'sending' status and when the sending is completed.	11 to 200	30

For details on each item and operations when a communication error occurs, refer to the following:

📖MELSEC iQ-R Serial Communication Module User's Manual(Application)

📖MELSEC iQ-F FX5 User's Manual (Serial Communication)

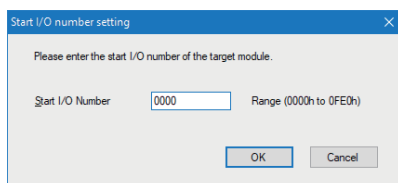📖Q Corresponding Serial Communication Module User's Manual (Basic)

📖MELSEC-L Serial Communication Module User's Manual (Basic)

6.3 Setting a Start I/O Number

Set the start I/O number of a serial communication module to be used for communication.

Window

[Online] ⇨ [Start I/O number setting]

Operating procedure

1. Set a start I/O number.

2. Click the [OK] button.

> **Point**
>
> The set start I/O number is displayed on the status bar.
>
>
>
> Start I/O number:0000

6.4 Writing Predefined Protocol Information

Write protocol setting data to a CPU module or a serial communication module.

Protocol setting data is automatically set based on the information set in a project.
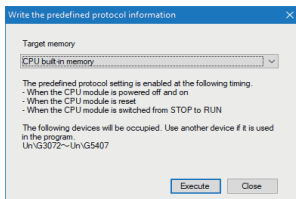
The data is written to the module extended parameters or the flash ROM of the serial communication module.

Point

- For MELSEC iQ-R series and MELSEC-Q/L series, set the start I/O number before writing data.
- Contents in "Connected model setting" of a project are written. Check the set contents before writing.

Window

[Online] ⇨ [Write the Predefined Protocol Information]

Operating procedure

1. Select a module or a memory where protocol setting data is to be written.

○: Selectable, —: Not selectable

Item	Description	MELSEC iQ-R	MELSEC iQ-F	MELSEC-Q, MELSEC-L
CPU built-in memory	The data is written to a CPU module.	○	○	—
SD memory card	The data is written to the SD memory card mounted on a CPU module.	○	○	—
Intelligent function module	The data is written to the serial communication module with the set start I/O number.	○	—	○

2. Click the [Execute] button.

3. Apply the settings by resetting the CPU module or turning the power OFF and ON.

For the MELSEC iQ-R series, the settings are applied when the status of a CPU module switches from STOP to RUN.

Precautions

The following devices are used to write predefined protocol information.

Series	Device type	Occupied device number by manufacturer		
		IAI	Oriental Motor	SMC
MELSEC iQ-R	Serial communication module 'User setting area' of a buffer memory	Un\G3072 to Un\G5407	Un\G3072 to Un\G4339	Un\G3072 to Un\G4347
MELSEC iQ-F	File registers	R0 to R1801	R0 to R1835	R0 to R1847
MELSEC-Q MELSEC-L	Serial communication module 'User free area' of a buffer memory	Un\G4240 to Un\G4852	Un\G3706 to Un\G4339	Un\G3710 to Un\G4347

Make sure not to overlap with the devices used for other controls.

7 POSITIONING DATA SETTINGS

This chapter explains the methods to set positioning data.

About positioning data

Positioning data is data for positioning control of a connected electric actuator. Set the position which the actuator is moved to, moving speed, acceleration and deceleration, etc.

Positioning data corresponds to the following data of a controller of each manufacturer.

- IAI: Position data
- Oriental Motor: Operation data
- SMC: Step data

No.	Position [mm]	Speed [mm/s]	Acceleration [G]	Deceleration [G]	Push [%]	Threshold [%]	Positioning width [mm]	Zone + [mm]	Zone - [mm]	Acceleration/ Deceleration mode	Incre mental	Gain set	Suppression No.
1	0.00	100.00	0.30	0.30	0	0	0.10	0.00	0.00	0	0	0	0
2	100.00	100.00	0.30	0.30	0	0	0.10	0.00	0.00	0	0	0	0
3	150.00	200.00	0.30	0.30	50	0	30.00	0.00	0.00	0	0	0	0
4	300.00	400.00	1.00	1.00	0	0	0.10	0.00	0.00	0	0	0	0
5	200.00	200.00	0.30	0.30	0	0	0.10	250.00	230.00	0	0	0	1
6	500.00	50.00	0.10	1.00	0	0	0.10	0.00	0.00	0	0	0	2

By specifying positioning data written to a controller, the operation of an electric actuator can be controlled.

Positioning data can be set to each controlled axis of the actuators in Support Tool.

The axes to which positioning data is to be set are displayed in the Navigation window.

7.1 Creating Positioning Data

This section shows the procedure to create new positioning data in a project.

Positioning data displayed in the Navigation window can be changed in the "Connected model setting" screen.

Operating procedure

1. Configure "Connected model setting" in the Navigation window. (☞ Page 33 Setting a Connected Model)

Axes to which models are set are displayed in the Navigation window.

2. Select an axis in the Navigation window, and double-click it or press the ⌷Enter⌷ key.

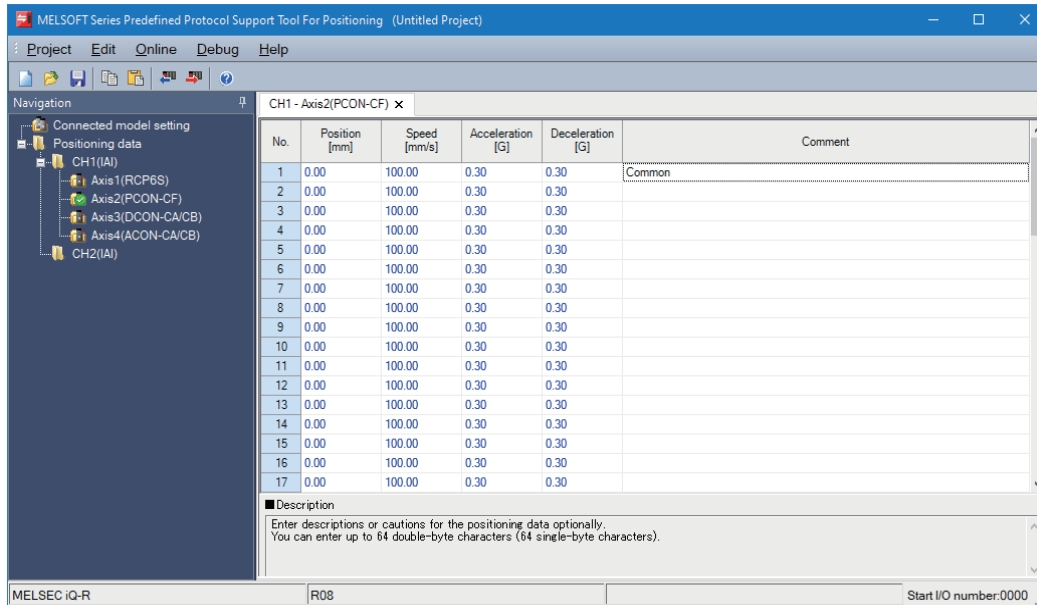A screen to set its positioning data appears.

3. Enter a value for each item in the screen.

7.2 Setting and Editing Positioning Data

This section shows items to be set for positioning data and respective editing methods.

Window

"Positioning data" ⇨ "(CH)" ⇨ "(Axis)" in the Navigation window.

Setting data

The following table shows the setting items for the simple display.

- IAI

Item	Description	Setting range	Initial value
Position	Set the target position by a relative distance from the home position (unit: mm).	-9999.99 to 9999.99	0.00
Speed	Set the speed in the operation (unit: mm).	0.01 to 9999.98	100.00
Acceleration	Set the acceleration (unit: G) at the operation start.	0.01 to 9.99	0.30
Deceleration	Set the deceleration (unit: G) at the operation completion (stop).	0.01 to 9.99	0.30
Comment	Enter a description or caution for the positioning data as necessary. It is not written to a controller. Manage the positioning data with comments as a project and save it to a file. Comments cannot be read from the positioning data of a controller.	64 characters	Blank

- Oriental Motor

Item	Description	Setting range	Initial value
Position	Set the position for positioning operation by the amount of movement from the home position (unit: step).	-8388608 to 8388607	0
Speed	Set the operating speed in positioning operation (unit: Hz).	0 to 1000000	1000
Acceleration Deceleration	Set the acceleration/deceleration rate (unit: ms/kHz) or acceleration/deceleration time (unit: s). This item is effective when "Acceleration/deceleration type" of the target controller is set to "separate." The unit can be set in the "Acceleration/deceleration unit" parameter of the target controller. For "Acceleration/deceleration type" and "Acceleration/deceleration unit," set them by using PC software developed by Oriental Motor.	0.001 to 1000.000	1.000
Operation mode	Set the method of specifying a position (travel amount) in positioning operation. • 0: Incremental • 1: Absolute	0 to 1	0
Comment	Enter a description or caution for the positioning data as necessary. It is not written to a controller. Manage the positioning data with comments as a project and save it to a file. Note that the comments cannot be read from operation data of a controller.	64 characters	Blank

Refer to the 'Considerations For Use' section.

☞ Page 18 Considerations For Use

• SMC

Item	Description	Setting range	Initial value
Movement MOD	Set the method of specifying a target position for positioning operation. • 1: Absolute coordination (based on the home position) • 2: Relative coordination (based on the home position)	1 to 2	1
Speed	Set the speed to move to the target position (unit: mm/s).	1 to 65535	100
Position	Set the target position (unit: mm).	-21474836.47 to 21474836.47	0.00
Acceleration	Set the acceleration to reach to the Speed (unit: mm/s^2).	1 to 65535	100
Deceleration	Set the deceleration to reach to the Speed (unit: mm/s^2).	1 to 65535	100
Comment	Enter a description or caution for the positioning data as necessary. It is not written to a controller. Manage the positioning data with comments as a project and save it to a file. Comments cannot be read from the step data of a controller.	64 characters	Blank

Items other than above can be set by switching to the detailed display.

For details on each setting item, refer to the manual of the controller used.

Point🔑

Values outside of the set range may be stored when positioning data of a controller is read.

If an error occurs in the set value, the icon indicating an error (🔲) is displayed in the Navigation window.

If the error cannot be found in the simple display, switch to the detailed display to check the error.

Switching the simple and detailed display formats

Simple display and detailed display can be switched by the following operations.

• [Edit] ⇨ [Change Edit Format] ⇨ [Simple]
• [Edit] ⇨ [Change Edit Format] ⇨ [Detail]

Copying/pasting data

Data of a project being edited, that of another project, and tabular format data created with Excel® can be utilized by the following operations.

- [Edit] ⇨ [Copy] ( )
- [Edit] ⇨ [Paste] ( )

Point

Copied data is stored in the clipboard as texts.

When multiple cells are selected, a line feed character is stored as the line separator, and a tab character as the column separator.
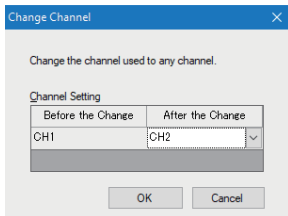
When pasting the data to Excel, select "Text" on the [Number] tab of "Format Cells" in Excel to display the copied character string as is.

Changing channels

Connected model settings and positioning data which are set to a channel can be moved to another channel.

Window

[Edit] ⇨ [Change Channel]

Operating procedure

1. Select a channel to be changed to.

2. Click the [OK] button.

Point

The "Change Channel" screen can also be displayed by right-clicking an axis in the Navigation window and selecting [Change Channel] from the shortcut menu.
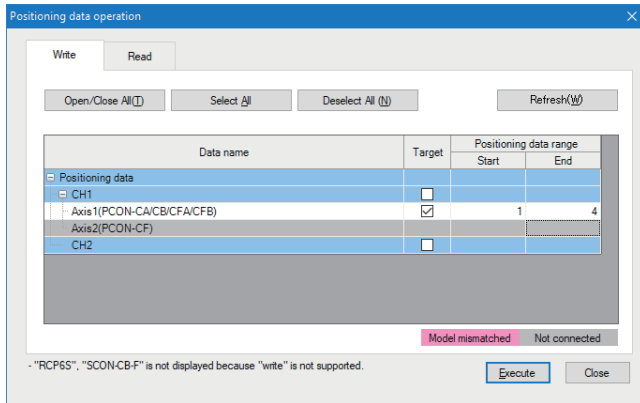
8 POSITIONING DATA OPERATIONS

This chapter explains operations to write/read positioning data to/from a controller.

8.1 Writing Positioning Data

Write created positioning data to a controller.

Window

[Online] ⇨ [Write Positioning Data] (📲)

> **Point**
>
> For details of the "Connected axis check" screen, refer to the following:
> ☞ Page 41 Checking a Connected Axis

Operating procedure

1. Select the [Write] tab in the "Positioning data operation" screen.

2. Select the checkbox of target positioning data.

3. Set "Positioning data range" of the positioning data whose checkbox is selected.

4. Click the [Execute] button.

The positioning data is written to a controller.

> **Point**
>
> In the following cases, check the settings and the actual system connection status.
> • Model mismatched (background color: pink): The model whose connection is confirmed does not match with the one set as the connected model.
> • Not connected (background color: gray): Connection cannot be confirmed.

Checking a Connected Axis

The "Connected axis check" screen appears at the first positioning data writing or reading after the following operations:
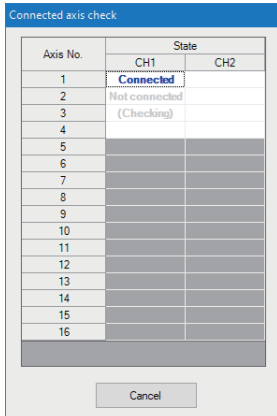
- Starting Support Tool
- Clicking the [Apply] button after changing "End axis No." or "Model" in the "Connected model setting" screen
- Changing channels (Page 39 Changing channels)

The "Connected axis check" screen does not appear when the check has been executed.

The screen can be displayed by clicking the [Refresh] button in the "Positioning data operation" screen.

Window

[Online] ⇨ [Write Positioning Data] ( )/[Read Positioning Data] ( )

The check result is displayed in the "State" column.

- Blank: not yet checked
- (Checking): check in progress
- Connected: connected properly
- Not supported: connection confirmed but unsupported
- Not connected: no connection

Point

The "Positioning data operation" screen is not displayed if there is an error in the check.
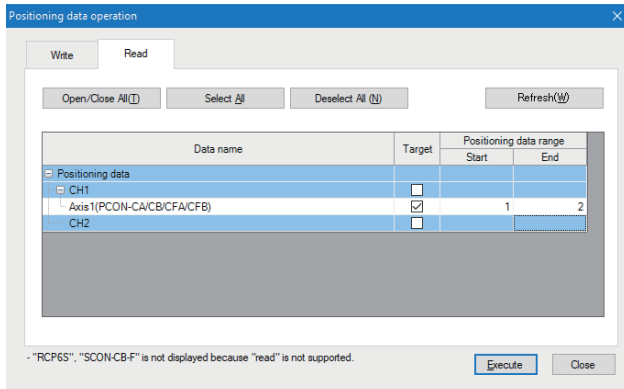
The check can be interrupted by clicking the [Cancel] button; however, information of axes whose connection had been confirmed before the interruption is displayed in the "Positioning data operation" screen.

8.2 Reading Positioning Data

Read positioning data from a controller.

Window

[Online] ⇨ [Read Positioning Data] ( )

Point

For details of the "Connected axis check" screen, refer to the following:

☞ Page 41 Checking a Connected Axis

Operating procedure

1. Select the [Read] tab in the "Positioning data operation" screen.

2. Select the checkbox of target positioning data.

3. Set "Positioning data range" of the positioning data whose checkbox is selected.

4. Click the [Execute] button.

The positioning data is read from a controller.

Point

Values outside of the set range may be stored when positioning data of a controller is read.

If an error occurs in the set value, the icon indicating an error ( ) is displayed in the Navigation window.

For the method to edit positioning data, refer to the following:

☞ Page 37 Setting and Editing Positioning Data

9 POSITIONING TEST

This chapter explains the positioning test functions.

A positioning test function adjusts positioning operation while monitoring the operation of an electric actuator.
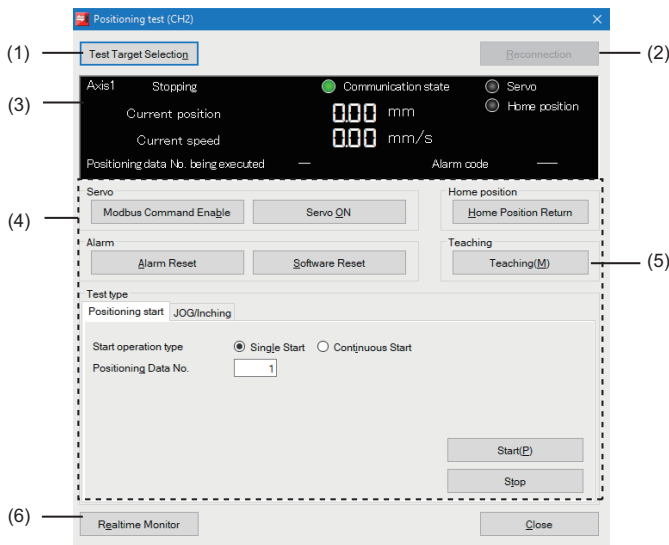
9.1 Common Operation

This section explains the basic operating procedure for the positioning test functions.

Window

[Debug] ⇨ [Positioning Test]

Select a channel number and an axis number of a test target in the "Select test target" screen.

Point

The "Positioning test" screen can also be displayed by right-clicking an axis in the Navigation window and selecting [Positioning Test] from the shortcut menu.

Displayed items

Item		Description
(1)	[Test Target Selection] button	To display the "Select test target" screen. The channel number and axis number of a test target can be selected in the "Select test target" screen. The status of the selected test target is displayed in the monitor area.
(2)	[Reconnection] button	To restart communication with a CPU module. This button can not be selected when communication is successfully established.
(3)	Monitor area	☞ Page 46 Operation by Manufacturers (IAI)
(4)	Test information area	☞ Page 52 Operation by Manufacturers (Oriental Motor) ☞ Page 58 Operation by Manufacturers (SMC)
(5)	[Teaching] button	To display the "Teaching" screen. By using the teaching function, a current position can be imported into the positioning data of a controller. ☞ Page 44 Teaching
(6)	[Realtime Monitor] button	To display the status of a test target with the realtime monitor function of GX LogViewer. ☞ Page 45 Realtime monitor It is displayed only for MELSEC iQ-R series.

Precautions

A measurement error occurs in "Current speed." Make sure to check the operation of the actual target device, and treat the current speed on the screen as a reference value.

Teaching

A current position can be imported into the positioning data of a controller.

The teaching function can be performed in the following cases by clicking the [Teaching] button in the "Positioning test" screen.

 • Support Tool communicates with a controller normally.
 • A CPU is in the STOP state.
 • An axis is stopped.
 • Modbus commands are enabled. (For IAI and SMC)

However, note that teaching cannot be performed during standby time for the continuous start operation (☞ Page 50 Continuous start) even when an axis is stopped.

Operating procedure

1. Click the [Teaching] button in the "Positioning test" screen.

The "Teaching" screen appears.
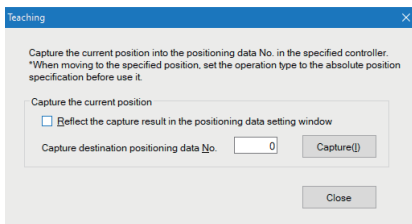
2. Set "Capture destination positioning data No." in the "Teaching" screen.

3. To import a current position into positioning data within a project, select the checkbox of "Reflect the capture result in the positioning data setting window."

4. Click the [Capture] button.

A current position is imported into positioning data.

Realtime monitor

The status of a test target can be displayed with the realtime monitor function of GX LogViewer.

Operating procedure

1. Click the [Realtime Monitor] button.

The "Realtime Monitor Setting" screen of GX LogViewer appears.

Monitor values can be updated only while the lamp indicating the communication status of a positioning test is ON.

2. Configure the settings for monitoring in the "Realtime Monitor Setting" screen.

3. Click the [Monitor Start] button in the screen.

For the method for using GX LogViewer, refer to the following:

📖 GX LogViewer Version 1 Operating Manual

Precautions

The displayed screen for the realtime monitor function of GX LogViewer is closed by either of the following operations.

Save the necessary monitoring result in GX LogViewer in advance.

• Closing the "Positioning test" screen
• Changing a test target by clicking the [Test Target Selection] button

Modules supporting this function

This function is not available for the MELSEC iQ-F series.

For modules supporting the realtime monitor function of GX LogViewer, refer to the following:

📖 GX LogViewer Version 1 Operating Manual

Monitored item list

The following shows the items monitored by the realtime monitor function.

Item	Data Type		
	IAI	Oriental Motor	SMC
Major Failure Alarm	Bit	Bit	—
Minor Failure Alarm	Bit	Bit	—
Alarm	—	—	Bit
Current position Monitor	Double word [signed]	Double word [signed]	Double word [signed]
Current speed Monitor	Double word [signed]	Double word [signed][1]	Word [Unsigned]
Modbus Command Enable/Disable	Bit	—	Bit
Axis ready	—	Bit	—
Servo[2]	Bit	Bit	Bit
Home Position Return Complete	Bit	Bit	Bit

[1] It is not displayed in RKII series.
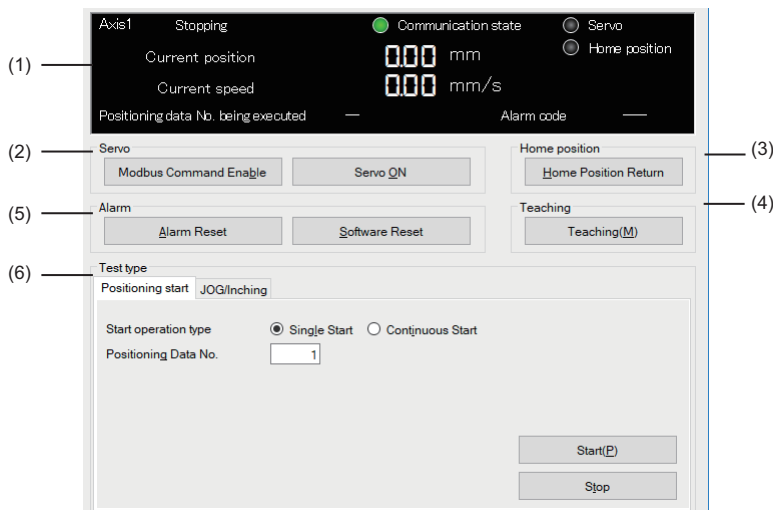[2] "Servo (Negative Logic)" is displayed in RKII series.

Restriction 🖑

> The values of a current position monitor and current speed monitor are displayed in integers.
> The values after the decimal point are rounded down.

9.2 Operation by Manufacturers (IAI)

This section explains the positioning test function when "IAI" is selected for "Select Manufacturer."

Displayed items

Item			Description	Reference
(1)	Monitor area		To display the status of a test target.	Page 47 Monitoring target axis
(2)	Servo		To send a command for changing test target status to a controller.	Page 47 Servo and home position Page 48 Preparation for test
(3)	Home position			
(4)	Teaching		To import a current position into the positioning data of a controller.	Page 44 Teaching
(5)	Alarm	[Alarm Reset] button	To reset an alarm.	Page 63 Checking Controller and Module Statuses
		[Software Reset] button	To restart a controller.	
(6)	Test type	[Positioning start] tab	To execute or stop the set positioning data.	Page 49 Positioning start
		[JOG/Inching] tab	To perform JOG or inching operation.	Page 51 JOG/Inching

Monitoring target axis

This section shows the status of a test target.

Displayed items

	Item	Description
(1)	Axis	To display the axis number of a test target.
(2)	Axis operation status	To display an axis operation status. The status follows Moving signal (MOVE), Push-motion operation in progress (PUSH), and Home return status (GHMS) of a controller. • Stopping: MOVE (0), PUSH (0), GHMS (0) • Moving: MOVE (1), PUSH (0), GHMS (0) • Pushing: PUSH (1) • Home position returning: GHMS (1)
(3)	Communication state	To display the communication status with an electronic actuator controller. • ON: Communication in progress (fixed cycle monitoring in progress) • OFF: Communication not executed
(4)	Servo	To display a servo status. The status follows Servo ON status (SV) in Device status register 1 (DSS1) of a controller. • ON: Servo ON • OFF: Servo OFF In the Servo OFF status, a controller does not accept any movement commands.
(5)	Home position	To display a home return status. The status follows Home return status (HEND) in Device status register 1 (DSS1) of a controller. • ON: Home return complete • OFF: Home return not yet complete
(6)	Current position	To display the current position of an electric actuator (unit: 0.01 mm).
(7)	Current speed	To display the current speed of an electric actuator (unit: 0.01 mm/s).
(8)	Positioning data No. being executed	To display a positioning data number being executed or executed last.
(9)	Alarm icon	To display an icon corresponding to the alarm levels. • 🔶 : Minor failure (message) • 🔺 : Major failure (operation cancellation or cold start)
	Alarm code	To display the alarm code of an occurring alarm.

Servo and home position

The following explains buttons that send a command for changing test target status to a controller.

Displayed items

	Item		Description
(1)	Servo	[Modbus Command Disable] button/ [Modbus Command Enable] button	To send a command for switching between PIO and Modbus. Modbus commands need to be enabled to perform home position return, switch a servo ON or OFF, and perform each function of tests.
		[Servo OFF] button/ [Servo ON] button	To send a servo ON or OFF command to a controller. A servo needs to be turned ON to perform operation such as home position return, positioning start, and the forward and reverse rotations of JOG/Inching.
(2)	Home position	[Home Position Return] button	To send a home position return command to a controller.

Preparation for test

Perform the following operation before using the positioning start or JOG/Inching function.

Operating procedure

1. [Debug] ⇨ [Positioning Test]

2. Select a channel number and an axis number of a test target in the "Select test target" screen.

The "Positioning test" screen appears.

The test target can be changed in the "Select test target" screen by clicking the [Test Target Selection] button on the "Positioning test" screen.

3. When the [Modbus Command Enable] button is displayed, click the button.

4. When the [Servo ON] button is displayed, click the button.

5. Click the [Home Position Return] button.

When the preparation is completed, both lamps of "Servo" and "Home position" are ON in the monitor area.

Positioning start

Positioning data can be executed by specifying a number.

Operating procedure

1. Check that both lamps of "Servo" and "Home position" are ON in the monitor area of the "Positioning test" screen.

When the lamps are OFF, refer to the following:

☞Page 48 Preparation for test

2. Select the [Positioning start] tab.

For operations when selecting "Continuous Start," refer to the following:

☞Page 50 Continuous start

3. Enter a positioning data number to be executed in "Positioning data No."

4. Click the [Start] button.

5. By clicking the [Stop] button, the positioning control being performed is decelerated and stopped.

Continuous start

Positioning data numbers can be specified and positioning control can be performed continuously by switching "Start operation type" to "Continuous Start."

1. Select "Continuous Start" for "Start operation type" in the [Positioning start] tab.
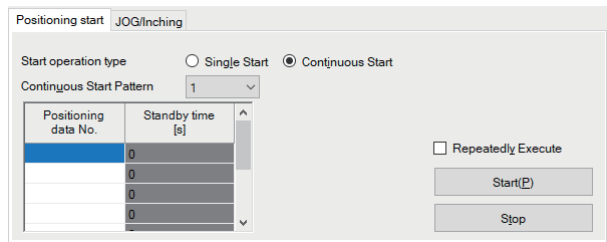
2. Enter a positioning data number to be executed in "Positioning data No."
By selecting multiple rows, then right-clicking and selecting [Input the serial number] from the shortcut menu, continuous values from the start of the specified range can be set in a batch.

3. For "Standby time," set the length of standby time until the next control starts in second units.

> **Restriction**
>
> In the continuous start operation, standby time may be different from the set time because a communication delay may occur depending on the status of a communication band or physical communication distance. Specify the standby time within a secure range by considering a communication delay.

4. Click the [Start] button.

5. By clicking the [Pause] button, positioning control is stopped at the time when the control being executed is completed. The axis operation status in the monitor area will be "Stopping."

6. By clicking the [Resume] button, positioning control is restarted from the next control that has been paused.

7. By clicking the [Stop] button, the positioning control being performed is decelerated and stopped.

■Repeat execution
Select the checkbox of "Repeatedly Execute" to execute settings repeatedly from the first row after the last row is completed.

■Stopping continuous start
By clicking the [Stop] button, the control being performed is canceled and an electric actuator is decelerated and stopped. Therefore, the actuator stops at a position different from the set position.
To terminate continuous start at the timing when one of the controls for set positioning data numbers is completed, click the [Pause] button first, and then click the [Stop] button.

■Patterns of continuous start
Up to three patterns can be set for the combination of positioning data numbers for continuous start. Select "Continuous Start Pattern" to switch the display.

■Considerations for when an alarm occurs
When an alarm occurs while the continuous start operation is in progress, the execution status of the actual electric actuator may not match with the one displayed in the monitor area.
Perform the continuous start operation again after removing an alarm cause and resetting the alarm. (☞ Page 63 Checking Controller and Module Statuses)
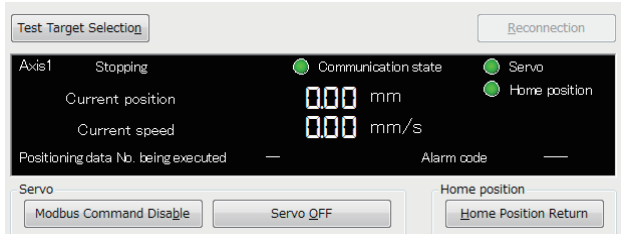
JOG/Inching

The current position of an axis can be moved by setting its speed or movement amount.
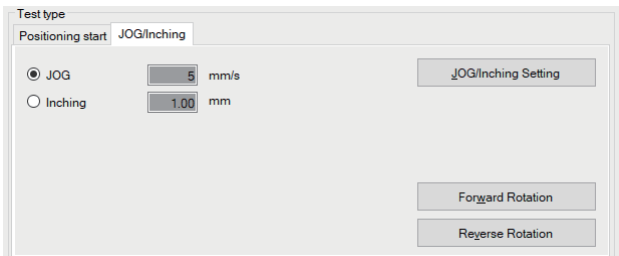
Operating procedure

1. Check that both lamps of "Servo" and "Home position" are ON in the monitor area of the "Positioning test" screen.

When the lamps are OFF, refer to the following:

☞Page 48 Preparation for test

2. Select the [JOG/Inching] tab.

3. Click the [JOG/Inching Setting] button.

4. Enter JOG operation speed or the amount of movement at inching operation in the "JOG/Inching setting" screen.
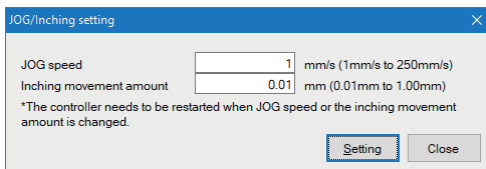
Item	Description
JOG speed	To enter the JOG operation speed.
Inching movement amount	To enter the travel distance of inching operation per time.

5. Click the [Setting] button in the "JOG/Inching setting" screen.

6. Select "JOG" or "Inching" in the [JOG/Inching] tab.

• JOG: The current position moves at the set speed during pressing the [Forward Rotation] or [Reverse Rotation] button.

• Inching: The current position moves by the set movement amount by clicking the [Forward Rotation] or [Reverse Rotation] button.

7. Click the [Forward Rotation] or [Reverse Rotation] button.

• Forward Rotation: The current position moves toward the positive direction.

• Reverse Rotation: The current position moves toward the negative direction.

Point

When "Inching" is selected, an inching is performed by the following key input.

• Forward Rotation: W

• Reverse Rotation: V

When "JOG" is selected, JOG operation is not performed even if the W and V keys are pressed.

9.3 Operation by Manufacturers (Oriental Motor)

This section explains the positioning test function when "Oriental Motor" is selected for "Select Manufacturer."
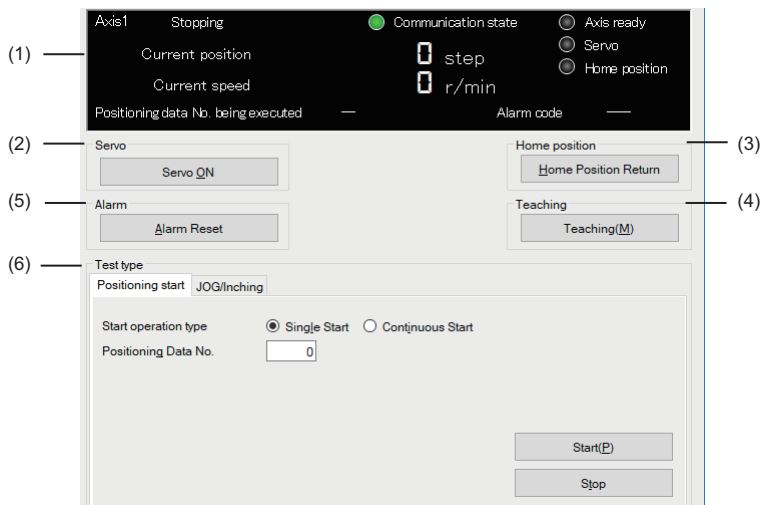
Displayed items

Item			Description	Reference
(1)	Monitor area		To display the status of a test target.	Page 54 Monitoring target axis
(2)	Servo		To send a command for changing test target status to a controller.	Page 54 Servo and home position
(3)	Home position			Page 55 Preparation for test
(4)	Teaching		To import a current position into the positioning data of a controller.	Page 44 Teaching
(5)	Alarm	[Alarm Reset] button	To reset an alarm.	Page 63 Checking Controller and Module Statuses
(6)	Test type	[Positioning start] tab	To execute or stop the set positioning data.	Page 56 Positioning start
		[JOG/Inching] tab	To perform JOG or inching operation.	Page 57 JOG/Inching

Advanced preparation

The remote I/O function of an Oriental Motor controller is used in the positioning test function of Support Tool.

Assignment of remote I/O

Before using the positioning test function, set the following controller parameters and assign the remote I/O by using PC software developed by Oriental Motor.

Precautions

Do not change controller parameters by the software while using Support Tool. (☞ Page 18 Considerations For Use)

Setting data

一: Optional

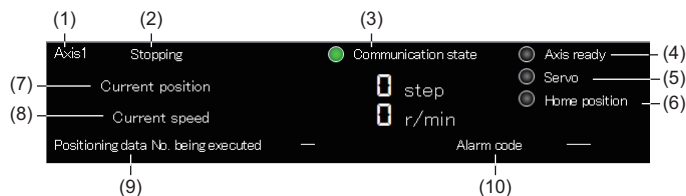| Type	AR series, RKⅡ series "I/O function [RS-485]" parameter			AZ series "Remote-I/O function (R-I/O)" parameter	
	Signal name	ARD-AD/CD/KD	RKSD503-AD/CD, RKSD507-AD/CD	Signal name	AZD-AD/CD/KD
Input signal	NET-IN0	M0	M0	R-IN0	START
	NET-IN1	M1	M1	R-IN1	HOME
	NET-IN2	M2	M2	R-IN2	STOP
	NET-IN3	M3	M3	R-IN3	C-ON
	NET-IN4	M4	M4	R-IN4	—
	NET-IN5	M5	M5	R-IN5	—
	NET-IN6	START	START	R-IN6	—
	NET-IN7	HOME	HOME	R-IN7	—
	NET-IN8	STOP	STOP	R-IN8	—
	NET-IN9	C-ON	AWO	R-IN9	—
	NET-IN10	FWD	FWD	R-IN10	—
	NET-IN11	RVS	RVS	R-IN11	—
	NET-IN12 to NET-IN15	—	—	R-IN12 to R-IN15	—
Output signal	NET-OUT0	HOME-P	HOME-P	R-OUT0	HOME-END
	NET-OUT1	READY	READY	R-OUT1	READY
	NET-OUT2	C-ON_R	AWO_R	R-OUT2	C-ON_R
	NET-OUT3	WNG	WNG	R-OUT3	INFO
	NET-OUT4	ALM	ALM	R-OUT4	ALM-A
	NET-OUT5	MOVE	MOVE	R-OUT5	MOVE
	NET-OUT6 to NET-OUT15	—	—	R-OUT6 to R-OUT15	—

Point🔎

When assigning the C-ON signal to both the remote I/O (accessed via RS-485 communication) and the direct I/O (accessed via the I/O signal connector), the positioning test function will be executed when both of them are set to ON.
When switching a servo ON or OFF only by the operation of the positioning test function, do not assign the C-ON signal to the direct I/O.

Monitoring target axis
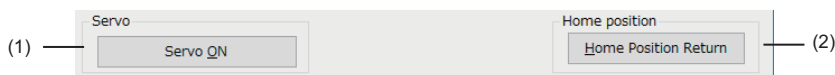
This section shows the status of a test target.

Displayed items

Item		Description
(1)	Axis	To display the axis number of a test target.
(2)	Axis operation status	To display an axis operation status. The status follows the output signal (MOVE) of a controller. • Stopping: MOVE (0) • Moving: MOVE (1)
(3)	Communication state	To display the communication status with an electronic actuator controller. • ON: Communication in progress (fixed cycle monitoring in progress) • OFF: Communication not executed
(4)	Axis ready	To display the output signal (READY) status of a controller.
(5)	Servo	To display a servo status. The status follows the output signal (C-ON_R/AWO_R) of a controller. • ON: Servo ON • OFF: Servo OFF In the Servo OFF status, a controller does not accept any movement commands.
(6)	Home position	To display a home return status. The status follows the output signal 1 (HOME-P/HOME-END) of a controller. • ON: Home return complete • OFF: Home return not yet complete
(7)	Current position	To display the current position of an electric actuator (unit: step).
(8)	Current speed	To display the current speed of an electric actuator (unit: r/min).
(9)	Positioning data No. being executed	To display a positioning data number being executed or executed last.
(10)	Alarm icon	To display an icon corresponding to the alarm levels. • ⚠ : Minor failure (warning or information) • 🔺 : Major failure (alarm)
	Alarm code	To display the alarm code of an occurring alarm.

Servo and home position

The following explains buttons that send a command for changing test target status to a controller.

Displayed items

Item			Description
(1)	Servo	[Servo OFF] button/ [Servo ON] button	To send a signal (C-ON/AWO) for switching between excitation and non-excitation of a motor to a controller. A servo needs to be turned ON to perform operation such as home position return, positioning start, and the forward and reverse rotations of JOG/Inching.
(2)	Home position	[Home Position Return] button	To send a home position return command (HOME) to a controller.

Preparation for test

Perform the following operation before using the positioning start or JOG/Inching function.

Operating procedure

1. [Debug] ⇨ [Positioning Test]

2. Select a channel number and an axis number of a test target in the "Select test target" screen.
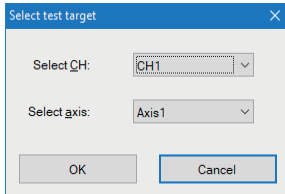
The "Positioning test" screen appears.
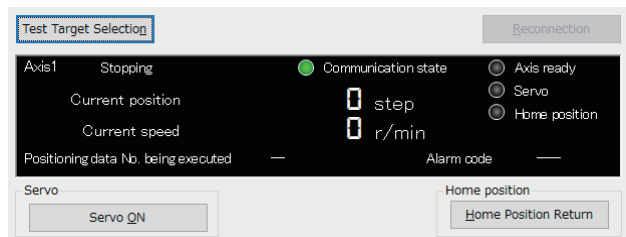
The test target can be changed in the "Select test target" screen by clicking the [Test Target Selection] button on the "Positioning test" screen.

3. When the [Servo ON] button is displayed, click the button.

4. Click the [Home Position Return] button.

When the preparation is completed, the lamps of "Axis ready," "Servo," and "Home position" are ON in the monitor area.

Positioning start

Positioning data can be executed by specifying a number.

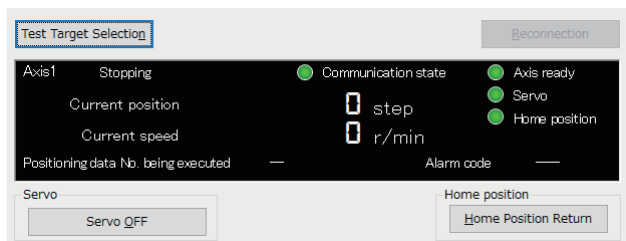## Operating procedure

1. Check that the lamp of "Axis ready" is ON in the monitor area of the "Positioning test" screen.

When the lamp is OFF, refer to the following:

☞ Page 48 Preparation for test

2. Select the [Positioning start] tab.

For operations when selecting "Continuous Start," refer to the following:

☞ Page 50 Continuous start

3. Enter a positioning data number to be executed in "Positioning data No."

4. Click the [Start] button.

5. By clicking the [Stop] button, the positioning control being performed is decelerated and stopped.
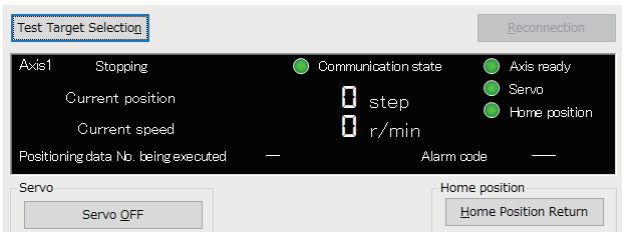
JOG/Inching

The current position of an axis can be moved by setting its speed or movement amount.
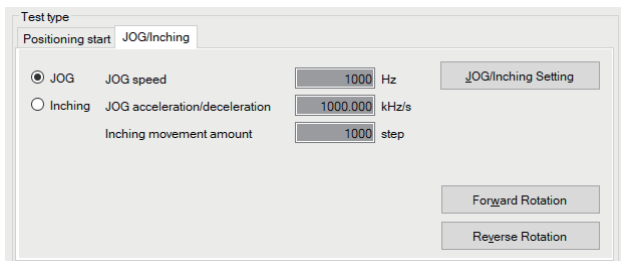
Operating procedure

1. Check that the lamp of "Axis ready" is ON in the monitor area of the "Positioning test" screen.

When the lamp is OFF, refer to the following:

2. Select the [JOG/Inching] tab.

3. Click the [JOG/Inching Setting] button.

4. Enter JOG operation speed or the amount of movement at inching operation in the "JOG/Inching setting" screen.
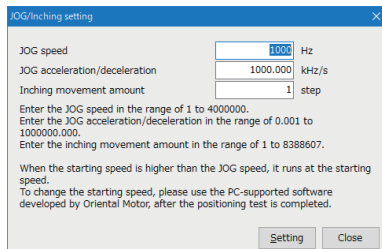
Item	Description
JOG speed	To enter the JOG operation speed.
JOG acceleration/deceleration	To enter the acceleration/deceleration time or rotation amount during JOG operation.
Inching movement amount	To enter the travel distance of inching operation per time.

5. Click the [Setting] button in the "JOG/Inching setting" screen.

6. Select "JOG" or "Inching" in the [JOG/Inching] tab.

- JOG: The current position moves at the set speed during pressing the [Forward Rotation] or [Reverse Rotation] button.
- Inching: The current position moves by the set movement amount by clicking the [Forward Rotation] or [Reverse Rotation] button.

7. Click the [Forward Rotation] or [Reverse Rotation] button.

- Forward Rotation: The current position moves toward the positive direction.
- Reverse Rotation: The current position moves toward the negative direction.

Point

When "Inching" is selected, an inching is performed by the following key input.
- Forward Rotation: W
- Reverse Rotation: V

When "JOG" is selected, JOG operation is not performed even if the W and V keys are pressed.

9.4 Operation by Manufacturers (SMC)

This section explains the positioning test function when "SMC" is selected for "Select Manufacturer."
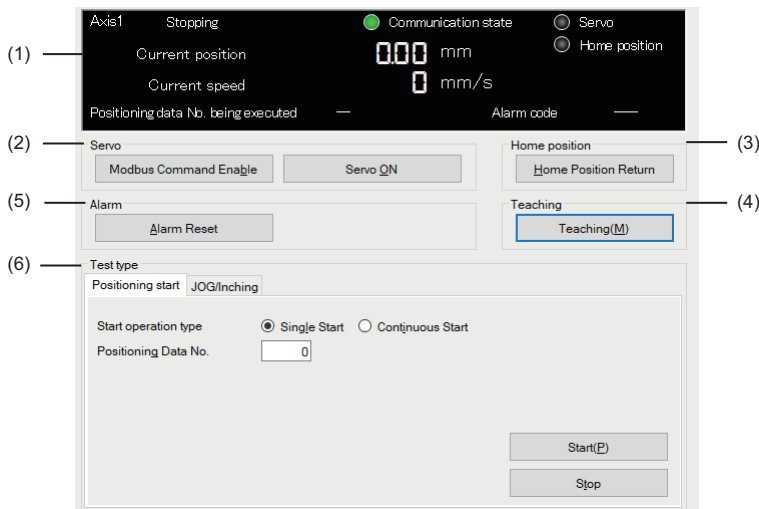
Displayed items

Item			Description	Reference
(1)	Monitor area		To display the status of a test target.	Page 59 Monitoring target axis
(2)	Servo		To send a command for changing test target status to a controller.	Page 59 Servo and home position Page 60 Preparation for test
(3)	Home position			
(4)	Teaching		To import a current position into the positioning data of a controller.	Page 44 Teaching
(5)	Alarm	[Alarm Reset] button	To reset an alarm.	Page 63 Checking Controller and Module Statuses
(6)	Test type	[Positioning start] tab	To execute or stop the set positioning data.	Page 61 Positioning start
		[JOG/Inching] tab	To perform JOG or inching operation.	Page 62 JOG/Inching

Monitoring target axis

This section shows the status of a test target.

Displayed items

Item		Description
(1)	Axis	To display the axis number of a test target.
(2)	Axis operation status	To display an axis operation status. The status follows the output signal (BUSY) of a controller. • Stopping: BUSY (0) • Moving: BUSY (1)
(3)	Communication state	To display the communication status with an electronic actuator controller. • ON: Communication in progress (fixed cycle monitoring in progress) • OFF: Communication not executed
(4)	Servo	To display a servo status. The status follows the output signal (SVRE) of a controller. • ON: Servo ON • OFF: Servo OFF In the Servo OFF status, a controller does not accept any movement commands.
(5)	Home position	To display a home return status. The status follows the output signal (SETON) of a controller. • ON: Home return complete • OFF: Home return not yet complete
(6)	Current position	To display the current position of an electric actuator (unit: 0.01 mm).
(7)	Current speed	To display the current speed of an electric actuator (unit: mm/s)
(8)	Positioning data No. being executed	To display a positioning data number being executed or executed last.
(9)	Alarm icon	To display an icon corresponding to the alarm levels. • ⚠ : Minor failure (alarm group B or C) • 🔥 : Major failure (alarm group D or E)
	Alarm code	To display the alarm code of an occurring alarm.

Servo and home position

The following explains buttons that send a command for changing test target status to a controller.
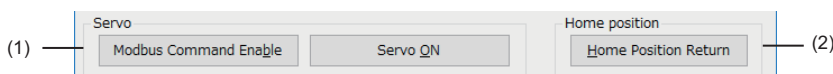
Displayed items

Item			Description
(4)	Servo	[Modbus Command Disable] button/ [Modbus Command Enable] button	To enable or disable operation instruction by the internal relay (Y30) for LEC serial communication of a controller. Modbus commands need to be enabled to perform home position return, switch a servo ON or OFF, and perform each function of tests.
		[Servo OFF] button/ [Servo ON] button	To send the input signal (SVON) which instructs a servo to turn ON or OFF to a controller. A servo needs to be turned ON to perform operation such as home position return, positioning start, and the forward and reverse rotations of JOG/Inching.
(5)	Home position	[Home Position Return] button	To send the input signal (SETUP) which instructs home position return to a controller.

Preparation for test

Perform the following operation before using the positioning start or JOG/Inching function.

Operating procedure

1. [Debug] ⇨ [Positioning Test]

2. Select a channel number and an axis number of a test target in the "Select test target" screen.

The "Positioning test" screen appears.

The test target can be changed in the "Select test target" screen by clicking the [Test Target Selection] button on the "Positioning test" screen.

3. When the [Modbus Command Enable] button is displayed, click the button.

4. When the [Servo ON] button is displayed, click the button.

5. Click the [Home Position Return] button.

When the preparation is completed, both lamps of "Servo" and "Home position" are ON in the monitor area.

Positioning start

Positioning data can be executed by specifying a number.

Operating procedure

1. Check that both lamps of "Servo" and "Home position" are ON in the monitor area of the "Positioning test" screen.

When the lamps are OFF, refer to the following:

☞ Page 48 Preparation for test

2. Select the [Positioning start] tab.

For operations when selecting "Continuous Start," refer to the following:

☞ Page 50 Continuous start

3. Enter a positioning data number to be executed in "Positioning data No."

4. Click the [Start] button.

5. By clicking the [Stop] button, the positioning control being performed is decelerated and stopped.

> **Point**
>
> When clicking the [Stop] button, the input signal (RESET) is sent to a controller.
> Therefore, for SMC controllers, an alarm is also reset when stopping positioning.

JOG/Inching

The current position of an axis can be moved by setting its speed or movement amount.
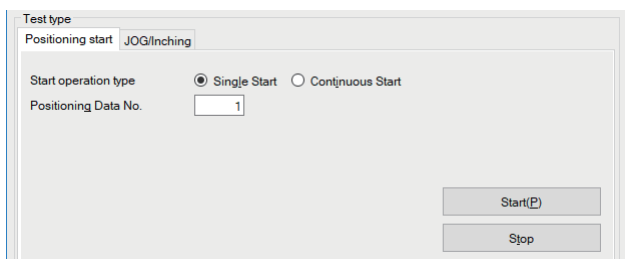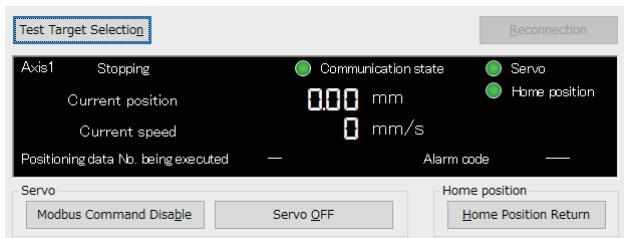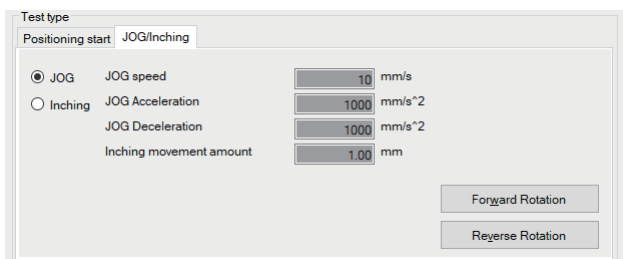
Operating procedure

1. Check that both lamps of "Servo" and "Home position" are ON in the monitor area of the "Positioning test" screen.

When the lamps are OFF, refer to the following:

☞ Page 48 Preparation for test

2. Select the [JOG/Inching] tab.

Item	Description
JOG speed	To indicate the JOG operation speed.
JOG Acceleration	To indicate acceleration during JOG operation.
JOG Deceleration	To indicate deceleration during JOG operation.
Inching movement amount	To indicate the travel distance of inching operation per time.

JOG speed, JOG acceleration, JOG deceleration, and inching movement amount cannot be changed in Support Tool.

Change these items in a setting tool developed by SMC.

3. Select "JOG" or "Inching" in the [JOG/Inching] tab.

- JOG: The current position moves at the set speed during pressing the [Forward Rotation] or [Reverse Rotation] button.
- Inching: The current position moves by the set movement amount by clicking the [Forward Rotation] or [Reverse Rotation] button.

4. Click the [Forward Rotation] or [Reverse Rotation] button.

- Forward Rotation: The current position moves toward the positive direction.
- Reverse Rotation: The current position moves toward the negative direction.

> **Point**
>
> When "Inching" is selected, an inching is performed by the following key input.
> - Forward Rotation: W
> - Reverse Rotation: V
>
> When "JOG" is selected, JOG operation is not performed even if the W and V keys are pressed.

10 TROUBLESHOOTING

This chapter explains the errors which may occur when using Support Tool, and corrective actions correspond to those errors.

10.1 Checking Controller and Module Statuses

This section shows the methods of checking an alarm occurred in a controller and an error occurred in the module of a programmable controller system.

Checking error descriptions of a module

Check the status of each module, network, and entire system of a programmable controller system by using the system monitor function in an engineering tool.

> **Point**
>
> For details on troubleshooting, refer to the manual of the module used.
> - For the error descriptions of a serial communication module and the details on troubleshooting, refer to the following:
> 📖MELSEC iQ-R Serial Communication Module User's Manual(Application)
> 📖Q Corresponding Serial Communication Module User's Manual (Basic)
> 📖MELSEC-L Serial Communication Module User's Manual (Basic)
> - For details on troubleshooting for MELSEC iQ-F series CPU modules, refer to the user's manual (hardware) of the module used.

Checking alarm descriptions of a controller

An alarm occurred in a controller is displayed on the "Positioning test" screen.

Window

[Debug] ⇨ [Positioning Test]
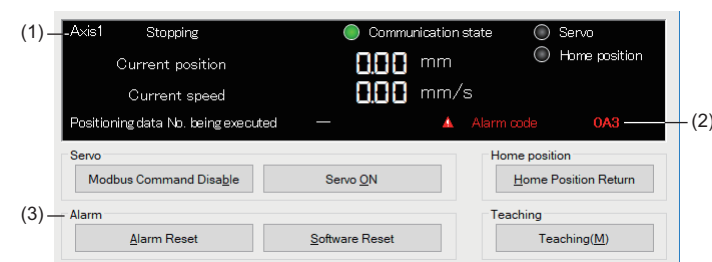
Displayed items

■IAI

Item			Description
(1)	Axis		To display a connection target axis number.
(2)	Occurring alarm	Alarm icon	To display an icon corresponding to the alarm levels. ⚠ : Minor failure: An alarm at the message level 🔺 : Major failure: An alarm at the operation release or cold start level
		Alarm code	To display an alarm code of a controller. For the alarm levels, causes, and corrective actions, refer to the manual of the controller used.
(3)	A button to be pressed after taking a corrective action	[Alarm Reset] button	To reset an alarm. Press the button when the alarm is at the level of "operation release" in the alarm code of a controller.
		[Software Reset] button	To restart a controller. Press the button when the alarm is at the level of "cold start" in the alarm code of a controller.

■**Oriental Motor**

Item			Description
(1)	Axis		To display a connection target axis number.
(2)	Occurring alarm	Alarm icon	To display an icon corresponding to the alarm levels. ⚠ Minor failure: This icon is displayed when the output signal of warning or information (WNG/INFO) is ON. 🔺 Major failure: This icon is displayed when the output signal of an alarm (ALM/ALM-A) is ON.
		Alarm code	To display an alarm code of a controller. If minor and major failure occurs simultaneously, an alarm code indicating major failure will be displayed. For the causes and corrective actions, refer to manuals of a controller being used.
(3)	A button to be pressed after taking a corrective action	[Alarm Reset] button	To reset an alarm. For AZ series, information is also cleared. For AR series and RKII series, a warning alarm is cancelled automatically on the controller side when the cause is removed.

■**SMC**

Item			Description
(1)	Axis		To display a connection target axis number.
(2)	Occurring alarm	Alarm icon	To display an icon corresponding to the alarm levels. ⚠ Minor failure: An alarm of the alarm group B or C 🔺 Major failure: An alarm of the alarm group D or E
		Alarm code	To display an alarm code of a controller. When multiple alarm codes are received, the first received code is displayed. For alarm groups, causes, and corrective actions, refer to manuals of the controller being used.
(3)	A button to be pressed after taking a corrective action	[Alarm Reset] button	To reset an alarm and operation. The input signal (RESET) is sent to a controller. Press the button when the alarm group of the controller is B, C, or D.

> **Point**
>
> A controller should be reset after removing the alarm cause. The cause may not be removed if the same alarm occurs again after the alarm is reset. A motor may cause malfunction when the reset is repeated without removing the cause.
> For the details on the controller alarm, refer to the manual of the controller used.

Checks when writing to/reading from positioning data

When an error occurred during writing to or reading from positioning data, an occurring error and an alarm are displayed in the "Write" or "Read" screen.

Window

Select [Online] ⇨ [Write Positioning Data] or [Read Positioning Data] and click the [Execute] button.
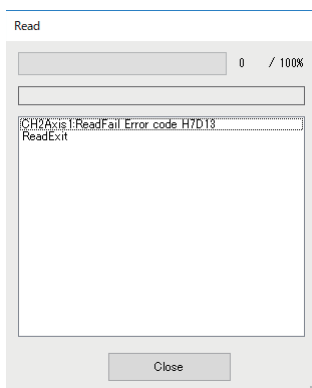
10.2 Troubleshooting by Symptom

When the functions of Support Tool may not operate normally, check the following items and perform troubleshooting.

Troubleshooting on installation and uninstallation

Symptom	Check point	Corrective action
The screen related to the license terms of Microsoft® Visual Basic® PowerPacks 10.0 appears.	—	Microsoft Visual Basic PowerPacks 10.0 is the required component for Support Tool. Check the license terms and install the component.
When installing this product, .NET Framework 4.0 is installed at the same time and the personal computer is restarted. After the restart of the personal computer, restarting of the personal computer is prompted again and unable to install this product. Restarting the personal computer again and again does not solve this problem.	Was the setting tool installed as the user with the administrator authority?	.NET Framework 4.0 must be installed with the administrator authority. Install the setting tool again with a user with the administrator authority.
When installing this product, a message that indicates .NET Framework 3.5 (including .NET 2.0 and 3.0) is disabled appears and unable to install.	Is .NET Framework 3.5 (including .NET 2.0 and 3.0) enabled?	Enable .NET Framework 3.5 (including .NET 2.0 and 3.0), and then install the setting tool again.

Troubleshooting on starting Support Tool

Symptom	Check point	Corrective action
Support Tool is not displayed on the menu.	Was Support Tool which is compatible with the programmable controller series being used installed?	Check the type of Support Tool which is compatible with the programmable controller series, and install it. ☞ Page 13 Software packages For the versions of GX Works3 which are supported by each version of Support Tool in which supported models are added, refer to the following: ☞ Page 68 Additions and Changes from Previous Version Update Support Tool and the engineering tool to the latest version as necessary. ☞ Page 21 How to Obtain Support Tool
	Has a project been set in GX Works3?	Set a project in GX Works3 before starting the GX Works3 compatible support tool. ☞ Page 21 Settings in GX Works3
Cannot start Support Tool.	Is the combination of the engineering tool and Support Tool versions correct?	Check a version of Support Tool compatible with the engineering tool and install it. ☞ Page 13 Software packages Update Support Tool and the engineering tool to the latest version as necessary. ☞ Page 21 How to Obtain Support Tool
	Has a project been set in GX Works2?	Set a project in GX Works2 before starting the GX Works2 compatible support tool. ☞ Page 23 Settings in GX Works2 Close GX Works2 once after setting the project.
	Is the module which is set in the engineering tool compatible with Support Tool?	Check the settings of the engineering tool and set a module which is compatible with Support Tool. For modules compatible with Support Tool, refer to the following: ☞ Page 14 Modules
	Are any unusable character strings used for the installation destination folder name?	Specify a folder whose name does not include unusable character strings as an installation destination, and reinstall Support Tool. For character strings that cannot be used for an installation destination folder name, refer to the following: ☞ Page 70 Unusable Character String (Reserved Word)

Troubleshooting on the display and operation of Support Tool

Symptom	Check point	Corrective action
Support Tool does not operate properly.	Was the product installed with "setup.exe"?	The required components are not installed if Support Tool is installed with "setup.msi." Install the product with "setup.exe."
Contents in the screen are not displayed properly. (For example, overlapping of icons, text overflowing from the frame of a button, etc.)	Is the size of the text and other items in the screen set to a value other than 100% (96 DPI, 9 pt etc.) in Windows settings?	• Set the value to 100% (96 DPI, 9 pt etc.). • For Windows 10 (version 1703 or later) or later[*1], the display of GX Works3 can be displayed with high DPI scaling by using a function of the operating system.[*2] ❶ Select and right-click 'ComUnitTool.exe'[*3] or 'ComUnitToolQL.exe'[*4], then select [Properties] from the shortcut menu. ❷ Click the [Change high DPI settings] button in the [Compatibility] tab. ❸ Select the checkbox of "Override high DPI scaling behavior. Scaling performed by:", then select "System" from the pull-down list. ❹ Click the [OK] button.

*1   The Windows version can be checked by the following procedure.
    ❶ Enter "winver" in the search box of Windows, and select it from the menu.
    ❷ Check the version in the displayed screen.
*2   Support Tool display will be blurred by enlarging.
    The following lists the setting values for "Change the size of text, apps, and other items" and the recommended display resolution for each setting value in Windows 10 or later.
    Setting value: 100%, display resolution: 1024 × 768 dots or more
    Setting value: 125%, display resolution: 1900 × 1200 dots or more
    Setting value: 150%, display resolution: 1900 × 1200 dots or more
    Setting value: 175%, display resolution: 2880 × 1620 dots or more
    Setting value: 200%, display resolution: 2880 × 1620 dots or more
    Setting value: 225%, display resolution: 3840 × 2160 dots or more
    Setting value: 250%, display resolution: 3840 × 2160 dots or more
*3   'ComUnitTool.exe' is stored in the folder where the GX Works3 compatible support tool (SW1DNN-SCMPTP) is installed.
    The following is an example of a storage location.
    64-bit version operating system: C:\Program Files (x86)\MELSOFT\SCMPTP\ComUnitTool.exe
    32-bit version operating system: C:\Program Files\MELSOFT\SCMPTP\ComUnitTool.exe
*4   'ComUnitToolQL.exe' is stored in the folder where the GX Works2 compatible support tool (SW1DNN-SCPMRP) is installed.
    The following is an example of a storage location.
    64-bit version operating system: C:\Program Files (x86)\MELSOFT\SCPMRP\ComUnitToolQL.exe
    32-bit version operating system: C:\Program Files\MELSOFT\SCPMRP\ComUnitToolQL.exe

Troubleshooting on accessing to the connection destination device

Symptom	Check point	Corrective action
Cannot communicate with the module. (Cannot operate online)	Is there a disconnection along the connection route?	• Connect the cables properly. • Replace the cable with new one.
	Is Windows firewall enabled on the personal computer?	Disable Windows firewall on the personal computer.
	Is antivirus software blocking Ethernet communications?	• Change the antivirus software settings to allow Ethernet communications. • Lower the antivirus software's security setting level. • Stop the antivirus software.
	Is there any problem on the personal computer?	Replace it with another personal computer.
	Is connecting and disconnecting a USB cable, resetting the CPU module, or turning the power ON or OFF performed frequently during communication with a CPU module?	A communication error may occur and it may not be recovered if connecting and disconnecting a USB cable, resetting the CPU module, or turning the power ON or OFF is performed frequently during communication with a CPU module. If the operation is not recovered from an error, remove the USB cable. Then, connect it again after five or more seconds. (Even after this operation, an error may occur at initial communication. However, communication will be successful after that.)
	Do the module type and operation mode set in the start source GX Works3 project match with the actual connected programmable controller CPU module? Alternatively, does the personal computer type set in the GX Works2 project before starting Support Tool match with the actual connected programmable controller CPU module?	End Support Tool, and then restart it after matching project settings with the actual connection destination in a corresponding engineering tool. Note that settings which are changed in an engineering tool while Support Tool is running will not be applied to Support Tool.
	Does the model set in Support Tool match with the actual connected electric actuator product?	Check the connected model settings, and try to communicate again. ☞ Page 33 Setting a Connected Model

When an abnormality exists in a module, the functions of setting tool may not operate normally. Refer to the user's manual of each CPU and perform troubleshooting.

APPENDIX

Appendix 1 Additions and Changes from Previous Version

Predefined Protocol Support Tool For Positioning

This section shows the additions and changes with upgrade.

Module type

■Supported modules

Supported version	Series	Module name	Model name	Supported version of GX Works3
Version 1.001B	MELSEC iQ-F	FX5U CPU module	FX5U-32MR/DS, FX5U-32MR/ES, FX5U-32MT/DS, FX5U-32MT/DSS, FX5U-32MT/ES, FX5U-32MT/ESS, FX5U-64MR/DS, FX5U-64MR/ES, FX5U-64MT/DS, FX5U-64MT/DSS, FX5U-64MT/ES, FX5U-64MT/ESS, FX5U-80MR/DS, FX5U-80MR/ES, FX5U-80MT/DS, FX5U-80MT/DSS, FX5U-80MT/ES, FX5U-80MT/ESS	Version 1.060N or later When the display language is set to English: Version 1.061P or later
		FX5UC CPU module	FX5UC-32MR/DS-TS, FX5UC-32MT/D, FX5UC-32MT/DS-TS, FX5UC-32MT/DSS, FX5UC-32MT/DSS-TS, FX5UC-64MT/D, FX5UC-64MT/DSS, FX5UC-96MT/D, FX5UC-96MT/DSS	

■Supported manufacturers and models

Supported version	Manufacturer name	Model name	Supported version of GX Works3
Version 1.002C	IAI	ERC2(SE), ERC3	—
	Oriental Motor	ARD-AD/CD/KD, AZD-AD/CD/KD, RKSD503-AD/CD, RKSD507-AD/CD	
	SMC	LECP6/LECA6	
Version 1.004E	SMC	JXC51/JXC61	

Functions and operability

■Version 1.001B

Item	Description	Reference
Realtime monitor	GX LogViewer can be started and data of positioning operations can be displayed on the trend graph.	Page 45 Realtime monitor
Changing channels	Connected model settings and positioning data set to a channel can be moved to another selected channel.	Page 39 Changing channels

■Version 1.002C

Item	Description	Reference
Positioning data	Guidance of IAI-related items displayed in the "Description" section in the setting screen of positioning data is improved.	Page 37 Setting and Editing Positioning Data

■Version 1.003D

Item	Description	Reference
Positioning data	Positioning data settings related to pressing operation when "IAI" is selected for "Select Manufacturer" are improved.	Page 37 Setting and Editing Positioning Data

■Version 1.004E

Item	Description	Reference
Positioning test	The teaching function is added.	Page 44 Teaching
	The continuous start function is added to the positioning start function.	Page 50 Continuous start

■Version 1.005F

Item	Description	Reference
Operating environment	Windows 11 is supported.	Predefined Protocol Support Tool For Positioning Installation Instructions
	Windows 7, Windows 8, and Windows 8.1 are no longer supported.	

Predefined Protocol Support Tool For Positioning (Q/L)

Functions and operability

■Version 1.001B

Item	Description	Reference
Positioning data	Positioning data settings related to pressing operation when "IAI" is selected for "Select Manufacturer" are improved.	Page 37 Setting and Editing Positioning Data
Operating environment	Windows 11 is supported.	Predefined Protocol Support Tool For Positioning Installation Instructions
	Windows 7, Windows 8, and Windows 8.1 are no longer supported.	

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Appendix 2 Unusable Character String (Reserved Word)

Reserved words may not be used for names.

When the character strings defined as reserved words are used for names, an error occurs at the registration or conversion.

Precautions

Characters are not case-sensitive.

Unusable character strings for project name

Category		Character string
Invalid character	Symbol	", %, ', *, /, :, <, >, ?, \, |
	Surrogate pair	0xD800 to 0xDBFF, 0xDC00 to 0xDFFF
	Control code	U+0000 to U+001F, U+0080 to U+009F, U+00A0 to U+00BF, U+FFFE, U+FFFF
Windows reserved word		COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9, LPT1, LPT2, LPT3, LPT4, LPT5, LPT6, LPT7, LPT8, LPT9, AUX, CON, PRN, NUL, CLOCK$, END_MARK

Unusable character strings for folder name

If any of the following invalid characters are used for an installation destination folder name, Support Tool does not start normally.

Category		Character string
Invalid character	Symbol	", ;, ,, *, /, :, <, >, ?, \, |
	Surrogate pair	0xD800 to 0xDBFF, 0xDC00 to 0xDFFF
	Control code	U+0000 to U+001F, U+0080 to U+009F, U+00A0 to U+00BF, U+FFFE, U+FFFF
Windows reserved word		COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9, LPT1, LPT2, LPT3, LPT4, LPT5, LPT6, LPT7, LPT8, LPT9, AUX, CON, PRN, NUL, CLOCK$, END_MARK

Appendix 3 Using a Project in a Different Version

This section explains the considerations for using a project in a different version from the one in which the project was created.

Note the following contents to use a project.

Predefined Protocol Support Tool For Positioning

Using a project in a later version

There is no restrictions.

Using a project in an earlier version

■Using a project, which was created in version 1.001B or later, in version 1.000A

A project cannot be opened since there is no data consistency.

■Using a project, which was created in version 1.002C or later, in version 1.001B or earlier

A project cannot be opened since there is no data consistency.

■Using a project, which was created in version 1.004E or later, in version 1.003D or earlier

A project cannot be opened since there is no data consistency.

Predefined Protocol Support Tool For Positioning (Q/L)

There is no restrictions.

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Appendix 4 USB Driver Installation Procedure

To communicate with a CPU module via USB, installing a USB driver is required.

If multiple MELSOFT products are installed previously, refer to the folder where the first MELSOFT product is installed.

Operating procedure

1. Connect the personal computer and the CPU module with a USB cable, and power ON the programmable controller.

2. Update a driver software in Windows Device Manager. The drive software is stored in the "Easysocket\USBDrivers" folder where GX Works3 is installed.

If multiple MELSOFT products are already installed, specify "Easysocket\USBDrivers" in the folder of the first product installed.

For details on the procedure, refer to the following:

📖GX Works3 Operating Manual

📖GX Works2 Version 1 Operating Manual (Common)

Appendix 5 Setting Example

This section shows a setting example in a simple system using Support Tool.

System configuration

Configure the sample system using the following devices and software.
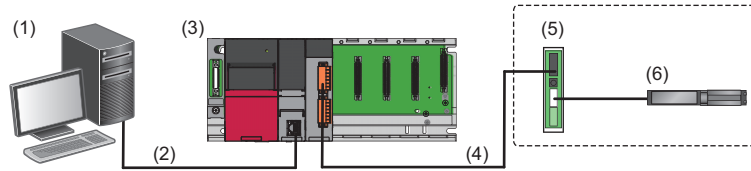
Device/software			Model/description
(1)	Personal computer	OS	Microsoft Windows 10 (Professional)
	Engineering tool	GX Works3	SW1DND-GXW3
	Predefined Protocol Support Tool For Positioning		SW1DNN-SCMPTP
(2)	Connection between a personal computer and a CPU module	USB cable (Direct connection)	USB cable (USB A type — USB miniB type)
(3)	Programmable controller system	CPU module	R08CPU
		Serial communication module	RJ71C24-R4
(4)	Connection between a serial communication module and a controller		Modbus RTU
(5)	Controller		PCON-CB
(6)	Electric actuator		RCP3-TA

Settings in GX Works3

Configure the settings in GX Works3 by following the procedure below before starting Support Tool.

Operating procedure

1. Select "Parameter" ⇨ "Module Information" in the Navigation window of GX Works3, then right-click it and select [Add New Module] from the shortcut menu.

2. Select each item as follows in the "Add New Module" screen.

Item		Setting value
Module Type		Information Module
Module Name		RJ71C24-R4
Advanced Settings	Mounted Slot No.	0
	Start I/O No. Specification	Not Set

3. Set the following items to "CH1" in the created 'Module Parameter.'

Item		Setting value
Communication protocol setting		Predefined protocol
Communication speed setting		38400 bps (Set the value according to the setting of an electric actuator controller to be used.)
Transmission setting	Data bit	8
	Parity bit	None
	Stop bit	1
Communication control specification	Echo back enable/prohibit specification	Echo back prohibit

4. Write the set parameters to the programmable controller system.

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System settings in Support Tool

Start Support Tool and configure the settings by following the procedure below.

Operating procedure

1. Start Predefined Protocol Support Tool For Positioning from the menu of GX Works3. (☞ Page 25 Start and End)

2. Select [Project] ⇨ [New].

Set the following items in the "Select manufacturer" screen.

Item	Setting value
Select Manufacturer	IAI
The channel to be used	CH1

3. Select "Connected model setting" in the Navigation window.

Set the following items in the "Connected model setting" screen.

Item	Setting value
End axis No.	4
Axis1Model	2: PCON-CA/CB/CFA/CFB
Clear OS area (receive data area) before protocol execution	Yes
Receive Wait Time	30
Number of Send Retries	3
Send Retry Interval	100
Send Standby Time	0
Send Monitoring Time	30

4. Select [Online] ⇨ [Start I/O number setting].

Set the start I/O number of the serial communication module.

5. Select [Online] ⇨ [Write the Predefined Protocol Information].

Select "Intelligent function module."

6. Enable the parameters by resetting the CPU module.

Positioning data settings and writing

Set positioning data and write it to the controller.

Operating procedure

1. Select 'Axis1' in the Navigation window and double-click it.

Enter a value for each item for the positioning data. (☞ Page 37 Setting and Editing Positioning Data)

Item	Setting value
Position	10.00
Speed	100.00
Acceleration	0.30
Deceleration	0.30

2. Select [Online] ⇨ [Write Positioning Data].

Write the created positioning data to the controller. (☞ Page 40 Writing Positioning Data)

Positioning test

Execute the positioning data written to the controller.

Operating procedure

1. Select 'Axis1' in the Navigation window, then right-click it and select [Positioning Test] from the short cut menu.

2. Check that both lamps of "Servo" and "Home position" are ON in the monitor area of the "Positioning test" screen.

When the lamps are OFF, click the [Modbus Command Enable], [Servo ON], and [Home Position Return] buttons.

3. Enter a positioning data number to be executed in "Positioning data No."

4. Click the [Start] button.

5. Check the operation status in the monitor area of the "Positioning test" screen.

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REVISIONS

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