MITSUBISHI ELECTRIC

Personal Computer Embedded Type Servo System Controller

Motion Control Software SWM-G Operating Manual

-MR-SWMG16-U
-MR-SWMG32-U
-MR-SWMG64-U
-MR-SWMG128-U

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.

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

- Configure safety circuits externally to ensure that the entire system operates safely 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.
  (1) Configure external safety circuits, such as an emergency stop circuit, protection circuit, and protective interlock circuit for forward/reverse operation or upper/lower limit positioning.
  (2) If an incorrect home position return direction is set, motion control may continue without deceleration. To prevent machine damage caused by this, configure an external interlock circuit.
  (3) When this product detects an error, the motion slows down and stops or the motion rapidly stops, depending on the stop setting in parameter. Set the parameter to meet the specifications of the positioning control system. In addition, set the home position return parameter and positioning data within the specified setting range.
- For the operating status of each station after a communication failure, refer to manuals for the network used. Incorrect output or malfunction due to a communication failure may result in an accident.
- When modifying control while this product is running, configure an interlock in the program to ensure that the entire system always operates safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change (status control)), read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents. Determine corrective actions to be taken by the system in case of a communication failure.
- Especially, when a remote system is controlled, immediate action cannot be taken if a problem occurs due to a communication failure. To prevent this, configure an interlock in the program, and determine corrective actions to be taken by the system in case of a communication failure.
- If a communication cable is disconnected, the network may be unstable, resulting in a communication failure of multiple stations. Configure an interlock in the program to ensure that the entire system will always operate safely even if communications fail. Failure to do so may result in an accident due to an incorrect output or malfunction.

[Design Precautions]

⚠WARNING

- If safety standards (ex. robot safety rules, etc.) apply to the system using the servo amplifier and servomotor, make sure that the safety standards are satisfied.
- Construct a safety circuit external to each remote station if the abnormal operation of the remote stations to be connected to this product differs from the safety directive operation in the system.

[Design Precautions]

⚠CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100 mm or more between them. Failure to do so may result in malfunction due to noise.
- After the personal computer is powered on or rebooted, the time taken for the system to enter the RUN status varies depending on the system configuration and/or performance of the personal computer. Design circuits so that the entire system will always operate safely, regardless of the time.

[Security Precautions]

⚠WARNING

- To maintain the security (confidentiality, integrity, and availability) of 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.

[Wiring Precautions]

⚠CAUTION

- Ground the controllers in which this product is installed, servo amplifiers, and servo motors with a ground resistance of 100 ohm or less. Do not use a common grounding with other equipment.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100 mm or more between them. Failure to do so may result in malfunction due to noise.
- Place the cables in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the cables or malfunction due to poor contact.
- Check the interface type and correctly connect the cable. Incorrect wiring (connecting the cable to an incorrect interface) may cause failure of the external device.
- When disconnecting the cable, do not pull the cable by the cable part. Pulling the cable may result in malfunction or damage to the cable.
- Prevent foreign matter such as dust or wire chips from entering the personal computer. Such foreign matter can cause a fire, failure, or malfunction.
- For Ethernet cables to be used in the system, select the ones that meet the specifications in the user's manual. If not, normal data transmission is not guaranteed.

[Startup and Maintenance Precautions]

⚠WARNING

- Shut off the external power supply (all phases) used in the system before cleaning. Failure to do so may result in electric shock or malfunction.
- Do not connect or disconnect any communication cable while power is on. Failure to do so may cause malfunction.

[Startup and Maintenance Precautions]

⚠CAUTION

- When modifying control while this product is running, configure an interlock in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change (status control)), read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents. Determine corrective actions to be taken by the system in case of a communication failure.
- Especially, when a remote system is controlled, immediate action cannot be taken if a problem occurs due to a communication failure. To prevent this, configure an interlock in the program, and determine corrective actions to be taken by the system in case of a communication failure.
- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25 cm away in all directions from the personal computer. Failure to do so may cause malfunction.
- Maintenance must be performed by qualified maintenance personnel with knowledge.
- Before testing the operation, set a low speed value for the speed limit parameter 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.
- When using the absolute position system function, on starting up, and when the absolute position motor has been replaced, always perform a home position return.
- Before starting the operation, confirm the brake function.
- Do not perform a megger test (insulation resistance measurement) during inspection.
- After maintenance and inspections are completed, confirm that the position detection of the absolute position detection function is correct.
- Extreme adjustments and changes may lead to unstable operation, so never make them.

[Operating Precautions]

⚠CAUTION

- When modifying control (such as data modification, program change, or operating status change (status control)), read relevant manuals carefully and ensure the safety before operation. Incorrect change or modification may cause system malfunction, damage to the machines, or accidents.
- Do not go near the machine during test operations. Doing so may lead to injuries.

CONDITIONS OF USE FOR THE PRODUCT

(1) Mitsubishi Motion Control Software ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

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

(3) We will not responsible for any problems on Motion Control Software and systems caused by DoS attacks, unauthorized accesses, computer viruses, and other cyber attacks.

INTRODUCTION

Thank you for purchasing Motion Control Software SWM-G.
This manual describes the required operating procedure of the engineering tool for using Motion Control Software SWM-G.
Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of the product to handle it correctly.
Make sure that the end users read this manual.

Applicable module

MR-SWMG16-U, MR-SWMG32-U, MR-SWMG64-U, MR-SWMG128-U

CONTENTS

RELEVANT MANUALS

Manual name [manual number]	Description	Available form
Motion Control Software SWM-G Operating Manual [IB-0300563ENG] (this manual)	System configuration, parameter settings, and online function operations of Motion Control Software SWM-G.	PDF
Motion Control Software SWM-G User's Manual (Installation) [IB-0300561ENG]	Required procedures and settings for installing Motion Control Software SWM-G in a personal computer.	PDF
Motion Control Software SWM-G User's Manual (Startup) [IB-0300562ENG]	Specifications, procedures before operation, and settings of Motion Control Software SWM-G.	PDF

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
I/O size	The number of I/O points. It is expressed in bytes.
MR Configurator2	The product name of the servo setup software.
MR-J5-G	An MR-J5-□G□(-RJ) servo amplifier.
MR-J5W-G	An MR-J5W□-□G servo amplifier.
NIC	A network interface card for Ethernet connection.
RTX	An extension function that operates Windows in real time, which is developed by IntervalZero. RTX64 is compatible with 64-bit natively.
RTX64	
SWM-G	A generic product name for Motion Control Software SWM-G.
SWM-G engine	A task on RTX64 that performs management of SWM-G modules, axis management, and API processing.
SWMOS	A generic product name for the engineering tool SWM-G Operating Station.
Device	An object for the communication between a user application and the SWM-G engine or each module.
Personal computer	A generic term for personal computers where Windows® operates.
Platform	A generic term for network connection functions to be loaded to RTX64. CC-Link IE TSN and a simulator are available as modules.
Module	A generic term for modules to be loaded to RTX64. A file with the extension "rtdll".
User unit	A unit of the position defined by the user (such as 1 mm and 1 μs). It is abbreviated as "U". The speed is expressed as "U/s", the acceleration is expressed as "U/s^2", and the jerk is expressed as "U/s^3" in user unit.

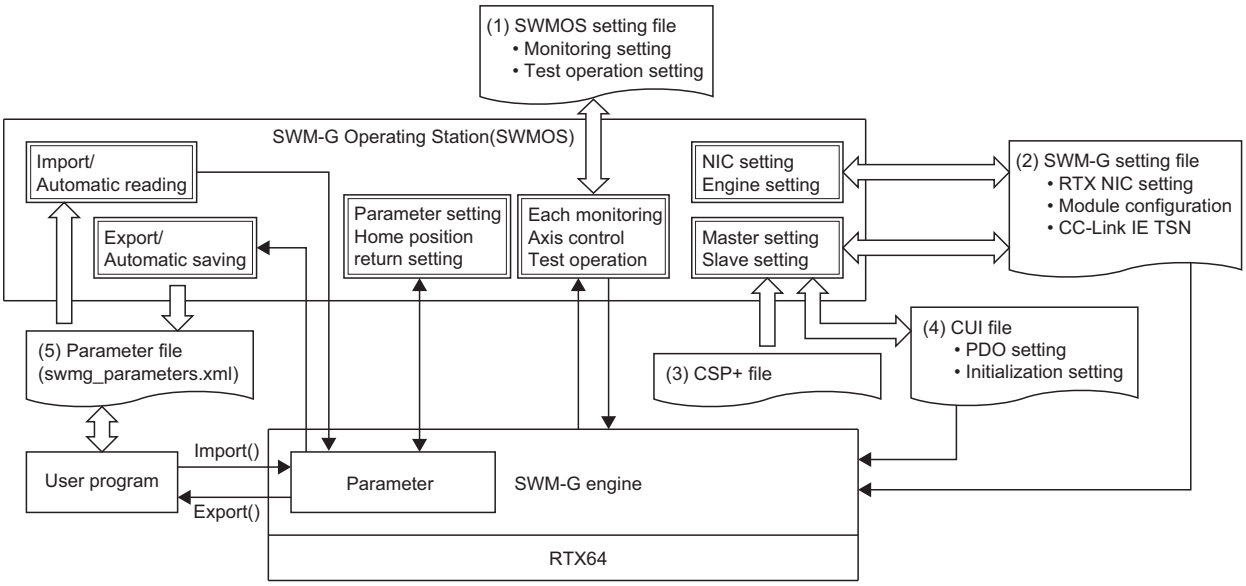
PART 1 BASICS OF SWMOS

This part describes the screen configuration and basic operation of SWMOS.

1 FUNCTION OF SWMOS

SWM-G Operating Station (SWMOS) is an engineering tool for SWM-G to configure various settings of SWM-G and to perform test operation on the personal computer in which the SWM-G engine is operating.

Overall configuration diagram and files used



File		Program used	Description
(1) SWMOS setting file	*.db	SWMOS	Used to set various types of monitoring, axis control, and test operation. Generated for each SWMOS project.
(2) SWM-G setting file	RTX NIC setting (RtxTcplp.ini)	SWMOS	Created in the NIC setting.
		SWM-G engine	Read at the startup of the engine.
	Module configuration (Module.ini)	SWMOS	Created in the engine setting.
		SWM-G engine	Read at the startup of the engine.
	CC-Link IE TSN master setting (*.def)	SWMOS	Created when "Save to Project" or "Save to Engine" is executed in the network setting.
		SWM-G engine	Read when the communication is started.
(3) CSP file	*.cspp	SWMOS	Read at network setting.
(4) CUI file	*.txt	SWMOS	Created when "Save to Project" or "Save to Engine" is executed in the network setting.
		SWM-G engine	Read when the communication is started.
(5) Parameter file	swmg_parameters.xml or an optional file name	SWMOS	The file is read and applied to the engine with the import function and automatic read. Parameters are read from the engine and the file is created with the export function and automatic save.
		User program	Used for the parameter file API such as Export() and Import().

1.1 Main Functions of SWMOS

The following table lists the main functions of SWMOS.

Function	Description	Reference
Project management	Manages settings used in the test operation or others as project data.	☞ Page 19 Home Tab
SWMOS system configuration	Sets the system configuration of SWMOS.	☞ Page 33 Configuration Tab
Network communication operation	Starts or stops the network communication.	☞ Page 39 Operation Tab
Axis control, axis status monitor	Performs control such as the servo ON/OFF of all the axes, alarm clear, and emergency stop. In addition, current values and status of axes are monitored and displayed.	☞ Page 39 Operation Tab
Waveform data collection/analysis	Collects waveform data and analyzes start timing and waveform patterns.	☞ Page 49 Analyzer Tab ☞ Page 155 CHART DISPLAY FUNCTION
SWMG engine setting/check	Checks the module setting and engine execution status of the SWMG engine.	☞ Page 53 SWM-G engine
License management	Manages the license of SWMG.	☞ Page 60 License
System diagnosis	Diagnoses the system of SWMG.	☞ Page 65 Diagnostics
Network setting	Configures the network setting of CC-Link IE TSN.	☞ Page 66 Network Setting
Axis setting	Sets parameters of axes and performs home position return.	☞ Page 96 Axis Setting
Single axis test operation	Performs test operation such as JOG operation, positioning operation, inching operation, speed control, and torque control.	☞ Page 105 Single-axis control
Multi-axis test operation	Performs test operation of multiple axes.	☞ Page 119 Multi-axis control
Interpolation control test operation	Performs test operation of linear interpolation, circular interpolation, and helical interpolation.	☞ Page 123 Interpolation control
Gantry control test operation	Performs home position return and test operation of the gantry control.	☞ Page 131 Gantry control
I/O control test	Performs control and monitoring of the digital I/O and analog I/O.	☞ Page 138 I/O Control

2 SCREEN CONFIGURATON AND BASIC OPERATION

This chapter describes the screen configuration and basic operation of SWMOS.

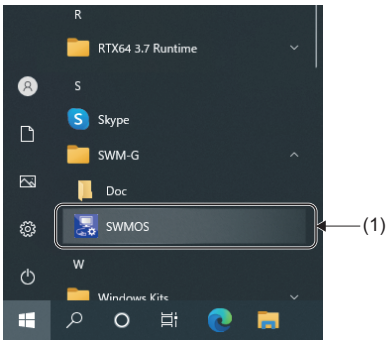
2.1 Start and End

The following describes how to start/end SWMOS.

Start

Operating procedure

Select [SWM-G] ⇨ [SWMOS] (1) from the Windows start menu.



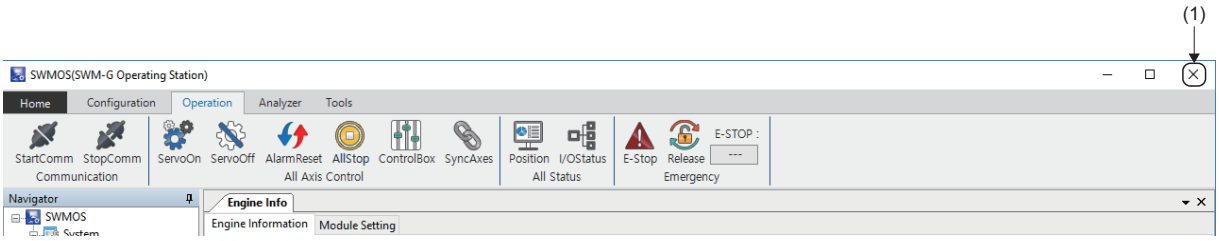
Point

- When SWMOS is started, the SWM-G engine is automatically started. The setting to start the network communication can be optionally configured.
- When the SWM-G engine is not started since the license is not authenticated, the functions of SWMOS that can be used are limited to the SWM-G engine management, license management, and system diagnosis.
- The following manual is stored in the Doc folder displayed by selecting [SWM-G] ⇨ [Doc] from the Windows start menu.
  SWM-G User Manual

End

Operating procedure

Click the [×] button (1) in the upper right of the SWMOS screen.



Point

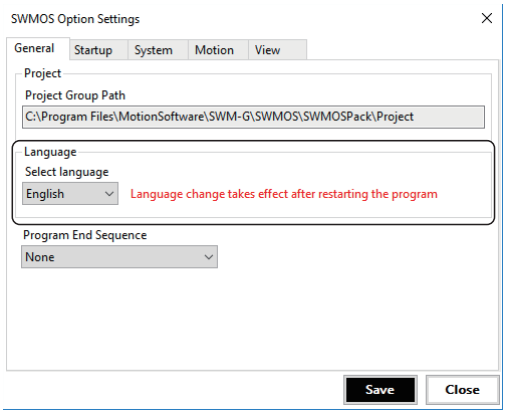
When SWMOS is ended, the SWM-G engine is automatically ended if no other device is operating. Since the network communication is disconnected as well, check the operation status before ending SWMOS.

2.2 Switching Display Language

SWMOS supports multiple display languages. The display language of the menu and others can be switched in one personal computer.

Window

[Home] ⇨ [Option] (🔧) ⇨ [General] tab



Operating procedure

In the [General] tab, select the language from the "Select language" pull-down list.

- Supported languages

Item	Language
English	English
Japanese	Japanese
Korean	Korean
Chinese	Chinese (Simplified)

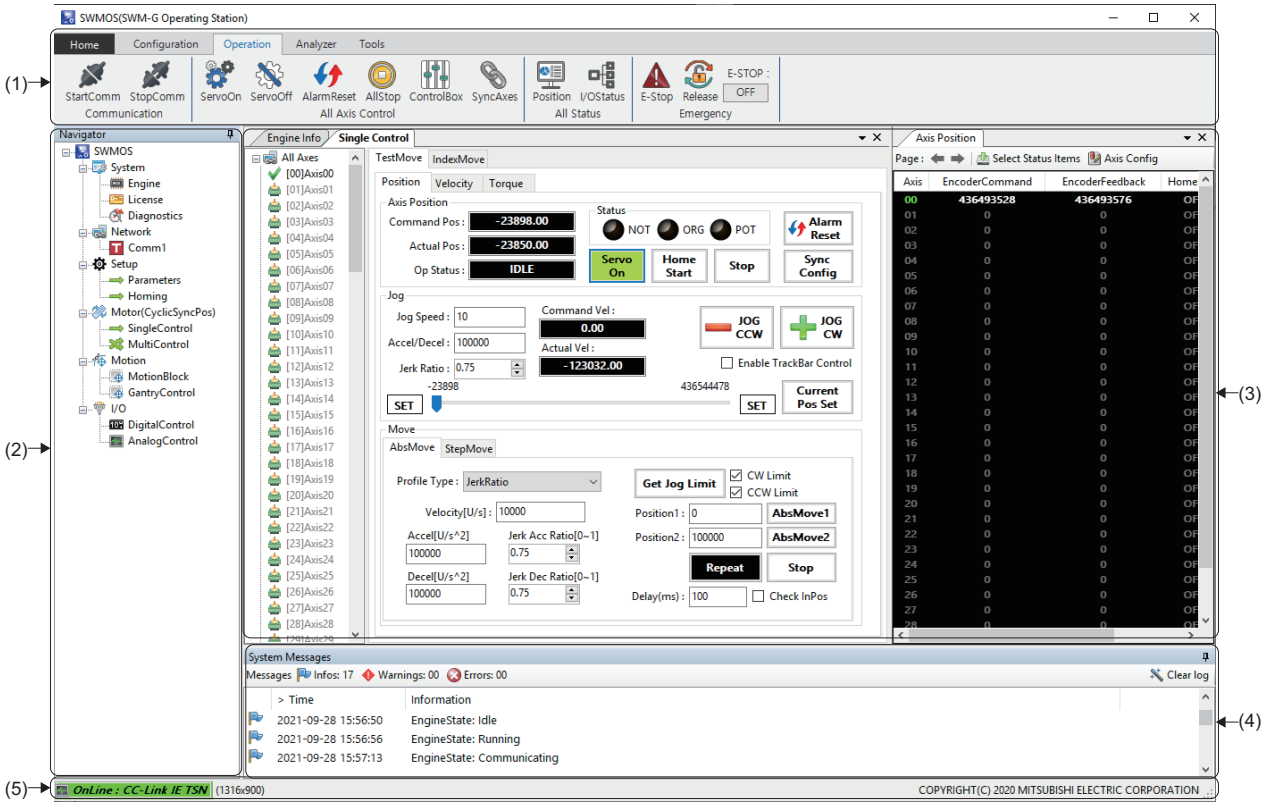
2.3 Screen Configuration

This section describes the screen configuration when SWMOS is started.

Overall screen

The following shows the overall screen configuration.

Window



Displayed items

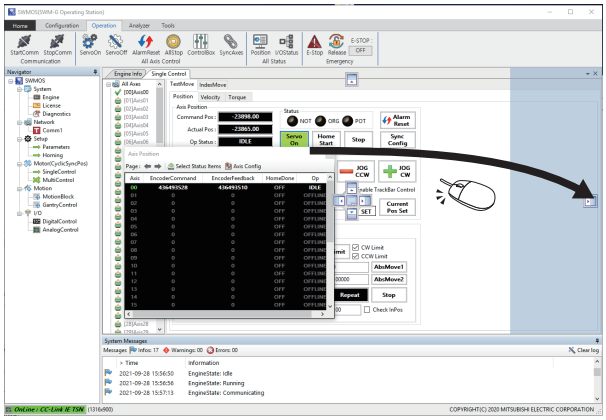
Name	Description
(1) Ribbon	The tab is switched to perform operation such as project setting, monitoring/control of servo axes and I/O, and data collection/analysis. The operation of the ribbon bar can be used separately from the operation of the navigation window. (☞ Page 18 Ribbon)
(2) Navigation window	The system setting, network setting, and axis setting are configured and the single axis control, multi-axis control, motion control, and I/O control are performed. The operation of the navigation window can be used separately from the operation of the ribbon bar. (☞ Page 18 Navigation window)
(3) Main window	Displays the function selected in the ribbon bar or navigation window. When multiple tabs are opened, the displayed functions can be switched with the tabs. Click the [×] button in the upper right of the main window to close a displayed function.
(4) Message window	Displays messages output from the SWM-G engine and SWMOS.
(5) Status bar	Displays the status of the network communication and display size of the "SWMOS" screen. ■Communication status display • OffLine : Network communication stopped • OnLine : CC-Link IE TSN : Communicating by CC-Link IE TSN • OnLine : Simulation : Communicating by simulator • OnLine : Hybrid(CC-Link IE TSN+Simulation) : Communicating by CC-Link IE TSN and simulator

■ Switching between docking and float of the docking window

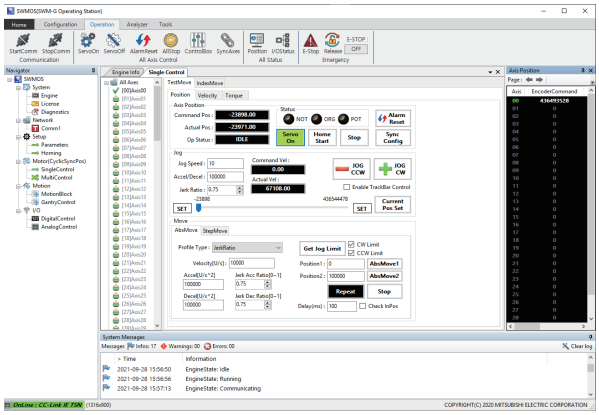
- Docking display

  Drag and drop the title bar of a floating window to the guidance in the main frame to dock it in the main window. Depending on the position of the guidance where the window is dropped, the window is docked and displayed as a title bar or tab.

■Docking display as a title bar (guidance at the upper right side)

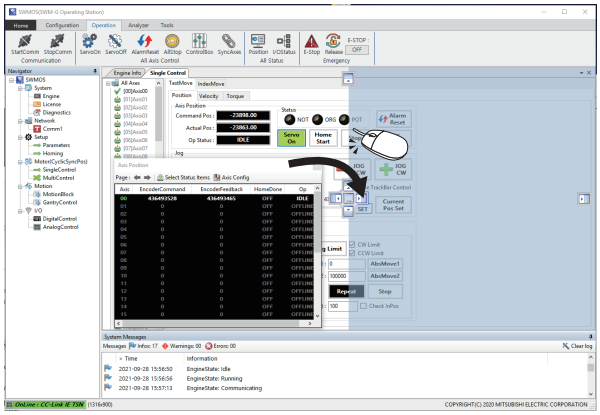


Drop the window to the guidance at the right edge.

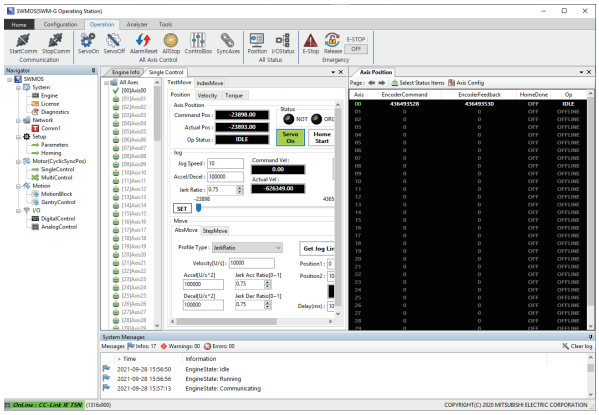


It is docked as a title bar.

■Docking display as a tab (guidance in the center)



Drop the window to the guidance at the center right.



It is docked as a tab.

- Floating display

  Drag the title bar of a docking window to an arbitrary position to display it independently of the main frame.

Point

Once a window is docked, its display format can be switched between the docking and floating by double-clicking the title bar or tab.

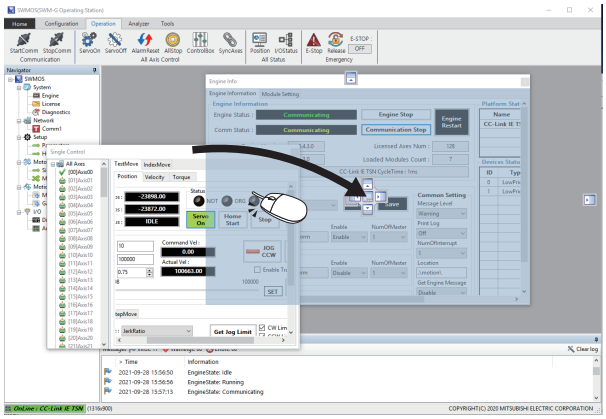
■ Combining work windows

The guidance is displayed when a floating window is moved close to another floating window.

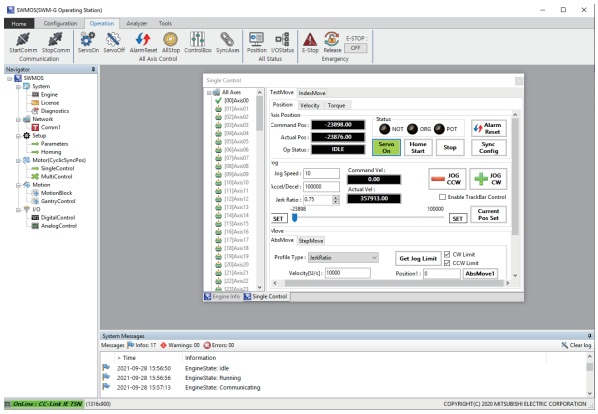
Drag and drop the window to the guidance to combine the windows.

Depending on the position of the guidance where the window is dropped, the windows are arranged next to each other or displayed as tabs.

■Displayed as tabs (guidance in the center)

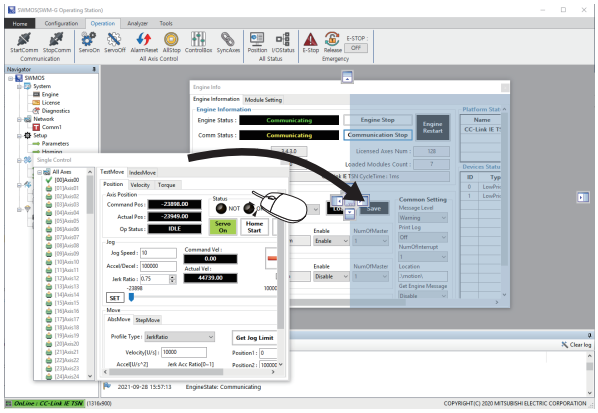


Drop the window to the guidance at the center.

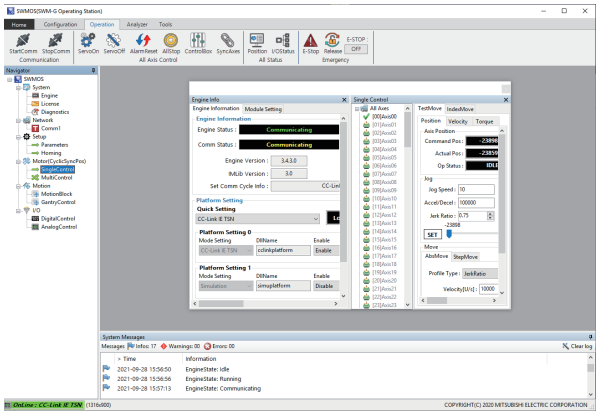


It is displayed as a tab.

■Arranged next to each other (guidance in the center)



Drop the window to the guidance at the center right.



It is displayed next to the other window.

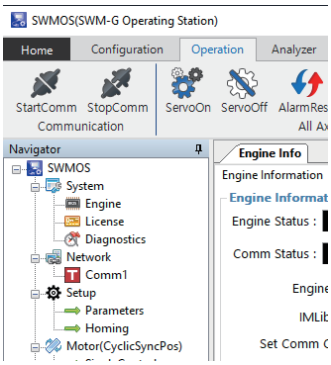
■ Unpinning the window

A window which has the pin button [📌] in the upper right can be hidden.

Click the pin button to pin/unpin the window.

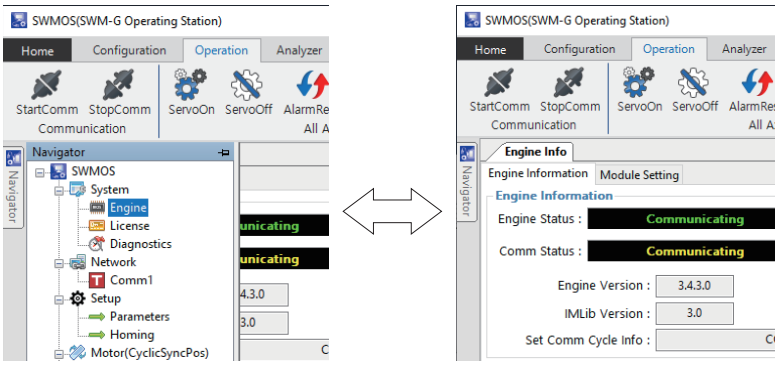
- Vertical pin button [📌]

  The window is pinned and always displayed. (Default)



- Horizontal pin button [📌]

  The window is automatically switched to the tab display when not being operated.

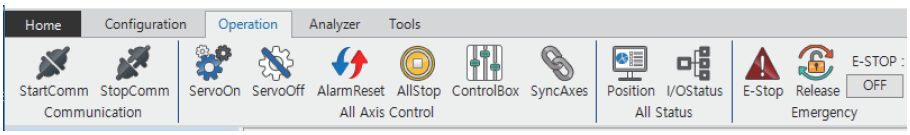


Ribbon

The ribbon is an interface in which the function can be switched with the tabs.
The operation of the ribbon can be used independently from the operation of the navigation window. The ribbon cannot be hidden or customized. For details of the ribbon, refer to the following.
☞ Page 19 FUNCTION OF RIBBON

Window

Click a tab at the top part of the ribbon to display the function assigned to the tab.

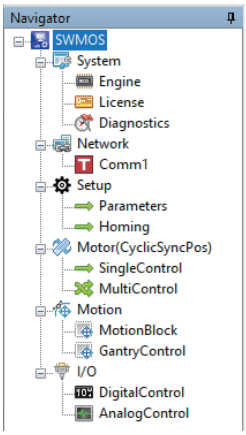


Navigation window

The navigation window is a window that displays various functions in a tree format.
By using the tree, the setting/status of the SWM-G engine can be displayed, parameters can be set, and test operation can be performed.
The operation of the navigation window can be used separately from the operation of the ribbon.
For details of the navigation window, refer to the following.
☞ Page 52 FUNCTION OF NAVIGATION WINDOW

Window

Click each item in the tree display to display each function.



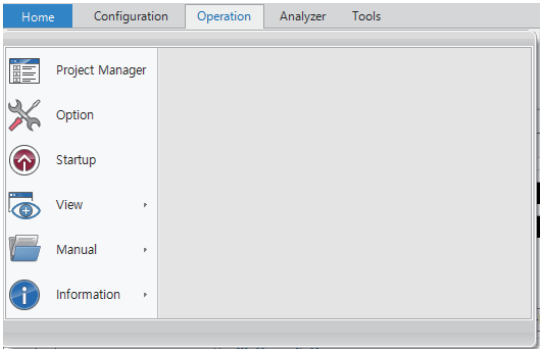
3 FUNCTION OF RIBBON

From the ribbon, configure project settings, monitor/control the servo axes and I/O, and collect/analyze data.

3.1 Home Tab

Project settings and option settings are configured, and information of SWMOS is checked.

Window



Displayed items

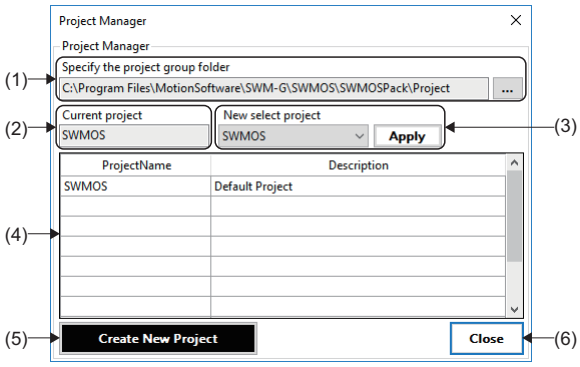
Item	Description	Reference
Project Manager ( )	Overall settings of SWMOS are managed for each project.	☞ Page 20 Project Manager
Option ( )	Option settings of SWMOS are configured.	☞ Page 22 Option
Startup ( )	Displays the "Getting started" screen of SWMOS.	☞ Page 28 Getting started
View ( )	The display size of the SWMOS screen is set.	☞ Page 30 View
Manual( )	Displays the manual (SWM-G User Manual) that describes the functions of SWM-G.	☞ Page 30 Manual
Information ( )	Windows Update information and the version of SWMOS are checked.	☞ Page 31 Information

Project Manager

Overall settings of SWMOS are managed for each project.

Window

[Home] ⇨ [Project Manager] ( )



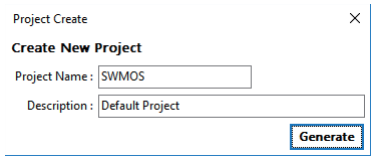
Displayed items

Item	Description
(1) Specify the project group folder	Set the group folder where the project is stored. In the "Browse For Folder" screen which is displayed by clicking the [...] button, set a folder to store the project.
(2) Current project	Displays the project currently selected.
(3) New select project	Select a project to which the current project is switched from the pull-down list. When a project is selected from the pull-down list and the [Apply] button is clicked, to the current project is switched to the selected one. (☞ Page 21 Switching the project)
(4) Project list	Displays projects in the project group. • ProjectName: Displays the names of the projects. • Description: Displays the descriptions (comments) of the projects.
(5) [Create New Project] button	Creates a new project. (☞ Page 20 Creating a new project)
(6) [Close] button	Closes the "Project Manager" screen.

Creating a new project

Operating procedure

1. Click the [Create New Project] button to open the "Project Create" screen.
2. In the "Project Create" screen, enter "Project Name" and "Description", and click the [Generate] button.



3. When the project is successfully created, the project is added to the project group and displayed in the project list. The project data newly created is initialized.

Point

The created project cannot be deleted from SWMOS.

Switching the project

Operating procedure

1. Select a project to which the current project is switched from the [New select project] pull-down list.
2. A confirmation message appears when the [Apply] button is clicked. Check the displayed message, and click the [Yes] button.
3. A restart confirmation message appears. Check the displayed message, and click the [Yes] button. Restart SWMOS.

To apply the switched project data to SWMOS, restarting SWMOS is required.

Project data

The setting data of the following functions in SWMOS is saved as the project data.

■ Settings that are saved as the SWMOS project data

Item	Description
Project data management target	• Axis status display item • Axis name • Number of displayed digits • Home position return (JOG speed) • Single axis operation • Multi-axis operation • Interpolation control • Gantry control • I/O control

Point

The project data does not include any of the SWM-G engine settings (module.ini, cclink_network.def, or RtxTcpIp.ini) or parameters.

Option

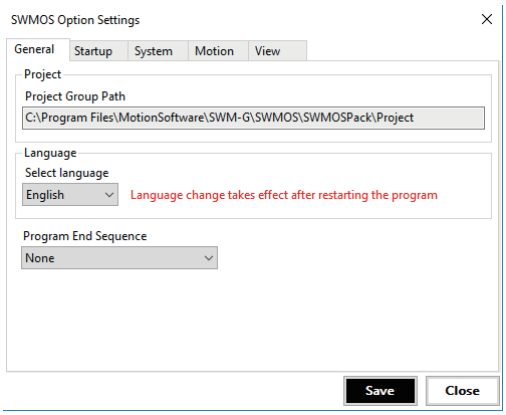
Option settings of SWMOS are configured.

Point

The configured option settings are applied to entire SWMOS. The option settings cannot be changed for each project.

Window

[Home] ⇨ [Option] ( )



Displayed items

Select each tab and configure the option settings.

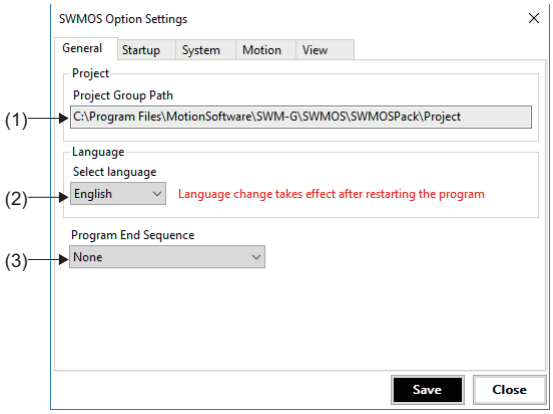
Item	Description	Reference
[General] tab	Set the project folder, language, and processing that is executed at the end.	☞ Page 23 General
[Startup] tab	Set the processing that is executed at the startup.	☞ Page 24 Startup
[System] tab	Set the display update cycle and automatic read/save of the parameter file.	☞ Page 25 System
[Motion] tab	Set the axis display mode and emergency stop level.	☞ Page 26 Motion
[View] tab	Set the window size and configure the docking window setting.	☞ Page 27 View
[Save] button	Saves the configured option settings.	—
[Close] button	Closes the "SWMOS Option Settings" screen.	—

General

Configure the general settings in the [General] tab of the option setting screen.

Window

[Home] ⇨ [Option] ( ) ⇨ [General] tab



Displayed items

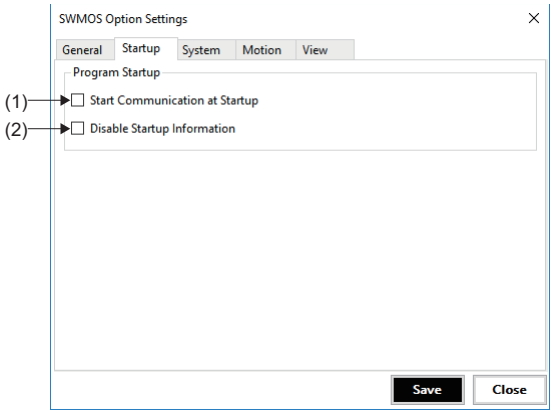
Name	Description	Default
(1) Project Group Path	Displays the project folder set in [Home] ⇨ [Project ( )] ⇨ [Specify the project group folder].	C:\Program Files\MotionSoftware\SWM-G\SWMOS\SWMOSPack\Project
(2) Select language	Set the display language of SWMOS. • English: English • Japanese: Japanese • Korean: Korean • Chinese: Chinese (Simplified)	Language set in Windows
(3) Program End Sequence	Set the processing that is executed when SWMOS is ended. • None: No processing is executed. • CommStop: The network communication is stopped. • ServoOffAndCommStop: The network communication is stopped after the servo OFF.	None

Startup

Configure the settings for SWMOS startup in the [Startup] tab of the option setting screen.

Window

[Home] ⇨ [Option] ( ) ⇨ [Startup] tab



Displayed items

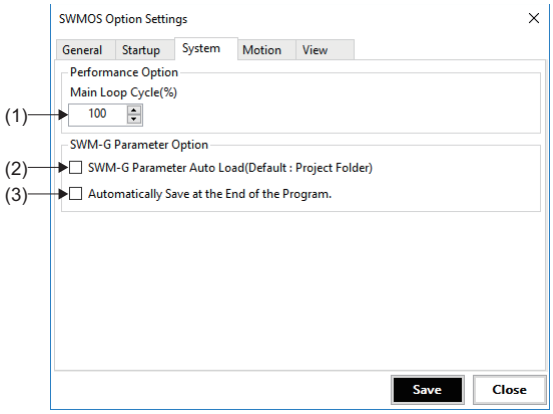
Name	Description	Default
(1) Start Communication at Startup	Set whether to start the network communication at the startup of SWMOS. • Selected: The network communication is started at the startup. • Not selected: The network communication is not started at the startup.	Not selected
(2) Disable Startup Information	Set whether to display the "Getting started" screen that displays the startup information at the startup of SWMOS. • Selected: The "Getting started" screen is not displayed at the startup. • Not selected: The "Getting started" screen is displayed at the startup.	Not selected

System

Configure the system settings of SWMOS in the [System] tab of the option setting screen.

Window

[Home] ⇨ [Option] ( ) ⇨ [System] tab



Displayed items

Name	Description	Default
(1) Main Loop Cycle	Set the load rate of the monitor value update cycle of the axis status. • Setting range: 10 to 100 [%]	100 [%]
(2) SWM-G Parameter Auto Load(Default: Project Folder)	Set whether to automatically read the parameter file at the startup of SWMOS. The "swmg_parameters.xml" file stored in "Project folder name*1\PARAMETERS" is read. • Selected: The parameter file is read. • Not selected: The parameter file is not read.	Not selected
(3) Automatically Save at the End of the Program	Set whether to save the parameter file when SWMOS is ended. The "swmg_parameters.xml" file stored in "Project folder name*1\PARAMETERS" is saved. • Selected: The parameter file is saved. • Not selected: The parameter file is not saved.	Not selected

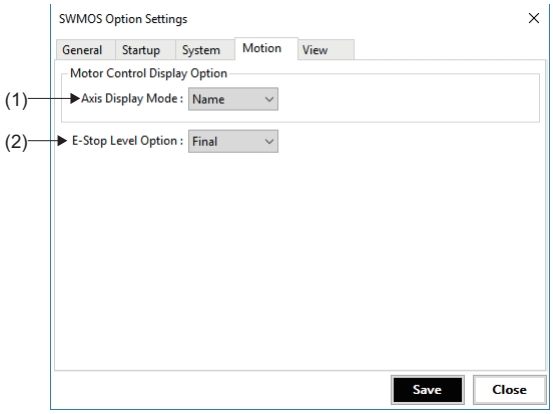
*1 The project folder name is the one created by the user.

Motion

Configure the motion control settings of SWMOS in the [Motion] tab of the option setting screen.

Window

[Home] ⇨ [Option] ( ) ⇨ [Motion] tab



Displayed items

Name	Description	Default
(1) Axis Display Mode*1	Set the axis display mode of the axis tree. • Number: The axis number (Axis00 to Axis127) is displayed. • Name: The axis name ([00] axis name to [127] axis name) is displayed. *: The axis name is set in [Axis Config] of the "Axis Position" screen. (☞ Page 46 Axis display setting)	Number
(2) E-Stop Level Option	Set the emergency stop level. • Final: Servo OFF • Level1: Emergency stop level 1 (Deceleration stop or servo OFF after deceleration stop)	Final

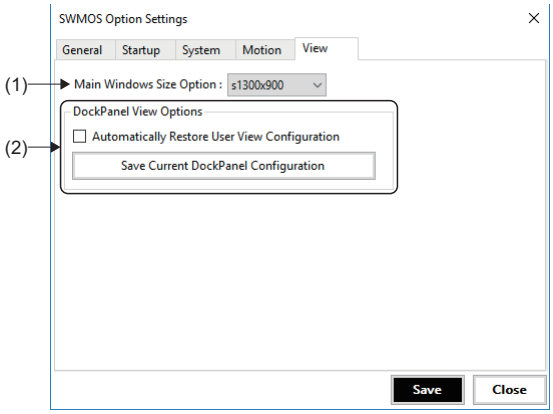
*1 When the [Apply] button is clicked in [Axis Config Information], the display is switched to the set axis display mode. The axis display mode is applied to the axis tree in the following screens. (☞ Page 46 Axis display setting)
- Navigation window ⇨ [SWMOS] ⇨ [Setup] ⇨ [Parameters] ⇨ [Detailed] tab
- Navigation window ⇨ [SWMOS] ⇨ [Setup] ⇨ [Homing]
- Navigation window ⇨ [SWMOS] ⇨ [Motor(CyclicSyncPos)] ⇨ [SingleControl]

View

Configure the display settings of SWMOS in the [View] tab of the option setting screen.

Window

[Home] ⇨ [Option] ( ) ⇨ [View] tab



Displayed items

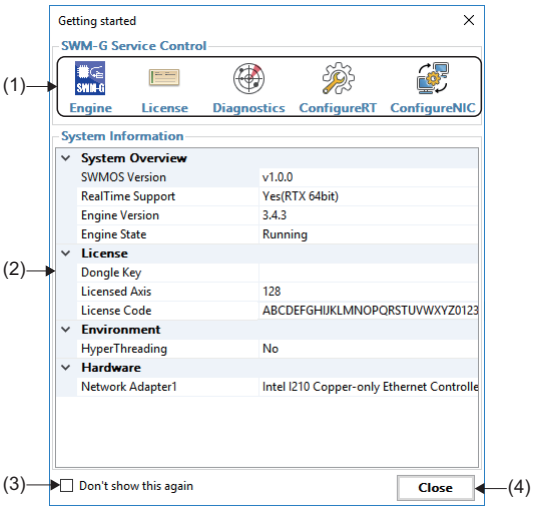
Name	Description	Default
(1) Main Windows Size Option	Set the size of the screen displayed at the startup of SWMOS. • s1024x768: 1024 × 768 dots • s1200x800: 1200 × 800 dots • s1300x900: 1300 × 900 dots	s1300x900
(2) DockPanel View Options	Click the [Save Current DockPanel Configuration] button to save the status of the docking window of SWMOS. Set whether to perform automatic restoration with the saved status of the docking window. • Selected: The status is saved and automatically restored. • Not selected: The status is not saved or automatically restored.	Not selected

Getting started

Display the "Getting started" screen.

Window

[Home] ⇨ [Startup] ( )



Displayed items

Configure the following option settings in each tab.

Item	Description
(1) SWM-G Service Control	Click each icon to display the window for the management function. • Engine ( ): Displays the window for the engine. (☞ Page 53 SWM-G engine) • License ( ): Displays the window for the license. (☞ Page 60 License) • Diagnostics ( ): Displays the window for the diagnosis. (☞ Page 65 Diagnostics) • ConfigureRT ( ): Displays the "RTX64 ### Control Panel" screen*1. (RTX64 Help) • ConfigureNIC ( ): Displays the "SWM-G Configure NIC" screen. (☞ Page 34 ConfigureNIC)
(2) System Information	Displays the information such as version and license of the system and the information of the personal computer. For details of each item, refer to the following. ☞ Page 29 System Information
(3) Disable getting started display (Don't show this again)	When "Don't show this again" is selected, the "Getting started" screen is not displayed at the startup of SWMOS. To display the "Getting started" screen at the startup of SWMOS again, configure the setting by selecting [Home] ⇨ [Option ( )] ⇨ [Startup] tab from the ribbon. (☞ Page 24 Startup)
(4) [Close] button	Closes the "Getting started" screen.

*1 ### = Displays the version of RTX.

System Information

The version information and license information of the system, environmental setting of the personal computer, and the information of the installed NIC can be checked.

Item		Description
System Overview*1	SWMOS Version	Displays the version of SWMOS.
	RealTime Support	Displays whether the real-time OS is supported.
	Engine Version	Displays the version of the SWM-G engine.
	Engine State	Displays the status of the SWM-G engine. • Shutdown: Stopped • Idle: Waiting • Running: Execution in progress • Communicating: Communication in progress
License	Dongle Key	Displays the unique ID number of the USB license key.
	Licensed Axis	Displays the number of axes of the licensed product.
	License Code	Displays the SWM-G license code.
Environment	Hyper-Threading	Displays the status of the Hyper-Threading setting of the personal computer. • No: Disabled • Yes: Enabled*2
Hardware		Displays the information of the NIC installed to the personal computer.

*1 For the version notation of each item, refer to the following.
SWM-G User Manual

*2 When Hyper-Threading is enabled, the SWM-G engine may not operate correctly. Disable it in the BIOS setting.

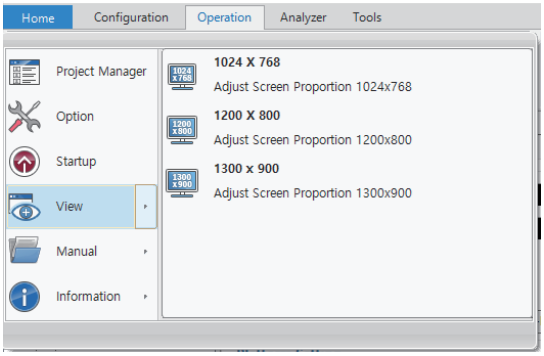
View

The display size of the SWMOS screen is set.

Select the size from the screen proportion displayed by selecting [Home] ⇨ [View] ( ) from the ribbon.

Window

[Home] ⇨ [View] ( )



Displayed items

Item	Description
Display proportion selection	Set the display size of the SWMOS screen. This setting is also applied to [Main Windows Size Option] displayed by selecting [Home] ⇨ [Option] ( ) ⇨ [View] tab. • 1024 × 768 ( ): Adjust screen proportion 1024 × 768 dots • 1200 × 800 ( ): Adjust screen proportion 1200 × 800 dots • 1300 × 900 ( ): Adjust screen proportion 1300 × 900 dots

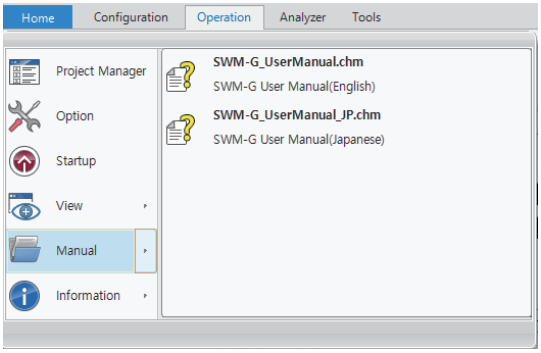
Manual

The manuals (SWM-G User Manual) that describe the functions of SWM-G are displayed.

Select the manual from the manuals displayed by selecting [Home] ⇨ [Manual] ( ) from the ribbon.

Window

[Home] ⇨ [Manual] ( )



Displayed items

Item	Description
Manual selection	Select a manual (SWM-G User Manual) for the language to be displayed. • SWM-G_UserManual.chm ( ): English manual • SWM-G_UserManual_JP.chm ( ): Japanese manual

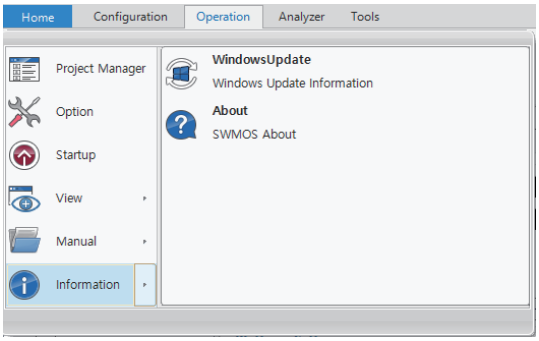
Information

Windows Update information and the version of SWMOS can be checked.

Select the information to check from the items displayed by selecting [Home] ⇨ [Information] ( ) from the ribbon.

Window

[Home] ⇨ [Information] ( )



☞ Page 31 Windows Update Information

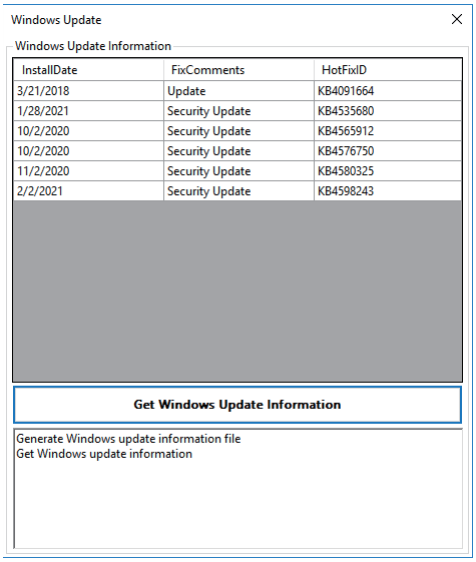
☞ Page 32 SWMOS About

Windows Update Information

The update information of Windows installed in the personal computer can be checked.

Window

[Home] ⇨ [Information] ( ) ⇨ [Windows Update Information] ( )



Operating procedure

1. Click the [Get Windows Update Information] button in the "Windows Update" screen to collect the update information applied to Windows.
2. After the collection is completed, a list is displayed in the Windows Update Information area. The collected Windows Update information is saved as a text file and stored in the following location.

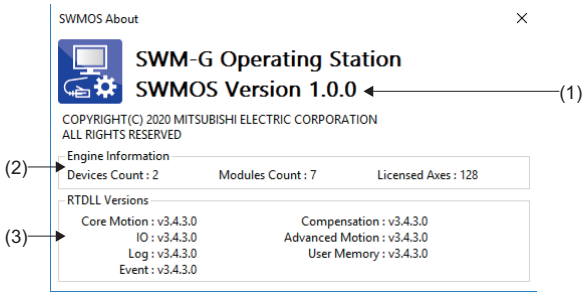
Storage destination of Windows Update information file
C:\WindowsUpdateInfo.txt

SWMOS About

The version of SWMOS, SWM-G engine information, and version of RTDLL can be checked.

Window

[Home] ⇨ [Information] ( ) ⇨ [SWMOS About] ( )



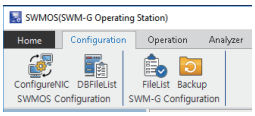
Displayed items

Item	Description
(1) SWMOS version	Displays the version of SWMOS.
(2) Engine Information	Displays the device information and license information. • Devices Count: Displays the number of operating devices. • Module Count: Displays the number of loaded modules. • Licensed Axes: Displays the number of axes of the licensed product.
(3) RTDLL Versions	Displays the version of the RTDLL module. For the version notation, refer to the following. 📖SWM-G User Manual

3.2 Configuration Tab

The NIC setting, SWMOS setting, and SWM-G setting are configured, and backup is performed.

Window



Displayed items

Item		Description	Reference
SWMOS Configuration	ConfigureNIC ( )	Configure the RTX driver setting of the network interface card (NIC).	☞ Page 34 ConfigureNIC
	DBFileList ( )	Check the contents of the setting file for each operation set in SWMOS.	☞ Page 36 DBFileList
SWM-G Configuration	FileList ( )	Check the contents of the SWM-G setting file.	☞ Page 37 FileList
	Backup ( )	Back up files related to SWM-G.	☞ Page 38 Backup

ConfigureNIC

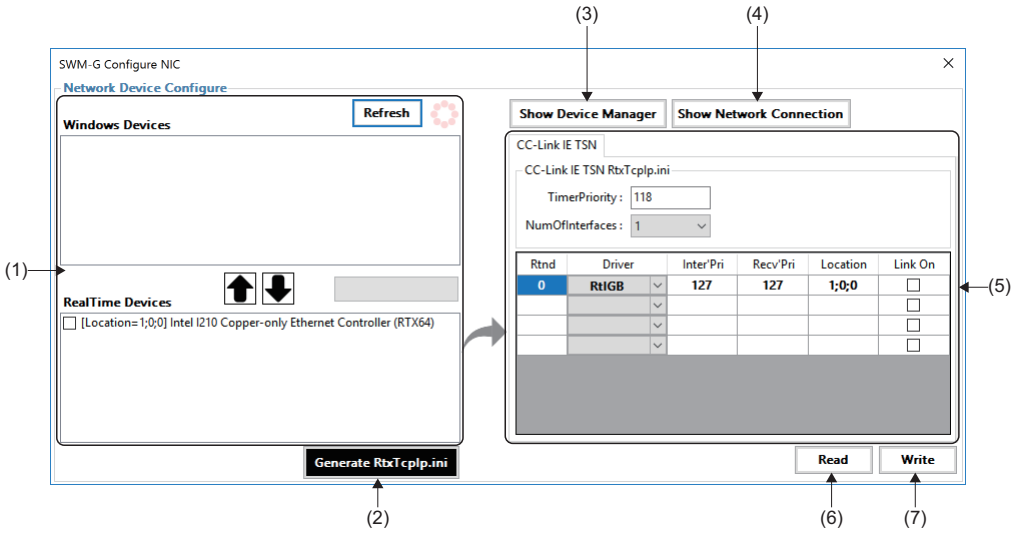
Configure the RTX driver setting of the network interface card (NIC).

Point

Normally, operation can be performed with the default settings configured at the installation. Use this function when an NIC is added or changed.

Window

[Configuration] ⇨ [ConfigureNIC] ( )



Displayed items

Item	Description
(1) NIC device assignment	Perform the NIC device assignment for Windows and RTX. • [Refresh]: Updates the list of NIC devices. • [↑]: Moves the selected NIC from RealTime Devices (RTX) to Windows Devices. • [↓]: Moves the selected NIC from Windows Devices to RealTime Device (RTX).
(2) [GenerateRtxTcpIp.ini] button	Generates the NIC setting file (RtxTcpIp.ini) from the NIC device selected for RTX.
(3) [Show Device Manager] button	Displays the "Device Manager" screen of Windows. The NIC status can be checked.
(4) [Show Network Connection] button	Displays the "Network Connections" screen of Windows. The network connection status can be checked in the "Network Connections" screen.
(5) RTX NIC setting	Configure the NIC setting for RTX. Normally, use the default settings.
(6) [Read] button	Reads the NIC setting file (RtxTcpIp.ini) and applies it to the "SWM-G Configure NIC" screen.
(7) [Write] button	Writes the contents of the "SWM-G Configure NIC" screen to the NIC setting file (RtxTcpIp.ini).

Operating procedure

The NIC driver setting can be configured with the normal installation procedure. To change the setting individually, configure it with the following procedure.

1. When the NIC device assignment is required to be changed between RTX and Windows, change it in the screen for the NIC device assignment.
2. Select the NIC device (RTX side) to be used for the CC-Link IE TSN connection, and click the [Generate RtxTcpIp.ini] button. Generate the NIC setting file (RtxTcpIp.ini) and update the RTX NIC setting. The NIC setting is set to the initial value.

3. Set the following items when changing the NIC setting of RTX. Normally, operation can be performed with the default settings. When changing the settings, refer to the following.

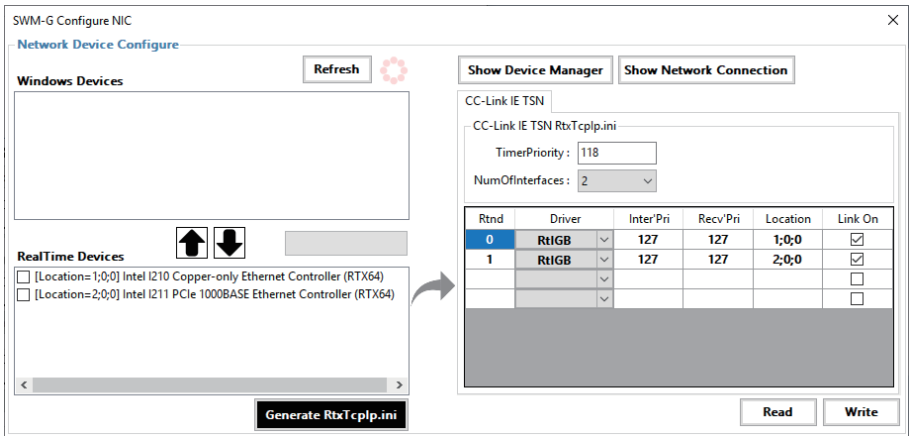
📖RTX64 Help

Item	Description	Default
TimerPriority (Timer priority)	Set the timer priority.	118
NumOfInterfaces (Number of communication masters)	Set the number of masters for CC-Link IE TSN. The supported number of masters is 2.	1
Rtnd (Communication master number)	The master number set in the NIC assignment order. This item cannot be changed.	—
Driver (Communication driver)	Select the communication driver according to the NIC type. The communication driver that supports CC-Link IE TSN is "RTIGB" only. For details of the supported NIC, refer to the following. 📖SWM-G User Manual	Automatically set according to the NIC type
Inter'Pri (Interrupt thread priority)	Set the interrupt thread priority.	127
Recv'Pri (Receive thread priority)	Set the receive thread priority.	127
Location (NIC installation location)	Set the location (PCI bus;Device;Function) where the NIC is installed. The installation location can be checked from "Device Manager" of Windows.	Automatically set according to the location where the NIC is installed.
Link On(Link status display of NIC)	Set whether to enable the link status display of the NIC. • Selected: Enabled • Not selected: Disabled	Not selected

4. Click the [Write] button to apply the settings to the NIC setting file (RtxTcpIp.ini).

Point

When there are multiple NIC devices to be used (RTX side), up to two ports are assigned to CC-Link IE TSN.



DBFileList

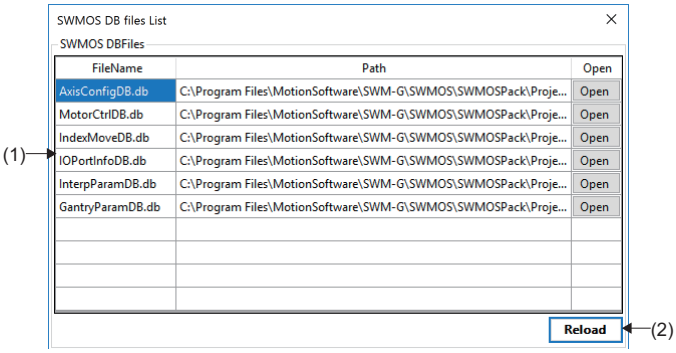
The contents of the setting file of each operation set in SWMOS can be checked.

Point

Normally, the SWMOS setting file is not edited. Use it only for checking the contents.

Window

[Configuration] ⇨ [DBFileList] ( )



Displayed items

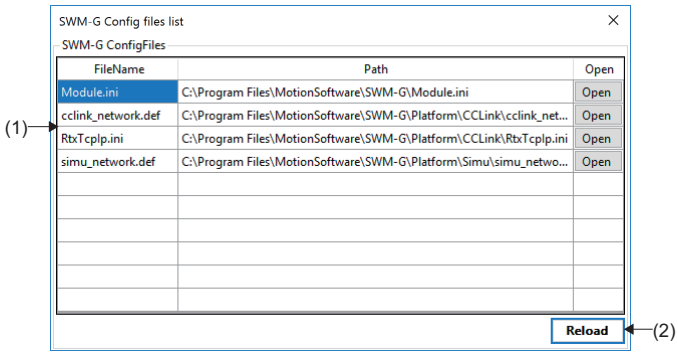
Item	Description
(1) SWMOS DBFiles	Check the following SWMOS setting files. Click the [Open] button to display each file. • AxisConfigDB.db: All-axes monitoring setting • MotorCtrlDB.db: Settings for home position return, single axis control, and multi-axis control • IndexMoveDB.db: Index operation setting • IOPortInfoDB.db: I/O control setting • InterpParamDB.db: Interpolation control setting • GantryParamDB.db: Gantry control setting
(2) [Reload] button	Reads the setting files again.

FileList

The contents of the SWM-G setting file can be checked.

Window

[Configuration] ⇨ [FileList] ( )



Displayed items

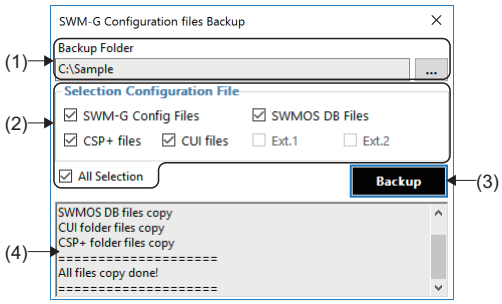
Item	Description
(1) SWM-G ConfigFiles	Check the following SWM-G setting files. Click the [Open] button to display each file. • Module.ini: Module configuration setting • cclink_network.def: CC-Link IE TSN setting • RtxTcpIp.ini: RTX NIC setting • simu_network.def: Simulation setting
(2) [Reload] button	Reads the setting files again.

Backup

Back up files related to SWM-G.

Window

[Configuration] ⇨ [Backup] ( )



Displayed items

Item	Description
(1) Backup Folder	Specify the backup destination folder where backup files are stored. In the "Browse For Folder" screen which is displayed by clicking the [...] button, specify a folder to store the backup file.
(2) Selection Configuration File	Select files to be backed up. Selecting "All Selection" selects all the target files.
(3) [Backup] button	Backs up the target files selected in "Selection Configuration File" in the backup destination folder.
(4) Backup status display field	Displays the execution result of the backup.

Operating procedure

1. In the "Browse For Folder" screen which is displayed by clicking [...] button of [Backup Folder], specify the backup destination folder.
2. Select files to be backed up.
3. Click the [Backup] button.

Backup data

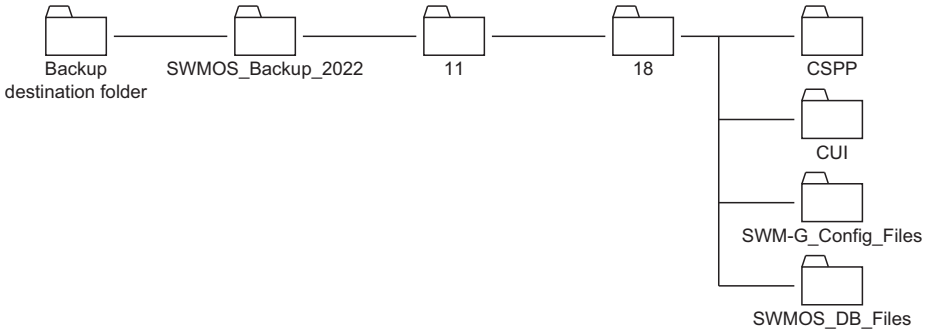
The backup data is stored in the "SWMOS_Backup_yyyy\mm\dd" folder which is created in the specified backup destination folder.

Ex.

Data backed up on November 18, 2022

The "SWMOS_Backup_2022\11\18" folder is created, and the backup data is stored in the folder.

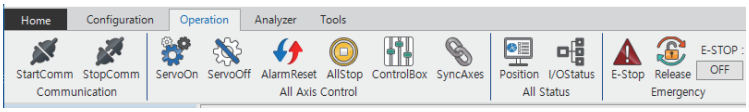
To restore a file, manually copy it from the folder.



3.3 Operation Tab

The network communication operation is performed, and servo axes and I/O are monitored/controlled.

Window



Displayed items

Item		Description	Reference
Communication	StartComm ( )	Starts the network communication.	☞ Page 39 Network communication start/ communication stop
	StopComm ( )	Stops the network communication.	
All Axis Control	ServoOn ( )	Performs servo ON for all the set axes.	☞ Page 40 All axes servo ON/ OFF
	ServoOff ( )	Performs servo OFF for all the set axes.	
	AlarmReset ( )	Clears the alarms that have occurred in axes.	☞ Page 40 Alarm clear
	AllStop ( )	Stops all the operating axes.	☞ Page 40 All axes stop
	ControlBox ( )	Performs servo ON/OFF, home position return, and alarm clear for the axes.	☞ Page 41 All axes control
	SyncAxes ( )	Starts/cancels the synchronous control of the slave axes that follow the master axis.	☞ Page 42 Synchronous control
All Status	Position ( )	The status item of each axis is set and the status of the axis is monitored.	☞ Page 43 Axis status monitor
	I/OStatus ( )	The status of the input address and output address is monitored.	☞ Page 47 I/O status
Emergency	E-Stop ( )	Performs the emergency stop.	☞ Page 48 Emergency stop/ emergency stop release
	Release ( )	Releases the emergency stop.	
	E-STOP	Displays the status of the emergency stop.	

Network communication start/communication stop

The network communication is started/stopped.

Operating procedure

■ Network communication start

1. Click [Operation] ⇨ [StartComm] ( ) in the ribbon.
2. When the network communication is started, the display of [Engine Information] displayed by selecting [SWMOS] ⇨ [System] ⇨ [Engine] ⇨ [Engine Info] tab in the navigation window is switched to "Engine Status: Communicating" and "Comm Status: Communicating".

■ Network communication stop

1. Click [Operation] ⇨ [StopComm] ( ) in the ribbon.
2. When the network communication is stopped, the display of [Engine Information] displayed by selecting [SWMOS] ⇨ [System] ⇨ [Engine] ⇨ [Engine Info] tab in the navigation window is switched to "Engine Status: Running" and "Comm Status: Stopped".

All axes servo ON/OFF

Servo ON/OFF is performed for all the set axes of the servo amplifier and others.

Operating procedure

■ All axes servo ON

1. Click [Operation] ⇨ [ServoOn] () in the ribbon.
2. Servo ON is performed for all the set axes.

■ All axes servo OFF

1. Click [Operation] ⇨ [ServoOff] () in the ribbon.
2. Servo OFF is performed for all the set axes.

Point

The servo ON/OFF status of the axes can be checked in the "Axes Control Box" screen displayed by selecting [Operation] ⇨ [ControlBox] () in the ribbon. (☞ Page 41 All axes control)

Alarm clear

The alarms that have occurred in axes are cleared.
Alarms in all the axes are cleared.

Operating procedure

1. Click [Operation] ⇨ [AlarmReset] () in the ribbon.
2. Alarms in all the axes are cleared.

Point

When the alarm clear is executed, both the servo amplifier alarms and axis alarms are cleared.

All axes stop

All the operating axes are stopped.

Operating procedure

1. Click [Operation] ⇨ [AllStop] () in the ribbon.
2. All the operating axes are stopped.

Point

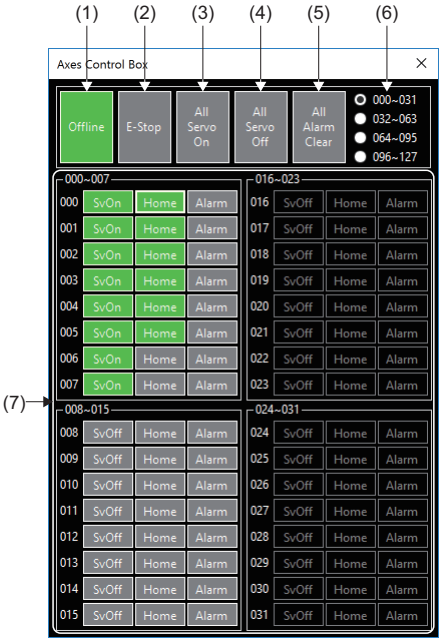
The stop processing is the equivalent of the processing of "ExecQuickStop function" and "StopTrq function" that are API functions. For detailed operation of the deceleration processing and others, refer to the following.
📖SWM-G User Manual

All axes control

Click each button to perform servo ON/OFF of the axes, home position return, or alarm clear.

Window

[Operation] ⇨ [ControlBox] ( )



Displayed items

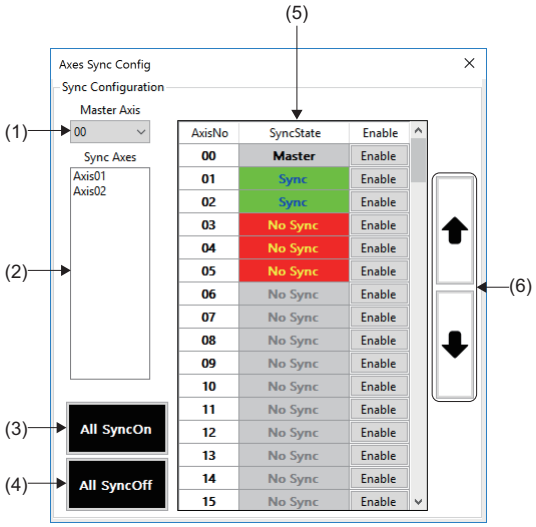
Item	Description
(1) [Online/Offline] button	Starts/stops the network communication. • : Network communication in progress • : Network communication stopped
(2) [E-Stop] button	Commands/releases the emergency stop. • : In emergency stop • : Emergency stop released
(3) [All Servo On] button	Performs servo ON for all the set axes.
(4) [All Servo Off] button	Performs servo OFF for all the set axes.
(5) [All Alarm Clear] button	Clears the alarms in all the axes.
(6) Axis display selection	Switches the axis display group to be displayed in the "Axes Control Box" screen. • 000 to 031: Axes 0 to 31 are displayed. • 032 to 063: Axes 32 to 63 are displayed. • 064 to 095: Axes 64 to 95 are displayed. • 096 to 127: Axes 96 to 127 are displayed.
(7) [Axis display] button	Displays the servo ON status, home position return, and alarm status of each. Click any of the buttons to perform each operation. For axes that are not connected, the buttons are displayed in black (SvOff). ■[SvOff]/[SvOn] button Performs servo ON/OFF for each axis. • SvOff : Servo OFF state • SvOn : Servo ON state ■[Home] button Performs the home position return of each axis. • Home : Home position return incomplete state • Home : Home position return complete state • Home : Home position return in progress ■[Alarm] button Clears alarms that have occurred in each axis. • Alarm : No alarm state • Alarm : Alarm state

Synchronous control

The synchronous control of the slave axes that follow the master axis is started and cancelled.

Window

[Operation] ⇨ [SyncAxes] ( )



Displayed items

Item	Description
(1) Master Axis	Select the master axis. • Setting range: 00 to 127
(2) Sync Axes	Displays slave axes that are synchronized with the selected master axis.
(3) [All SycnOn] button	Sets all the axes to the synchronous slave axes. However, axes in states other than the IDLE state and the other master axes are not set.
(4) [All SyncOff] button	Cancels the synchronization of the selected master axis and its synchronous slave axes.
(5) Synchronous axes display	The status of the synchronous axes is displayed and set. ■AxisNo Displays the axis number. (00 to 127) ■SyncState Displays the status of the synchronous control. • Master : Master axis • Sync : The slave axis is in the synchronous state. • No Sync : The synchronization of the slave axis is cancelled. • No Sync : The slave axis is in the servo OFF state. ■Enable Click the [Enable] button to set/cancel the synchronous slave axis.
(6) Synchronous axis display switch button	Switches the synchronous axis display by 16 axes. • [↑] button: Displays the previous 16 axes. • [↓] button: Displays the next 16 axes.

Operating procedure

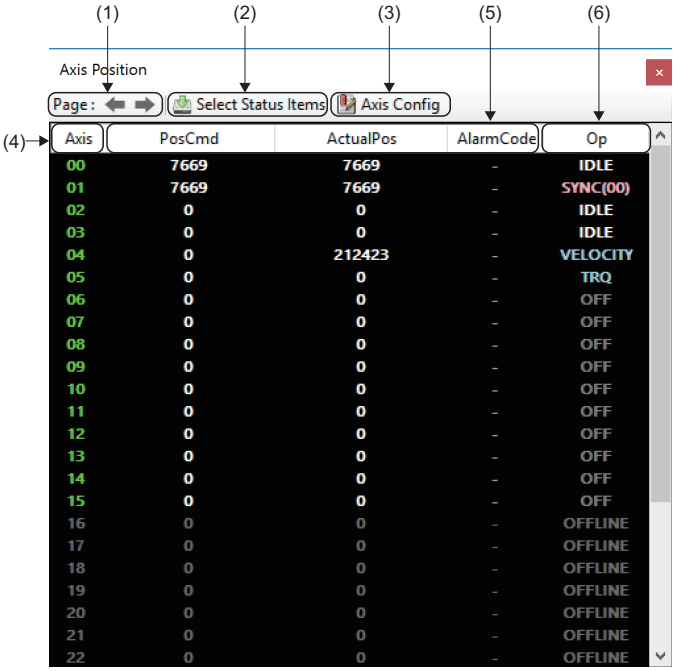
1. Select the master axis number, and start/cancel the synchronous control of the slave axes that follow the master axis. The synchronous control is started only for the axes in the IDLE state. The status of the axes can be checked in the axis status monitor. (☞ Page 43 Axis status monitor)
2. After starting the synchronous control of the slave axes, perform the test operation of the synchronous control by operating the master axis.

Axis status monitor

The status item of each axis is set and the status of the axis is monitored.

Window

[Operation] ⇨ [Position] ( )



Displayed items

Item	Description
(1) Axis display selection button	Switches the synchronous axis display by 32 axes. • [←] button: Displays the previous 32 axes. • [→] button: Displays the next 32 axes.
(2) [Select Status Items] button	Clicking the [Select Status Items] button displays the "All Position Setting" screen. Set status to be displayed as the status display items. (☞ Page 44 Axis item selection)
(3) [Axis Config] button	Clicking the [Axis Config] button displays the "Axis Config Information" screen. Set axis names to be displayed in the status display item (AxisName). (☞ Page 46 Axis display setting)
(4) Axis display item (Axis)	Displays the axis number. • Green: The axis is set and the network communication is in progress. • Gray: Network is stopped or the axis is not set.
(5) Status display item	Displays the status items set in the "All Position Setting" screen.
(6) Axis status item (Op)	Displays the axis status. • OFFLINE: Not connected • OFF: Servo OFF • IDLE: Waiting • JOG: JOG operation in progress • HOME: Home position return in progress • POS: Positioning control in progress • VELOCITY: Speed control in progress • TRQ: Torque control in progress • SYNC(□*1): Synchronous control in progress • INTPL: Interpolation control in progress • STOP: Stopped • ALARM: Alarm occurring

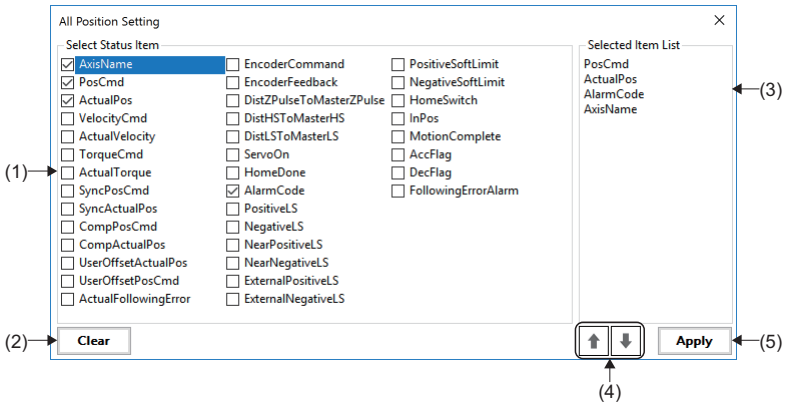
*1 □= Axis number of the master axis (00 to 127)

Axis item selection

Click the [Select Status Item] button in the "Axis Position" screen to display the "All Position Setting" screen. Set status items to be displayed in the axis status monitor.

Window

[Operation] ⇨ [Position] ( ) ⇨ [Select Status Item]



Displayed items

Item	Description
(1) Select Status Item	Select status items to be displayed in the "Axis Position" screen. The selected items are displayed in the selected item list. Up to 20 items can be selected as the status items. For the status items, refer to the following. ☞ Page 45 List of status items
(2) [Clear] button	Deselects all the selected status items.
(3) Selected Item List	Displays the status items selected in the select status item field. In the "Axis Position" screen, the status items are arranged in the display order here. The item at the top is displayed at the left end in the "Axis Position" screen. When no status item is selected, only Axis (axis number) and Op (axis status) are displayed in the "Axis Position" screen.
(4) Display item reorder button	Reorders the display order of the selected items in the selected item list. Select an item and click the [↑]/[↓] button to move it to the position to display. • [↑] button: Moves the selected item up a row. • [↓] button: Moves the selected item down a row.
(5) [Apply] button	Applies the status items selected in the select status item field to the "Axis Position" screen and closes the "All Position Setting" screen. To close the "All Position Setting" screen without applying the setting, click the [×] button in the upper right.

■ List of status items

Item	Description	Unit
AxisName	Axis name	Character string
PosCmd	Command position	User unit
ActualPos	Feedback position	User unit
VelocityCmd	Command speed	U/s
ActualVelocity	Feedback speed	U/s
TorqueCmd	Command torque	%
ActualTorque	Feedback torque	%
SyncPosCmd	Synchronous control command position	User unit
SyncActualPos	Synchronous control feedback position	User unit
CompPosCmd	Command position after applying compensation offset	User unit
CompActualPos	Feedback position after applying compensation offset	User unit
UserOffsetActualPos	Feedback position after applying user offset	User unit
UserOffsetPosCmd	Command position after applying user offset	User unit
ActualFollowingError	Feedback following error	Pulse
EncoderCommand	Servo command position	Pulse
EncoderFeedback	Pulse feedback position	Pulse
DistZPulseToMasterZPulse	Difference in Z-phase position between slave axis and master axis	User unit
DistHSToMasterHS	Difference in home switch position between slave axis and master axis	User unit
DistLSToMasterLS	Difference in limit switch position between slave axis and master axis	User unit
ServoOn	Servo ON status	Bit
HomeDone	Home position return completion status	Bit
AlarmCode	Alarm code (Object ID: 603Fh)*1	32-bit integer
PositiveLS	Positive direction limit switch status	Bit
NegativeLS	Negative direction limit switch status	Bit
NearPositiveLS	Positive direction proximity limit switch status	Bit
NearNegativeLS	Negative direction proximity limit switch status	Bit
ExternalPositiveLS	Positive direction external limit switch status	Bit
ExternalNegativeLS	Negative direction external limit switch status	Bit
PositiveSoftLimit	Positive direction software limit switch status	Bit
NegativeSoftLimit	Negative direction software limit switch status	Bit
HomeSwitch	Home switch status	Bit
InPos	In-position status	Bit
MotionComplete	Motion command completion status	Bit
AccFlag	Acceleration status	Bit
DecFlag	Deceleration status	Bit
FollowingErrorAlarm	Following error status	Bit

*1 The object ID (603Fh: 00h(Error Code)) is displayed only in the supported servo amplifiers.
For MR-J5-G, check the object ID (2A41h: 00h(Current alarm)) by SDO communication or check the alarm contents in MR Configurator2. For the SDO communication method, refer to the following.
☞ Page 93 Operation

Point

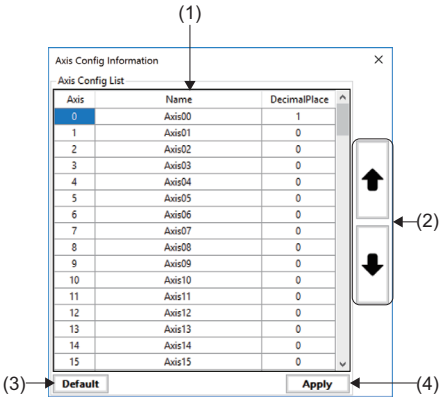
For details of each item, refer to the following.
📖SWM-G User Manual

Axis display setting

Click the [Axis Config] button in the "Axis Position" screen to display the "Axis Config Information" screen. Set axis names to be displayed in the axis status monitor and the numbers of decimal places in values to be displayed as the position/speed.

Window

[Operation] ⇨ [Position] ( ) ⇨ [Axis Config]



Displayed items

Item	Description
(1) Axis Config List	The name and number of decimal places for each axis can be set. ■Name Set the axis name. Axis names are displayed in the "Axis Config Information" screen when "AxisName" is selected as the status item for the "Axis Position" screen. • Setting range: Up to 64 one-byte characters (Default value: Axis00 to Axis127 (Axis numbers 00 to 127)) ■DecimalPlace Set the number of decimal places in values to be displayed as the position/speed. • Setting range: 0 to 6 (Default value: 0)
(2) Set axis switch button	Switches the display of axis to be set by 16 axes. • [↑] button: Displays the previous 16 axes. • [↓] button: Displays the next 16 axes.
(3) [Default] button	Restores the set axis names and numbers of decimal places to the default values.
(4) [Apply] button	Applies the settings configured in the axis config list to the "Axis Position" screen and closes the "Axis Config Information" screen. To close the "Axis Config Information" screen without applying the settings, click the [×] button in the upper right.

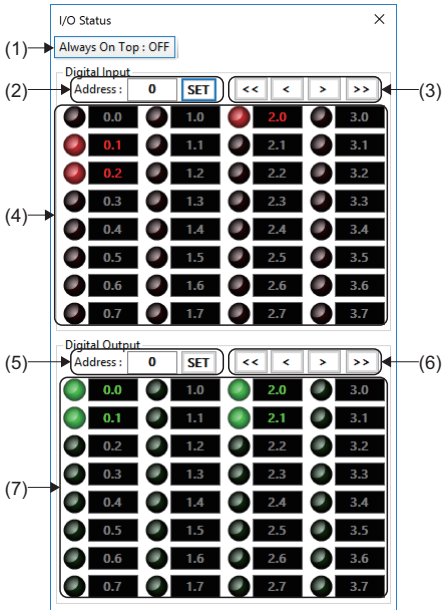
I/O status

The status of the input address and output address is monitored.

Displays 32 points (4 bytes) of input and 32 points (4 bytes) of output in one screen.

Window

[Operation] ⇨ [I/OStatus] ( )



Displayed items

Item	Description
(1) [Always On Top] button	Displays the "I/O Status" screen on the top. When this setting is enabled, the "I/O Status" screen is displayed on the top even if it is overlapped with another screen. • [Always On Top: ON]: The screen is displayed on the top. • [Always On Top: OFF]: The screen is not displayed on the top.
(2) Input address setting	Set the input address (byte unit) to be displayed. Enter the input address and click the [SET] button to switch the display to the set input address. • Setting range: 0 to 7999
(3) Display switch button	Switches the display of input address by 16 axes. • [<<] button: Switches the display to the input address of 4 bytes before. • [<] button: Switches the display to the input address of 1 byte before. • [>] button: Switches the display to the input address of 1 byte after. • [>>] button: Switches the display to the input address of 4 bytes after.
(4) Input status display	Displays the input status for 32 points (4 bytes). The input address is displayed in a format of "(input address).(bit position)". • : OFF • : ON
(5) Output address setting	Set the output address (byte unit) to be displayed. Enter the output address and click the [SET] button to switch the display to the set input address. • Setting range: 0 to 7999
(6) Display switch button	Switches the display of output address by 16 axes. • [<<] button: Switches the display to the output address of 4 bytes before. • [<] button: Switches the display to the output address of 1 byte before. • [>] button: Switches the display to the output address of 1 byte after. • [>>] button: Switches the display to the output address of 4 bytes after.
(7) Output status display/control	Displays the output status for 32 points (4 bytes). The output address is displayed in a format of "(output address).(bit position)". Click the button ( ) to turn on/off the output. • : OFF • : ON

Emergency stop/emergency stop release

Perform or release the emergency stop on the axis during the operation.

Operating procedure

■ Emergency stop

1. Click [Operation] ⇨ [E-Stop] () in the ribbon.
2. The emergency stop is performed. When the emergency stop is performed, the display of [E-STOP] in the ribbon is switched to [ON].

⚠ CAUTION

- Since the emergency stop is performed by the software, this function is not appropriate for the stop in case of an emergency. Use this function along with the emergency stop with the hardware.

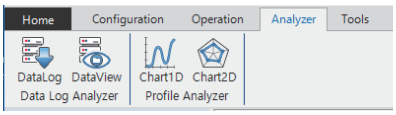
■ Emergency stop release

1. Click [Operation] ⇨ [Release] () in the ribbon.
2. The emergency stop is released. When the emergency stop is released, the display of [E-STOP] in the ribbon is switched to [OFF].

3.4 Analyzer Tab

Data of servo axes and I/O is collected/analyzed.

Window



Displayed items

Item		Description	Reference
Data Log Analyzer	DataLog ( )	Generates the log file using the data log function.	☞ Page 49 Data logging
	DataView ( )	Displays the log file generated by DataLog in a table format.	☞ Page 49 Data log display
Profile Analyzer	Chart1D ( )	Displays the time series data of one axis in a chart.	☞ Page 50 One axis chart
	Chart2D ( )	Displays the path data of two axes in a chart.	☞ Page 50 Two axes chart

Data logging

The log file is generated by using the data log function.

Operating procedure

1. Click [Analyzer] ⇨ [DataLog] ( ) in the ribbon.
2. The "Data Log" screen appears. Configure the settings to generate the log file.

Point

For details of the data logging, refer to the following.

☞ Page 148 Data Log Collection

Data log display

The log file generated by data logging is displayed in a table format.

Operating procedure

1. Click [Analyzer] ⇨ [DataView] ( ) in the ribbon.
2. The "Data View" screen appears. Set and read the log file to be displayed.

Point

For details of the data log display, refer to the following.

☞ Page 153 Data log display

One axis chart

The time series data of one axis is displayed in a chart.

Operating procedure

1. Click [Analyzer] ⇨ [Chart1D] ( ) in the ribbon.
2. The "Single Axis Profile Analyzer" screen appears. Configure the settings, and click the [▶ Start] button to start the sampling.

Point

For details of the one axis chart, refer to the following.

☞ Page 155 One Axis Chart Display Function

Two axes chart

The path data of two axes is displayed in a chart.

Operating procedure

1. Click [Analyzer] ⇨ [Chart2D] ( ) in the ribbon.
2. The "2D Axis Profile Analyzer" screen appears. Configure the settings, and click the [▶ Start] button to start the sampling.

Point

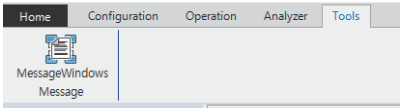
For details of the two axes chart, refer to the following.

☞ Page 158 Two Axes Chart Display Function

3.5 Tools Tab

The status of the SWM-G engine and related information can be checked.

Window



Displayed items

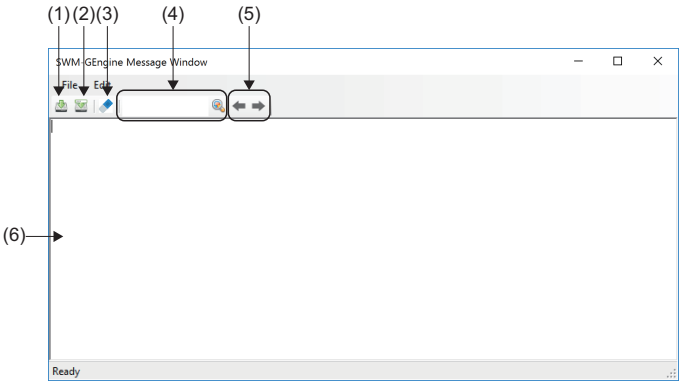
Item		Description	Reference
Message	MessageWindows	Messages of the SWM-G engine can be checked.	☞ Page 51 Message window

Message window

Messages of the SWM-G engine are checked.

Window

[Tools] ⇨ [MessageWindows]



Displayed items

Item	Description
(1) Overwrite save	Saves the message displayed in the message display field in a file.
(2) Save as	Saves the message file once overwritten and displayed in the message display field with a different name.
(3) Delete	Deletes the message displayed in the message display field.
(4) Search	Searches for a character string in the message displayed in the message display field. Enter the character string to search in the input field, and click .
(5) Find next/previous	Searches for the character string in the message. • [←]: Finds the previous occurrence of the character string from the cursor position. • [→]: Finds the next occurrence of the character string from the cursor position.
(6) Message display field	Displays the message of the SWM-G engine.

Point

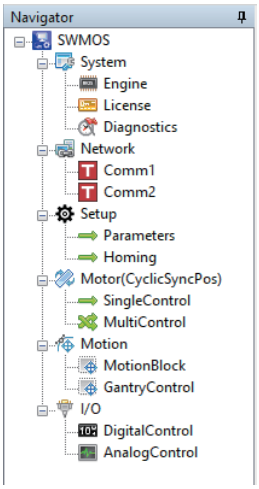
To output the SWM-G engine message to the "SWM-GEngine Message Window", set "Get Engine Message" to "Enable" in the "Common Setting" of the "Platform Setting" area of the tab displayed by selecting [SWMOS] ⇨ [System] ⇨ [Engine] in the navigation window. For details, refer to the following.

☞ Page 55 Platform setting

4 FUNCTION OF NAVIGATION WINDOW

From the navigation window, the system setting, network setting, and axis setting are configured and the axis control, motion control, and I/O control are performed.

Window



Displayed items

Item		Description	Reference
System	Engine	The SWM-G engine is managed.	☞ Page 53 SWM-G engine
	License	The SWM-G license is managed.	☞ Page 60 License
	Diagnostics	The system status of the SWM-G engine is diagnosed.	☞ Page 65 Diagnostics
Network	Comm1	The communication setting and communication status of the master and slave devices are displayed.	☞ Page 66 Network Setting
	Comm2*1		
Setup	Parameters	The axis parameters are set.	☞ Page 96 Parameter
	Homing	Home position return settings of axes are configured and home position return is performed.	☞ Page 100 Home position return
Motor(CyclicSyncPos)	SingleControl	The single-axis control is tested.	☞ Page 105 Single-axis control
	MultiControl	Test operations are performed on multiple axes simultaneously.	☞ Page 119 Multi-axis control
Motor(ProfilePos)*2	DriveControl	The PM motion axis control is tested.	☞ Page 143 PM motion axis control
Motion	Motion Block	Test operations on the linear interpolation, circular interpolation, and helical interpolation are performed.	☞ Page 123 Interpolation control
	GantryControl	Test operations on the gantry control are performed.	☞ Page 131 Gantry control
I/O	DigitalControl	Set the name and start address of the digital I/O to perform I/O control.	☞ Page 138 Digital I/O control
	AnalogControl	Set the name and start address of the analog I/O to perform I/O control.	☞ Page 140 Analog I/O control

*1 To display Comm2, select [SWMOS] ⇨ [System] ⇨ [Engine] in the navigation window, select the [Engine Information] tab, set to use two ports (CC-Link IE TSN×2 or CC-Link IE TSN×2+Simulation×2) or "Simulation" in [Quick Setting] under [Platform Setting].

*2 To display Motor(ProfilePos), select [SWMOS] ⇨ [System] ⇨ [Engine] in the navigation window, select [Add PMMotion] in [Module Setting] in the [Module Setting] tab, and add a PM motion module. For details of the setting method, refer to the following.
☞ Page 165 PM Motion Function

Point

In the following cases, only [System] is displayed in the tree of the navigation window, and [Setup], [Motor(CyclicSyncPos)], [Motion], or [I/O] is not displayed.

- When the SWM-G engine is stopped
- When the license of SWM-G has not been registered

4.1 System

Settings of the SWM-G engine are configured, the license is managed, and diagnosis is performed.

SWM-G engine

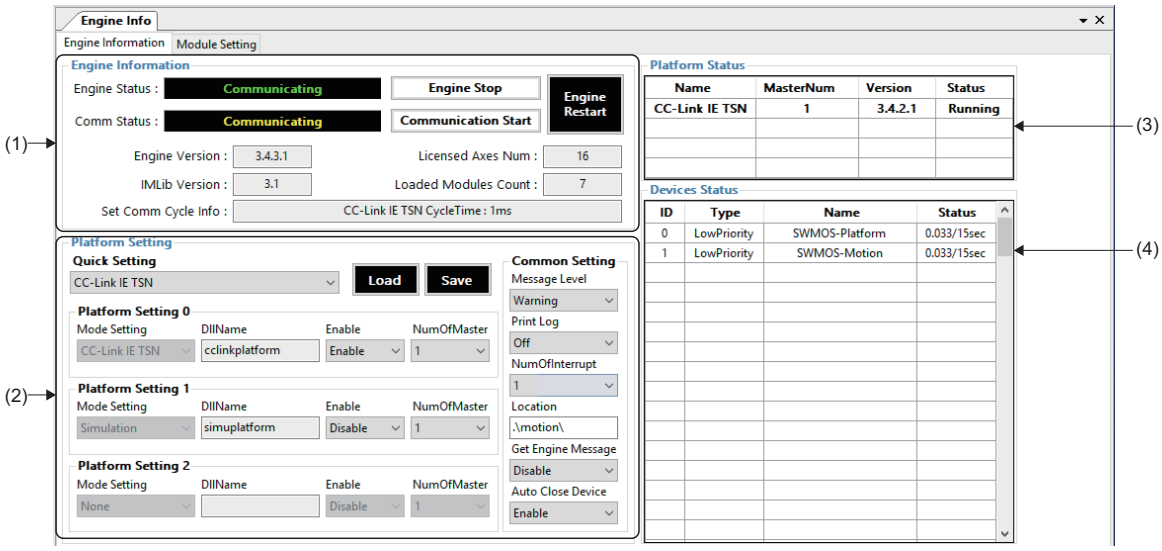
The SWM-G engine is managed.

Engine information

The status of the SWM-G engine is checked and controlled, and the platform setting is configured.

Window

Navigation window ⇨ [SWMOS] ⇨ [System] ⇨ [Engine] ⇨ [Engine Information] tab



Displayed items

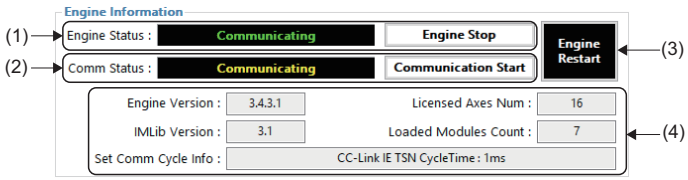
Item	Description
(1) Engine Information	Check the status of the SWM-G engine and operate the SWM-G engine. (☞ Page 54 Engine information)
(2) Platform Setting	Configure settings for the platform modules (CC-Link IE TSN communication and simulator) and common settings for the entire system. (☞ Page 55 Platform setting)
(3) Platform Status	Displays the status of the platform module used in the SWM-G engine. ■Name Displays the name of the module. ■MasterNum Displays the number of masters. ■Version Displays the version of the module. ■Status Displays the status of the module. • Stopped: Stopped • Running: Execution in progress
(4) Device Status	Displays the status of the generated device (communication channel). ■ID Displays the ID number of the device. ■Type Displays the device type. • Normal • LowPriority • ExitWOCnt • LowpriorityExitWOCnt ■Name Displays the name of the device. ■Status Displays the watchdog count value/watchdog time to timeout.

■ Engine information

The SWM-G engine and network communication are started/stopped in the engine information. In addition, the status of the SWM-G engine and network communication can be checked.

Window

Navigation window ⇨ [SWMOS] ⇨ [System] ⇨ [Engine] ⇨ [Engine Information] tab ⇨ [Engine Information]



Displayed items

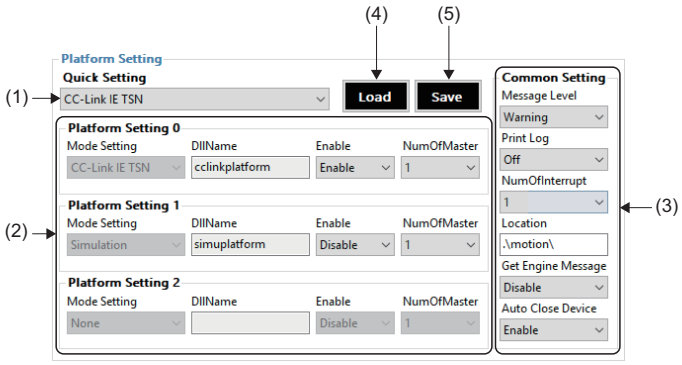
Item	Description
(1) SWM-G engine status	Displays the status and starts/stops the SWM-G engine. Click the [Engine Start/Engine Stop] button to start/stop the SWM-G engine. ■Engine status Displays the status of the SWM-G engine. • Stopped: Engine stopped • Preparing: Engine in preparation • Running: Engine running • Communicating: Network communication in progress
(2) Network communication status	Displays the status and starts/stops the network communication. Click the [Communication Start/Communication Stop] button to start/stop the network communication. ■Communication status Displays the status of the network communication. • Stopped: Network communication stopped • Communicating: Network communication in progress
(3) [Engine Restart] button	Restarts the SWM-G engine.
(4) SWM-G engine information	Displays the information of the SWM-G engine. • Engine Version: Displays the version of the SWM-G engine. • Licensed Axes Num: Displays the number of axes of the licensed product. • IMLib Version: Displays the version of IMLib. • Loaded Modules Count: Displays the number of loaded modules. • Set Comm Cycle Info: Displays the communication cycle [ms]. *: The information of the communication cycle is updated when the network communication is started.

■ Platform setting

Settings for the platform module to be used in SWM-G are configured in the platform setting. There are two types of SWM-G platform modules: "CC-Link IE TSN module" and "Simulation module".

Window

Navigation window ⇨ [SWMOS] ⇨ [System] ⇨ [Engine] ⇨ [Engine Information] tab ⇨ [Platform Setting]



Displayed items

Item	Description
(1) Quick Setting	Set the platform module. • Custom: Custom setting • Simulation: Simulation • CC-Link IE TSN: CC-Link IE TSN • CC-Link IE TSN×2: Two ports of CC-Link IE TSN used • CC-Link IE TSN+Simulation: CC-Link IE TSN and simulation • CC-Link IE TSN×2+Simulation×2: Two ports each of CC-Link IE TSN and simulation used
(2) Platform Setting	Configure settings for up to three platform modules (0 to 2) when "Custom" is set in "Quick Setting". ■Mode Setting Select the platform module. • None: No setting • Simulation: Simulation module • CC-Link IE TSN: CC-Link IE TSN module ■DllName Displays the platform module name. • cclinkplatform: CC-Link IE TSN platform • simuplatform: Simulation platform ■Enable Enable/disable the platform set in "Mode Setting". • Disable: The platform is disabled. • Enable: The platform is enabled. ■NumOfMaster Set the number of masters in the platform. • 1 or 2 *: For the CC-Link IE TSN platform, only "1" can be set as the number of masters.

Item	Description
(3) Common Setting	Configure common settings for the module configuration. ■Message level (Message Level) Set the message level of the SWM-G engine. • Error: Displays errors only. • Warning: Displays errors and warnings. • Setting: Displays errors, warnings, and set parameters. • Debug: Displays errors, warnings, set parameters, and debug messages. ■Message output flag (Print Log) Set the message output flag of the SWM-G engine. • Off: The message output is OFF. • On: The message output is ON. ■NumOfInterrupt Set the number of interruptions to "1" or "2". When the number of interruptions is set to "2", the communication master processes with different cycles can be simultaneously controlled by distributing them to multiple threads. For example, CC-link IE TSN and simulator can be controlled with different communication cycles. ■Module path (Location) Set the path where the module file to be loaded is stored. Either of the relative path and absolute path from the module configuration file (Module.ini) can be set. • Default: .\motion\ ■Message output method (Get Engine Message) Set the output method of the SWM-G engine. • Disable: The message is output to the console. • Enable: The message is output to the message output buffer of the SWM-G engine. ■Device automatic deletion (Auto Close Device) Set whether to perform the alive check for devices. • Disable: The alive check is not performed for devices. • Enable: The alive check is performed for devices.
(4) [Load] button	Reads the contents of the module configuration file (Module.ini) and applies them to the screen.
(5) [Save] button	Saves the settings configured in the platform setting in the module configuration file (Module.ini).

Operating procedure

1. Select the platform module from the [Quick Setting] pull-down list. Configure the settings as listed below according to the selected platform module.

Quick Setting	Module setting configured in Platform Setting			Description
	Platform Setting	DllName	Enable	
Custom	Platform Setting 0	Set Platform Setting 0 to 2 individually.		Custom setting
	Platform Setting 1			
	Platform Setting 2			
Simulation	Platform Setting 0	CC-Link IE TSN	Disable	Only for simulation
	Platform Setting 1	Simulation	Enable	
	Platform Setting 2	None	—	
CC-Link IE TSN	Platform Setting 0	CC-Link IE TSN	Enable	Only for CC-Link IE TSN
	Platform Setting 1	Simulation	Disable	
	Platform Setting 2	None	—	
CC-Link IE TSN×2	Platform Setting 0	CC-Link IE TSN	Enable	Two ports of CC-Link IE TSN used
	Platform Setting 1	Simulation	Disable	
	Platform Setting 2	None	—	
CC-Link IE TSN+Simulation	Platform Setting 0	CC-Link IE TSN	Enable	CC-Link IE TSN and simulation
	Platform Setting 1	Simulation	Enable	
	Platform Setting 2	None	—	
CC-Link IE TSN×2+Simulation×2	Platform Setting 0	CC-Link IE TSN	Enable	Two ports each of CC-Link IE TSN and simulation used
	Platform Setting 1	Simulation	Enable	
	Platform Setting 2	None	—	

2. To change the platform setting, change the settings in [Platform Setting 0] to [Platform Setting2]. When any of the settings is changed, [Quick Setting] is set to "Custom".

3. To change the common setting, change the settings in [Common Setting].

4. After configuring the settings, click the [Save] button. The confirmation message "Do you want to save in Module.ini?" appears. Click the [Yes] button to save the module configuration file (Module.ini).

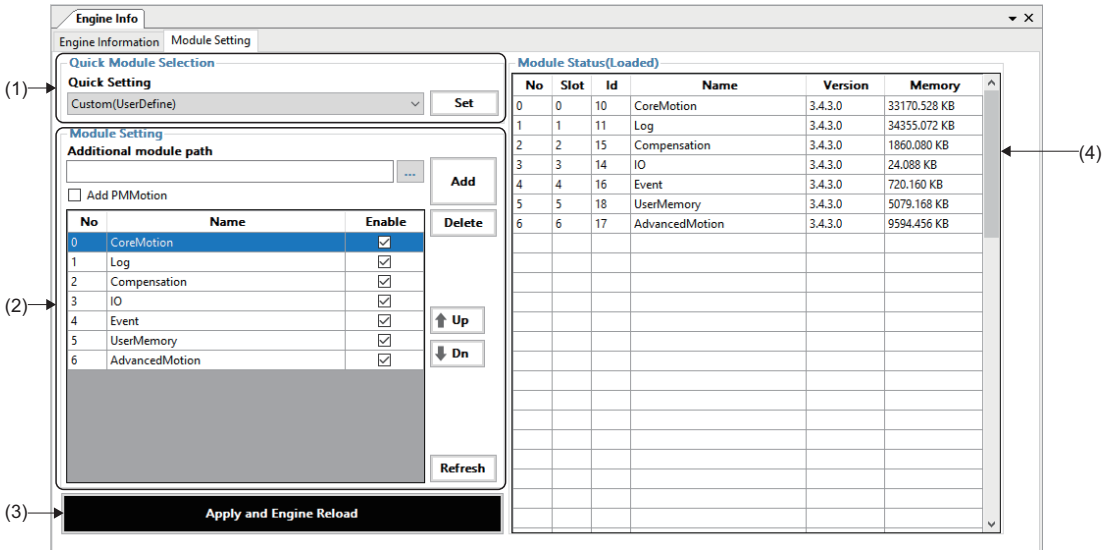
5. Then, the confirmation message "Do you want to restart the SWM-GEngine?" appears. Click the [Yes] button to restart the SWM-G engine. The settings are applied to the SWM-G engine after the restart.

Module setting

Settings for the motion module to be used in the SWM-G engine are configured and checked.

Window

Navigation window ⇨ [SWMOS] ⇨ [System] ⇨ [Engine] ⇨ [Module Setting] tab



Displayed items

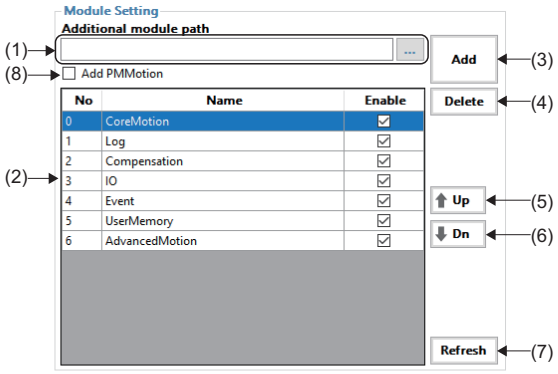
Item	Description
(1) Quick Module Selection	Configure the motion module setting. Click the [Set] button to apply it to the module setting. • Custom(UserDefine): Custom setting • Default: Default setting (CoreMotion, Log, Compensation, IO, Event, UserMemory, AdvancedMotion)
(2) Module Setting	Motion modules are added, deleted, enabled, and disabled and the definition order is changed. (☞ Page 58 Module setting)
(3) [Apply and Engine Reload] button	Saves the configured settings in the module configuration file (Module.ini), and restarts the SWM-G engine. The settings are applied to the SWM-G engine after the restart.
(4) Module Status(Loaded)	Displays the status of the motion modules used in the SWM-G engine. ■No Displays the order of module definition. ■Slot Displays the slot number of the module. This number is assigned to each module in the order of loading. ■Id Displays the ID number of the module. This number is specific to each module. ■Name Displays the name of the module. ■Version Displays the version of the module. ■Memory Displays the memory usage amount of the module.

■ Module setting

Motion modules are added, deleted, enabled, and disabled and the definition order is changed.

Window

Navigation window ⇨ [SWMOS] ⇨ [System] ⇨ [Engine] ⇨ [Module Setting] tab ⇨ [Module Setting]



Displayed items

Item	Description
(1) Additional module path	Set the module file (*.rtdll) to be added. From the "Open" screen that is displayed by clicking the [...] button, the module file can be set.
(2) Module list	Displays the list of the set modules. ■No Displays the order of module definition. ■Name Displays the name of the module. ■Enable*2 Enables/disables the module loading. • Selected: The module loading is enabled. • Not selected: The module load is disabled.
(3) [Add] button*1	Adds a module to the module list. After setting a configured module file (*.rtdll) in "Additional Module Path", click the [Add] button to add it.
(4) [Delete] button*1	Deletes a module from the module list. Select a module from the module list and click the [Delete] button to delete it.
(5) [↑Up] button*1	Moves the definition order of a module up a row. Select a module to move its definition order up from the module list, and click the [↑Up] button.
(6) [↓Dn] button*1	Moves the definition order of a module down a row. Select a module to move its definition order down from the module list, and click the [↓Dn] button.
(7) [Refresh] button	Reads the module configuration file (Module.ini) and applies it to the screen.
(8) Add PMMotion	Adds a PM motion module. Adding a PM motion module adds "PMMotion" to the module list and adds [SWMOS] ⇨ [Motor(Profilepos)] ⇨ [DriveControl] to the navigation window. (☞ Page 143 PM motion axis control, ☞ Page 165 PM Motion Function) • Not selected: No PM motion module is added. • Selected: A PM motion module is added.

*1 The module configuration file (Module.ini) is updated at the timing of clicking the button.

*2 The module configuration file (Module.ini) is not updated when the status of the checkbox is changed. Click the [Apply and Engine Reload] button to update the file.

Point

The PM motion module can be added by selecting "Add PMMotion". The PM motion module controls the axes using the PP, HM, PV, and TQ command modes. The PM motion axis is required to be connected to a network different from the one for normal axes. For details of the setting method, refer to the following.

☞ Page 165 PM Motion Function

Operating procedure

1. Select a module from the [Quick Setting] pull-down list in [Quick Module Selection], and click the [Set] button.

Quick Setting	Description	Module to be set
Custom(UserDefine)	Custom setting	Set modules individually.
Default (CoreMotion, Log, Comp', IO, Event, UserMem', AdvMotion)	Default setting	Set CoreMotion, Log, Compensation, IO, Event, UserMemory, and AdvancedMotion.

2. When the confirmation message "Do you want to apply the quick setting?" appears, click the [Yes] button. The settings of the selected module is applied to [Module Setting] and the module configuration file (Module.ini) is updated.

3. To change the module setting, change the settings in [Module Setting].

- When adding a module
  Specify the module file (*.rtdl) to be added in [Additional module path] and click the [Add] button.
- When deleting a module
  Select the module to be deleted from the module list and click the [Delete] button.
- When changing the module definition order
  Select a module to change its definition order from the module list and click the [↑Up] or [↓Dn] button.

4. When the module setting is completed, click the [Apply and Engine Reload] button to update the module configuration file (Module.ini).

5. The confirmation message "Do you want to restart the SWM-GEngine?" appears. Click the [Yes] button to restart the SWM-G engine. The settings are applied to the SWM-G engine after the restart.

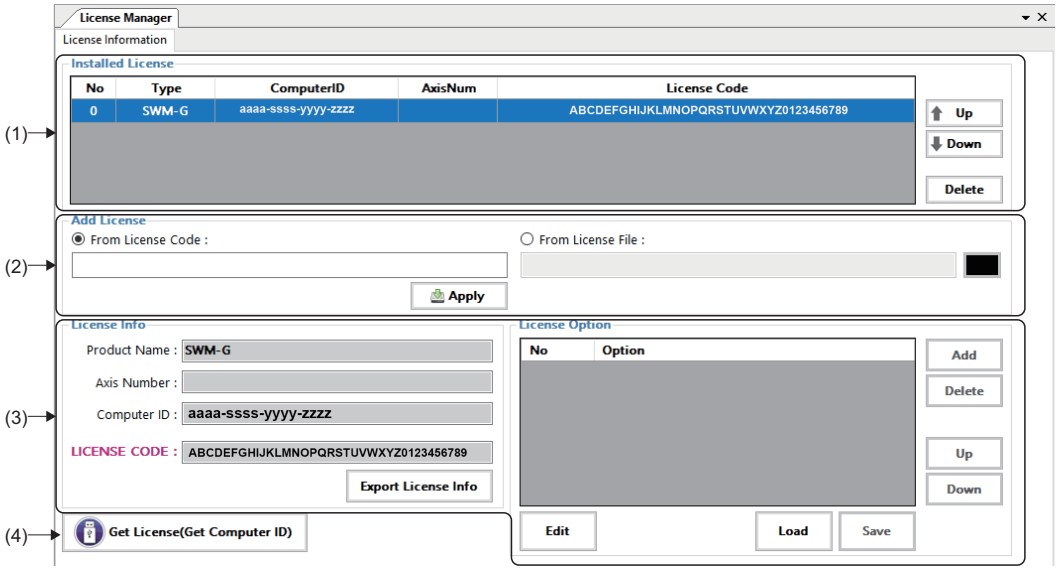
License

The SWM-G license is managed.

Typically, inputting the license is completed at the time of the SWM-G installation. This function is used to check, back up, and restore the license.

Window

Navigation window ⇨ [SWMOS] ⇨ [System] ⇨ [License] ⇨ [License Information] tab



Displayed items

Item	Description
(1) Installed License	Registered licenses are displayed and can be deleted. Select a license from the license list and click the [Delete] button to delete it. ■No Displays the order of license registration. The order of the license selected in the license list can be changed by clicking the [↑Up] button/[↓Down] button. ■Type Displays the name of the licensed product. ■ComputerID Displays the computer ID. ■AxisNum Displays the number of axes of the licensed product. ■License Code Displays the registered license code.
(2) Add License	Used to add a license. ■From License Code Enter a license code and click the [Apply] button to add it. ■From License File Set a license file (*.lic) and click the [Apply] button to add it. A license file can be set in the "Open" screen which is displayed by clicking the [...] button.
(3) License Info	Detailed information of the license is displayed and edited. (☞ Page 61 License information/option information)
(4) [Get License(Get Computer ID)] button	Check the computer ID assigned to the USB key.

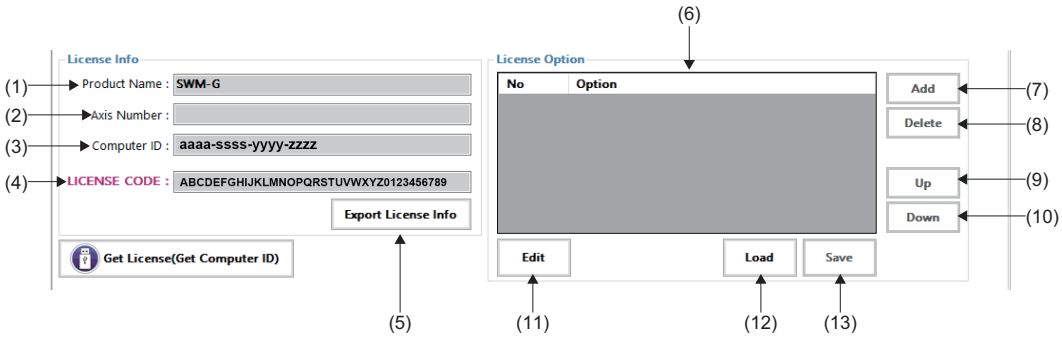
■ License information/option information

The license information of the license selected in installed license is displayed and edited.

In addition, option information is added to the license information as necessary.

Window

Navigation window ⇨ [SWMOS] ⇨ [System] ⇨ [License] ⇨ [License Information] tab ⇨ [License Option]



Displayed items

Item	Description
(1) Product Name	The product name is displayed and edited.
(2) Axis Number	The number of axes is displayed and edited.
(3) Computer ID	The computer ID is displayed and edited.
(4) LICENSE CODE	Displays the license code. *: The license code cannot be edited.
(5) [Export License Info] button	Saves the license information in s license file (*.lic). Set the file saving destination and file name in the "Save As" screen which is displayed by clicking the [Export License Info] button.
(6) Option list	Displays the list of the set option names. ■No Displays the addition order of the option information. ■Option Displays the input option information.
(7) [Apply] button	Adds an option information to the option list. Click the [Edit] button, and click the [Apply] button to add it.
(8) [Delete] button	Deletes an option information from the option list. Select an option name from the option list, and click the [Delete] button to delete it.
(9) [Up] button	Moves an option up a row in the option list. Select an option to be moved up from the option list, and click the [Up] button.
(10) [Down] button	Moves an option down a row in the option list. Select an option to be moved down from the option list, and click the [Down] button.
(11) [Edit] button	Enables editing the following columns. ■License Info • Product Name • Axis Number • Computer ID ■License Option • Option
(12) [Load] button	Reads the saved license information and applies it to the screen.
(13) [Save] button	Saves the edited settings.

SWM-G license

To enable the SWM-G engine, registering "License code" is required.

The SWM-G engine can be enabled by registering "License code" and inserting the USB key to the personal computer.

■ License code

The license code is the character string described in the license agreement included with the USB key.

Ex.

License code: "AAAAAA-BBBBBB-CCCCCC-DDDDDD-EEEEEE-FFFFFF"

The license code is linked with the ID specific to the USB key (computer ID).

License operation

■ How to add a license with a license code

Operating procedure

1. Select [From License Code] in [Add License]. The text box is enabled. Then, enter a 36-character license code, which is described in the license agreement, in the text box.
2. Click the [Add] button to register it to the [Installed License] list.
3. To check that the license is normally registered, restart the SWM-G engine and check that [Engine Status] is in the "Running" state. (☞ Page 54 Engine information)

■ How to add a license with a license file

Operating procedure

1. Select [From License File] in [Add License]. The text box is enabled. Then, specify a license file (*.lic). A license file can be set in the "Open" screen which is displayed by clicking the [...] button.
2. Click the [Add] button to register it to the [Installed License] list.
3. To check that the license is normally registered, restart the SWM-G engine and check that [Engine Status] is in the "Running" state. (☞ Page 54 Engine information)

■ How to delete a license

Operating procedure

1. Select a license to be deleted from the [Installed License] list.
2. Click the [Delete] button to delete the selected license.

■ How to check and edit license detailed information

Operating procedure

1. Select a license to check its detailed information from the [Installed License] list. The detailed information of the selected license can be checked in [License Info]. Additional information can be checked in [License Option].
2. Clicking the [Edit] button in [License Option] enables editing the items other than the license code.

Item	Description	Edit
Product Name	Name of licensed product	○
Axis Number	Number of axes of licensed product	○
Computer ID	Computer ID	○
LICENSE CODE	License code	×

3. Edit the option information as necessary. When editing the information is completed, click the [Save] button to save. Clicking the [Load] button cancels the edited information and loads the information before the edit.

- When adding a module
  Click the [Add] button.
- When deleting a module
  Click the [Delete] button.
- When changing the order of modules
  Select an option from the module list, and click the [Up] or [Down] button to change the order.

Point

The items other than the license code are information only to display. They do not affect the license authentication.
The items other than the license code are blank immediately after the license registration. Add information as necessary.

■ Saving a license file

The registered license can be saved in a license file (*.lic). It can be used as a backup of the license.

Operating procedure

1. Select the license to be saved from the [Installed License] list.
2. Click [License Information] ⇨ [Export License Info] button to display the "Save As" screen. Set the saving destination and file name of the license file, and click the [Save] button to save it.

Point

The saved license file (*.lic) is used when a license file is registered by selecting it from [Add License] ⇨ [From License File].

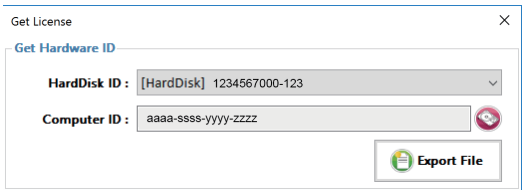
■ Acquiring the computer ID

The computer ID uniquely assigned to the USB key can be checked.

Use the computer ID when contacting Mitsubishi Electric.

Operating procedure

1. Click the [Get License(Get Computer ID)] button to display the "Get License" screen.



2. Select the [Dongle] item from the pull-down list. The computer ID for the USB key is displayed in [Computer ID].

3. Click the [Export File] button to display the "Save As" screen. Set the saving destination and name of the file, and click the [Save] button.

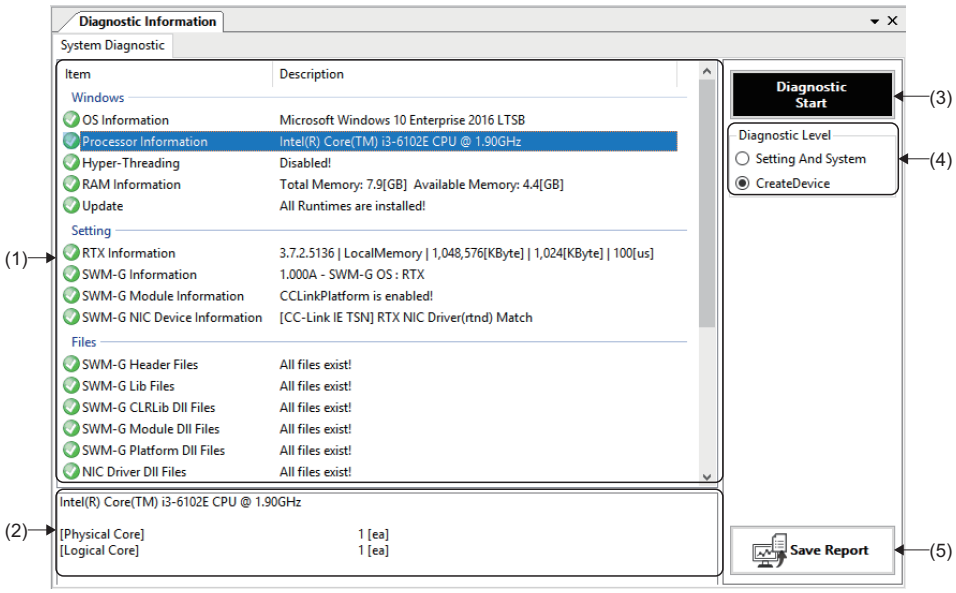
The computer ID information is saved in a text file (*.txt).

Diagnostics

The system status of the SWM-G engine is diagnosed.

Window

Navigation window ⇨ [SWMOS] ⇨ [System] ⇨ [Diagnostics] ⇨ [System Diagnostic] tab



Displayed items

Item	Description
(1) Diagnostic item list	Displays the list of diagnostic items and the diagnostic results. ■Diagnostic result • : Normal • : Error or not diagnosed
(2) Diagnostic result detail display	Displays the detailed information of the selected diagnostic item.
(3) [Diagnostic Start] button	Starts diagnostics.
(4) Diagnostic Level	Select the level of diagnostics. • Setting And System: The system status is diagnosed. • CreateDevice: The system status and device creation are diagnosed.
(5) [Save Report] button	Saves the diagnostic results in a text file (*.txt) on the desktop.

Operating procedure

1. Select the level of diagnostics in [Diagnostic Level].
2. Click the [Diagnostic Start] button to start the diagnostics.
3. When the diagnostics is completed, the completion message "System diagnosis is completed" appears. Click the [OK] button and check the diagnostic results displayed in the diagnostic item list.
4. Select an item to display its detailed information in the diagnostic result detail display. For details of the items, refer to the following.

☞ Page 164 Diagnostic Result

5. Click the [Save Report] button to save the diagnostic results in a text file (*.txt). The diagnostic results file is saved on the desktop of the personal computer with a file name "SWMOS_DiagnosisLog-yyyy-mm-dd_tt-mm-ss".

Ex.

When the file is saved at "1:36:52 PM on December 25, 2020"

SWMOS_DiagnosisLog-20-12-25_13-36-52.txt

yy-mm-dd hh-mm-ss

4.2 Network Setting

The network setting of CC-Link IE TSN is configured.

When two ports are assigned in the NIC setting, Comm1 and Comm2 are displayed in the order of the RTX NIC setting in the "NIC setting" screen. Configure the settings for each port.

Comm1/Comm2

The communication setting and communication status of the master and slave devices are displayed.

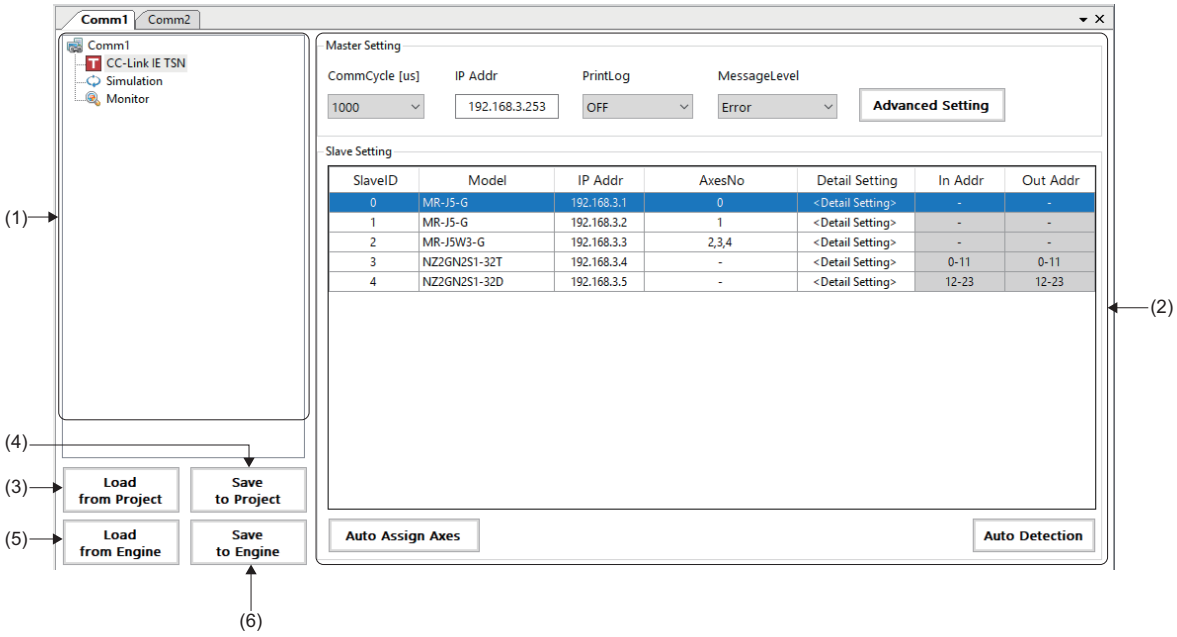
Select an item to be set (CC-Link IE TSN, Simulation, Monitor) from the Comm1/Comm2 tree.

Point

To display Comm2, select [SWMOS] ⇨ [System] ⇨ [Engine] in the navigation window, select the [Engine Information] tab, set to use two ports (CC-Link IE TSN×2 or CC-Link IE TSN×2+Simulation×2) or "Simulation" in [Quick Setting] under [Platform Setting].

Window

Navigation window ⇨ [SWMOS] ⇨ [Network] ⇨ [Comm1/Comm2]



Displayed items

Item		Description
(1) Comm1/ Comm2 tree	CC-Link IE TSN	Configure the master setting and slave setting of the CC-Link IE TSN platform. (☞ Page 71 CC-Link IE TSN)
	Simulation	Configure the master setting and axis number setting of the simulation platform. (☞ Page 85 Simulation)
	Monitor	Displays the master and slave statuses. (☞ Page 87 Monitor)
(2) Setting/status display		Displays the setting items and statuses of the master/slave. The displayed items differ depending on the item selected in the Comm1/Comm2 tree.
(3) [Load from Project] button		Loads the information of the master setting, slave setting, and simulation setting from the setting file. (☞ Page 68 Loading a setting file)
(4) [Save to Project] button		Saves the set master setting, slave setting, and simulation setting in the setting file. (☞ Page 67 Saving a setting file)
(5) [Load from Engine] button		Loads the information of the master setting, slave setting, and simulation setting from the SWM-G engine. (☞ Page 69 Loading information from the SWM-G engine)
(6) [Save to Engine] button		Writes the information of the master setting, slave setting, and simulation setting to the SWM-G engine. (☞ Page 69 Writing information to the SWM-G engine)

Saving/Loading a setting file

■ Saving a setting file

Save the master setting, slave setting, and simulation setting as a setting file in the specified folder.
Manage the setting file in the following folder.

Storage destination folder
C:\Program Files\MotionSoftware\SWM-G\SWMOS\SWMOSPack\Project\SWMOS\NETWORK

By default, no storage destination folder is set. Specify it on the "Folder browsing" screen at saving. After saving the setting, the specified folder is created in the above folder, and the following files are saved. (If the setting file already exists, the file is overwritten.)

Setting file	Storage destination folder	File name
Master setting (Network definition file)	\Specified folder*1\DEF\	cclink_network.def
Slave setting (CUI file)	\Specified folder*1\CUI\	swmos-**********.txt*2
Simulation setting (Simulation definition file)	\Specified folder*1\DEF\	simu_network.def

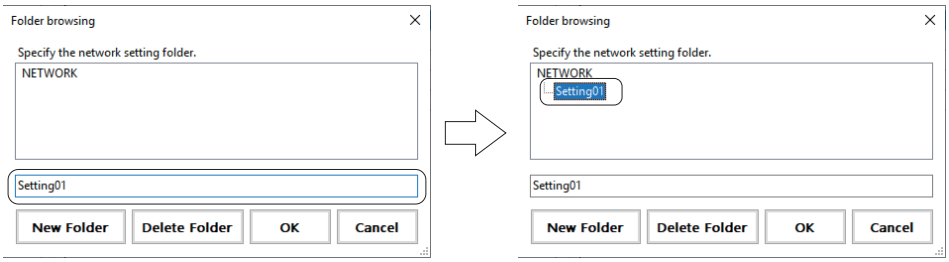
*1 The folder name specified in the "Folder browsing" screen
*2 ********** = IP address of the slave device

Operating procedure

1. Click the [Save to Project] button.
2. The confirmation message "Do you want to save the setting to the project data?" appears. Click the [Yes] button.
3. The "Folder browsing" screen appears.

<When saving the setting in a newly created folder>

- Enter the "Folder name" in the folder name entry column, and click the [New Folder] button. A folder is created under "NETWORK". Select the created folder, and click the [OK] button.



<When saving the setting in an existing folder>

- Select the save destination folder, and click the [OK] button.

4. When the saving is completed, the completion message "Succeeded in saving the setting to the project data." appears. Click the [OK] button to close the message.

Point

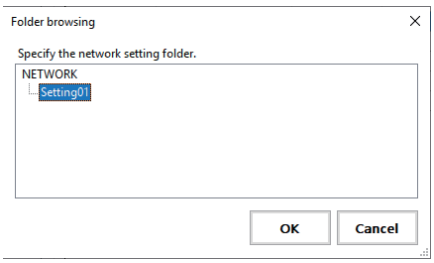
- Click the [Save to Project] button to save the setting file, and if the setting has an error, an error message appears. Click the [OK] button to close the error message. The "Network Setting Error Information" screen appears. Check the displayed error details and eliminate the error. For details of the "Network Setting Error Information" screen, refer to the following.
  ☞ Page 70 Network setting error information
- Any created folders can be deleted with the [Delete Folder] button. To delete a folder, select a folder under "NETWORK", and click the [Delete Folder] button.

■ Loading a setting file

Load the setting file (master setting, slave setting, simulation setting) from the specified folder.

Operating procedure

1. Click the [Load from Project] button.
2. The confirmation message "Do you want to load the setting from the project data?" appears. Click the [Yes] button.
3. The "Folder browsing" screen appears. Select a folder from which the setting file is loaded, and click the [OK] button.



4. When the loading is completed, the completion message "Succeeded in loading the setting from the project data." appears. Click the [OK] button to close the message.

Writing/Loading information to/from the SWM-G engine

■ Writing information to the SWM-G engine

Write the information of the master setting, slave setting, and simulation setting to the SWM-G engine.

Store the files in the following folder to apply each setting information to the SWM-G engine.

Load the setting file at the communication start.

Setting file	Storage destination folder	File name
Master setting (Network definition file)	C:\Program Files\MotionSoftware\SWM-G\Platform\CCLink\	cclink_network.def
Slave setting (CUI file)	C:\cui\	swmos-**********.txt*1
Simulation setting (Simulation definition file)	C:\Program Files\MotionSoftware\SWM-G\Platform\Simu\	simu_network.def

*1 ********** = IP address of the slave device

Point

- The setting written to the SWM-G engine is applied at the communication start.

Operating procedure

1. Click the [Save to Engine] button.
2. The confirmation message "Do you want to load the setting from the engine?" appears. Click the [Yes] button.
3. When the writing is completed, the completion message "Succeeded in loading the setting from the engine." appears. Click the [OK] button to close the message.

Point

Click the [Save to Engine] button to write the setting file, and if the setting has an error, an error message appears. Click the [OK] button to close the error message. The "Network Setting Error Information" screen appears. Check the displayed error details and eliminate the error. For details of the "Network Setting Error Information" screen, refer to the following.

☞ Page 70 Network setting error information

■ Loading information from the SWM-G engine

Load the information of the master setting, slave setting, and simulation setting from the SWM-G engine.

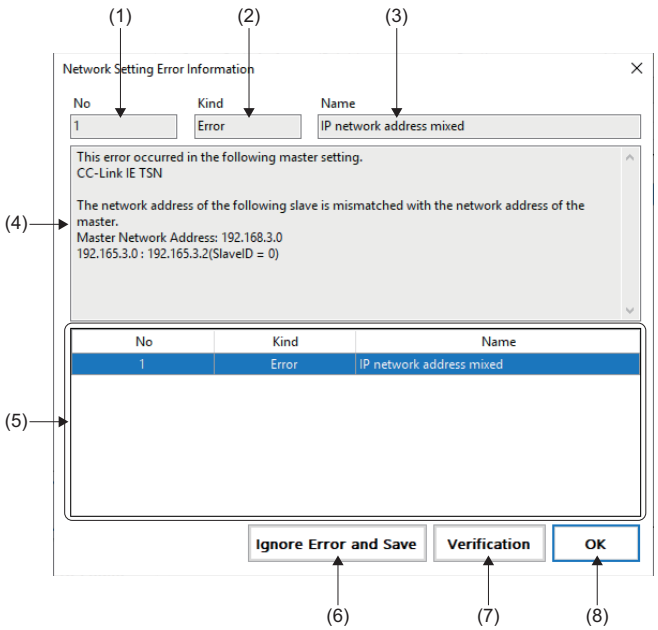
Operating procedure

1. Click the [Load from Engine] button.
2. The confirmation message "Do you want to save setting to the engine?" appears. Click the [Yes] button.
3. When the loading is completed, the completion message "Succeeded in saving the setting to the engine." appears. Click the [OK] button to close the message.

Network setting error information

When the setting file is saved with the [Save to Project] button or written to the SWM-G engine with the [Save to Engine] button, if the setting has an error, the error message "A setting error has occurred. Please resolve the error indicated in the Network Setting Error Information window." appears. Clicking the [OK] button in the error message displays the "Network Setting Error Information" screen. Check the error details displayed on the "Network Setting Error Information" screen and eliminate the error.

Window



Displayed items

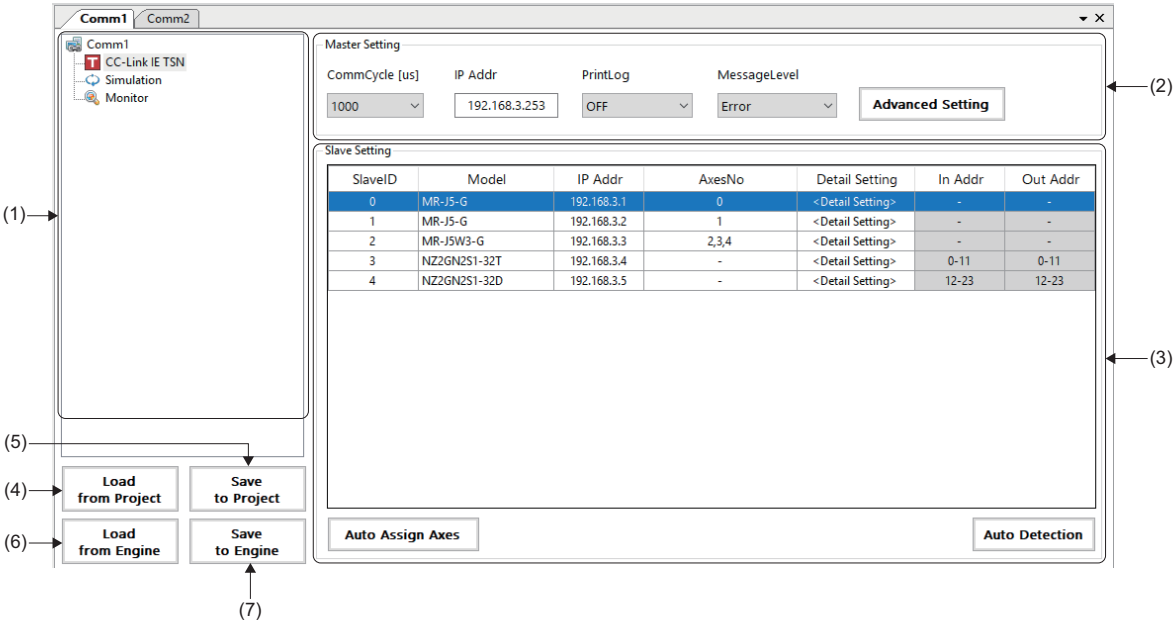
Item	Description
(1) No	Displays the order in the list of the error selected in the error list.
(2) Kind	Displays the type of the error selected in the error list.
(3) Name	Displays the name of the error selected in the error list.
(4) Details	Displays the details of the error selected in the error list.
(5) Error list	Displays the list of occurring errors. Selecting an error in the list displays the error details in (1) to (4).
(6) [Ignore Error and Save] button	Saves each file of the master setting, slave setting, and simulation setting ignoring the error details.
(7) [Verification] button	Clicking the [Verification] button after eliminating the error cause can verify the measures against the error.
(8) [OK] button	Closes the "Network Setting Error Information" screen. Saving the setting file or writing the file to the engine is not performed.

CC-Link IE TSN

Configure the master setting and slave setting of the CC-Link IE TSN platform.

Displayed items

Navigation window ⇨ [SWMOS] ⇨ [Network] ⇨ [Comm1/Comm2] ⇨ [CC-Link IE TSN] in the Comm1/Comm2 tree

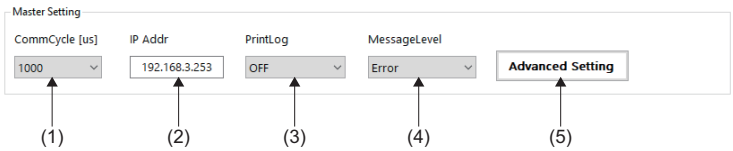


Displayed items

Item	Description
(1) Comm1/Comm2 tree	Select a function to be set from the tree.
(2) Master Setting	Set the communication cycle, IP address, log output, message level, and advanced setting. (☞ Page 72 Master setting)
(3) Slave Setting	Set the model, axis number, and detail setting of the slave device. (☞ Page 74 Slave setting)
(4) [Load from Project] button	Loads the information of the master setting, slave setting, and simulation setting from the setting file. (☞ Page 68 Loading a setting file)
(5) [Save to Project] button	Saves the set master setting, slave setting, and simulation setting in the setting file. (☞ Page 67 Saving a setting file)
(6) [Load from Engine] button	Loads the information of the master setting, slave setting, and simulation setting from the SWM-G engine. (☞ Page 69 Loading information from the SWM-G engine)
(7) [Save to Engine] button	Writes the information of the master setting, slave setting, and simulation setting to the SWM-G engine. (☞ Page 69 Writing information to the SWM-G engine)

■ Master setting

Window



Displayed items

Item	Description	Default
(1) CommCycle [us] (Communication cycle)	Set the communication cycle. • Setting value: 125, 250, 500, 1000, 2000, 4000, 8000 [μs]	1000 [μs]
(2) IP Addr (IP address)	Set the IP address of the master.	192.168.3.253
(3) PrintLog (Log output)	Select whether to output the log after the communication stop. • OFF: Log is not output. • ON: Log is output.	OFF
(4) MessageLevel (Message level)	Set the message level. • Error: Error message only • Warning: Error message, warning message • Setting: Error message, warning message, setting message • Debug: Error message, warning message, setting message, debug message	Error
(5) [Advanced Setting] button	Clicking the [Advanced Setting] button displays the "Master Advanced Setting" screen. Configure the settings related to the CC-Link IE TSN network. (☞ Page 73 Master advanced setting)	—

Point

- When multiple ports are used, the master setting for Comm2 is also required. For the Comm2 master setting, configure the settings for the communication cycle, log output, message level, and advanced setting.
- A common IP address is set to Comm1 and Comm2. The last IP address set for either Comm1 or Comm2 is valid.

Precautions

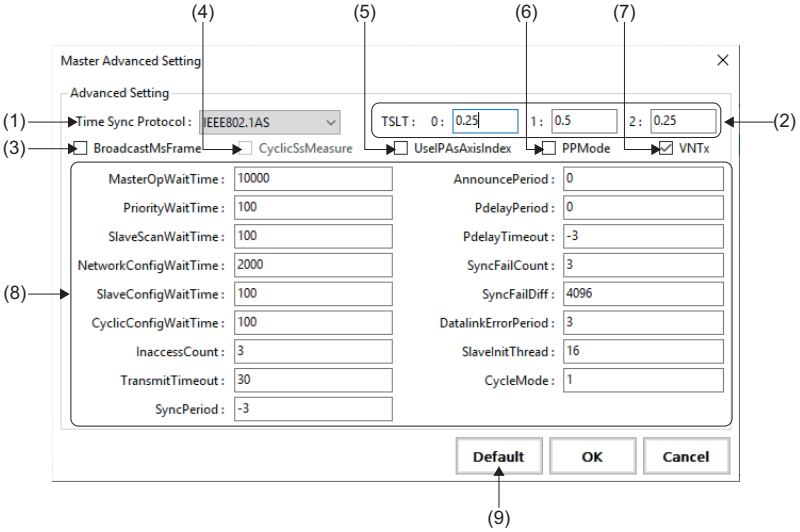
- Set the communication cycle of Comm2 the same as or longer than that of Comm1. (Comm1 communication cycle ≤ Comm2 communication cycle)
- Comm1 and Comm2 cannot perform synchronization and interpolation control. For details of the affected functions, refer to "Motion ⇨ Architecture ⇨ Interrupts and Multi-Cycle" in the following manual.
  📖SWM-G User Manual

■ Master advanced setting

Clicking the [Advanced Setting] button in the master setting displays the "Master Advanced Setting" screen. Detailed settings related to the CC-Link IE TSN network can be configured. For details of the settings, refer to "CC-Link IE TSN Platform ⇨ Network Define (cclink_network.def)" in the following manual.

📖SWM-G User Manual

Window

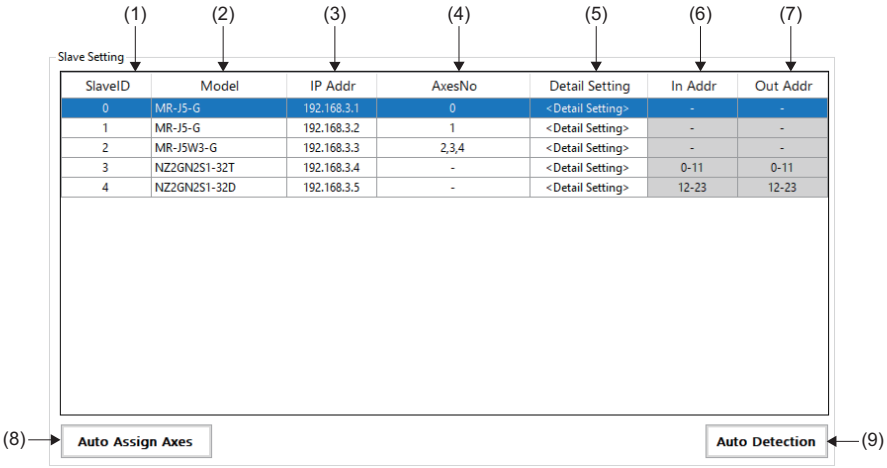


Displayed items

Item	Description	Default value
(1) Time Sync Protocol (Time synchronous protocol)	Select the time synchronous protocol. • IEEE802.1AS • IEEE1588	IEEE802.1AS
(2) TSLT (Time slot)	Set the division ratio of the time slot. • TSLT0: IP communication • TSLT1: CC-Link IE TSN Network • TSLT2: Time synchronization	TSLT 0 = 0.25 TSLT 1 = 0.5 TSLT 2 = 0.25
(3) BroadcastMsFrame (Ms frame broadcast setting)	Select whether to broadcast the CyclicMs frame. • Selected: The frame is broadcasted. • Not selected: The frame is not broadcasted.	Not selected
(4) CyclicSsMeasure (CyclicSs frame log output)	Select whether to output the log of the CyclicSs frame after the communication stop. This item can be selected when [PrintLog] in the master setting is set to "ON: Log is output". • Selected: Log is output. • Not selected: Log is not output.	Not selected
(5) UseIPAsAxisIndex (Axis index selection)	Select whether to use the fourth octet in the IP address of the slave as the start value of the axis number. • Selected: Use • Not selected: Not use	Not selected
(6) PPMode (PM motion function selection)	Select whether to use the PM motion function. • Selected: Use • Not selected: Not use	Not selected
(7) VNTx (IP communication selection)	Select whether to use the IP communication mixed function. • Selected: Use • Not selected: Not use	Selected
(8) Setting item	There is no need to change the setting values for the items in (8). Normally, use the default values.	—
(9) [Default] button	Discards the changed setting and returns to the default value.	—

■ Slave setting

Window



Displayed items

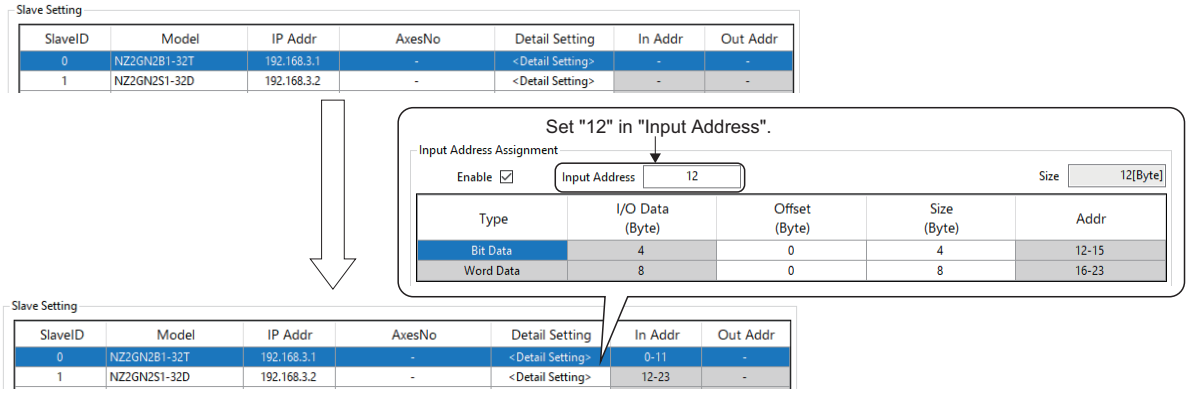
Item	Description
(1) SlaveID	Displays the slave ID of the slave device. The number is assigned from "0" in the order of connection.
(2) Model	Clicking a cell in the [Model] column displays the "Model Selection" screen. Set the slave device to be connected.
(3) IP Addr	Set the IP address of the slave device.
(4) AxesNo	Clicking a cell in the [AxesNo] column displays the "Axis Number Setting" screen. Set the axis number of the slave device. When a multi-axis servo amplifier is selected, axis numbers for the number of axes are displayed.
(5) Detail Setting	Clicking a cell in the [<Detail Setting>] column displays the "Detail Setting" screen. Set the detail information (TXPDO, RXPDO, IoInputAssignment, and IoOutputAssignment) of the slave device. • TXPDO: The data to be sent from the slave is set. • RXPDO: The data to be received by the slave is set. • IoInputAssignment: The input address is set. • IoOutputAssignment: The output address is set. *: The setting items differ depending on the selected slave device. • When the servo amplifier (MR-J5(W)-G) is selected (☞ Page 76 Detail setting (When the servo amplifier (MR-J5(W)-G) is selected)) • When the I/O module is selected (☞ Page 80 Detail setting (When the input/output module is selected))
(6) In Addr*1	Displays the input address of the slave device. Set the input address in "IoInputAssignment" on the "Detail Setting" screen.
(7) Out Addr*1	Displays the output address of the slave device. Set the output address in "IoOutputAssignment" on the "Detail Setting" screen.
(8) [Auto Assign Axes] button	Axis numbers are automatically assigned to servo amplifiers that are detected automatically or added manually. Axis numbers are assigned from the lowest number excluding axes that have already been assigned from [CC-Link IE TSN] ⇨ slave setting in the Comm1/Comm2 tree and [Simulation] ⇨ [Simulation Axis Setting]. The axis number automatically assigned differs depending on the setting of "UseIPAsAxisIndex (Axis index selection)" in the “Master Advanced Setting” window, which is displayed by clicking [Master Setting] ⇨ the [Advanced Setting] button. For details, refer to the following. ☞ Page 84 Automatic assignment of axis numbers
(9) [Auto Detection] button	Automatically detects the connected slave device.

*1 Set the input and output addresses so that they do not overlap with the ones set for each slave device.

Ex.

When setting the input address of SlaveID "0"

Since the input address of SlaveID "0" occupies "0 to 11", set a value equal to or greater than "12" to the input address of SlaveID "1".



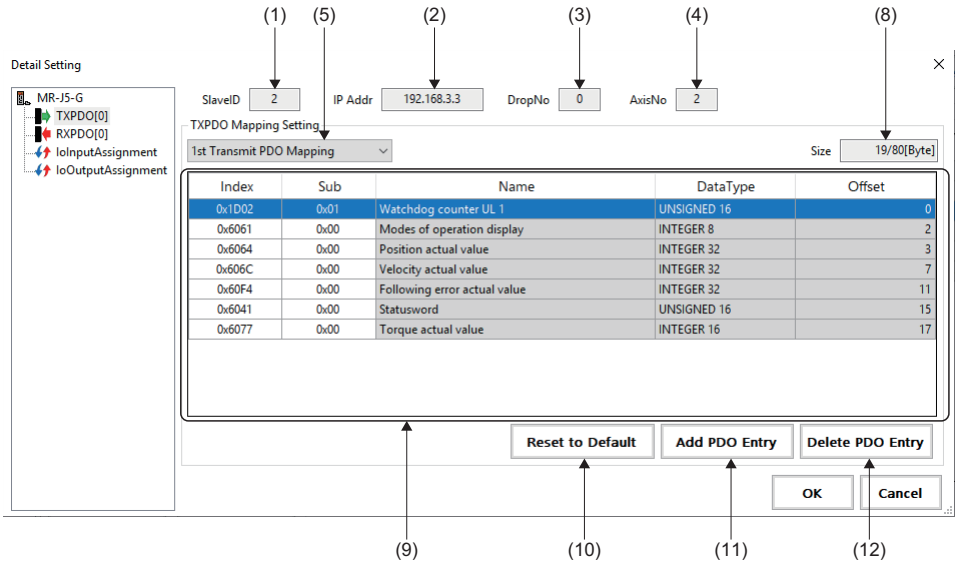
■ Detail setting (When the servo amplifier (MR-J5(W)-G) is selected)

Clicking a cell in the [<Detail Setting>] column in the slave setting displays the "Detail Setting" screen. Set the detail information (TXPDO, RXPDO, IoInputAssignment, and IoOutputAssignment) of the slave device.

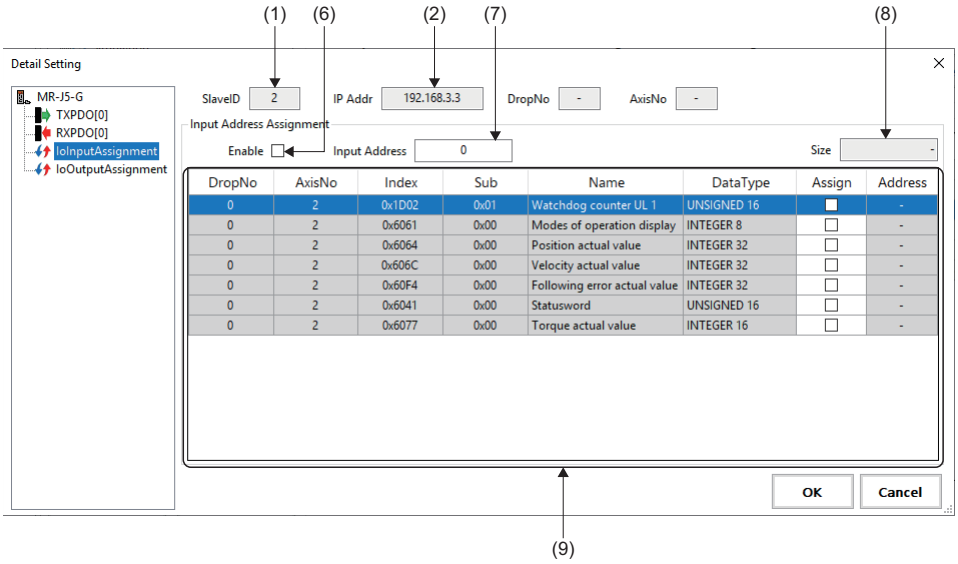
Set IoInputAssignment and IoOutputAssignment only when assigning them to the input/output to use.

Window

- When TXPDO or RXPDO is selected



- When IoInputAssignment or IoOutputAssignment is selected



Displayed items

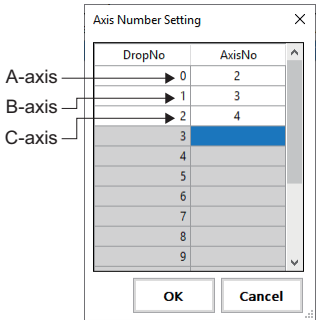
Item	Description
(1) SlaveID	Displays the slave ID of the selected slave device.
(2) IP Addr	Displays the IP address of the selected slave device.
(3) DropNo	Displays the drop number[*1] of the selected slave device.
(4) AxisNo	Displays the axis number of the selected slave device.
(5) Mapping setting	Select a mapping object of Transmit PDO Mapping/Receive PDO Mapping (1st, 2nd, 3rd, 4th) from the pull-down list. Selecting an object from the pull-down list switches the object list. • 1st: PDO mapping for cyclic synchronous operation (csp/csv/cst/hm) • 2nd: PDO mapping for motion mode (high-speed) • 3rd: PDO mapping for profile mode operation (pp/pv/tq/hm) • 4th: PDO mapping for positioning mode (pt/jg/hm)

Item	Description
(6) Enable	Set whether to assign the input/output address. • Selected: The input/output address is assigned. • Not selected: The input/output address is not assigned.
(7) Input/Output Address	Set the start number of the input/output address to be assigned. *: Set the input and output addresses so that they do not overlap with the ones set for each slave device.
(8) Size	Displays the total size of the objects displayed in the object list.
(9) Object list	Displays the list of object items. Objects are added and deleted. ■DropNo Displays the drop number*1 of the selected slave device. ■AxisNo Displays the axis number of the selected slave device. ■Index Displays the index number of the PDO object. ■Sub Displays the sub index number of the PDO object. ■Name Displays the name of the PDO object determined by the index and sub. ■DataType Displays the data size of the PDO object. ■Offset Displays the offset of the PDO object. ■Assign Select whether to assign the object. • Selected: Assign • Not selected: Not assign ■Address Displays the range of the address to be used when the checkbox in the "Assign" column is selected.
(10) [Reset to Default] button	Resets the object set to the object list to the default value.
(11) [Add PDO Entry] button	Adds an object to the object list. The object can be added from the "Object list" screen displayed by clicking the [Add PDO Entry] button.
(12) [Delete PDO Entry] button	Deletes the selected object from the object list.

*1 The drop number is a number for identifying the logical axis of the slave device.

Ex.

For the multi-axis servo amplifier (MR-J5W-G)



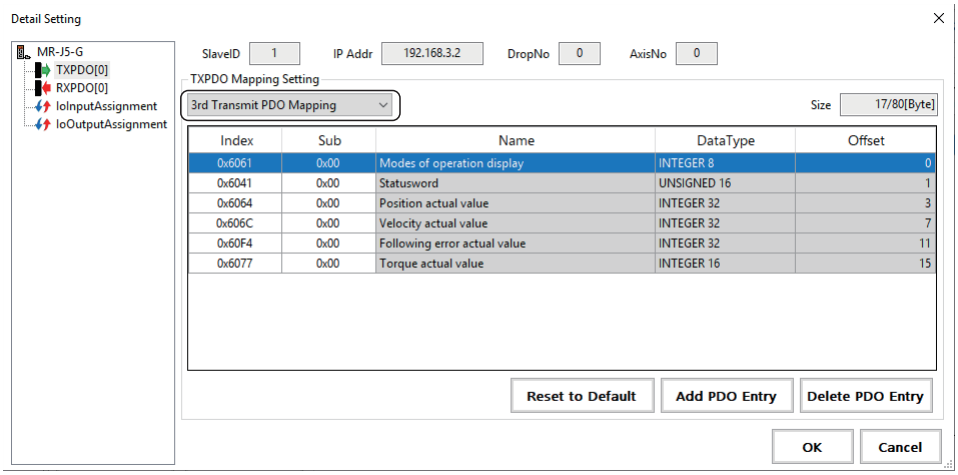
*: For the single axis servo amplifier (MR-J5-G), only "0" is displayed in DropNo.

Operating procedure

1. Select TXPDO/RXPDO to switch the display to the TXPDO or RXPDO mapping setting. Select Transmit PDO Mapping/Receive PDO Mapping (1st, 2nd, 3rd, 4th) to be set from the pull-down list of the TXPDO or RXPDO mapping setting. The default mapping of the selected Transmit PDO Mapping/Receive PDO Mapping is displayed in the object list.

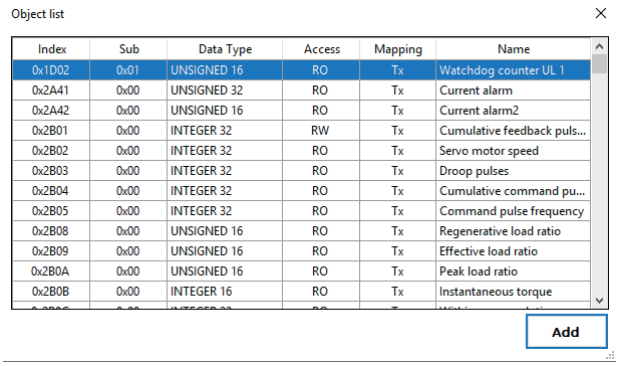
Ex.

When "3rd Transmit PDO Mapping" is selected



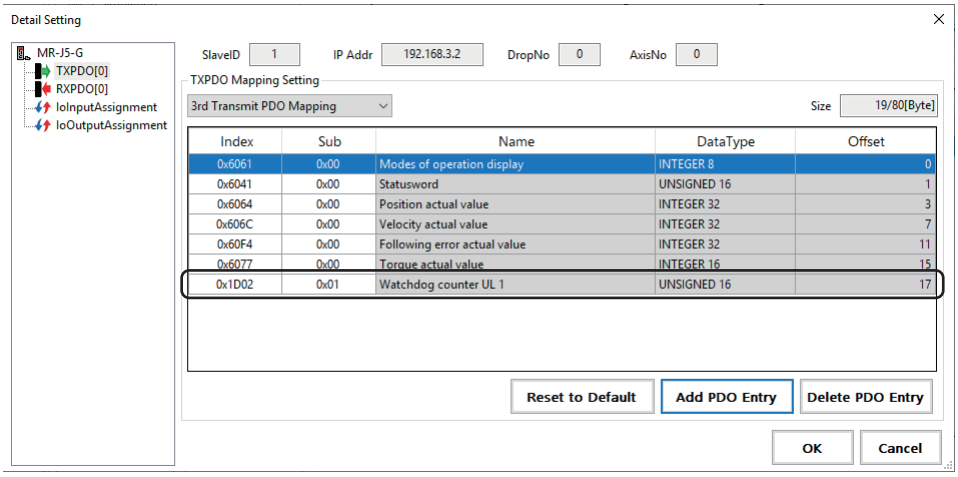
2. To add a PDO object, click the [Add PDO Entry] button to display the "Object list" screen.

3. Select an object to be added from the "Object list" screen, and click the [Add] button. When adding an object is completed, click the [×] button in the upper right of the "Object list" screen to close the screen.



4. The object added to the object list is displayed.

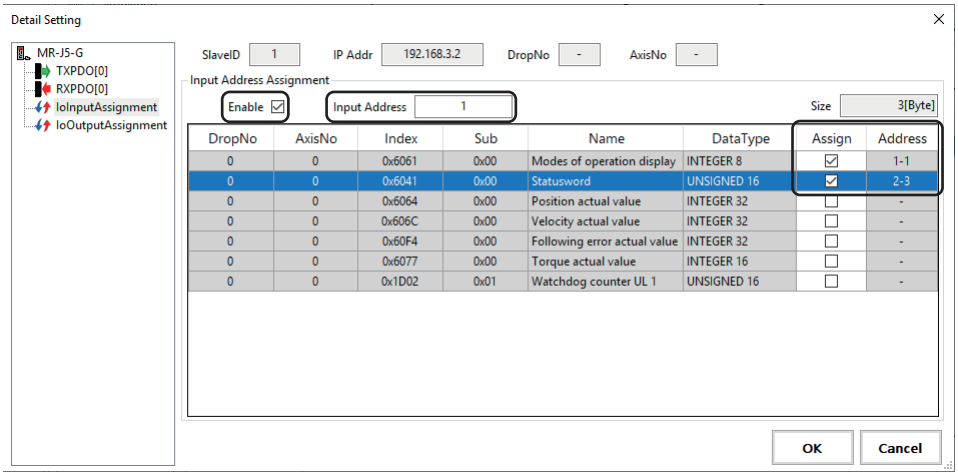
*: For unnecessary objects, select the object and click the [Delete PDO Entry] button to delete it.



5. IoInputAssignment/IoOutputAssignment are used only when the data assigned to TXPDO/RXPDO is input/output to the input device/output device. When configuring the setting, select IoInputAssignment or IoOutputAssignment to switch the display to the input address assignment or output address assignment, and select "Enable". Items can be assigned.

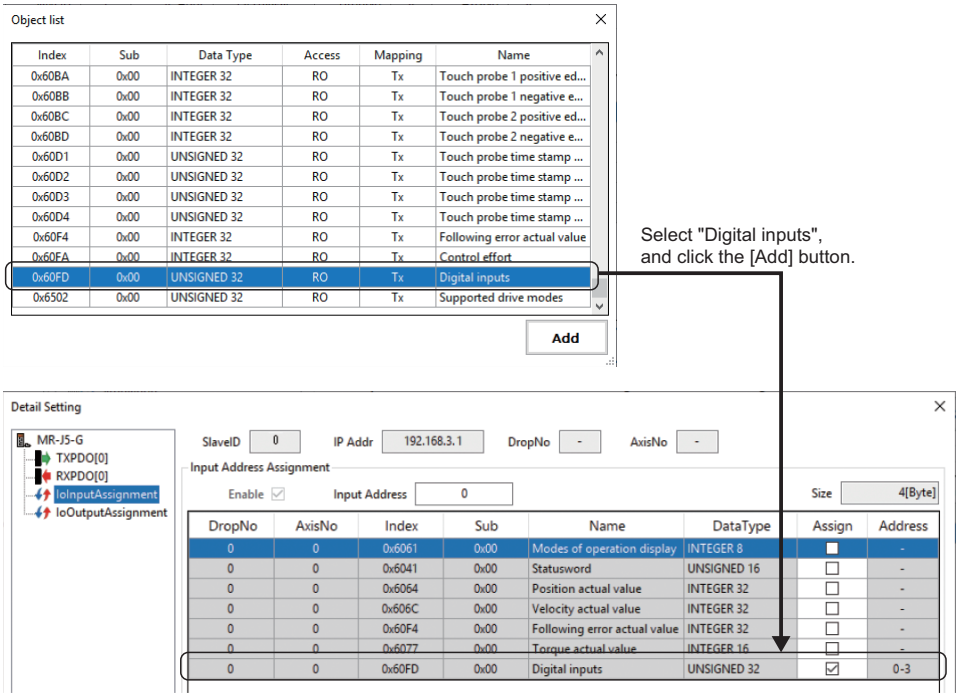
6. By setting the input address or output address and selecting the items to be assigned, the address with the start number set in the input/output address is automatically assigned and displayed in the address field.

*: Set the input and output addresses so that they do not overlap with the ones assigned to other slave devices.



Point

- When using an external signal of the servo amplifier, select "Digital inputs" in the "Object list" screen to add it. When "Digital inputs" is added, an address is automatically assigned to IoInputAssignment.



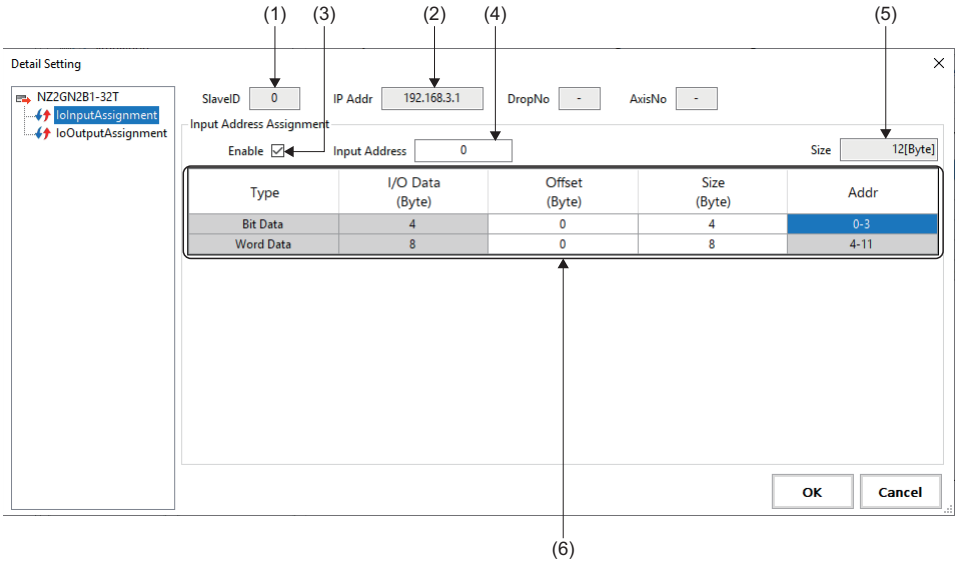
- When IoInputAssignment or IoOutputAssignment is enabled, the status of the input address and output address can be checked and the operation can be performed in the "I/O Status" screen. (☞ Page 47 I/O status)
- Note that if the object assigned to RXPDO is assigned to IoOutputAssignment, the I/O control is prioritized and control operations on SWMOS may become unavailable.

■ Detail setting (When the input/output module is selected)

Clicking a cell in the [<Detail Setting>] column in the slave setting displays the "Detail Setting" screen. Set the detail information (IoInputAssignment, IoOutputAssignment) of the slave device.

Window

• When IoInputAssignment or IoOutputAssignment is selected



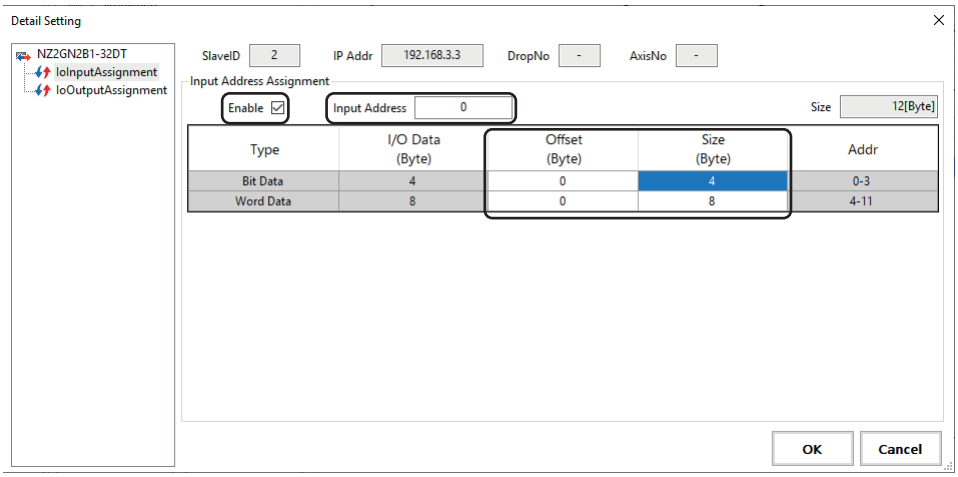
Displayed items

Item	Description
(1) SlaveID	Displays the slave ID of the selected slave device.
(2) IP Addr	Displays the IP address of the selected slave device.
(3) Enable	Set whether to assign the input/output address. • Selected: The input/output address is assigned. • Not selected: The input/output address is not assigned.
(4) Input/Output Address	Set the start number of the input/output address to be assigned. *: Set the input and output addresses so that they do not overlap with the ones set for each slave device.
(5) Size	Displays the total size of the input/output addresses displayed in the input/output list.
(6) Input/Output data list	Displays the list of input/output address items. Set the bit data and word data. ■Type Displays the data type (bit data, word data). ■I/O Data (Byte) Displays the size of the bit data and word data. ■Offset (Byte) Set the offset of the bit data and word data. ■Size (Byte) Set the size of the bit data and word data. ■Addr Displays the range of the address to be used according to the offset and size setting.

Operating procedure

1. Select IoInputAssignment or IoOutputAssignment to switch the display to the input address assignment or output address assignment, and select "Enable". The offset and size can be set.

2. Set the start number of the input/output address, and set the offset and size.



3. By setting the input address or output address and selecting the items to be assigned, the address with the start number set in the input/output address is automatically assigned and displayed in the address field.

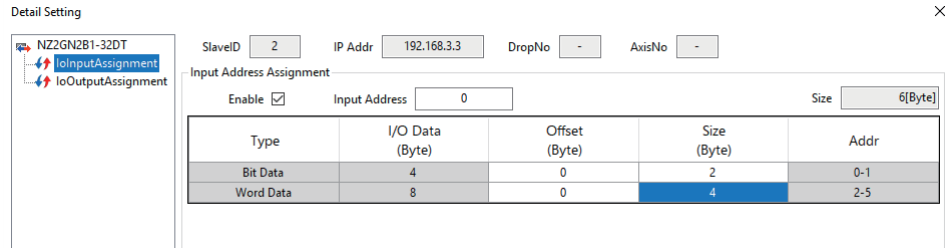
*: Set the input and output addresses so that they do not overlap with the ones assigned to other slave devices.

Ex.

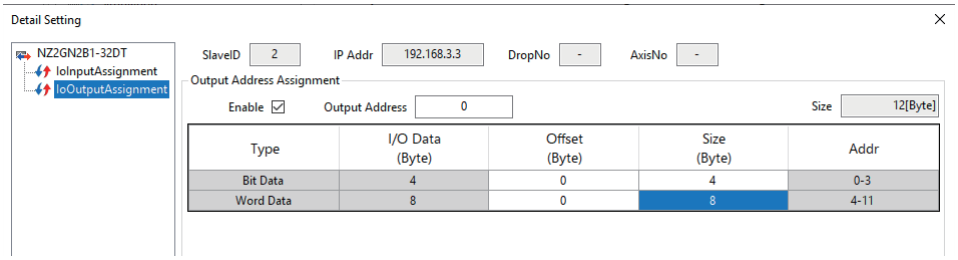
When setting the offset and size of the I/O combined module (32-point module)

Type	Setting details
Bit Data	The data is used with the remote input signal use prohibited areas (RX10 to RX1F) and remote output signal use prohibited areas (RY0 to RY0F) skipped.
Word Data	Only the data for 4 bytes is used.

- IoInputAssignment



- IoOutputAssignment



Editing a slave

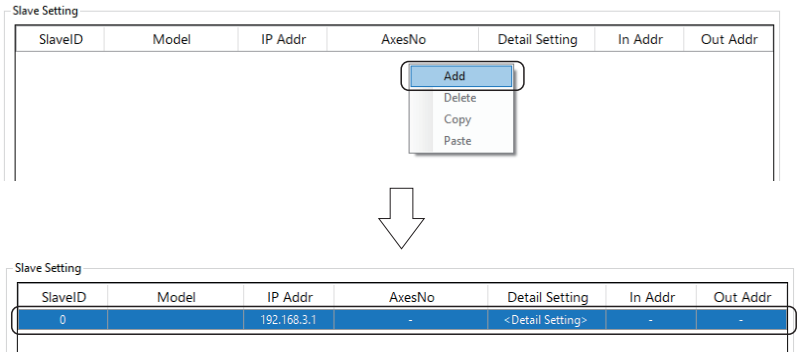
This section describes how to add a slave device to the list and edit it.

■ Adding a slave device

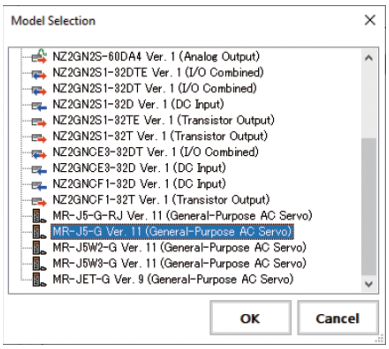
Add a slave device to the slave setting.

Operating procedure

1. Right-click the object list in the slave setting, and click [Add] to add a line in the object list.



2. Clicking a cell in the [Model] column displays the "Model Selection" screen. Select a slave to be added (example: MR-J5-G) from the list, and click the [OK] button.

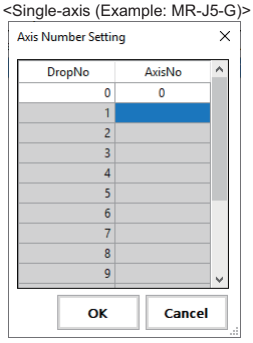


3. The selected slave is displayed in the cell in the [Model] column.

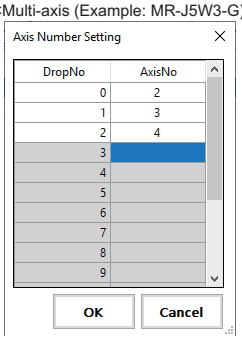
4. Set the IP address of the slave.

5. Clicking a cell in the [AxesNo] column displays the "Axis Number Setting" screen. Set the axis number for the drop number, and click the [OK] button. For a multi-axis, set axis numbers for the number of axes.

<Single-axis (Example: MR-J5-G)>



<Multi-axis (Example: MR-J5W3-G)>



6. Clicking a cell in the [<Detail Setting>] column displays the "Detail Setting" screen. Configure the detail setting of the slave. Configure the detail setting as necessary. For the "Detail Setting" screen, refer to the following.

- Servo amplifier (MR-J5(W)-G) (☞ Page 76 Detail setting (When the servo amplifier (MR-J5(W)-G) is selected))
- I/O module (☞ Page 80 Detail setting (When the input/output module is selected))

Point

Click the [Auto Detection] button to detect the slave device connected to CC-Link IE TSN and apply it to the slave setting. However, the axis number is not detected. Set the axis number in the "Axis Number Setting" screen displayed by clicking a cell in the [AxesNo] column.

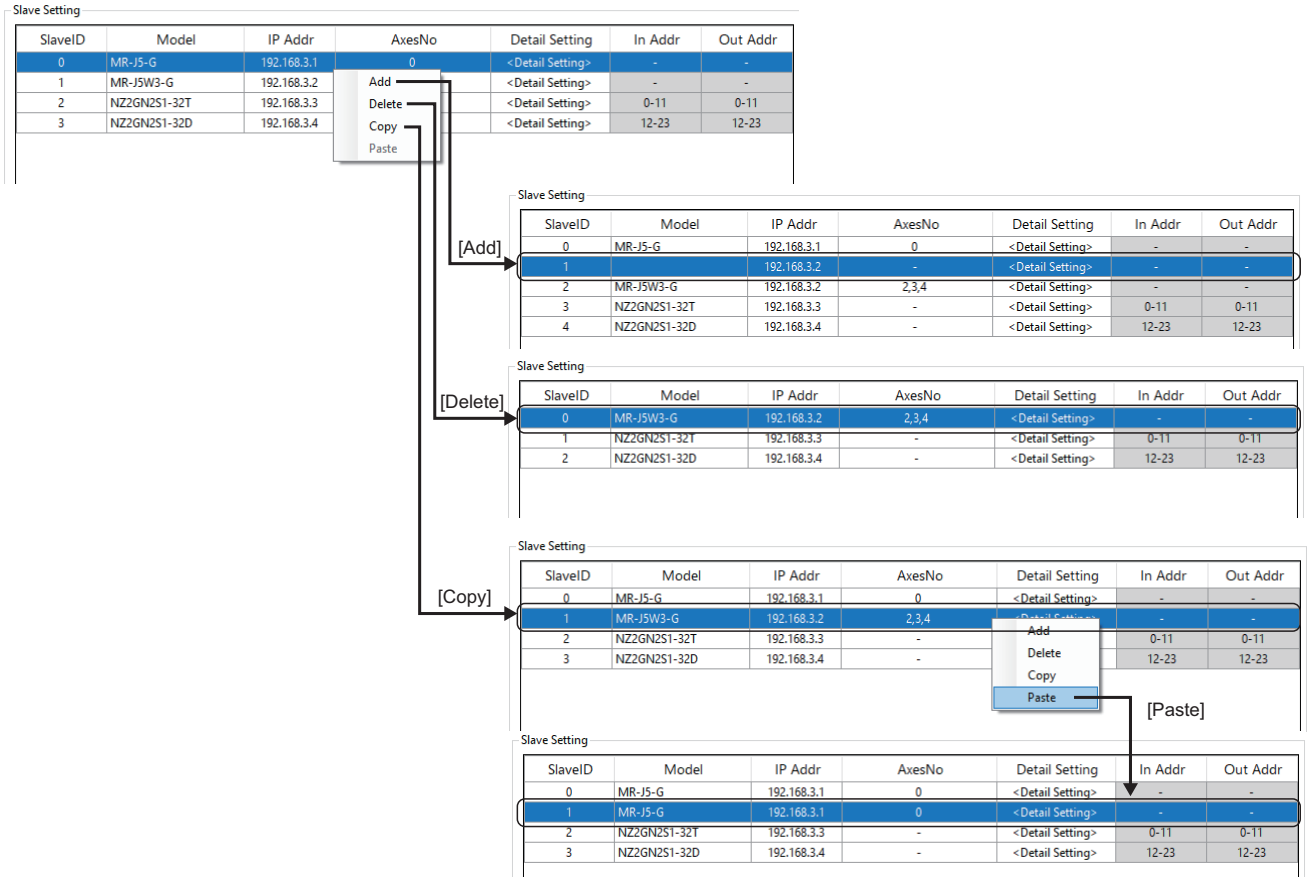
■ Editing a slave device

Edit the slave list added to the slave setting.

Operating procedure

1. Select the SlaveID line to be edited from the slave list, and right-click it. Click the item for editing ([Add], [Copy], [Delete]).

Editing operation	Description
[Add]	A line is added below the selected SlaveID line.
[Copy]	After copying the selected SlaveID line, select another SlaveID line as a pasting destination and click [Paste] to paste the SlaveID line selected earlier on the pasting destination.
[Delete]	The selected SlaveID line is deleted.



Automatic assignment of axis numbers

Click the [Auto Assign Axes] button in the slave setting to automatically assign axis numbers to a servo amplifier that has been automatically detected or manually added. Axis numbers that have been already set from [CC-Link IE TSN] ⇨ slave setting in the Comm1/Comm2 tree and [Simulation] ⇨ [Simulation Axis Setting] are ignored.
When there are multiple ports, the [Auto Assign Axes] button must be operated for each port.
The assigned axis number differs depending on the setting of "UseIPAsAxisIndex (Axis index selection)" and "PPMode (PM motion function selection)" in the "Master Advanced Setting" window, which is displayed by clicking [Master Setting] ⇨ the [Advanced Setting] button.
An error occurs if the assignment fails when the [Auto Assign Axes] button is operated.

■ When UseIPAsAxisIndex (Axis index selection) is "Disabled (Not selected)"

Click the [Auto Assign Axes] button to automatically assign axis numbers from the lowest number (from 0) excluding the axis numbers that have already been set.
If there is no vacant number, an error is displayed.
When multiple ports are used, the axis numbers are assigned from the port set first (Comm1 or Comm2). For the port set last (including manually set axes and simulation axes), axis numbers are assigned starting from "the last number assigned+1" of the port set first.
When the axis number reaches the license limit (number of axes of licensed product-1), a vacant number is assigned starting from "0" again.

■ When UseIPAsAxisIndex (Axis index selection) is "Enabled (Selected)"

Click the [Auto Assign Axes] button to automatically assign the value in the fourth octet of the IP address.
Axes that have already been set will also have their number assignments overwritten.
To set the axis numbers manually, rewrite the axis numbers before executing "Writing information to the SWM-G engine" or "Save to project".
If an IP address that cannot automatically an axis number is set, an error occurs and automatic assignment is canceled.

Precautions

- When setting the IP address to the axis number, set the fourth octet of the servo amplifier in the range of "1 to the number of axes of licensed product". Note that because the upper limit of the axis number is "the number of axes of licensed product-1", set the last axis to "Axis number 0" manually.

Point

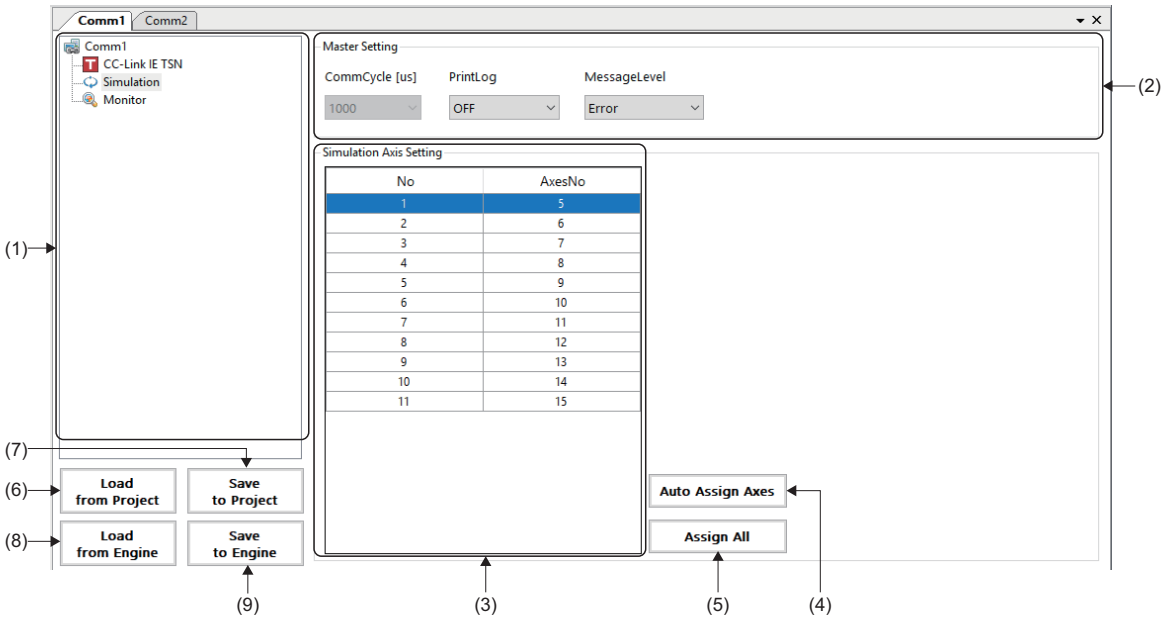
- When PPMode (PM motion function selection) is "Selected (Used)", axis numbers can be automatically assigned to axes used in PM motion in the same way as normal axes. However, when normal axes and PM motion axes are used in multiple ports, the axis numbers are managed separately for each port. Additionally, when setting the IP address to the axis number, the fourth octet of the servo amplifier must be set to "1 to 128".
- The setting contents are checked when executing "Writing information to the SWM-G engine" or "Save to project", and if the setting has an error, the error is displayed on the "Network Setting Error Information" screen. (☞ Page 70 Network setting error information)

Simulation

The motion control is verified without servo amplifiers.

Window

Navigation window ⇨ [SWMOS] ⇨ [Network] ⇨ [Comm1/Comm2] ⇨ [Simulation] in the Comm1/Comm2 tree



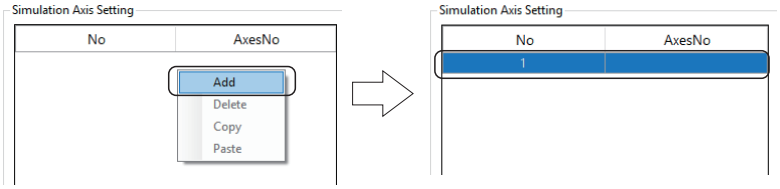
Displayed items

Item	Description
(1) Comm1/Comm2 tree	Select a function to be set from the tree.
(2) Master Setting	Set the communication cycle display, log output, and message level. ■CommCycle [us] (Communication cycle) Displays the communication cycle. The value set in [CommCycle [us]] under [Master Setting] displayed by selecting [CC-Link IE TSN] in the Comm1/Comm2 tree is displayed. ■PrintLog (Log output) Select whether to output the log after the communication stop. • OFF: Log is not output. • ON: Log is output. ■MessageLevel (Message level) Set the message level. • Error: Error message only • Warning: Error message, warning message • Setting: Error message, warning message, setting message • Debug: Error message, warning message, setting message, debug message
(3) Simulation Axis Setting	Configure the simulation axis setting. ■No Displays the order of the simulation axis setting list. ■AxesNo Set the axis number of the simulation axis.
(4) [Auto Assign Axes] button	Axis numbers are automatically assigned to simulation axes that are manually added. Axis numbers are assigned from the lowest number (from 0) excluding the axis numbers that have already been set from [CC-Link IE TSN] ⇨ slave setting in the Comm1/Comm2 tree and [Simulation] ⇨ [Simulation Axis Setting].
(5) [Assign All] button	Assigns all the axis numbers that are not used for the real axes as simulation axes. When there are axis numbers used for the real axes, assign consecutive numbers excluding the ones for the real axes.
(6) [Load from Project] button	Loads the information of the master setting, slave setting, and simulation setting from the setting file. (☞ Page 68 Loading a setting file)
(7) [Save to Project] button	Saves the set master setting, slave setting, and simulation setting in the setting file. (☞ Page 67 Saving a setting file)
(8) [Load from Engine] button	Loads the information of the master setting, slave setting, and simulation setting from the SWM-G engine. (☞ Page 69 Loading information from the SWM-G engine)
(9) [Save to Engine] button	Writes the information of the master setting, slave setting, and simulation setting to the SWM-G engine. (☞ Page 69 Writing information to the SWM-G engine)

Operating procedure

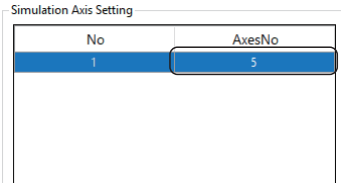
■ Adding a simulation axis

1. Right-click the table in the simulation axis setting, and click [Add] to add a line in the list.



2. Set the axis number (example: 5) of the simulation axis.

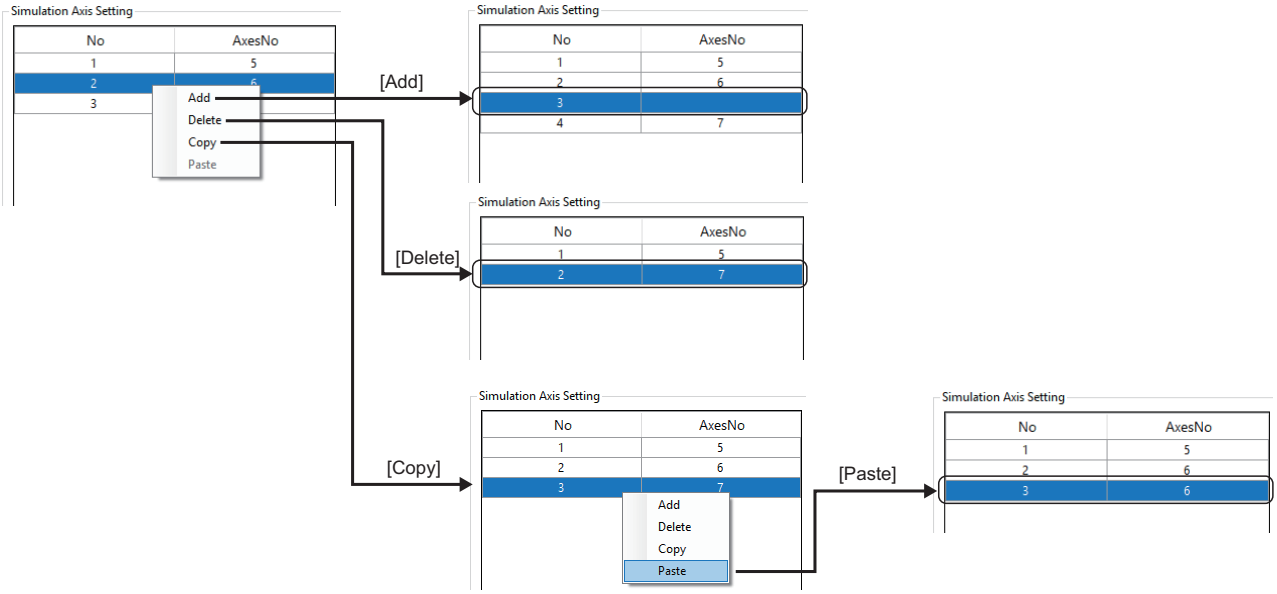
*: Clicking the [Assign All] button can assign all the axes that are not used for the real axes as simulation axes.



■ Editing a simulation axis

1. Select and right-click the line of the simulation axis No. to be edited. Click the item for editing ([Add], [Copy], [Delete]).

Editing operation	Description
[Add]	A line is added below the selected No. line.
[Copy]	After copying the selected No. line, select another No. line as a pasting destination and click [Paste] to paste the No. line selected earlier on the pasting destination.
[Delete]	The selected No. line is deleted.



Monitor

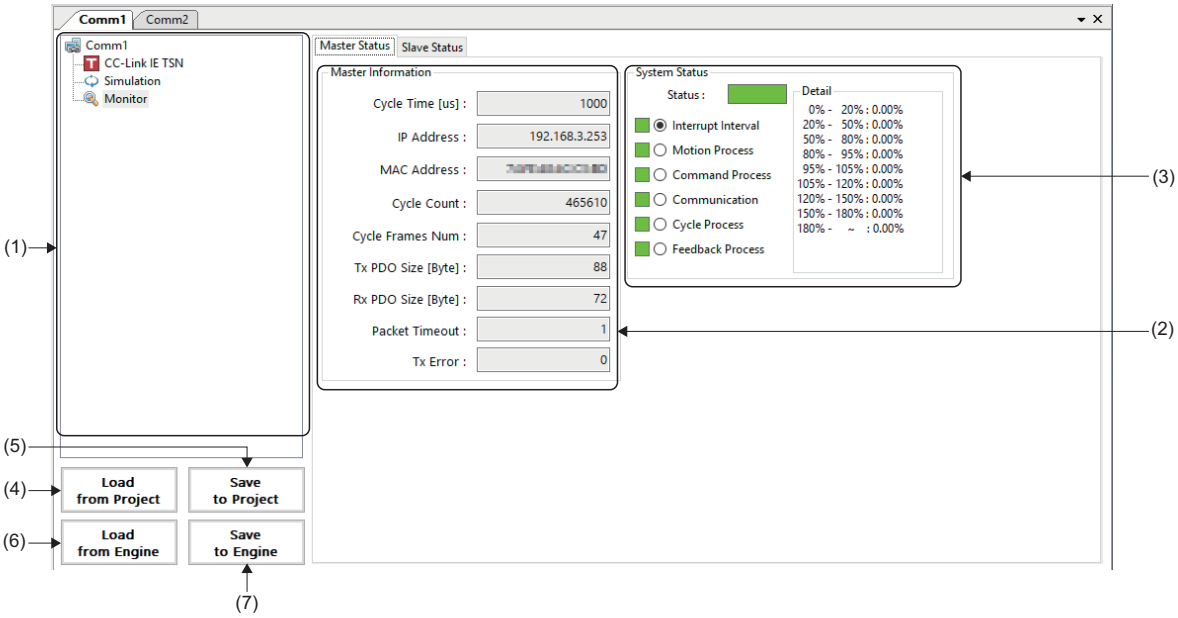
The master and slave statuses are displayed.

Master status

The master information and status and the system status can be checked.

Window

Navigation window ⇨ [SWMOS] ⇨ [Network] ⇨ [Comm1/Comm2] ⇨ [Monitor] in the Comm1/Comm2 tree ⇨ [Master Status] tab



Displayed items

Item	Description
(1) Comm1/Comm2 tree	Select a function to be set from the tree.
(2) Master Information	Displays the communication information of the master. (☞ Page 87 Master information)
(3) System Status	Displays the system status. (☞ Page 88 System status)
(4) [Load from Project] button	Loads the information of the master setting, slave setting, and simulation setting from the setting file. (☞ Page 68 Loading a setting file)
(5) [Save to Project] button	Saves the set master setting, slave setting, and simulation setting in the setting file. (☞ Page 67 Saving a setting file)
(6) [Load from Engine] button	Loads the information of the master setting, slave setting, and simulation setting from the SWM-G engine. (☞ Page 69 Loading information from the SWM-G engine)
(7) [Save to Engine] button	Writes the information of the master setting, slave setting, and simulation setting to the SWM-G engine. (☞ Page 69 Writing information to the SWM-G engine)

■ Master information

The communication information of the master is displayed.

Item	Description
Cycle Time [us]	Displays the communication cycle set in the master.
IP Address	Displays the IP address of the master.
MAC Address	Displays the MAC address of the master.
Cycle Count	Displays the number of communication cycles after the SWM-G engine is started.
Cycle Frames Num	Displays the number of frames sent at each communication cycle.
Tx PDO Size [Byte]	Displays the overall Tx PDO data amount (master → slave).
Rx PDO Size [Byte]	Displays the overall Rx PDO data amount (slave → master).
Packet Timeout	Displays the number of packet timeouts.
Tx Error	Displays the number of sending errors.

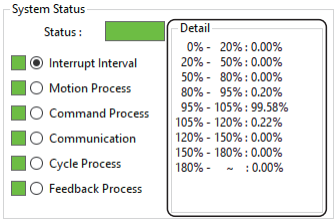
■ System status

The system status is displayed. The stability of the system can be checked.

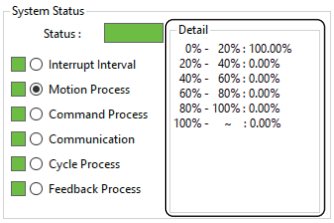
Selecting a radio button of the item indicating the status displays the status bar in a color according to the status.

In addition, the detail data of the item selected in [Detail] is displayed.

• Interrupt Interval



• Motion Process/Command Process/Communication/Cycle Process/Feedback Process



Item	Description
Interrupt Interval	Displays the statistics of the ratio of the interrupt interval to nominal communication cycle. The nominal communication cycle is the communication cycle specified in the master.
Motion Process	Displays the statistics of the ratio of the processing time of the motion module to nominal communication cycle.
Command Process	Displays the statistics of the ratio of the command processing time to nominal communication cycle.
Communication	Displays the statistics of the ratio of the communication processing time to nominal communication cycle.
Cycle Process	Displays the statistics of the ratio of the cycle processing time to nominal communication cycle.
Feedback Process	Displays the statistics of the ratio of the feedback processing time to nominal communication cycle.

The following table lists the display colors of the status bar. For details, refer to the following.

SWM-G User Manual

• Interrupt Interval

Item	Description
Green	The status is normal.
Yellow	Although there is a little processing load, it is not a problem.
Orange	The processing load is high. It may be improved by adjusting the communication cycle or others.
Red	The processing load is too high and the communication may be disconnected. Review the settings such as the communication cycle.

• Motion Process/Command Process/Communication/Cycle Process/Feedback Process

Item	Description
Green	Indicates that the rate of data between 0% and 40% is 90% or more.
Yellow	Indicates that the rate of data between 0% and 40% is between 60% and 90%.
Orange	Indicates that the rate of data between 0% and 40% is between 30% and 60%.
Red	Indicates that the rate of data between 0% and 40% is less than 30%.

Point

• Since the communication amount is relatively high and a jitter tends to occur immediately after the communication start, a packet timeout or sending error may occur. When the settings of "MessageLevel" and "PrintLog" under [Master Setting] in [CC-Link IE TSN] in the Comm1/Comm2 tree are as follows, the log output at the communication stop may temporarily become a processing load and a packet timeout or sending error may occur. These errors are not problems unless they occur at the normal state.

· MessageLevel: Debug (Error message, warning message, setting message, debug message)

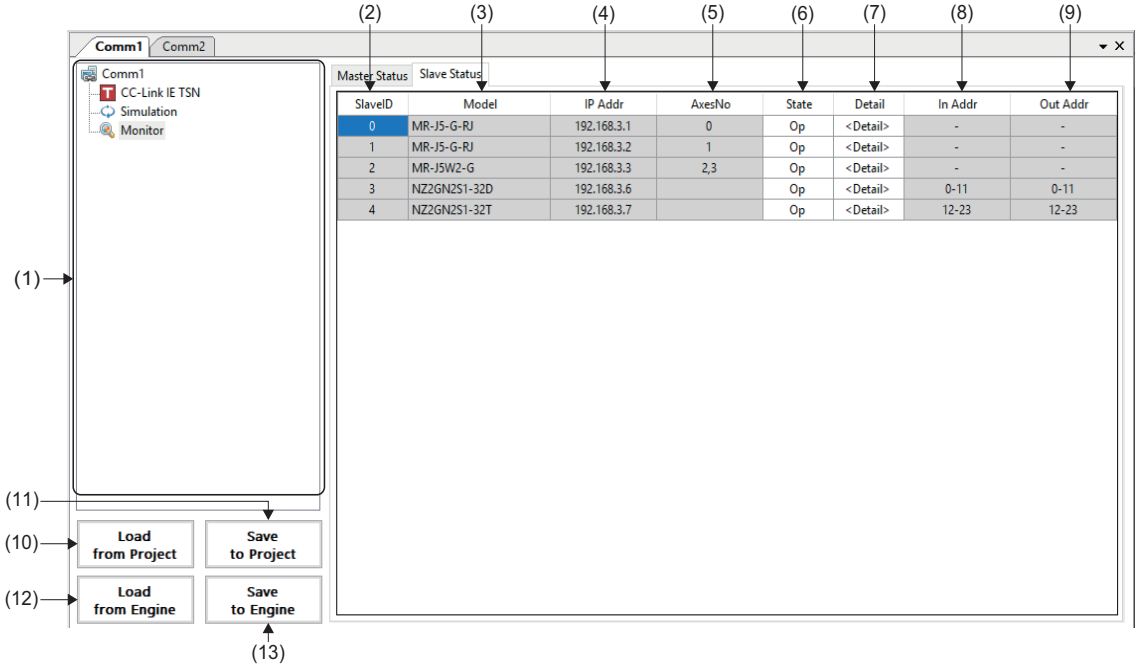
· PrintLog: ON (Log is output.)

Slave status

The slave information can be checked.

Window

Navigation window ⇨ [SWMOS] ⇨ [Network] ⇨ [Comm1/Comm2] ⇨ [Monitor] in the Comm1/Comm2 tree ⇨ [Slave Status] tab



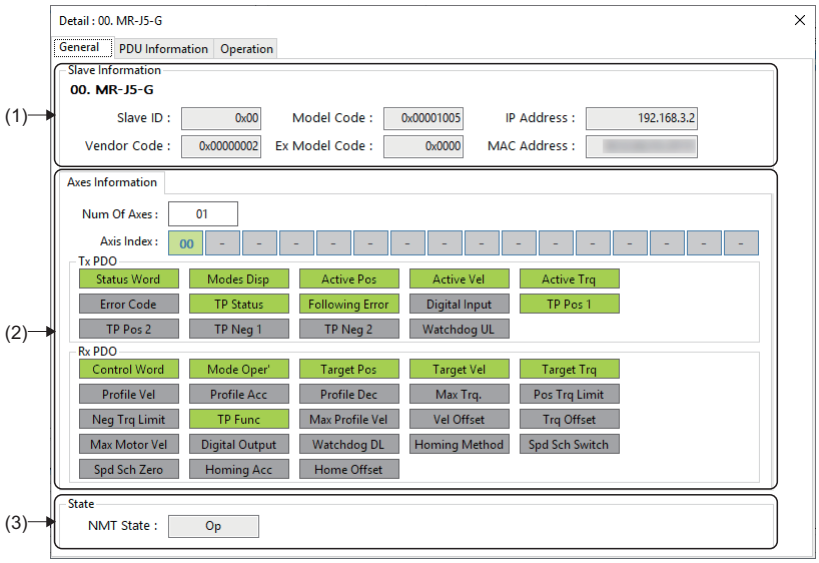
Displayed items

Item	Description
(1) Comm1/Comm2 tree	Select a function to be set from the tree.
(2) SlaveID	Displays the slave ID of the slave device. The number is assigned from "0" in the order of connection.
(3) Model	Displays the model name of the slave device.
(4) IPAddr	Displays the IP address set in the slave device.
(5) AxesNo	Displays the axis number of the slave device. When a multi-axis servo amplifier is selected, axis numbers for the number of axes are displayed.
(6) State	Displays the communication status of the slave device. • None: Not connected • Init: Initial communication state • Preop (Pre-Operational): SDO communication state by transient transmission • Safeop (Safe-Operational): PDO communication state by cyclic transmission (Servo motor driving is impossible) • Op (Operational): PDO communication state by cyclic transmission (Servo motor driving is possible)
(7) Detail	Clicking a cell in the [<Detail>] column displays the "Detail" screen. The detail information of the slave device can be checked. Select each tab of the information to be checked in the "Detail" screen to switch the screen. • [General] tab: Displays the slave information and axis information of the slave device. (☞ Page 90 General) • [PDU Information] tab: Displays the basic information and PDU information of the slave device. (☞ Page 91 PDU Information) • [Operation] tab: Displays the information of the slave device and reads/writes the object. (☞ Page 93 Operation)
(8) In Addr	Displays the input address usage range of the slave device.
(9) Out Addr	Displays the output address usage range of the slave device.
(10) [Load from Project] button	Loads the information of the master setting, slave setting, and simulation setting from the setting file. (☞ Page 68 Loading a setting file)
(11) [Save to Project] button	Saves the set master setting, slave setting, and simulation setting in the setting file. (☞ Page 67 Saving a setting file)
(12) [Load from Engine] button	Loads the information of the master setting, slave setting, and simulation setting from the SWM-G engine. (☞ Page 69 Loading information from the SWM-G engine)
(13) [Save to Engine] button	Writes the information of the master setting, slave setting, and simulation setting to the SWM-G engine. (☞ Page 69 Writing information to the SWM-G engine)

■ General

Window

Comm1/Comm2 tree ⇨ [Monitor] ⇨ [Slave Status] tab ⇨ Click a cell in the [<Detail>] column ⇨ [General] tab



Displayed items

Item	Description
(1) Slave Information	Displays the information of the slave. (☞ Page 90 Slave Information)
(2) Axes Information	Displays the axis information of the slave. (☞ Page 90 Axis Information)
(3) State	Displays the communication information. (☞ Page 90 State)

■ Slave Information

Item	Description
Slave ID (Slave ID)	Displays the slave ID. The number is assigned from "0" in the order of connection.
Model Code	Displays the model code of the slave device.
IP Address	Displays the IP address set in the slave device.
Vendor Code	Displays the vendor code of the slave device.
Ex Model Code	Displays the extension model code of the slave device.
MAC Address	Displays the MAC address of the Ethernet port assigned to the slave device.

■ Axis Information

Item	Description
Num Of Axes	Displays the number of axes of the slave device.
Axis Index	Displays the axis number for multiple axes.
Tx PDO	Displays the status of Tx PDO mapping of the axis specified with the CANopen object required for PDO of the axis. • Gray: PDO mapping disabled • Green: PDO mapping enabled
Rx PDO	Displays the status of the Rx PDO mapping of the axis specified with the CANopen object required for PDO of the axis. • Gray: PDO mapping disabled • Green: PDO mapping enabled

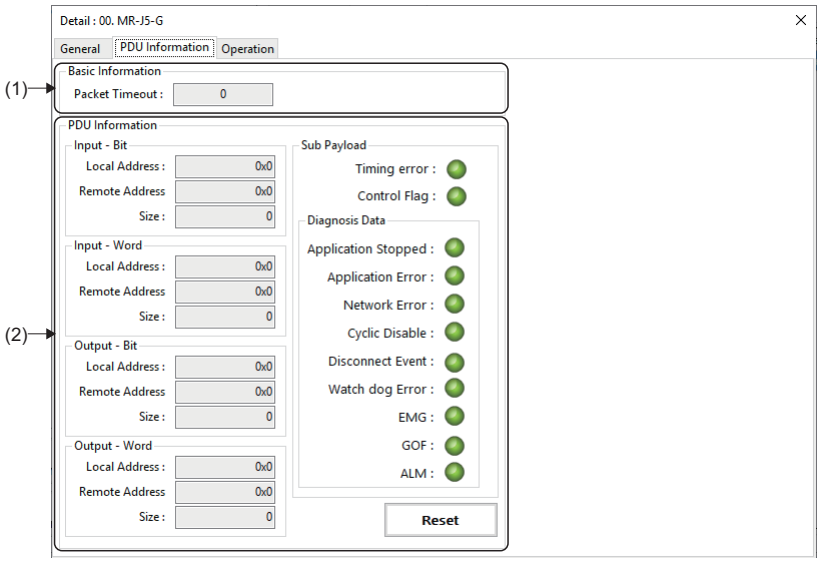
■ State

Item	Description
NMT State	Displays the communication status of the NMT state machine. • None: Not connected • Init: Initial communication state • Preop (Pre-Operational): SDO communication state by transient transmission • Safeop (Safe-Operational): PDO communication state by cyclic transmission (Servo motor driving is impossible) • Op (Operational): PDO communication state by cyclic transmission (Servo motor driving is possible)

■ PDU Information

Window

Comm1/Comm2 tree ⇨ [Monitor] ⇨ [Slave Status] tab ⇨ Click a cell in the [<Detail>] column ⇨ [PDU Information] tab



Displayed items

Item	Description
(1) Basic Information	Displays the basic information of the PDU. ■Packet Timeout Displays the number of packet timeouts.
(2) PDU Information	Displays the PDU information. (☞ Page 91 PDU information)

■ PDU information

Item	Description
Input - Bit	Displays the input bit information. • Local Address: Displays the I/O address of SWM-G. • Remote Address: Displays the I/O address of the slave. • Size: Displays the size of the I/O.
Input - Word	Displays the input word information. • Local Address: Displays the I/O address of SWM-G. • Remote Address: Displays the I/O address of the slave. • Size: Displays the size of the I/O.
Output - Bit	Displays the output bit information. • Local Address: Displays the I/O address of SWM-G. • Remote Address: Displays the I/O address of the slave. • Size: Displays the size of the I/O.
Output - Word	Displays the output word information. • Local Address: Displays the I/O address of SWM-G. • Remote Address: Displays the I/O address of the slave. • Size: Displays the size of the I/O.
Sub Payload	Indicates the sub payload information with lamps. ■Timing error Indicates the timing error information with the lamp. • Green: Timing error not detected • Red: Timing error detected ■Control Flag Indicates the control flag information with the lamp. • Green: Cyclic transmission can be performed • Red: Cyclic transmission cannot be performed

Item		Description
Diagnosis Data	Application Stopped	Indicates the application stop information with the lamp. • Green: Application operating • Red: Application stopped
	Application Error	Indicates the application error information with the lamp. • Green: Application error not detected • Red: Application error detected
	Network Error	Indicates the network error information with the lamp. • Green: Network error not detected • Red: Network error detected
	Cyclic Disable	Indicates the cyclic control data information with the lamp. • Green: Cyclic data enabled • Red: Cyclic data disabled
	Disconnect Event	Indicates the existence of the disconnection event of the slave with the lamp. • Green: Disconnection event not detected • Red: Disconnection event detected
	Watch dog Error	Indicates the watchdog error information with the lamp. • Green: Watchdog error not detected • Red: Watchdog error detected
	EMG	Indicates the system emergency stop information with the lamp. • Green: EMG signal not detected • Red: EMG signal detected
	GOF	Indicates the gate off request information of the power supply module with the lamp. • Green: GOF signal not detected • Red: GOF signal detected
	ALM	Indicates the alarm occurrence information with the lamp. • Green: ALM signal not detected • Red: ALM signal detected
[Reset] button		Clears the errors in the sub payload information of the slave. When any of these errors turns on, the error display is not cleared until reset. Click the [Reset] button to acquire the latest error information.

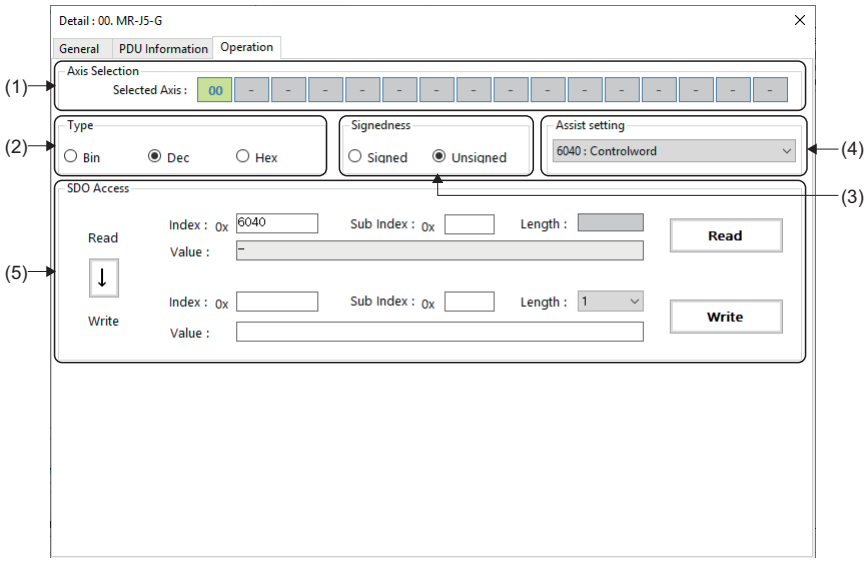
Point

Since the communication amount is relatively high and a jitter tends to occur immediately after the communication start, an error may occur. When an error occurs at the communication start, click the [Reset] button to clear the error. These errors are not problems unless they occur at the normal state.

■ Operation

Window

Comm1/Comm2 tree ⇨ [Monitor] ⇨ [Slave Status] tab ⇨ Click a cell in the [<Detail>] column ⇨ [Operation] tab

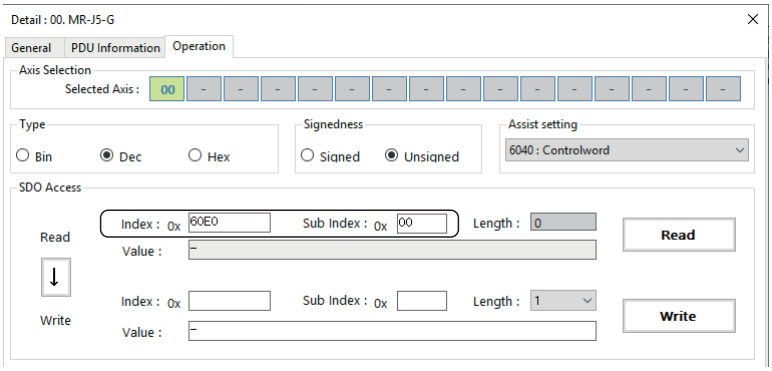


Item	Description
(1) Axis Selection	Displays the axis number when a servo amplifier is selected. When a multi-axis servo amplifier is selected, axis numbers for the number of axes are displayed.
(2) Type	Select the data format for values. • Bin(Binary) • Dec(Decimal) • Hex(Hexadecimal)
(3) Signedness	Select the signedness of values when "Dec" is selected as the type. • Signed • Unsigned
(4) Assist setting	Select the object from/to which the SDO value is read/written from the pull-down list. Selecting an SDO value from the pull-down list displays the object set as the index or sub index on the reading side.
(5) SDO Access	The object is read or written. • Index: Specify the index of the object. • Sub Index: Specify the sub index of the object. • [↓] button: Copies the object information (index/sub index/length) on the reading side to the writing side. • [Read] button: Reads the object specified with the index and sub index. • [Write] button: Writes the specified value to the object specified with the index and sub index.

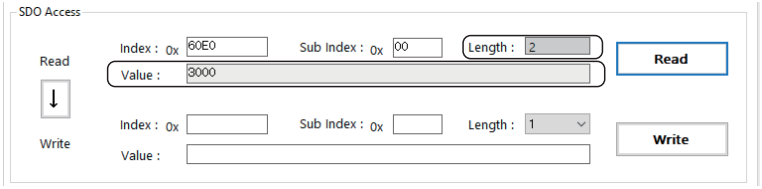
Operating procedure

■ Reading an object

1. Select a number of the axis to be read, and select a data type of the value from "Type". Select the signedness when "Dec" is selected as the type.
2. Enter the index and sub index of the object to be read, and click the [Read] button.



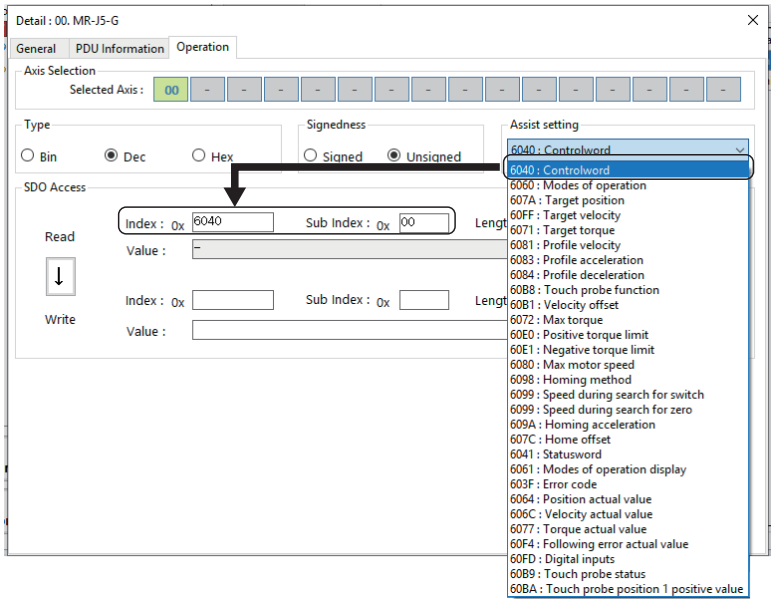
3. When the reading is completed, the length and value of the object are displayed.



Point

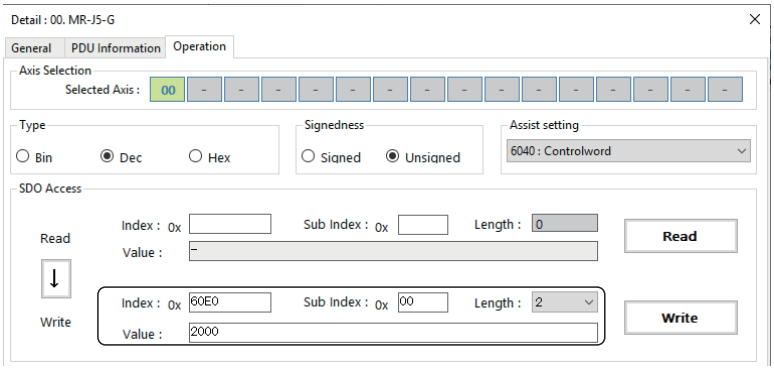
The index and sub index of the object to be read can be selected and input from the pull-down list in the assist setting.

Selecting an object from the pull-down list displays the selected object in the index and sub index on the reading side.



■ Writing an object

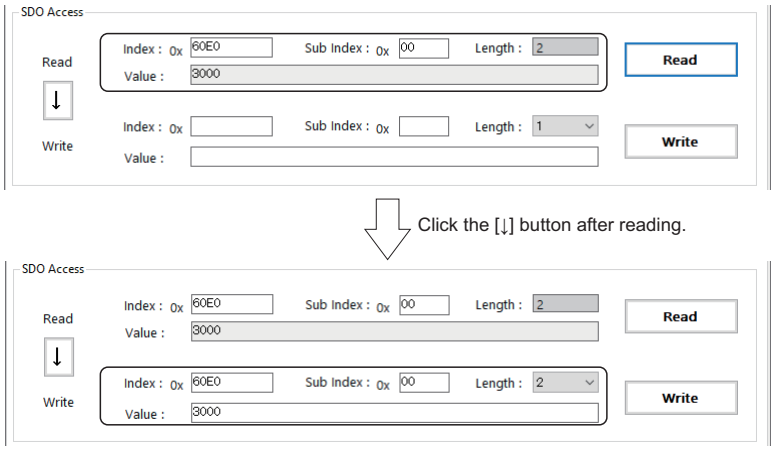
1. Select a number of the axis to be written, and select a data type of the value from "Type". Select the signedness when "Dec" is selected as the type.
2. Enter the index, sub index, value, and length of the object to be written, and click the [Write] button.



3. Write the value to the object.

Point

- Writing a value may fail when the object length is different. In that case, click the [Read] button to read a value, after acquiring the object length, click the [↓] button to copy the value to the writing side, and click the [Write] button to write the value.



4.3 Axis Setting

Axis parameters are set and home position return is performed.

Parameter

The axis parameters are set.

Point

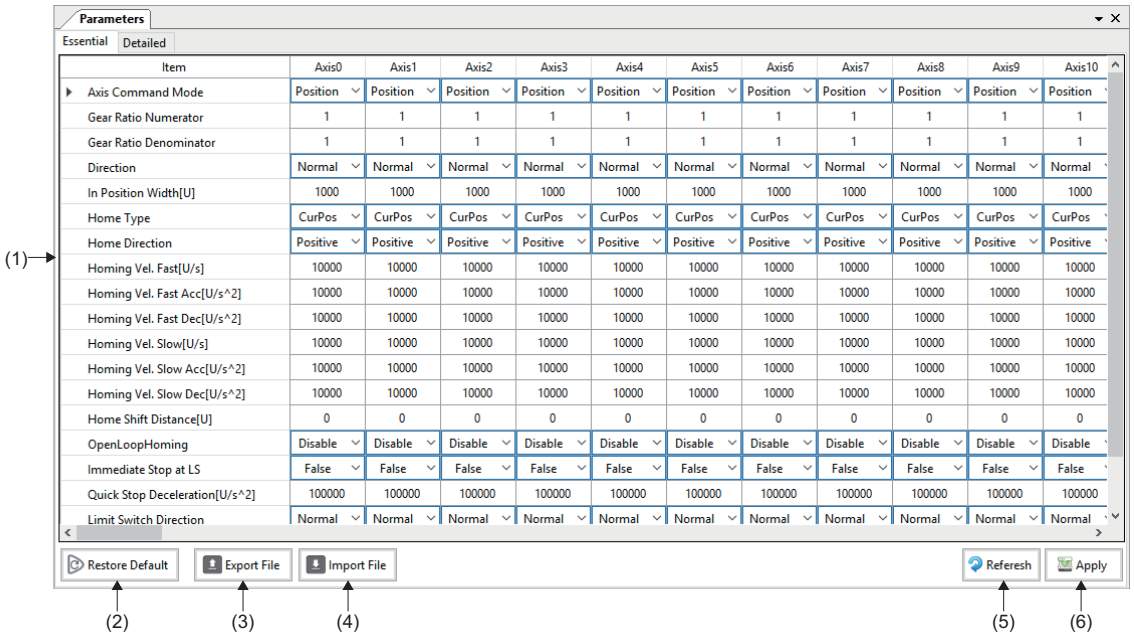
When the SWM-G engine is restarted, the parameters in SWM-G are initialized and set to the default values. It is recommended to save the parameters set in this function with the [Export File] button. The saved parameter file can be applied to the SWM-G engine with the [Import File] button.

Basic settings

The basic parameters for all the axes are set. In addition, the set parameters are saved in a file and loaded.

Window

Navigation window ⇨ [SWMOS] ⇨ [Setup] ⇨ [Parameters] ⇨ [Essential] tab



Displayed items

Item	Description
(1) Parameter setting screen	Set the parameters for all the axes. Parameters set here are basic ones such as the gear ratio and home position return setting. The set parameters can be applied to the SWM-G engine with the [Apply] button. For details of each parameter, refer to "Parameters" in the following manual. SWM-G User Manual
(2) [Restore Default] button	Restores the set parameters for all the axes to the default values and applies them to the SWM-G engine.
(3) [Export File] button	Acquires the parameters applied to the SWM-G engine with the [Apply] button and saves them in a parameter file (.xml).
(4) [Import File] button	Loads parameter from a parameter file (.xml) and applies them to the SWM-G engine.
(5) [Refresh] button	Reads the parameters for all the axes from the SWM-G engine and applies them to the screen. Use this button when applying parameters, which are changed in the user program (API) or others, to the SWMOS screen.
(6) [Apply] button	Applies the parameters for all the axes set in the parameter setting screen to the SWM-G engine.

■ Setting parameters for all axes

Operating procedure

1. Set the parameters in the parameter setting screen.
2. When the parameter setting is completed, click the [Apply] button to apply the parameters to the SWM-G engine.

Precautions

- When the parameter setting screen is switched to another operation screen during the parameter setting, the set values are not applied to the SWM-G engine. Click the [Apply] button to apply them to the SWM-G engine before switching the screen.

■ Saving a parameter file

Operating procedure

1. Click the [Export File] button to display the "Get and Export Parameter" screen.
2. Set the parameter file name and click the [Save] button to save the parameter file (.xml).

Point

The system parameters and axis parameters for all the axes are saved in an xml file format. This xml file can be used from the user program (Import function).

Precautions

- The saving operation with the [Export File] button saves the parameters directly read from the SWM-G engine instead of the parameters set and displayed in the screen in a file.
  To save the set parameters in a file, apply the parameters to the SWM-G engine with the [Apply] button, and then perform the saving operation.

■ Loading a parameter file

Operating procedure

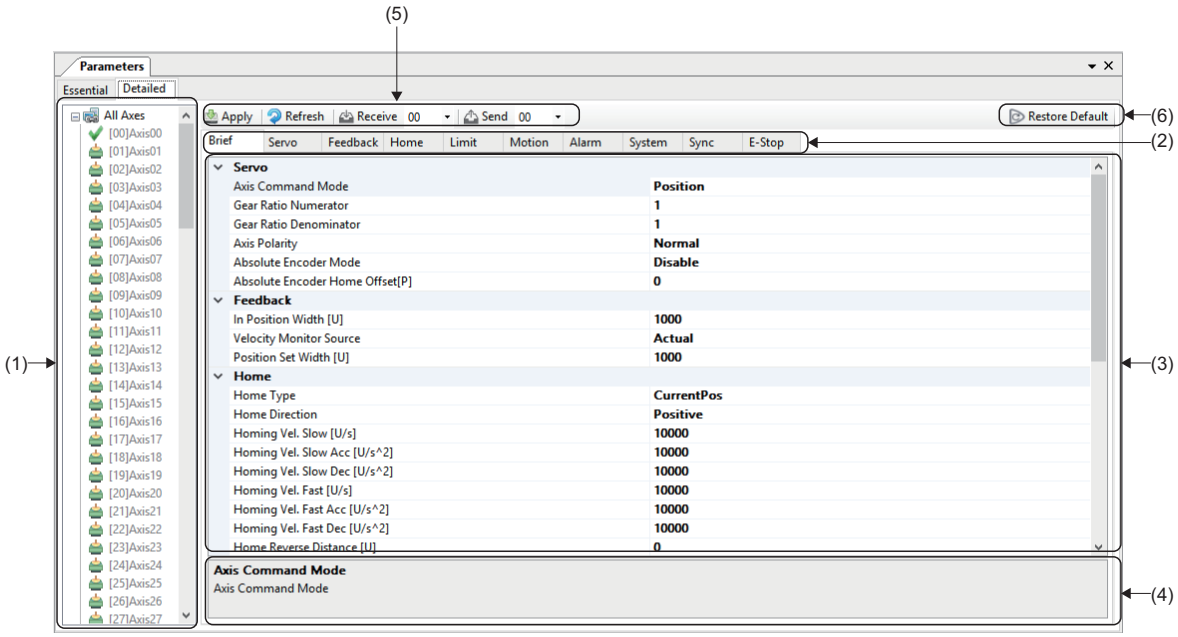
1. Click the [Import File] button to display the "Import and Set Parameter" screen.
2. Select a parameter file to be loaded, and click the [Open] button to load and apply parameters from the parameter file (.xml) to the SWM-G engine.

Detailed settings

Detailed parameters are set for each axis.

Window

Navigation window ⇨ [SWMOS] ⇨ [Setup] ⇨ [Parameters] ⇨ [Detailed] tab



Displayed items

Item	Description
(1) Axis tree	Select an axis to set parameters. The axis display can be set in the axis display mode. (☞ Page 26 Motion)
(2) Parameter type tab	Switch the parameters to be set by selecting the type tab. • [Brief] tab: Simple setting • [Servo] tab: Axis parameters • [Feedback] tab: Feedback parameters • [Home] tab: Home position parameters • [Limit] tab: Limit parameters • [Motion] tab: Motion parameters • [Alarm] tab: Alarm parameters • [System] tab: Flight recorder parameters • [Sync] tab: Synchronous parameters • [E-Stop] tab: Emergency stop parameters
(3) Parameter list	Displays the list of parameters selected from the parameter type tabs.
(4) Simple description display	Displays a simple description for the selected parameter. For details of parameters, refer to "Parameters" in the following manual. 📖SWM-G User Manual
(5) Parameter operation button	Operate the parameters of the target axis. • [Apply] button: Applies the parameters to the SWM-G engine. • [Refresh] button: Loads the parameters from the SWM-G engine. • [Receive] button: Copies the parameters from the specified axis and applies them to the SWM-G engine. • [Send] button: Copies the parameters to the specified axis and applies them to the SWM-G engine.
(6) [Restore Default] button	Restores all the parameters set in the target axis to the default values and applies them to the SWM-G engine.

■ Setting parameters for all axes

Operating procedure

1. Select an axis to set parameters from the axis tree.
2. Select the tab in which the parameter to be set is included, and set the parameter.
3. When the parameter setting is completed, click the [Apply] button to apply the parameters to the SWM-G engine.

Precautions

- If the target axis is switched in the axis tree or the parameter setting screen is switched to other operation screen during the parameter setting, the set value is not applied to the SWM-G engine. Click the [Apply] button and apply them to the SWM-G engine before switching the screen.

Point

Since the flight recorder parameters are common to all the axes, the same values are set regardless of where they are set. However, "Collect Axis Flight Recorder Data" is an exception.

■ Copying parameters from the specified axis

Operating procedure

1. Select the copy destination axis (example: Axis00) from the axis tree.
2. Select the copy source axis number (example: Axis01) from the pull-down list for [Receive], and click the [Receive] button.
3. All the parameters of the copy source are copied to the axis (example: Axis00), and applied to the SWM-G engine.

■ Copying parameters to the specified axis

Operating procedure

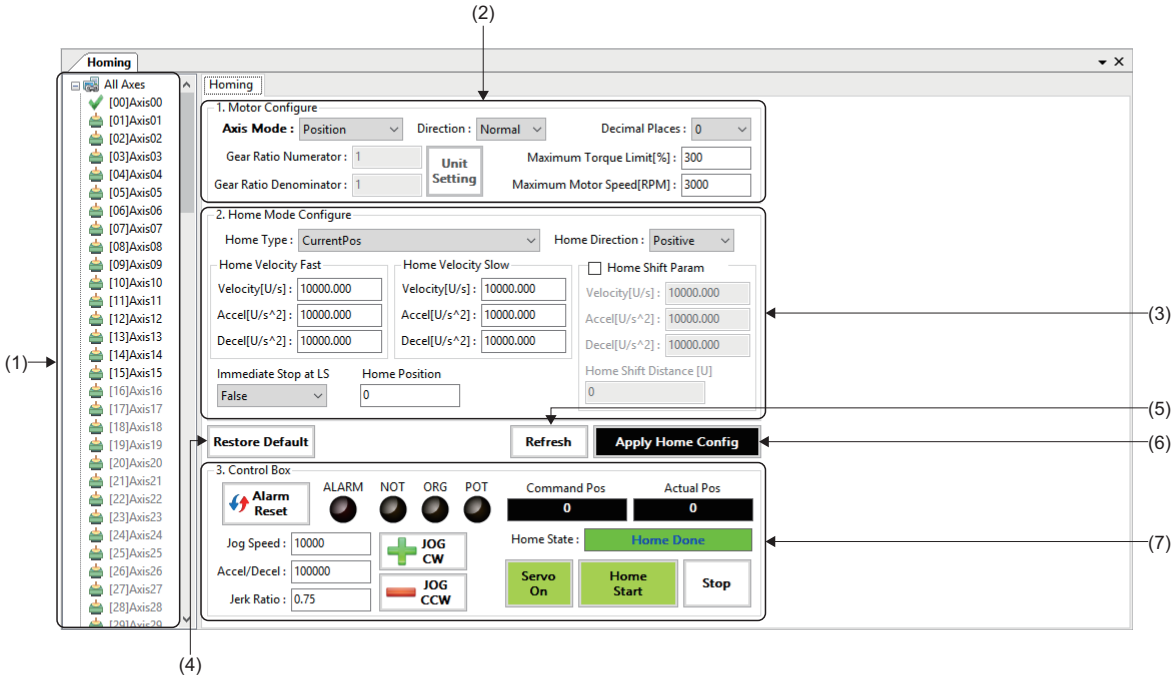
1. Select the copy source axis (example: Axis00) from the axis tree.
2. Select the copy destination axis number (example: Axis02) from the pull-down list for [Send], and click the [Send] button.
3. All the parameters are copied to the specified copy destination axis (example: Axis02), and applied to the SWM-G engine.

Home position return

Home position return settings of axes are configured and home position return is performed.

Window

Navigation window ⇨ [SWMOS] ⇨ [Setup] ⇨ [Homing] ⇨ [Homing] tab

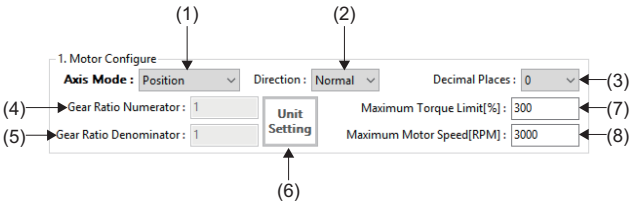


Displayed items

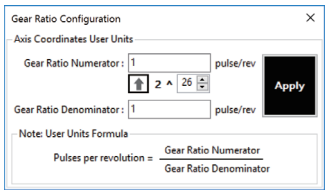
Item	Description
(1) Axis tree	Select the axis for which the home position return is performed. The axis display can be set in the axis display mode. (☞ Page 26 Motion)
(2) Motor Configure	Set the axis parameters required for the home position return test. (☞ Page 101 Axis parameter setting)
(3) Home Mode Configure	Set the parameters for the home position return. (☞ Page 102 Home position return setting)
(4) [Restore Default] button	Restores the axis parameter setting and home position return setting which are set in the target axis to the default values and applies them to the SWM-G engine. *: [Decimal Places] of the axis parameter setting is not restored to the default value.
(5) [Refresh] button	Loads the axis parameter setting and home position return setting from the SWM-G engine.
(6) [Apply Home Config] button	Applies the set axis parameters and home position return setting to the SWM-G engine.
(7) Control Box	Performs test operation of the home position return. (☞ Page 103 Home position return control)

■ Axis parameter setting

Window

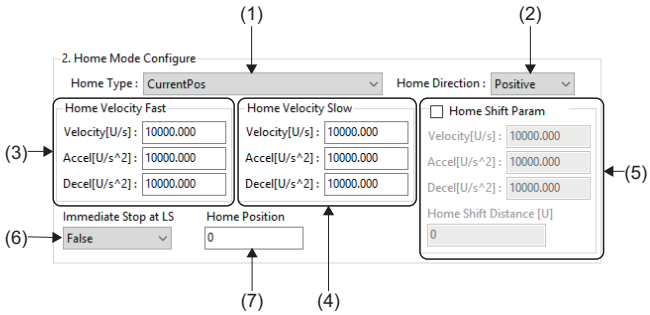


Displayed items

Item	Description
(1) Axis Mode	Set the command mode of the axis. *: When performing the home position return, set the axis mode to "Position".
(2) Direction	Set the direction of the axis. • Normal: The servo position command of positive direction is sent by the normal direction command. • Reverse: The servo position command of negative direction is sent by the normal direction command.
(3) Decimal Places	Set the number of decimal places in the monitor display of SWMOS. • 0 to 6
(4) Gear Ratio Numerator	Set the numerator of the gear ratio of SWM-G. This item cannot be changed at servo ON.
(5) Gear Ratio Denominator	Set the denominator of the gear ratio of SWM-G. This item cannot be changed at servo ON.
(6) [Unit Setting] button	Click the [Unit Setting] button to display the "Gear Ratio Configuration" window. Enter the gear ratio denominator, and click the [↑] button to calculate the gear ratio numerator. Click the [Apply] button to set the calculated numerical values to the gear ratio numerator and gear ratio denominator in the axis parameter setting. 
(7) Maximum Torque Limit[%]	Set the maximum torque limit.
(8) Maximum Motor Speed[RPM]	Set the maximum motor speed.

■ Home position return setting

Window

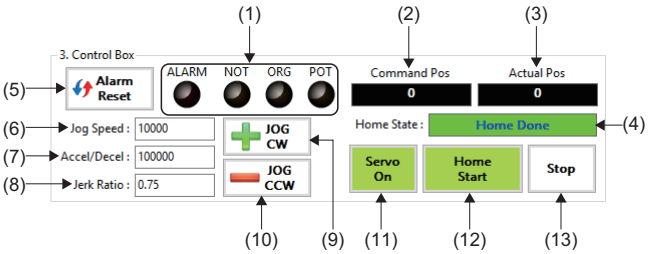


Displayed items

Item		Description
(1) Home Type		Set the home position return method. For details of the home type of the home position return method, refer to "Homing ⇨ Home Types" in the following manual. 📖SWM-G User Manual
(2) Home Direction		Set the direction searched for the home position at the time of the home position return operation. • Positive: Positive direction • Negative: Negative direction
(3) Home Velocity Fast	Velocity[U/s]	Set the speed [U/s] of the high-speed home position return.
	Accel[U/s^2]	Set the acceleration [U/s^2] of the high-speed home position return.
	Decel[U/s^2]	Set the deceleration [U/s^2] of the high-speed home position return.
(4) Home Velocity Slow	Velocity[U/s]	Set the speed [U/s] of the low-speed home position return.
	Accel[U/s^2]	Set the acceleration [U/s^2] of the low-speed home position return.
	Decel[U/s^2]	Set the deceleration [U/s^2] of the low-speed home position return.
(5) Home shift	Home Shift Param	Select [Home Shift Param] to configure the settings for the home shift. • Selected: The settings for the home shift are enabled. • Not selected: The settings for the home shift are disabled.
	Velocity[U/s]	Set the speed [U/s] of the home shift.
	Accel[U/s^2]	Set the acceleration [U/s^2] of the home shift.
	Decel[U/s^2]	Set the deceleration [U/s^2] of the home shift.
	Home Shift Distance [U]	Set the home shift distance [U].
(6) Immediate Stop at LS		Set whether to enable/disable the immediate stop without decelerating the axis when reaching the limit switch is detected. • False: Immediate stop disabled • True: Immediate stop enabled
(7) Home Position		Set the home position [user unit] to be set at the home position return completion.

■ Home position return control

Window



Displayed items

Item	Description
(1) Axis status	Displays the axis statuses with lamps. • ALARM: Alarm status • NOT: Negative direction limit switch status • ORG: Home switch status • POT: Positive direction limit switch status
(2) Command Pos	Displays the command position.
(3) Actual Pos	Displays the feedback position.
(4) Home State	Displays the home position return status. • Not Homed: Home position return not performed • Home Done: Home position return complete • □□Search*1: Home position return in progress
(5) [Alarm Reset] button	Clears the alarm.
(6) Jog Speed	Set the JOG operation speed [U/s].
(7) Accel/Decel	Set the JOG operation acceleration/deceleration [U/s^2].
(8) Jerk Ratio	Set the jerk ratio of the JOG operation. • 0 to 1.0
(9) [JOG CW] button	Performs the JOG operation in the forward direction (the command position is added).
(10) [JOG CCW] button	Performs the JOG operation in the reverse direction (the command position is subtracted).
(11) [Servo On] button	Switches servo ON/OFF. Performing servo ON turns on this button in green.
(12) [Home Start] button	Starts the home position return. This button turns green when the home position return is completed.
(13) [Stop] button	Stops the home position return.

*1 □□= Selected home type

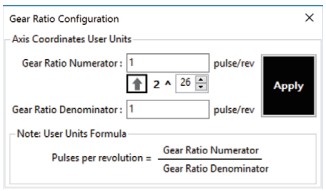
Home position return operation

■ Setting parameters for home position return

Operating procedure

1. Select the axis for which the home position return is performed from the axis tree.
2. Set the axis parameters required for the home position return test operation in [1. Motor Configure].

*1 Click the [Unit Setting] button to display the "Gear Ratio Configuration" screen.
Enter the gear ratio denominator, and click the [↑] button to calculate the gear ratio numerator.
Click the [Apply] button to set the calculated numerical values to the gear ratio numerator and gear ratio denominator in the axis parameter setting.



3. Set the parameters for home position return in [2. Home Mode Configure].
4. When the setting is completed, click the [Apply Home Config] button to apply the set parameters to the SWM-G engine.

■ Test operation of the home position return

Operating procedure

1. Select the axis for which the test operation of the home position return is performed from the axis tree.
2. Click the [Servo On] button to perform servo ON for the axis.
3. Use the [JOG CW]/[JOG CCW] button as necessary to move the axis to the start position of the home position return.
4. Click the [Home Start] button to start the home position return operation.
5. When the home position return is normally completed, "Home Done" is displayed in [Home State].

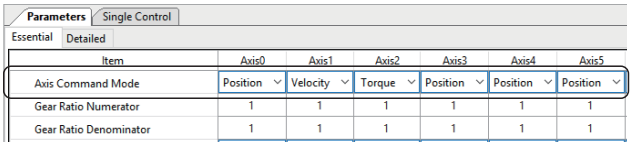
4.4 Axis Control

The single-axis control and multi-axis control of the axis (cyclic mode) are performed.

Single-axis control

The single-axis control is tested. For the single-axis control, the test operations of the position control, speed control, and torque control can be performed. Switch and use the axis control mode according to the operation.

To switch the axis control mode, set the axis control mode to be performed in the single-axis control in [Axis Command Mode] in the [Essential] tab which is displayed by selecting [SWMOS] ⇨ [Setup] ⇨ [Parameters] in the navigation window, and write the parameters to the SWM-G engine.



Parameter	Setting value
Axis Command Mode	• Position: Position control • Velocity: Speed control • Torque: Torque control

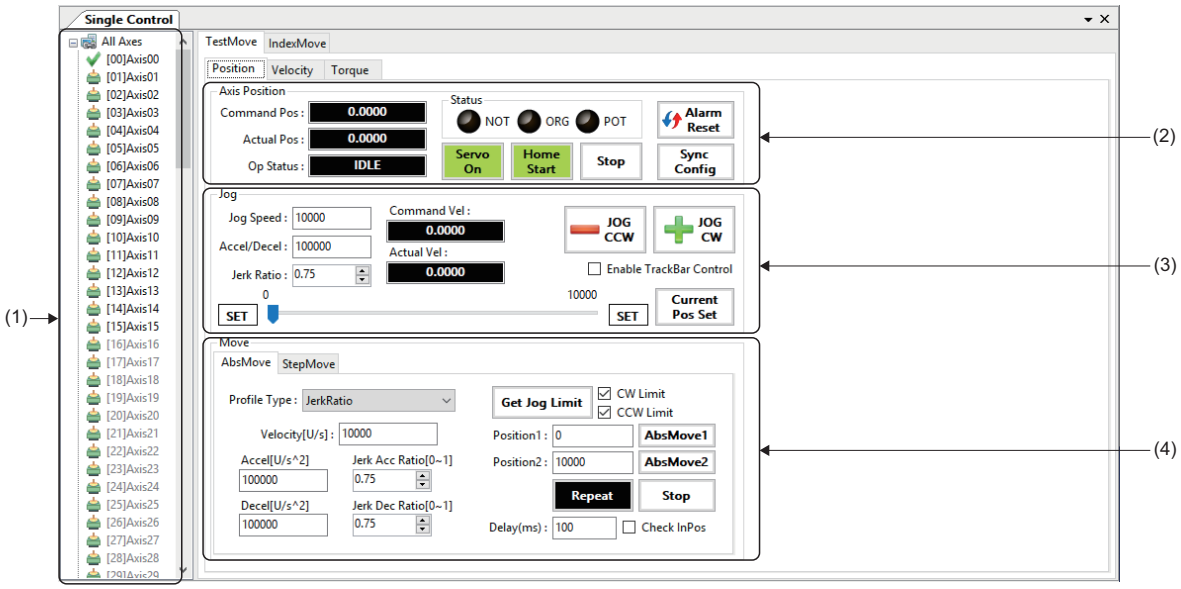
Test operation (position control)

The operation of the single-axis position control is performed.

To operate the position control, set "Position" in "Axis Command Mode" in the [Essential] tab which is displayed by selecting [SWMOS] ⇨ [Setup] ⇨ [Parameters] in the navigation window.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motor(CyclicSyncPos)] ⇨ [SingleControl] ⇨ [TestMove] ⇨ [Position] tab



Displayed items

Item	Description
(1) Axis tree	Select the axis for which the position control of the test operation is executed. The axis display can be set in the axis display mode. (☞ Page 26 Motion)
(2) Axis Position	The position and status of the axis are displayed, servo ON/OFF, home position return, stop, and alarm reset are performed, and synchronous setting is configured. (☞ Page 107 Axis status)
(3) Jog	JOG operation is performed. (☞ Page 108 JOG operation)
(4) Move/StepMove	The positioning operation and step operation are performed. (☞ Page 109 Positioning operation (absolute position operation), ☞ Page 110 Positioning operation (step operation))

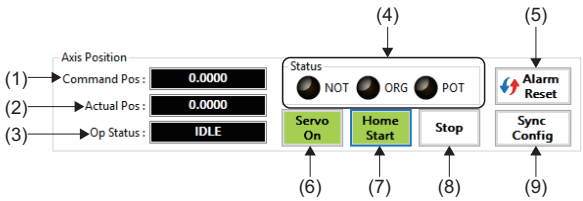
■ Axis status

The current position and axis status are checked in the "Axis Position" area.

Servo ON/OFF, home position return, stop, and alarm reset can be performed, and the synchronous setting can be configured.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motor(CyclicSyncPos)] ⇨ [SingleControl] ⇨ [TestMove] ⇨ [Position] tab ⇨ [Axis Position]



Displayed items

Item	Description
(1) Command Pos	Displays the command position.
(2) Actual Pos	Displays the feedback position.
(3) Op Status	Displays the control status of the axis. • OFFLINE: Not connected • OFF: Servo OFF • IDLE: Waiting • JOG: JOG operation in progress • HOME: Home position return in progress • POS: Positioning operation in progress • SYNC (□*1): Synchronous control in progress • INTPL: Interpolation control in progress • STOP: Stopped • ALARM: Alarm occurring
(4) Status	Displays each signal status of the axis with lamps. • NOT: Negative direction limit switch status • ORG: Home switch status • POT: Positive direction limit switch status
(5) [Alarm Reset] button	Clears the alarm.
(6) [Servo On] button	Switches servo ON/OFF. Performing servo ON turns on this button in green.
(7) [Home Start] button	Starts the home position return. This button turns green when the home position return is completed.
(8) [Stop] button	Stops the operation.
(9) [Sync Config] button	Displays the "Axes Sync Config" screen to configure the synchronous control setting. For details of the "Axes Sync Config" screen, refer to the following. ☞ Page 42 Synchronous control

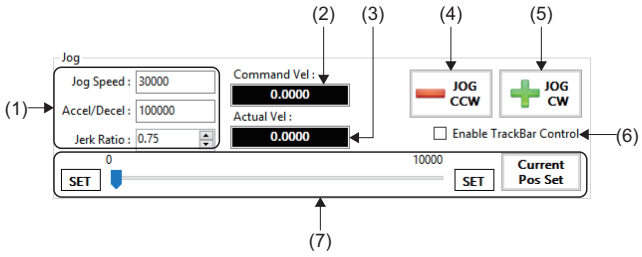
*1 □= Axis number of the master axis (00 to 127)

■ JOG operation

JOG operation is performed in the jog area.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motor(CyclicSyncPos)] ⇨ [SingleControl] ⇨ [TestMove] ⇨ [Position] tab ⇨ [Jog]



Displayed items

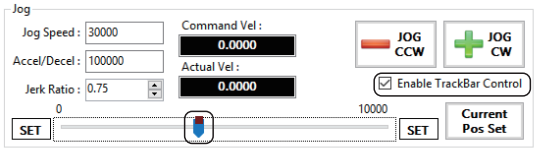
Item	Description
(1) Jog Speed	Set the speed for JOG operation. • Jog Speed: Set the JOG operation speed [U/s]. • Accel/Decel: Set the JOG operation acceleration/deceleration [U/s^2]. • Jerk Ratio: Set the jerk ratio (0 to 1.0) of the JOG operation.
(2) Command Vel	Displays the command speed [U/s].
(3) Actual Vel	Displays the feedback speed [U/s].
(4) [JOG CCW] button	Performs the JOG operation in the reverse direction (the command position is subtracted).
(5) [JOG CW] button	Performs the JOG operation in the forward direction (the command position is added).
(6) Enable TrackBar Control	Selecting this item displays ■ (current position) on the arrow ( ) in the trackbar. The JOG operation is performed by operating the trackbar.
(7) Trackbar	The upper limit value and lower limit value during the test operation are displayed, and the JOG operation is performed with the trackbar. ■[SET] button (Left side) Sets the current command position to the lower limit position of the trackbar. ■[SET] button (Right side) Sets the current command position to the upper limit position of the trackbar. ■[Current Pos Set] button Sets the current command position to the center position of the trackbar, and sets the lower limit position and upper limit position of the trackbar to the positions shown below. • Lower limit position of the trackbar: Current position "-10" • Upper limit position of the trackbar: Current position "+10"

Operating procedure

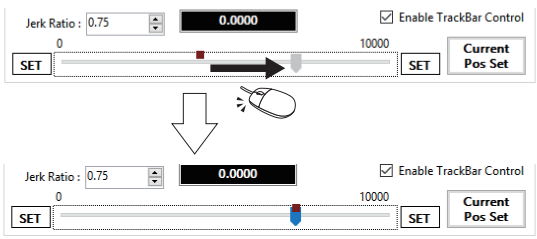
The following describes how to perform the JOG operation using the trackbar.

1. Perform positioning to the upper limit position and lower limit position with the [JOG CW]/[JOG CCW] button, and update the upper limit position and lower limit position for the trackbar operation.

2. Selecting [Enable TrackBar Control] displays ■ (current position) in the trackbar.



3. Drag and drop the arrow ( ) in the trackbar to start the JOG operation towards the moved position.

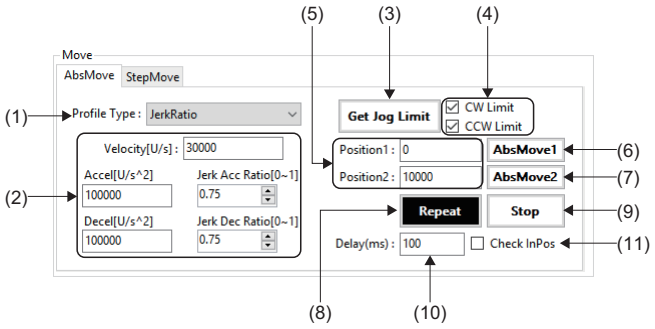


■ Positioning operation (absolute position operation)

In the "AbsMove" tab in the "Move" area, positioning operation to the two set points is performed.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motor(CyclicSyncPos)] ⇨ [SingleControl] ⇨ [TestMove] ⇨ [Position] tab ⇨ [Move] ⇨ [AbsMove] tab



Displayed items

Item	Description
(1) Profile Type*1	Select the acceleration/deceleration method used for the positioning operation. • Trapezoidal: Trapezoid • SCurve: S-curve • Jerk Ratio: Jerk ratio • Parabolic: Parabolic • Sin: Sine • AdvancedS: Advanced-S • TrapezoidalMAT: Trapezoidal moving average time • JerkLimited: Jerk-limited • JerkLimitedSCurve: Jerk limited S-curve • JerkLimitedAdvancedS: Jerk limited advanced-S • TwoVelocityTrapezoidal: Two velocity trapezoidal • TwoVelocitySCurve: Two velocity S curve • TwoVelocityJerkRatio: Two velocity jerk ratio • TimeAccTrapezoidal: Time acceleration trapezoidal • TimeAccSCurve: Time acceleration S-curve • TimeAccJerkRatio: Time acceleration jerk ratio • TimeAccParabolic: Time acceleration parabolic • TimeAccSin: Time acceleration sine • TimeAccAdvancedS: Time acceleration advanced-S • ConstantDec: Constant deceleration • JerkRatioFixedVelocityT: Jerk ratio/fixed velocity-T • JerkRatioFixedVelocityS: Jerk ratio/fixed velocity-S • JerkLimitedFixedVelocityT: Jerk-limited/fixed velocity-T • JerkLimitedFixedVelocityS: Jerk-limited/fixed velocity-S • ParabolicVelocity: Parabolic velocity
(2) Speed setting	• Velocity[U/s]: Set the target speed. • Accel[U/s^2]: Set the acceleration. • Decel[U/s^2]: Set the deceleration. • Jerk Acc Ratio[0~1]: Set the acceleration jerk ratio. • Jerk Dec Ratio[0~1]: Set the deceleration jerk ratio.
(3) [Get Jog Limit] button	Sets the upper limit position and lower limit position displayed in the trackbar in [Jog] as the target positions. The lower limit position value of the trackbar is set in [Position1] and the upper limit position value is set in [Position2].
(4) CW Limit/CCW Limit	Selecting these items enable the target position setting for the upper limit position and lower limit position of the trackbar in [Jog]. • CW Limit: Enables the operation in which the upper limit position of the trackbar is set to [Position 2]. • CCW Limit: Enables the operation in which the lower limit position of the trackbar is set to [Position 1].
(5) Position1/Position2	Set the target position of the absolute position positioning operation. • Position1: Set the absolute position value for Position1. • Position2: Set the absolute position value for Position2.
(6) [AbsMove1] button	Performs the absolute position positioning operation on the position set in Position1. Depending on whether [Enable TrackBar Control] in [Jog] is selected or not, the following moves within the trackbar when the [AbsMove1] button is clicked. • Selected: ■ in the trackbar moves to the position of the value set in [Position1]. • Not selected: ▮ in the trackbar moves to the position of the value set in [Position1].

Item	Description
(7) [AbsMove2] button	Performs the absolute position positioning operation on the position set in Position2. Depending on whether [Enable TrackBar Control] in [Jog] is selected or not, the following moves within the trackbar when the [AbsMove2] button is clicked. • Selected: ■ in the trackbar moves to the position of the value set in [Position2]. • Not selected: ▮ in the trackbar moves to the position of the value set in [Position2].
(8) [Repeat] button	Starts the reciprocating positioning operation with the values set in [Position1] and [Position2]. Depending on whether [Enable TrackBar Control] in [Jog] is selected or not, the following moves within the trackbar and the reciprocating operation is performed. • Selected: ■ moves and the reciprocating operation is performed. • Not selected: ▮ moves and the reciprocating operation is performed.
(9) [Stop] button	Stops the positioning operation.
(10) Delay(ms)	Set the standby time [ms] after the positioning completion.
(11) Check InPos	When this item is selected, the next positioning is started after the in-position is turned on.

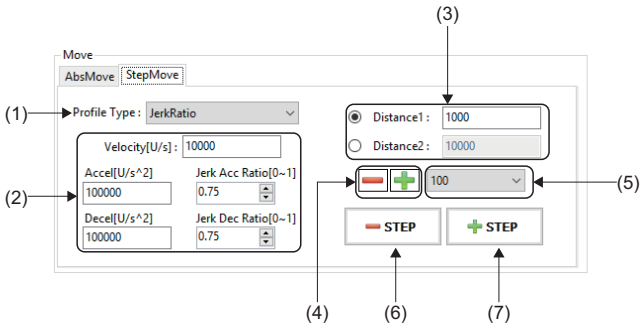
*1 For details of the acceleration/deceleration method, refer to the following.
SWM-G User Manual

■ Positioning operation (step operation)

In the "StepMove" tab in the "Move" area, step operation is performed.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motor(CyclicSyncPos)] ⇨ [SingleControl] ⇨ [TestMove] ⇨ [Position] tab ⇨ [Move] ⇨ [StepMove] tab



Displayed items

Item	Description
(1) Profile Type*1	Select the acceleration/deceleration method used for the step operation. • Trapezoidal: Trapezoid • S-Curve: S-curve • Jerk Ratio: Jerk ratio • Parabolic: Parabolic • Sin: Sine • AdvancedS: Advanced-S • TrapezoidalMAT: Trapezoidal moving average time • JerkLimited: Jerk-limited • JerkLimitedSCurve: Jerk limited S-curve • JerkLimitedAdvancedS: Jerk limited advanced-S • TwoVelocityTrapezoidal: Two velocity trapezoidal • TwoVelocitySCurve: Two velocity S curve • TwoVelocityJerkRatio: Two velocity jerk ratio • TimeAccTrapezoidal: Time acceleration trapezoidal • TimeAccSCurve: Time acceleration S-curve • TimeAccJerkRatio: Time acceleration jerk ratio • TimeAccParabolic: Time acceleration parabolic • TimeAccSin: Time acceleration sine • TimeAccAdvancedS: Time acceleration advanced-S • ConstantDec: Constant deceleration • JerkRatioFixedVelocityT: Jerk ratio/fixed velocity-T • JerkRatioFixedVelocityS: Jerk ratio/fixed velocity-S • JerkLimitedFixedVelocityT: Jerk-limited/fixed velocity-T • JerkLimitedFixedVelocityS: Jerk-limited/fixed velocity-S • ParabolicVelocity: Parabolic velocity

Item	Description
(2) Speed setting	• Velocity[U/s]: Set the target speed. • Accel[U/s^2]: Set the acceleration. • Decel[U/s^2]: Set the deceleration. • Jerk Acc Ratio[0~1]: Set the acceleration jerk ratio. • Jerk Dec Ratio[0~1]: Set the deceleration jerk ratio.
(3) Step movement amount setting	Set the movement amount of the step operation. • Distance1: Set the movement amount 1. • Distance2: Set the movement amount 2.
(4) [−] button/[+] button	Subtracts/adds the value in the pull-down list from/to the values set in [Distance1]/[Distance2]. • [−] button: Subtracts the value. • [+] button: Adds the value.
(5) Pull-down list	Set the value to be subtracted or added from/to [Distance1]/[Distance2]. • 10, 100, 1000, 10000, 100000
(6) [−STEP] button	Executes the step operation once in the subtraction direction. Depending on whether [Enable TrackBar Control] in [Jog] is selected or not, the following moves within the trackbar to the position calculated by subtracting the value set in [Distance1] or [Distance2] when the [−STEP] button is clicked. • Selected: ■ in the trackbar moves to the position calculated by subtracting the set value. • Not selected: ▮ in the trackbar moves to the position calculated by subtracting the set value.
(7) [+STEP] button	Executes the step operation once in the addition direction. Depending on whether [Enable TrackBar Control] in [Jog] is selected or not, the following moves within the trackbar to the position calculated by adding the value set in [Distance1] or [Distance2] when the [+STEP] button is clicked. • Selected: ■ in the trackbar moves to the position calculated by adding the set value. • Not selected: ▮ in the trackbar moves to the position calculated by adding the set value.

*1 For details of the acceleration/deceleration method, refer to the following.
SWM-G User Manual

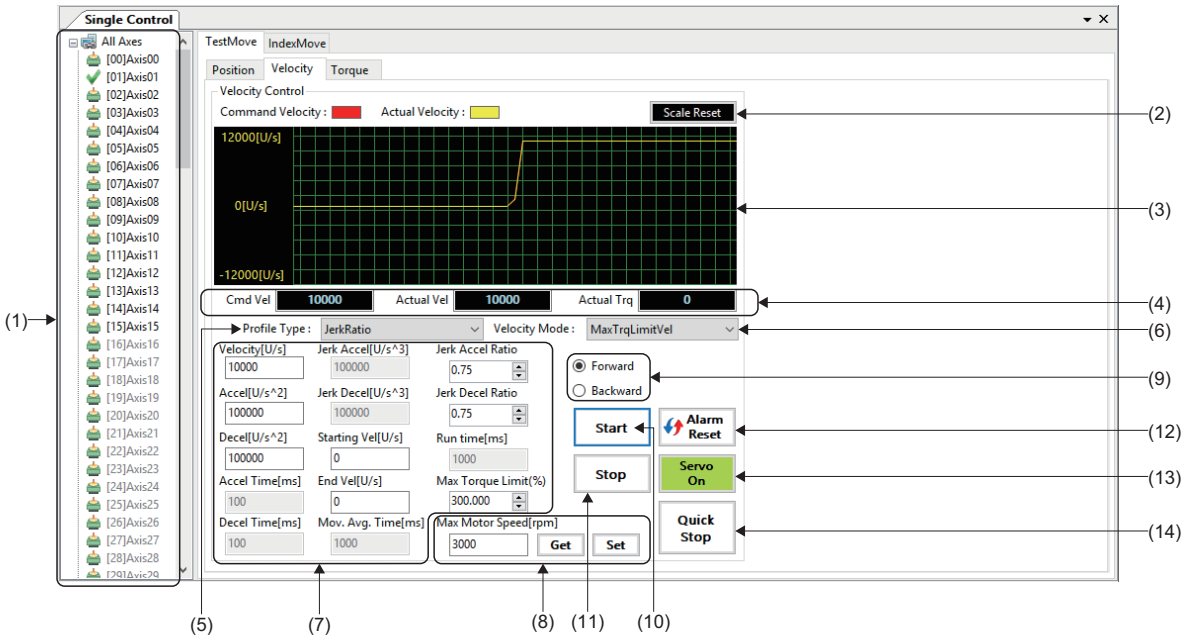
Test operation (speed control)

The operation of the single-axis speed control is performed.

To operate the speed control, set "Velocity" in "Axis Command Mode" in the [Essential] tab which is displayed by selecting [SWMOS] ⇨ [Setup] ⇨ [Parameters] in the navigation window.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motor(CyclicSyncPos)] ⇨ [SingleControl] ⇨ [TestMove] ⇨ [Velocity] tab



Displayed items

Item	Description
(1) Axis tree	Select the axis for which the speed control of the test operation is executed. The axis display can be set in the axis display mode. (☞ Page 26 Motion)
(2) [Scale Reset] button	Recalculates the scale of the graph area.
(3) Graph area	Displays the status of the speed control. The command speed and feedback speed are plotted in the graph area. • Command speed: Red • Feedback speed: Yellow
(4) Speed control status	Displays the command speed, feedback speed, and feedback torque. • Cmd Vel: Displays the command speed [U/s]. • Actual Vel: Displays the feedback speed [U/s]. • Actual Trq: Displays the feedback torque [%].

Item	Description
(5) Profile Type[*1]	Select the acceleration/deceleration method for the speed control. • Trapezoidal: Trapezoid • S-Curve: S-curve • Jerk Ratio: Jerk ratio • Parabolic: Parabolic • Sin: Sine • AdvancedS: Advanced-S • TrapezoidalMAT: Trapezoidal moving average time • JerkLimited: Jerk-limited • JerkLimitedSCurve: Jerk limited S-curve • JerkLimitedAdvancedS: Jerk limited advanced-S • TwoVelocityTrapezoidal: Two velocity trapezoidal • TwoVelocitySCurve: Two velocity S curve • TwoVelocityJerkRatio: Two velocity jerk ratio • TimeAccTrapezoidal: Time acceleration trapezoidal • TimeAccSCurve: Time acceleration S-curve • TimeAccJerkRatio: Time acceleration jerk ratio • TimeAccParabolic: Time acceleration parabolic • TimeAccSin: Time acceleration sine • TimeAccAdvancedS: Time acceleration advanced-S • ConstantDec: Constant deceleration • JerkRatioFixedVelocityT: Jerk ratio/fixed velocity-T • JerkRatioFixedVelocityS: Jerk ratio/fixed velocity-S • JerkLimitedFixedVelocityT: Jerk-limited/fixed velocity-T • JerkLimitedFixedVelocityS: Jerk-limited/fixed velocity-S • ParabolicVelocity: Parabolic velocity
(6) Velocity Mode	Select the specification method for the speed control. • Velocity: Speed command • TimedVel: Speed command with the time specified • MaxTrqLimitVel: Speed command with the maximum torque limit specified
(7) Speed setting	Set the parameters for the speed control to perform the test operation. • Velocity[U/s]: Set the target speed. • Accel[U/s^2]: Set the acceleration. • Decel[U/s^2]: Set the deceleration. • Accel Time [ms]: Set the acceleration time. • Decel Time [ms]: Set the deceleration time. • Jerk Accel [U/s^3]: Set the acceleration jerk. • Jerk Decel [U/s^3]: Set the deceleration jerk. • End Vel [U/s]: Set the end speed. • Mov. Avg. Time [ms]: Set the moving average time. • Jerk Accel Ratio [0 to 1.0]: Set the acceleration jerk ratio. • Jerk Decel Ratio [0 to 1.0]: Set the deceleration jerk ratio. • RunTimeMilliseconds: Set the execution time for the time specification method. • Max Torque Limit(%): Set the maximum torque limit for the maximum torque limit specification method.
(8) Max Motor Speed[rpm][*2]	Set the maximum motor speed for the axis. Set the motor speed and click the [Set] button to set the motor speed. Click the [Get] button to acquire the current value.
(9) Forward/Backward	Set the direction in which the speed control is executed. • Forward: Speed control in the positive direction • Backward: Speed control in the negative direction
(10) [Start] button	Starts the speed control.
(11) [Stop] button	Stops the speed control.
(12) [Alarm Reset] button	Clears the alarm.
(13) [Servo On] button	Switches servo ON/OFF. Performing servo ON turns on this button in green.
(14) [Quick Stop] button	Stops the speed control with the quick stop.

*1 For details of the acceleration/deceleration method, refer to the following.
SWM-G User Manual

*2 This item cannot be changed for the servo amplifier (MR-J5(W)-G).

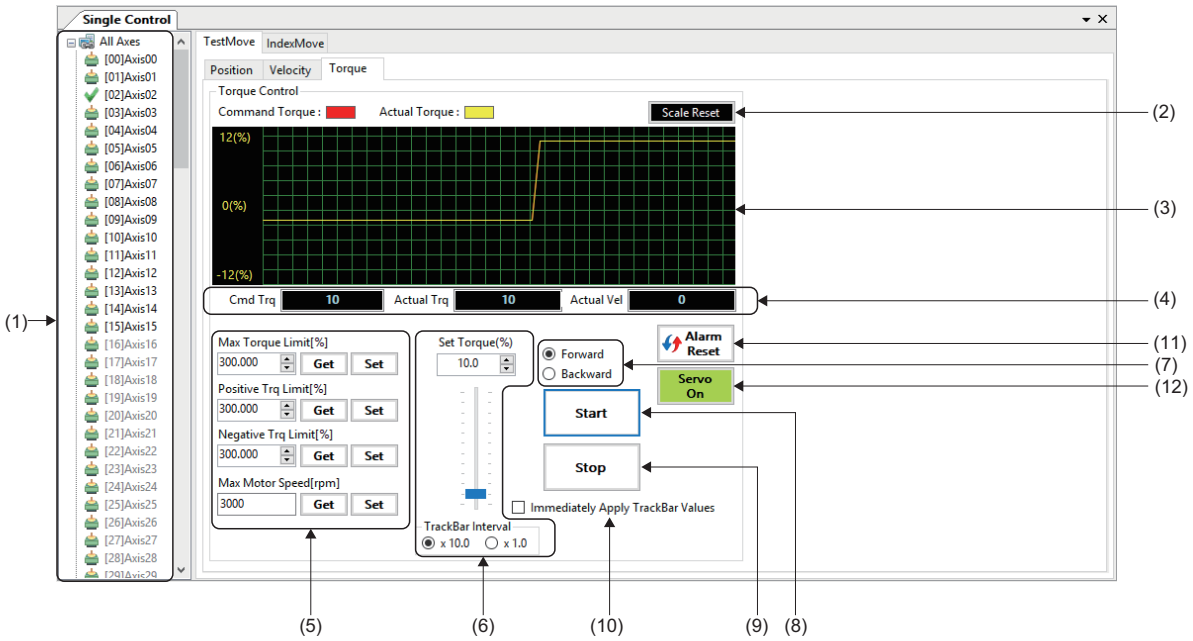
Test operation (torque control)

The operation of the single-axis torque control is performed.

To operate the torque control, set "Torque" in "Axis Command Mode" in the [Essential] tab which is displayed by selecting [SWMOS] ⇨ [Setup] ⇨ [Parameters] in the navigation window.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motor(CyclicSyncPos)] ⇨ [SingleControl] ⇨ [TestMove] ⇨ [Torque] tab



Displayed items

Item	Description
(1) Axis tree	Select the axis for which the torque control of the test operation is executed. The axis display can be set in the axis display mode. (☞ Page 26 Motion)
(2) [Scale Reset] button	Recalculates the scale of the graph area.
(3) Graph area	Displays the status of the torque control. The command torque and feedback torque are plotted in the graph area. • Command torque: Red • Feedback torque: Yellow
(4) Torque control status	Displays the command torque, feedback torque, and feedback speed. • Cmd Trq: Displays the command torque [%]. • Actual Trq: Displays the feedback torque [%]. • Actual Vel: Displays the feedback speed [U/s].
(5) Torque setting	Set the parameters for the torque control to perform the test operation. Set each item and click the [Set] button to set the values. Click the [Get] button to acquire the current value. • Max Torque Limit[%]: Set the maximum torque limit. • Positive Trq Limit[%]: Set the positive-direction torque limit. • Negative Trq Limit[%]: Set the negative-direction torque limit. • Max Motor Speed[rpm][*1]: Set the maximum motor speed.
(6) Trackbar	During the test operation, the torque command value is changed with the trackbar and applied to the graph area. ■Set Torque(%) Set the torque command value. ■TrackBar Interval Select the unit of scale for the trackbar. • ×10.0% • ×1.0%
(7) Forward/Backward	Set the direction in which the torque control is executed. • Forward: Torque control in positive direction • Backward: Torque control in negative direction
(8) [Start] button	Starts the torque control.
(9) [Stop] button	Stops the torque control.

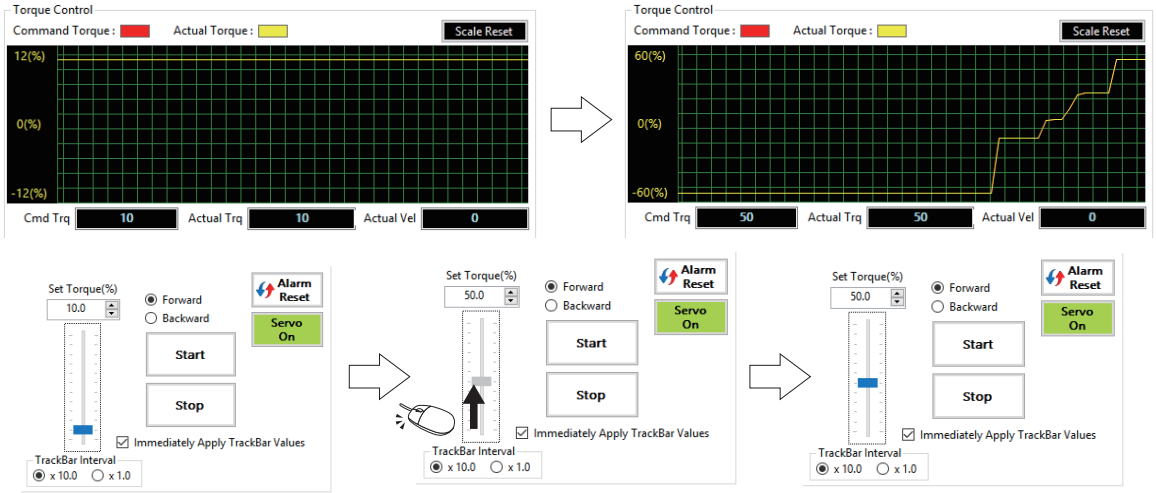
Item	Description
(10) Immediately Apply TrackBar Values	When this item is selected, the torque command value set with the trackbar is immediately applied to the graph area.
(11) [Alarm Reset] button	Clears the alarm.
(12) [Servo On] button	Switches servo ON/OFF. Performing servo ON turns on this button in green.

*1 This item cannot be changed for the servo amplifier (MR-J5(W)-G). Set the maximum speed with the servo parameter [PV21 (Speed limit extension setting)] of the servo amplifier.

Operating procedure

The following describes the torque control operation performed by using the trackbar.

1. Click the [Start] button to start the torque control operation.
2. When the trackbar is dragged while [Immediately Apply TrackBar Values] is selected, the torque command value is changed, and the changed value is applied as the actual torque control command in real time. The unit of scale for the trackbar can be selected from "10.0%" and "1.0%" in [TrackBar Interval].



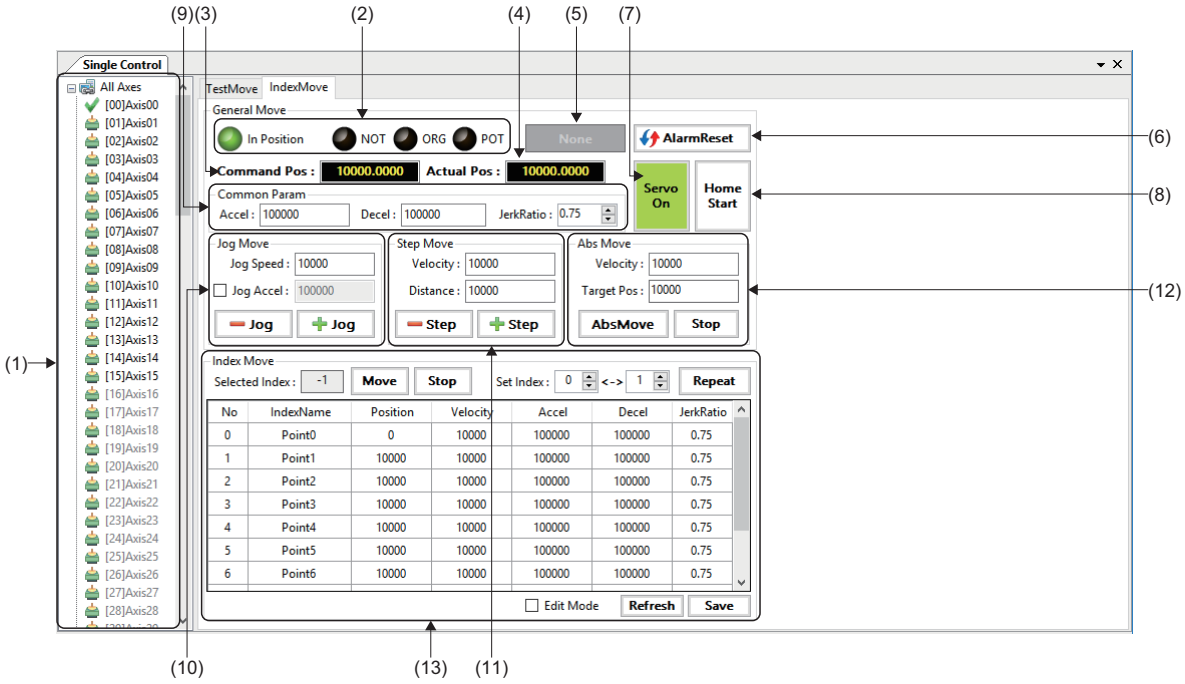
3. When [Immediately Apply TrackBar Values] is not selected, the torque command value changed with the trackbar is applied to the actual torque control when the [Start] button is clicked.

Index operation

The positioning operation to the registered index position is performed.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motor(CyclicSyncPos)] ⇨ [SingleControl] ⇨ [IndexMove]



Displayed items

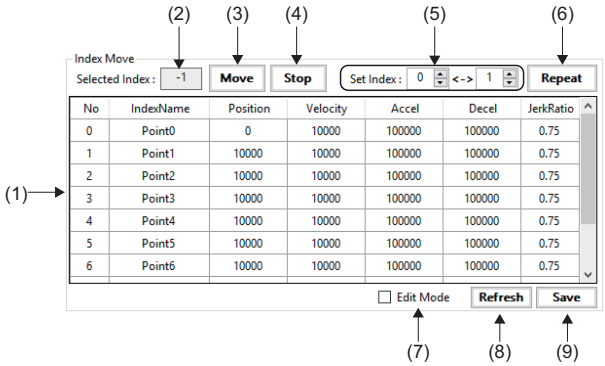
Item	Description
(1) Axis tree	Select the axis for which the index operation is executed. The axis display can be set in the axis display mode. (☞ Page 26 Motion)
(2) Axis status	Displays the axis statuses with lamps. • In Position: In-position status • NOT: Negative direction stroke limit status • ORG: Home position status • POT: Positive direction stroke limit status
(3) Command Pos	Displays the command position.
(4) Actual Pos	Displays the feedback position.
(5) Alarm display	Displays the status of the alarm occurrence in the axis. Gray: No alarm Red: Alarm occurring
(6) [AlarmReset] button	Clears the alarm.
(7) [Servo On] button	Switches servo ON/OFF. Performing servo ON turns on this button in green.
(8) [Home Start] button	Starts the home position return. This button turns green when the home position return is completed.
(9) Common Param	Set the acceleration, deceleration, and jerk ratio of the JOG operation, step operation, and ABS operation. • Accel: Set the acceleration [U/s^2]. • Decel: Set the deceleration [U/s^2]. • JerkRatio: Set the jerk ratio (0 to 1.0).
(10) Jog Move	JOG operation is performed. • Jog Speed: Set the JOG operation speed [U/s]. • Jog Accel: Selecting this item enables the JOG operation acceleration/deceleration [U/s^2] to be set. • [Jog] button: Performs the JOG operation in the reverse direction (the command position is subtracted). • [Jog] button: Performs the JOG operation in the forward direction (the command position is added).

Item	Description
(11) Step Move	Step operation is performed. • Velocity: Set the step speed [U/s]. • Distance: Set the step movement amount [user unit]. • [Step] button: Performs the step operation in the subtraction direction. • [Step] button: Performs the step operation in the addition direction.
(12) Abs Move	Positioning operation with the absolute position is performed. • Velocity: Set the positioning speed [U/s]. • Target Pos: Set the target position [user unit]. • [AbsMove] button: Starts the positioning operation. • [Stop] button: Stops the positioning operation.
(13) Index Move	Ten index positions are registered to perform the test operation. (☞ Page 117 Index control)

■ Index control

Index operation data is set to execute the index operation.

Window



Displayed items

Item	Description
(1) Index operation data	Set 10 index operation data. • No: Displays the index number (0 to 9). • IndexName: Set the name of the index operation data. • Position: Set the target position [user unit] with the absolute position specification. • Velocity: Set the speed [U/s] of the index operation. • Accel: Set the acceleration [U/s^2] of the index operation. • Decel: Set the deceleration [U/s^2] of the index operation. • JerkRatio: Set the jerk ratio (0 to 1.0) of the index operation. *: When setting the data for the index operation, select [Edit Mode]. *: The column of the set index operation data is highlighted in yellow and the setting is not confirmed. Click the [Save] button to confirm the setting.
(2) Selected Index	Displays the index number of the selected index operation data.
(3) [Move] button	Starts the absolute position positioning with the selected index operation data.
(4) [Stop] button	Stops the index operation in execution.
(5) Set Index	Set two index numbers (0 to 9) to perform the reciprocating operation.
(6) [Repeat] button	Starts the reciprocating operation with the absolute position positioning between two points. The button display is switched to [Stop] during the reciprocating operation. When the [Stop] button is clicked, the reciprocating operation is ended after the index operation in execution is completed, and then the button display is switched to [Repeat].
(7) Edit Mode	Selecting this item enables the index operation data to be edited. When the [Refresh] button or [Save] button is clicked, this item is deselected.
(8) [Refresh] button	Reads the index operation data from the SWMOS project data and applies it to the screen.
(9) [Save] button	Saves the set index operation data to the SWMOS project data.

Operating procedure

1. Select [Edit Mode] and set the position, speed, acceleration/deceleration, and jerk ratio of the index operation data.
2. Click the [Save] button to save the set data in the SWMOS project.

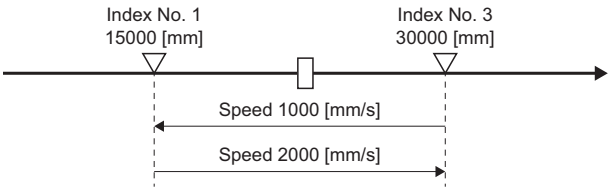
Point

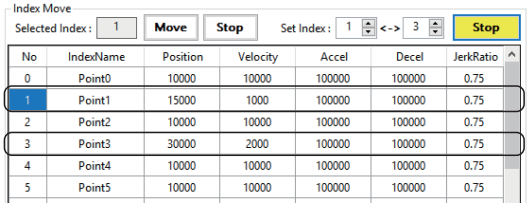
After the index operation data is set, the data highlighted in yellow is not confirmed. Click the [Save] button to confirm it before starting the operation.

3. Select the index operation data to be operated in [Set Index], and click the [Move] button.
4. When performing the reciprocating operation between two index positions, set two index numbers in [Set Index] and click the [Repeat] button.

Ex.

When executing the reciprocating operation between two index numbers "1" and "3"





No	IndexName	Position	Velocity	Accel	Decel	JerkRatio
0	Point0	10000	10000	100000	100000	0.75
1	Point1	15000	1000	100000	100000	0.75
2	Point2	10000	10000	100000	100000	0.75
3	Point3	30000	2000	100000	100000	0.75
4	Point4	10000	10000	100000	100000	0.75
5	Point5	10000	10000	100000	100000	0.75

5. To execute the reciprocating operation between different index positions, stop the operation by clicking the [Stop] button, set different index numbers in [Set Index], and then click the [Repeat] button to start the reciprocating operation.
   *: The button display switches between [Repeat] and [Stop] depending on the status of the reciprocating operation.

Point

When the index operation data is changed during the reciprocating operation, the changed value is applied at the next positioning operation.

Multi-axis control

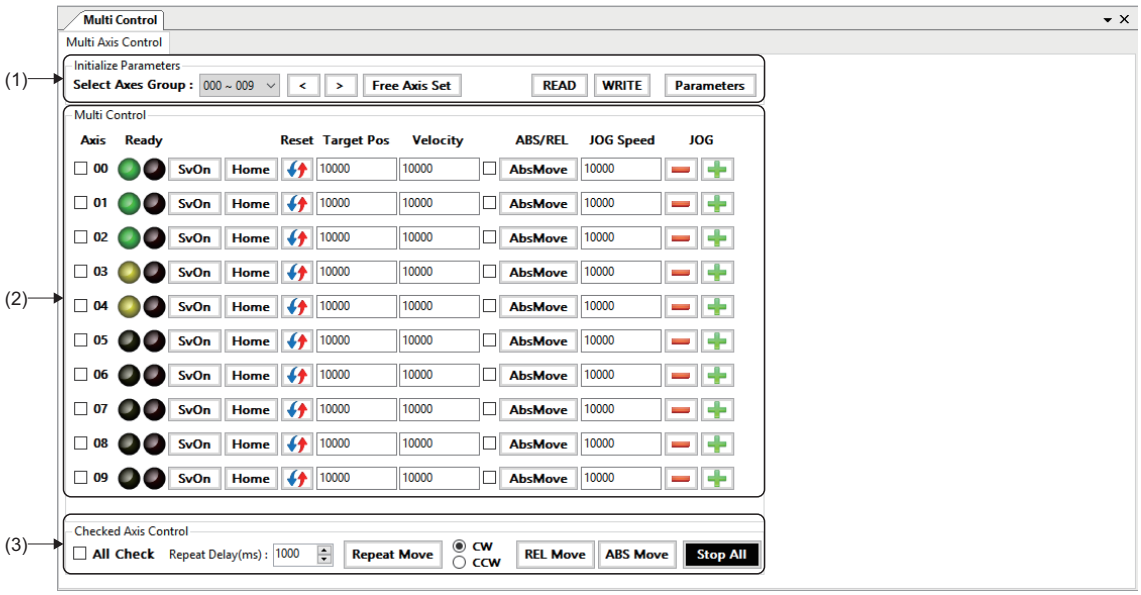
Test operations are performed on multiple axes simultaneously.

CAUTION

- Positioning operation can be performed with the settings for up to 10 axes displayed on one screen, however, when operating multiple axes that interfere with each other simultaneously, pay full attention to the interference.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motor(CyclicSyncPos)] ⇨ [MultiControl]



Displayed items

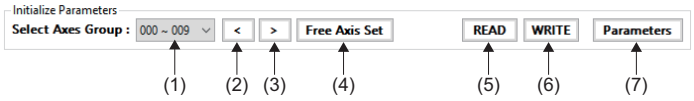
Item	Description
(1) Initialize Parameters	Set the group of the axes (up to 10 axes) to be controlled and the parameters. (☞ Page 120 Multi-axis operation setting)
(2) Multi Control	Servo ON/OFF, home position return, positioning operation, and JOG operation are performed on the axis group. (☞ Page 121 Multi-axis operation)
(3) Checked Axis Control	Positioning operation is performed on the selected axis. (☞ Page 122 Selected axis operation)

■ Multi-axis operation setting

Set the group of the axes (up to 10 axes) to be controlled and the parameters.

Two methods are provided for the axis group: one is to select 10 axes from axis 0, and the other is to select 10 axes with arbitrary settings.

Window

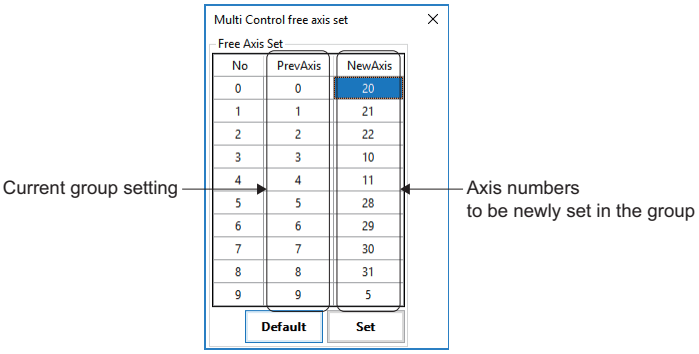


Displayed items

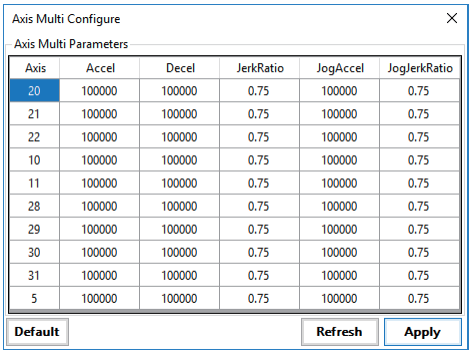
Item	Description
(1) Axis group setting	Select the group of the axes for which multi-axis operation is performed. • "000 to 009" to "120 to 127": "Axis 00 to 09" to "Axis 120 to 127" • Free Axis: Arbitrary axes can be set in the "Multi Control free axis set" screen.
(2) [<] button	Switches the display from the displayed axis group to the one 10 axes before.
(3) [>] button	Switches the display from the displayed axis group to the one 10 axes after.
(4) [Free Axis Set] button	Displays the "Multi Control free axis set" screen. Arbitrary 10 axes can be set for multi-axis operation.
(5) [READ] button	Reads the settings of the multi-axis control from the SWMOS project data.
(6) [WRITE] button	Saves the settings of the multi-axis control to the SWMOS project data.
(7) [Parameters] button	Displays the "Axis Multi Configure" screen. Set the acceleration, deceleration, jerk ratio, JOG acceleration/deceleration, and JOG jerk ratio of the axis group.

Operating procedure

1. Click the [Free Axis Set] button to display the "Multi Control free axis set" screen. Set the axis in the [NewAxis] column for each axis number and click the [Set] button. The axis group for 10 axes that are controlled simultaneously are set.



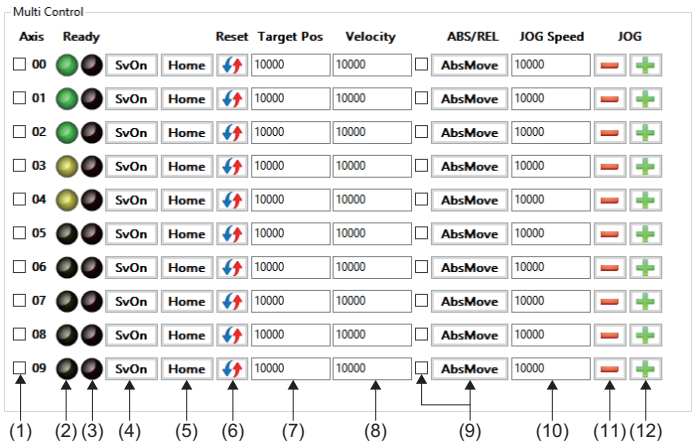
2. Click the [Parameters] button to display the "Axis Multi Configure" screen. Set the acceleration, deceleration, and jerk ratio of the set axis group. When the setting is completed, click the [Apply] button.



■ Multi-axis operation

Servo ON/OFF, home position return, positioning operation, and JOG operation are performed on the axis group set in the multi-axis operation setting.

Window



Displayed items

Item	Description
(1) Axis	Displays the axis number of the axis group. When this item is selected, the axis can be set in [Checked Axis Control] as the axis used.
(2) Axis status (left side)	Displays the axis statuses with lamps. • Black: Servo OFF • Yellow: Servo ON • Green: Home position return complete
(3) Axis status (right side)	Displays the axis status. • Black: No alarm • Red: Alarm occurring
(4) [SvOn] button	Switches servo ON/OFF.
(5) [Home] button	Starts the home position return.
(6) [] button	Resets the alarm.
(7) Target Pos	Set the absolute position/movement amount [user unit] of the positioning operation.
(8) Velocity	Set the positioning operation speed [U/s].
(9) [AbsMove]/[RelMove] button	Starts the positioning operation. Depending on whether this item is selected or not, the positioning operation is switched between the absolute position and relative position and the button display is also switched. • Selected: The positioning operation of the relative position is started. The [RelMove] button is displayed. • Not selected: The positioning operation of the absolute position is started. The [AbsMove] button is displayed. *: The button display changes to [Stop] during the positioning operation, and returns to the original display when the positioning operation is completed. Click the button when [Stop] is displayed to stop the positioning operation.
(10) JOG Speed	Set the JOG operation speed [U/s].
(11) [] button	Performs the JOG operation in the reverse direction (the command position is subtracted).
(12) [] button	Performs the JOG operation in the forward direction (the command position is added).

Operating procedure

1. Click the [SvOn] button to perform servo ON.
2. Click the [Home] button to perform home position return.
3. To perform positioning operation, set [Target Pos] and [Velocity]. Select the absolute position (not selected) or relative position (selected) in [ABS/REL], and then click the [AbsMove]/[RelMove] button to start the positioning operation.
4. To perform JOG operation, set [JOG Speed] and click the [] button or [] button.

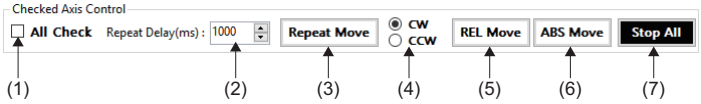
Point

If the [] button or [] button of the same axis is clicked during the positioning operation, the operation is switched to the JOG operation.

■ Selected axis operation

The positioning operation is performed on the axis whose axis number is selected for the multi-axis operation.

Window



Displayed items

Item	Description
(1) All Check	Selecting this item selects all the [Axis] check boxes in [Multi Control] to select all the axes in the axis group.
(2) Repeat Delay(ms)	Set the standby time [ms] after the positioning operation is completed.
(3) [Repeat Move] button	Starts reciprocating operation by positioning between the operation start position and set positioning operation data position.
(4) REL+/REL-	Select the movement direction of the relative position positioning operation. • REL+: Positioning operation is performed with the set movement amount. • REL-: Positioning operation is performed with the set movement amount subtracted.
(5) [REL Move] button	Performs positioning operation on the selected axis at the relative position. Whether the axis is selected in [ABS/REL] under [Multi Control] is ignored.
(6) [ABS Move] button	Performs positioning operation on the selected axis at the absolute position. Whether the axis is selected in [ABS/REL] under [Multi Control] is ignored.
(7) [Stop All] button	Stops all the axes of the axis group.

Operating procedure

1. Select [Axis] in [Multi Control] or [All Check] to select the target axes.

2. Set the positioning operation data of the target axes in [Multi Control].

Positioning operation	Setting item
Reciprocating operation	• Target Pos • Velocity • ABS/REL (Select the target axis)
REL operation	• Target Pos (movement amount) • Velocity
ABS operation	• Target Pos (target position) • Velocity

3. To perform reciprocating operation, set [Repeat Delay(ms)] and click the [Repeat Move] button to start the reciprocating operation of the target axis.

4. To perform positioning operation, click the [REL Move] button or [ABS Move] button to start the positioning operation of the target axis.

4.5 Motion Control

Test operations on the interpolation control and gantry control are performed.

Interpolation control

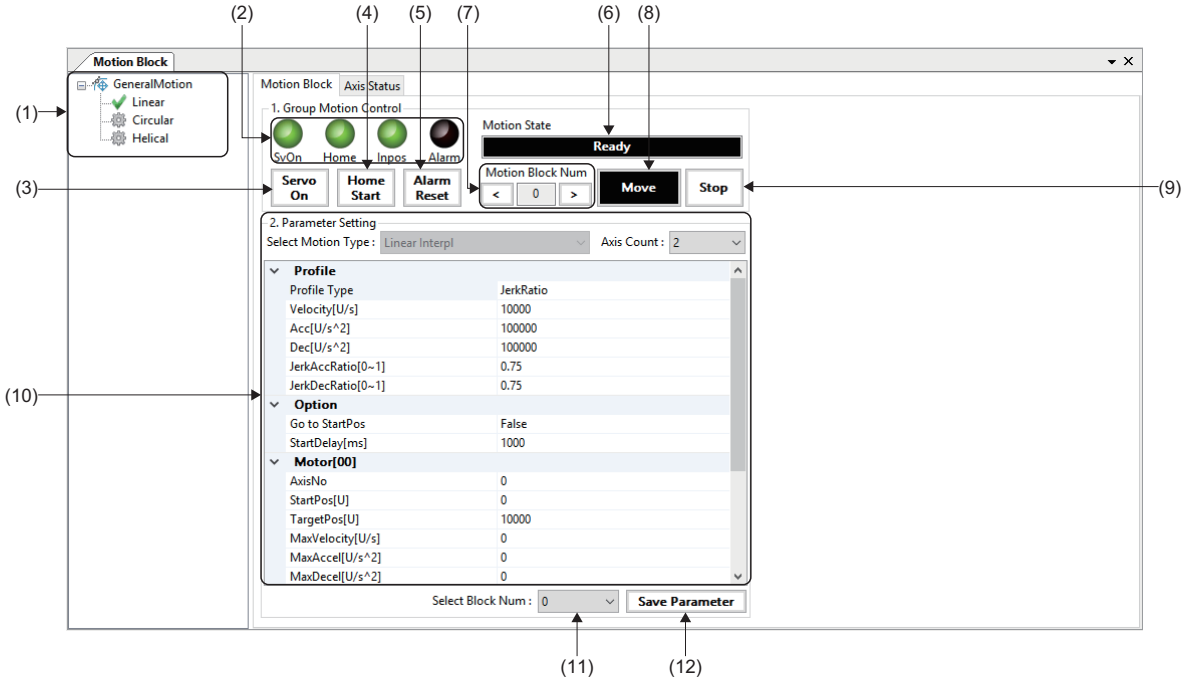
Test operations on the linear interpolation, circular interpolation, and helical interpolation are performed.

Interpolation operation

Motion blocks (up to 30 blocks) are set in the linear interpolation, circular interpolation, or helical interpolation, and test operations are performed with the selected motion block setting.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motion] ⇨ [MotionBlock] ⇨ [Motion Block] tab



Displayed items

Item	Description
(1) Interpolation type tree	Select the interpolation control type. • Linear • Circular • Helical
(2) Interpolation axis status	Displays the interpolation axis status with lamps. • SvOn: Lights in green ( ) when servo ON is performed for all the interpolation axes. • Home: Lights in green ( ) when the home position return for all the interpolation axes is completed. • Inpos: Lights in green ( ) when all the interpolation axes are in the in-position state. • Alarm: Lights in red ( ) when any of the interpolation axes is in the alarm state.
(3) [Servo On] button	Performs servo ON/OFF for all the interpolation axes.
(4) [Home Start] button	Performs home position return for all the interpolation axes.
(5) [Alarm Reset] button	Resets the alarms for all the interpolation axes.
(6) Motion State	Displays the status of the motion control. • Idle: Servo OFF • Ready: Waiting • Homing: Home position return in progress • Running: Interpolation control in progress

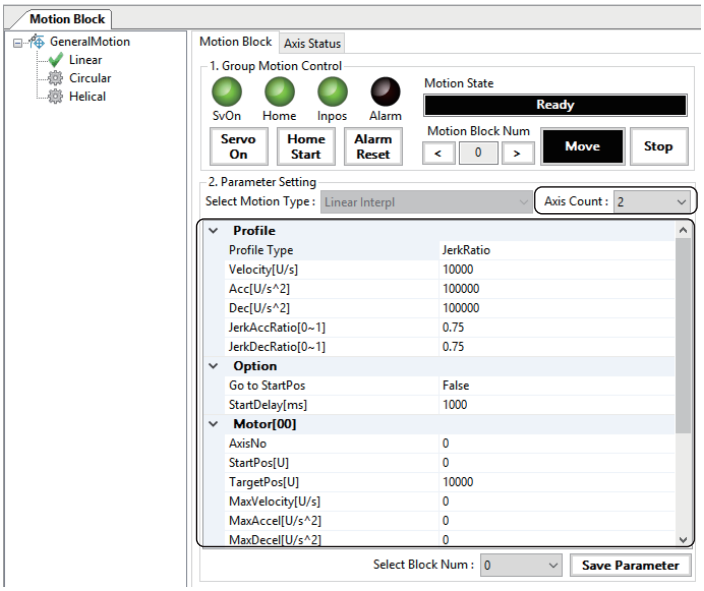
Item	Description
(7) Motion Block Num	Select the motion block number (0 to 29). • Entry column: Enter the motion block number to be displayed. • [<] button: Switches the display from the displayed motion block number to the number one block before. • [>] button: Switches the display from the displayed motion block number to the number one block after. *: When a motion block number is selected, (11) displays the same number.
(8) [Move] button	Starts the interpolation control of the selected motion block.
(9) [Stop] button	Stops the interpolation control in execution.
(10) Interpolation control data setting	Set the interpolation control data of the selected motion block number. For the interpolation control data of each interpolation control, refer to the following. • Linear interpolation (☞ Page 124 Linear interpolation) • Circular interpolation (☞ Page 126 Circular interpolation) • Helical interpolation (☞ Page 128 Helical interpolation)
(11) Select Block Num	Select the motion block number (0 to 29) from the pull-down list. *: When a motion block number is selected, (7) displays the same number.
(12) [Save Parameter] button	Saves the settings of the selected motion block setting to the SWMOS project data.

■ Linear interpolation

Test operations on the linear interpolation are performed.

Operating procedure

1. Select [Linear] from the interpolation type tree.
2. Select the number of the motion block for which linear interpolation is performed in [Select Block Num].
3. Select the number of axes from the [Axis Count] pull-down list. Up to 15 linear interpolation axes can be selected.
4. Set the linear interpolation data.



Item		Description
Profile	Profile Type*1	Select the acceleration/deceleration method. • Trapezoidal: Trapezoid • SCurve: S-curve • JerkRatio: Jerk ratio • Parabolic: Parabolic • Sin: Sine • AdvancedS: Advanced-S • TrapezoidalMAT: Trapezoidal moving average time
	Velocity[U/s]	Set the target speed [U/s].
	Acc[U/s^2]	Set the acceleration [U/s^2].
	Dec[U/s^2]	Set the deceleration [U/s^2].
	JerkAccRatio[0~1]	Set the acceleration jerk ratio [0~1.0].
	JerkDecRatio[0~1]	Set the deceleration jerk ratio [0~1.0].

Item		Description
Option	Go to StartPos	Set the start position of the axis for which linear interpolation is performed. • True: The interpolation is started after the axis is moved to the start position. • False: The interpolation is started from the current position.
	StartDelay[ms]	Set the standby time [ms] after moving the axis to the start position.
Motor[00] to [14]*2	AxisNo	Set the number of the axis for which linear interpolation is performed. • 0 to 127
	StartPos[U]	Set the start position [user unit]. *: It is used when "True" is set in [Go to StartPos].
	TargetPos[U]	Set the target position [user unit].
	MaxVelocity[U/s]	Set the maximum speed [U/s].
	MaxAccel[U/s^2]	Set the maximum acceleration [U/s^2].
	MaxDecel[U/s^2]	Set the maximum deceleration [U/s^2].

*1 For details of the acceleration/deceleration method, refer to the following.
SWM-G User Manual

*2 It differs depending on the number of axes set in [Axis Count].

Point

The linear interpolation profile calculation mode (Linear Intpl Profile Calc Mode) uses the axis parameter specified in Axis [00]. Set the parameter in the parameter setting in advance. For details of the linear interpolation profile calculation mode, refer to the following.
SWM-G User Manual

5. When the setting of the linear interpolation data is completed, click the [Save Parameter] button to save the motion block number setting.
6. Make the test operation of the axis for which linear interpolation is performed ready and click the [Start] button to start the linear interpolation.
7. When [Go to StartPos] is set to "True", the linear interpolation is started after each axis has moved to the position set in [Go to StartPos] and the standby time set in [StartDelay[ms]] has elapsed.

■ Circular interpolation

Test operations on the circular interpolation are performed.

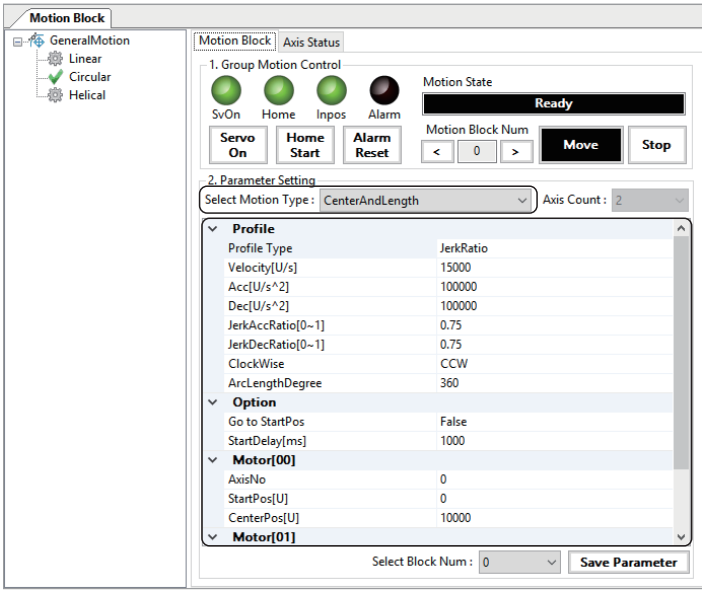
Operating procedure

1. Select [Circular] from the interpolation type tree.
2. Select the number of the motion block for which circular interpolation is performed in [Select Block Num].
3. Select the circular interpolation method from the [Select Motion Type] pull-down list.

Circular interpolation method*1	Description
CenterAndLength	Performs the circular interpolation by setting the center position and circular ark length.
CenterAndEnd	Performs the circular interpolation by setting the center position and end position (target position).
ThroughAndEnd	Performs the circular interpolation by setting the passing position and end position (target position).
LengthAndEnd	Performs the circular interpolation by setting the circular ark length and end position (target position).
RadiusAndEnd	Performs the circular interpolation by setting the radius and end position (target position).
ThroughAndEnd3D	Performs the circular interpolation in a 3D space by setting the passing position and end position (target position).

*1 For details of the circular interpolation method, refer to the following.
SWM-G User Manual

4. Set the circular interpolation data.



Item		Description
Profile	Profile Type*1	Select the acceleration/deceleration method. • Trapezoidal: Trapezoid • SCurve: S-curve • JerkRatio: Jerk ratio • Parabolic: Parabolic • Sin: Sine • AdvancedS: Advanced-S • TrapezoidalMAT: Trapezoidal moving average time
	Velocity[U/s]	Set the target speed [U/s].
	Acc[U/s^2]	Set the acceleration [U/s^2].
	Dec[U/s^2]	Set the deceleration [U/s^2].
	JerkAccRatio[0~1]	Set the acceleration jerk ratio [0~1.0].
	JerkDecRatio[0~1]	Set the deceleration jerk ratio [0~1.0].
	ClockWise*2*3*5	Select the rotation direction. • CCW: Counter-clockwise • CW: Clockwise
	ArcLengthDegree*2*5	Set the circular ark length.
	Radius*6	Set the radius.

Item		Description
Option	Go to StartPos	Set the start position of the axis for which circular interpolation is performed. • True: The interpolation is started after the axis is moved to the start position. • False: The interpolation is started from the current position.
	StartDelay[ms]	Set the standby time [ms] after moving the axis to the start position.
Motor[00] Motor[01] Motor[02]*7	AxisNo	Set the number of the axis for which circular interpolation is performed. • 0 to 127
	StartPos[U]	Set the start position [user unit]. *: It is used when "True" is set in [Go to StartPos].
	CenterPos[U]*2*3	Set the center position [user unit] of the circular ark.
	ThroughPos[U]*4*7	Set the passing position [user unit] of the circular ark.
	EndPos[U]*3*4*5*6*7	Set the target position [user unit] of the circular ark.

*1 For details of the acceleration/deceleration method, refer to the following.
SWM-G User Manual
*2 Settable only when CenterAndLength is selected
*3 Settable only when CenterAndEnd is selected
*4 Settable only when ThroughAndEnd is selected
*5 Settable only when LengthAndEnd is selected
*6 Settable only when RadiusAndEnd is selected
*7 Settable only when ThroughAndEnd3D is selected

5. When the setting of the circular interpolation data is completed, click the [Save Parameter] button to save the motion block number setting.

6. Make the test operation of the axis for which circular interpolation is performed ready and click the [Start] button to start the circular interpolation.

7. When [Go to StartPos] is set to "True", the circular interpolation is started after each axis has moved to the position set in [Go to StartPos] and the standby time set in [StartDelay[ms]] has elapsed.

■ Helical interpolation

Test operations on the helical interpolation are performed.

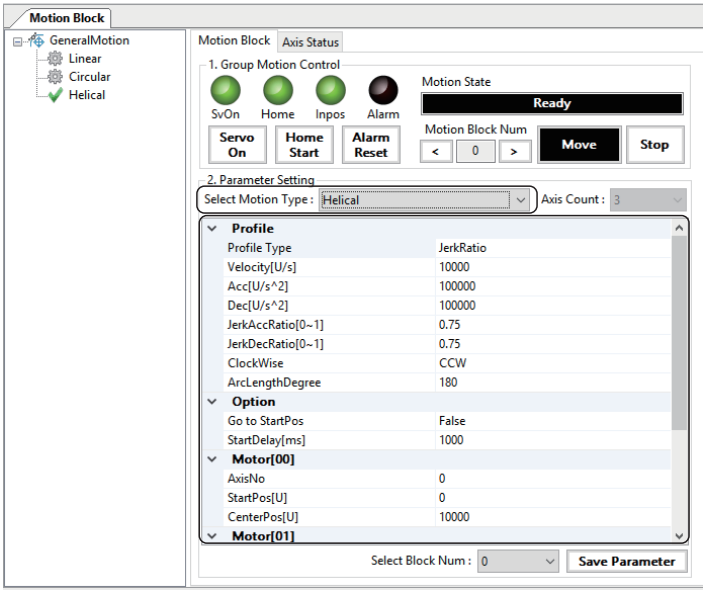
Operating procedure

1. Select [Helical] from the interpolation type tree.
2. Select the number of the motion block for which helical interpolation is performed in [Select Block Num].
3. Select the helical interpolation method from the [Select Motion Type] pull-down list.

Helical interpolation method*1	Description
Helical	Path on the spiral
Circular	Circular path
Linear	Linear path

*1 For details of the helical interpolation method, refer to the following.
SWM-G User Manual

4. Set the helical interpolation data.



Item		Description
Profile	Profile Type*1	Select the acceleration/deceleration method. • Trapezoidal: Trapezoid • SCurve: S-curve • JerkRatio: Jerk ratio • Parabolic: Parabolic • Sin: Sine • AdvancedS: Advanced-S • TrapezoidalMAT: Trapezoidal moving average time
	Velocity[U/s]	Set the target speed [U/s].
	Acc[U/s^2]	Set the acceleration [U/s^2].
	Dec[U/s^2]	Set the deceleration [U/s^2].
	JerkAccRatio[0~1]	Set the acceleration jerk ratio [0~1.0].
	JerkDecRatio[0~1]	Set the deceleration jerk ratio [0~1.0].
	ClockWise	Select the rotation direction. • CCW: Counter-clockwise • CW: Clockwise
	ArcLengthDegree	Set the circular ark length.
Option	Go to StartPos	Set the start position of the axis for which helical interpolation is performed. • True: The interpolation is started after the axis is moved to the start position. • False: The interpolation is started from the current position.
	StartDelay[ms]	Set the standby time [ms] after moving the axis to the start position.

Item		Description
Motor[00] Motor[01]	AxisNo	Set the number of the circular axis for which helical interpolation is performed. • 0 to 127
	StartPos[U]	Set the start position [user unit]. *: It is used when "True" is set in [Go to StartPos].
	CenterPos[U]	Set the center position [user unit] of the circular ark.
Motor[02]	Z-AxisNo	Set the number of the linear axis for which helical interpolation is performed. • 0 to 127
	StartPos[U]	Set the start position [user unit]. *: It is used when "True" is set in [Go to StartPos].
	Z-AxisEndPos[U]	Set the target position [user unit] of the linear axis.

*1 For details of the acceleration/deceleration method, refer to the following.
SWM-G User Manual

5. When the setting of the helical interpolation data is completed, click the [Save Parameter] button to save the motion block number setting.

6. Make the test operation of the axis for which helical interpolation is performed ready and click the [Start] button to start the linear interpolation.

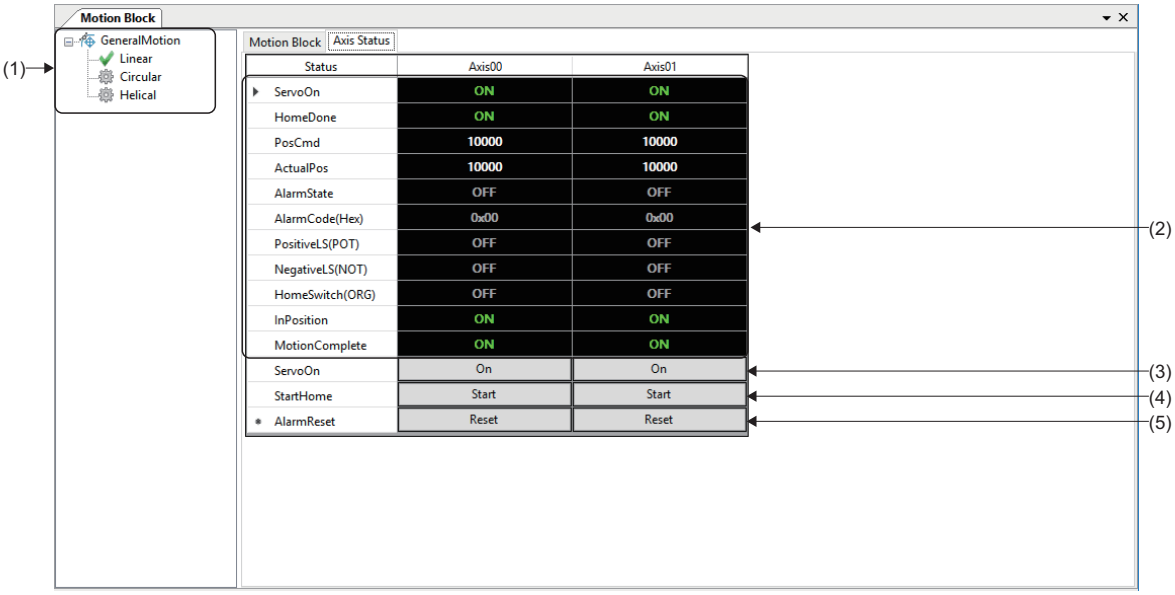
7. When [Go to StartPos] is set to "True", the helical interpolation is started after each axis has moved to the position set in [Go to StartPos] and the standby time set in [StartDelay[ms]] has elapsed.

Interpolation axis status

The axis statuses during the interpolation control are monitored.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motion] ⇨ [MotionBlock] ⇨ [Axis Status] tab



Displayed items

Item	Description
(1) Interpolation type tree	Select the interpolation control type. • Linear • Circular • Helical
(2) Axis status	Displays the each axis status. • ServoOn: Displays the servo ON/OFF status. • HomeDone: Displays the home position return status. • PosCmd: Displays the command position. • ActualPos: Displays the feedback position. • AlarmState: Displays the alarm occurrence status. • AlarmCode(Hex): Displays the alarm code that has occurred in hexadecimal. • PositiveLS(POT): Displays the status of the limit switch in the positive direction. • NegativeLS(NOT): Displays the status of the limit switch in the negative direction. • HomeSwitch(ORG): Displays the home switch status. • InPosition: Displays the in-position status. • MotionComplete: Displays the motion command completion status.
(3) [On] button	Performs servo ON/OFF for each axis.
(4) [Start] button	Performs home position return of each axis.
(5) [Reset] button	Resets alarms of each axis.

Gantry control

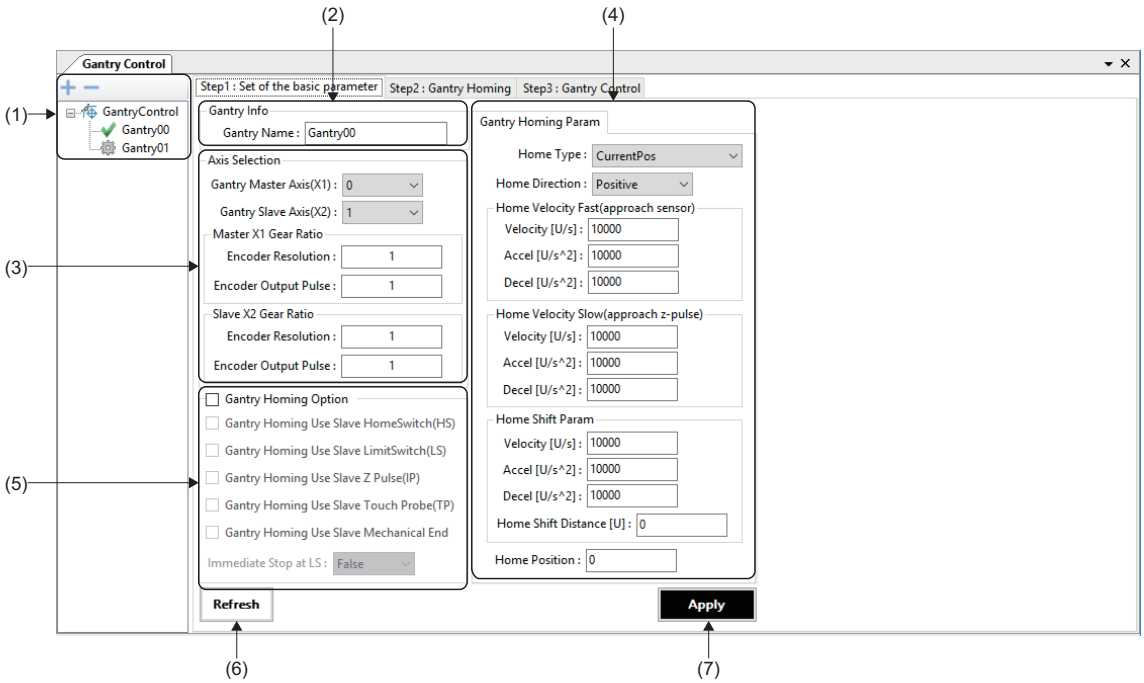
Test operations on the gantry control are performed.

Gantry control setting

Set the parameters for gantry control.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motion] ⇨ [GantryControl] ⇨ [Step1: Set of the basic parameter] tab



Displayed items

Item	Description
(1) GantryControl tree	Select the gantry setting to be operated. Click the [+]/[-] button to add/delete the gantry setting. • [+] button: Adds a new gantry setting. (Up to 30 settings) • [-] button: Deletes the gantry setting displayed at the bottom of the tree.
(2) Gantry Info	Set the gantry setting name. Click the [Apply] button to apply the name to the display of the GantryControl tree.
(3) Axis Selection	Set the axis number and gear ratio of the gantry axis. • Gantry Master Axis(X1): Set the axis number (0 to 127) of the master axis. • Gantry Slave Axis(X2): Set the axis number (0 to 127) of the slave axis. • Master X1 Gear Ratio: Set the gear ratio of the master axis. • Slave X2 Gear Ratio: Set the gear ratio of the slave axis.
(4) Gantry Homing Param	Set the home position return parameters of the master axis (X1). ■Home Type Select the home type of the gantry home position return. ■Home Direction Select the home position return direction. • Positive: Positive direction • Negative: Negative direction ■Home Velocity Fast(approach sensor)/Home Velocity Slow(approach z-pulse) Set the speed [U/s], acceleration [U/s^2], and deceleration [U/s^2] of the high-speed home position return and low-speed home position return. ■Home Shift Param Set the speed [U/s], acceleration [U/s^2], deceleration [U/s^2], and home shift distance [U] of the home shift. ■Home Position Set the home position [user unit] to be set at the completion of the home position return. *: For details of the home type, refer to "Gantry Homing Home Types" in the following manual. SWM-G User Manual

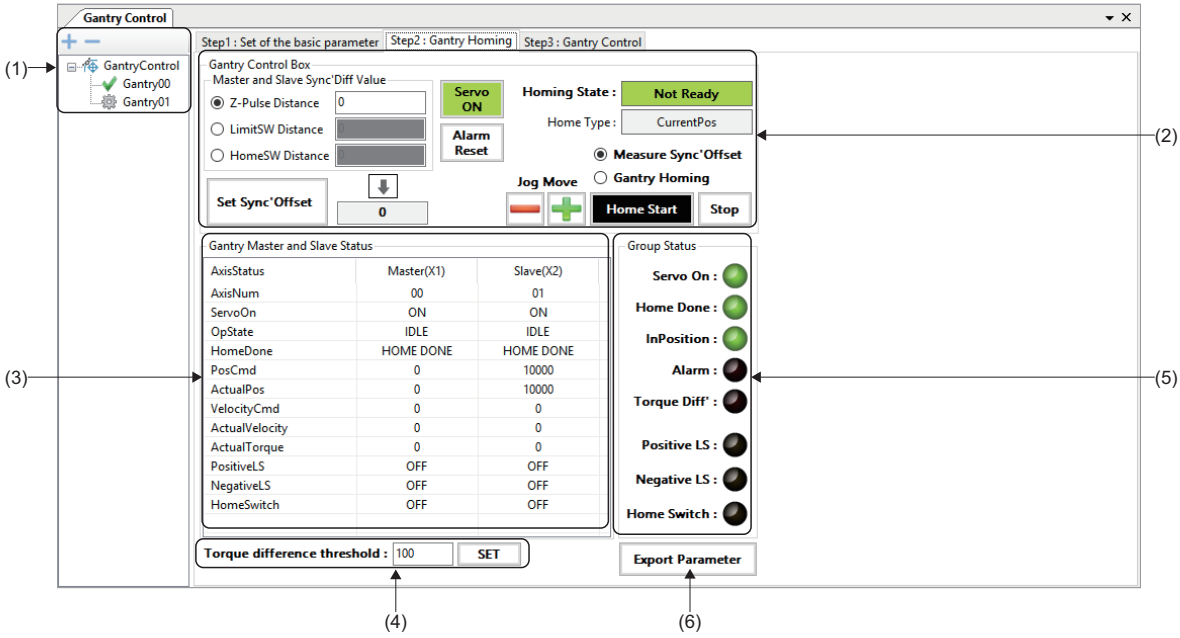
Item	Description
(5) Gantry Homing Option	Selecting [Gantry Homing Option] enables setting the home position return option of the master axis (X1). ■Slave axis setting Select a function to be used in the slave axis. • Selected: Used in the slave axis • Not selected: Not used in the slave axis ■Immediate Stop at LS Set whether to enable/disable the immediate stop without decelerating the axis when reaching the limit switch is detected. • False: Immediate stop disabled • True: Immediate stop enabled
(6) [Refresh] button	Reads the parameters from the SWM-G engine and applies them to the screen.
(7) [Apply] button	Applies the parameters to the SWM-G engine.

Gantry home position return

The gantry home position return is performed.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motion] ⇨ [GantryControl] ⇨ [Step2: Gantry Homing] tab

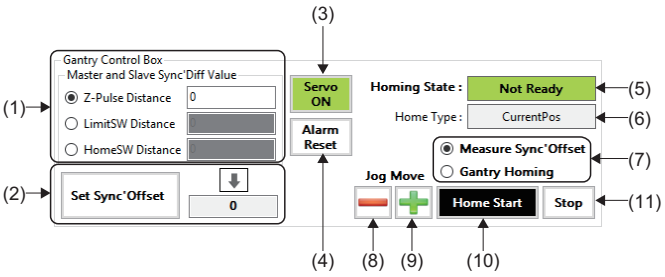


Displayed items

Item	Description
(1) GantryControl tree	Select the gantry setting to be operated. Click the [+]/[-] button to add/delete the gantry setting. • [+] button: Adds a new gantry setting. (Up to 30 settings) • [-] button: Deletes the gantry setting displayed at the bottom of the tree.
(2) Gantry Control Box	Displays each difference distance between the master axis and slave axis, and performs each control of the gantry home position return. (☞ Page 133 Gantry home position return control)
(3) Gantry Master and Slave Status	Displays the statuses of the master axis and slave axis.
(4) Torque difference threshold	Set the torque difference check threshold between the master axis and slave axis in percentage. Enter a value and click the [SET] button.
(5) Group Status	Displays the group status of the gantry control with lamps. • Servo On: Servo ON status • Home Done: Home position return completion status • InPosition: In-position status • Alarm: Servo alarm status • Torque Diff': Torque difference status • Positive LS: Positive direction limit switch status • Negative LS: Negative direction limit switch status • Home Switch: Home switch status
(6) [Export Parameter] button	Acquires the parameters from the SWM-G engine and saves them in a file.

■ Gantry home position return control

Window



Displayed items

Item	Description
(1) Master and Slave Sync'Diff Value	Displays the difference distance between the master axis and slave axis. ■Z-Pulse Distance Displays the distance between the Z-phases of the master axis and slave axis. (Equivalent to the variable "distZPulseToMasterZPulse" [user unit]) ■LimitSW Distance Displays the distance between the limit switches of the master axis and slave axis. (Equivalent to the variable "distLSToMasterLS" [user unit]) ■HomeSW Distance Displays the distance between the home switches of the master axis and slave axis. (Equivalent to the variable "distHSToMasterHS" [user unit])
(2) Home shift distance setting	Sets the home shift distance of the slave axis. • [↓] button: Sets the selected difference distance as the setting value. • [Set Sync'Offset] button: Sets the home shift distance of the slave axis.
(3) [Servo On] button	Switches servo ON/OFF. Performing servo ON turns on this button in green. *: When servo ON is performed, servo ON is performed for both the master axis and slave axis, and they automatically enter the synchronous control state.
(4) [Alarm Reset] button	Clears the alarm.
(5) Homing State	Displays the home position return status. • Not Ready: Home position return not performed, slave axis synchronization cleared • Ready: Home position return not performed • Homing: Home position return in progress • Home Done: Home position return complete
(6) Home Type	Displays the home type of the gantry home position return.
(7) Mode selection	Select the mode in which gantry home position return is performed. • Measure Sync'Offset: For measuring the distance between signals • Gantry Homing: Parallel compensation home position return by home shift
(8) [▬] button	Performs the JOG operation in the reverse direction (the command position is subtracted).
(9) [✚] button	Performs the JOG operation in the forward direction (the command position is added).
(10) [Home Start] button	Starts the gantry home position return.
(11) [Stop] button	Stops the gantry home position return.

Operating procedure

■ Measurement mode

Follow the procedure below to measure each difference distance between the master axis and slave axis (between Z-phases/ home switches/limit switches).

1. Adjust the parallelism of the gantry mechanism and click the [Servo On] button to perform servo ON.
2. Select [Measure Sync'Offset] and click the [Home Start] button to start the gantry home position return.
3. When the gantry home position return is completed, [Z-Pulse Distance]/[LimitSW Distance]/[HomeSW Distance] for each difference distance is updated according to the home position return method.
4. Select the difference distance to be set from [Z-Pulse Distance]/[LimitSW Distance]/[HomeSW Distance], and click the [↓] button to set it as the setting value.
5. Clicking the [Set Sync'Offset] button and setting the distance as the home shift distance of the slave axis eliminate the need for the parallelism adjustment for subsequent home position return and enable gantry home position return in "Gantry Homing".

■ Normal mode

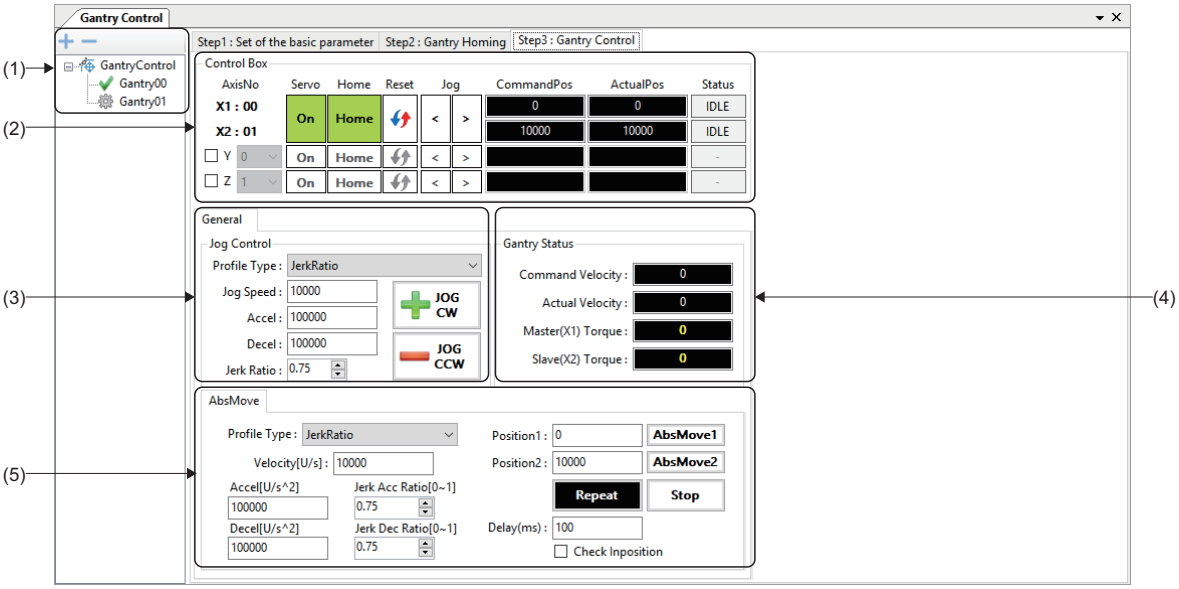
1. Click the [Servo On] button to perform servo ON. The parallelism adjustment is not necessary, however, check that the home shift distance of the slave axis (the value set in [Set Sync'Offset]) is set correctly.
2. Select [Gantry Homing] and click the [Home Start] button to start the gantry home position return.
3. When the gantry home position return is completed, the parallelism of the slave axis is automatically adjusted with the set home shift amount.

Gantry operation

Test operations by the gantry control are performed.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motion] ⇨ [GantryControl] ⇨ [Step3: Gantry Control] tab

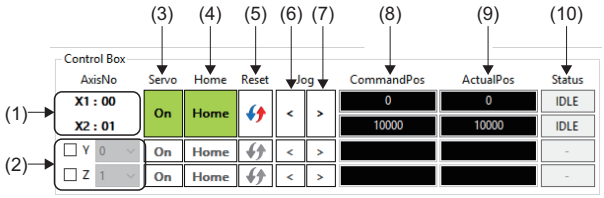


Displayed items

Item	Description
(1) GantryControl tree	Select the gantry setting to be operated. Click the [+]/[-] button to add/delete the gantry setting. • [+] button: Adds a new gantry setting. (Up to 30 settings) • [-] button: Deletes the gantry setting displayed at the bottom of the tree.
(2) Control Box	Displays the statuses of X1 (master axis) and X2 (slave axis) and performs the control. In addition, the Y-axis and Z-axis that configure the gantry mechanism can be controlled. (☞ Page 136 Gantry axis control)
(3) Jog Control	The JOG operation of the gantry mechanism is performed. (☞ Page 136 JOG operation)
(4) Gantry Status	Monitors the speed and torque of the gantry axis. • Command Velocity: Displays the command speed [U/s]. • Actual Velocity: Displays the feedback speed [U/s]. • Master(X1) Torque: Displays the feedback torque [%] of the master axis. • Slave(X2) Torque: Displays the feedback torque [%] of the slave axis.
(5) AbsMove	The positioning operation of the gantry mechanism is performed. (☞ Page 137 Absolute position operation)

■ Gantry axis control

Window

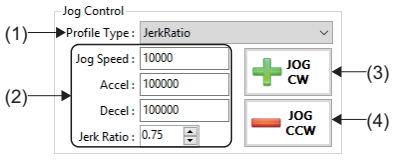


Displayed items

Item	Description
(1) AxisNo	Displays the axis numbers assigned to X1 (master axis) and X2 (slave axis) that are used in the gantry axis control.
(2) Y-axis/Z-axis	Selecting each item specifies the Y-axis or Z-axis. Select the axes to be assigned to the Y-axis and Z-axis from the pull-down list.
(3) [On] button	Switches servo ON/OFF. Performing servo ON turns on this button in green.
(4) [Home] button	Starts the gantry home position return. This button turns green when the home position return is completed.
(5) [ ] button	Clears the alarm.
(6) [<] button	Performs the JOG operation in the reverse direction (the command position is subtracted).
(7) [>] button	Performs the JOG operation in the forward direction (the command position is added).
(8) CommandPos	Displays the command position [user unit].
(9) ActualPos	Displays the feedback position [user unit].
(10) Status	Displays the axis status. • OFF: Servo OFF • IDLE: Waiting • JOG: JOG operation in progress • HOME: Home position return in progress • POS: Positioning operation in progress • VELOCITY: Speed control in progress • TRQ: Torque control in progress • SYNC: Synchronous control in progress • INTPL: Interpolation control in progress • STOP: Stopped • ALARM: Alarm occurring

■ JOG operation

Window



Displayed items

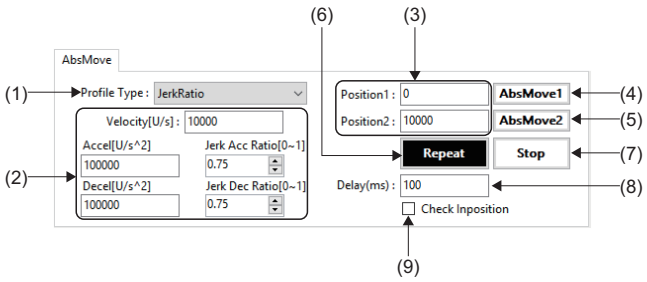
Item	Description
(1) ProfileType[*1]	Select the acceleration/deceleration method used for the JOG operation of the gantry mechanism. • Trapezoidal: Trapezoid • SCurve: S-curve • Jerk Ratio: Jerk ratio • Parabolic: Parabolic • Sin: Sine • AdvancedS: Advanced-S • TrapezoidalMAT: Trapezoidal moving average time

Item	Description
(2) JOG speed	Set the speed for JOG operation. • Jog Speed: Set the JOG operation speed [U/s]. • Accel: Set the acceleration of the JOG operation [U/s^2]. • Decel: Set the deceleration of the JOG operation [U/s^2]. • Jerk Ratio: Set the jerk ratio (0 to 1.0) of the JOG operation.
(3) [JOG CW] button	Performs the JOG operation in the forward direction (the command position is added).
(4) [JOG CCW] button	Performs the JOG operation in the reverse direction (the command position is subtracted).

*1 For details of the acceleration/deceleration method, refer to the following.
SWM-G User Manual

■ Absolute position operation

Window



Displayed items

Item	Description
(1) ProfileType*1	Select the acceleration/deceleration method used for the positioning operation of the gantry mechanism. • Trapezoidal: Trapezoid • SCurve: S-curve • Jerk Ratio: Jerk ratio • Parabolic: Parabolic • Sin: Sine • AdvancedS: Advanced-S • TrapezoidalMAT: Trapezoidal moving average time
(2) Speed setting	• Velocity[U/s]: Set the target speed. • Accel[U/s^2]: Set the acceleration. • Decel[U/s^2]: Set the deceleration. • Jerk Acc Ratio[0~1]: Set the acceleration jerk ratio. • Jerk Dec Ratio[0~1]: Set the deceleration jerk ratio.
(3) Position1/Position2	Set the target position of the absolute position positioning operation. • Position1: Set the absolute position value for Position1. • Position2: Set the absolute position value for Position2.
(4) [AbsMove1] button	Performs the absolute position positioning operation on the position set in Position1.
(5) [AbsMove2] button	Performs the absolute position positioning operation on the position set in Position2.
(6) [Repeat] button	Starts the reciprocating positioning operation with the values set in [Position1] and [Position2].
(7) [Stop] button	Stops the positioning operation.
(8) Delay(ms)	Set the standby time [ms] after the positioning completion.
(9) Check Inposition	When this item is selected, the next positioning is started after the in-position is turned on.

*1 For details of the acceleration/deceleration method, refer to the following.
SWM-G User Manual

4.6 I/O Control

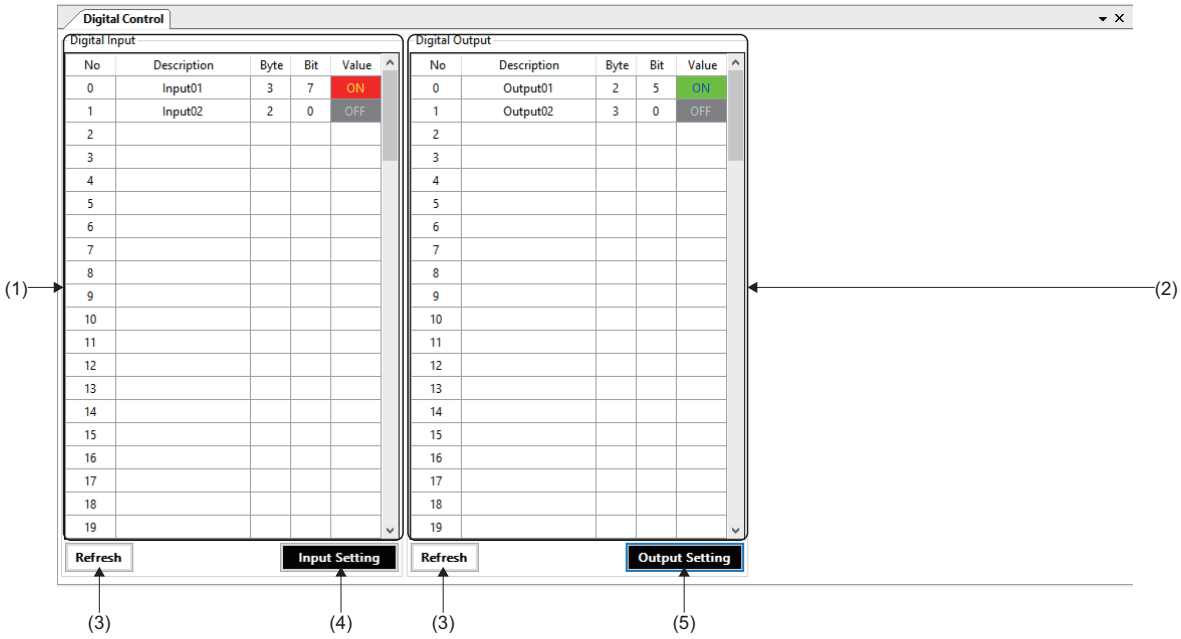
The I/O module is set and controlled.

Digital I/O control

Set the name and start address of the digital I/O to perform I/O control.
It is used to check the signal status or perform an output test by registering the frequently-used digital I/O during the test operation.

Window

Navigation window ⇨ [SWMOS] ⇨ [I/O] ⇨ [Digital Control]



Displayed items

Item	Description
(1) Digital Input	Displays the registered digital input signals. Digital input signals for up to 100 points can be registered. ■No Displays the registration order of the digital input signals. ■Description Displays the digital input signal names. ■Byte Displays the input addresses. • 0 to 7999 ■Bit Displays the input bits. • 0 to 7 ■Value Displays the input statuses. • ON : ON • OFF : OFF

Item	Description
(2) Digital Output	Displays the registered digital output signals. Digital output signals for up to 100 points can be registered. ■No Displays the registration order of the digital output signals. ■Description Displays the digital output signal names. ■Byte Displays the output addresses. • 0 to 7999 ■Bit Displays the output bits. • 0 to 7 ■Value Displays the input statuses. Click the button to switch the ON/OFF state. • ON : ON • OFF : OFF
(3) [Refresh] button	Reads the setting and apply it to the screen.
(4) [Input Setting] button	Click the [Input Setting] button or [Output Setting] button to display the "I/O Setting" screen. Digital input signals and digital output signals are registered. (☞ Page 139 Registration method of the digital I/O signal)
(5) [Output Setting] button	

Registration method of the digital I/O signal

The following shows the procedure for registering digital input signals and digital output signals.

Operating procedure

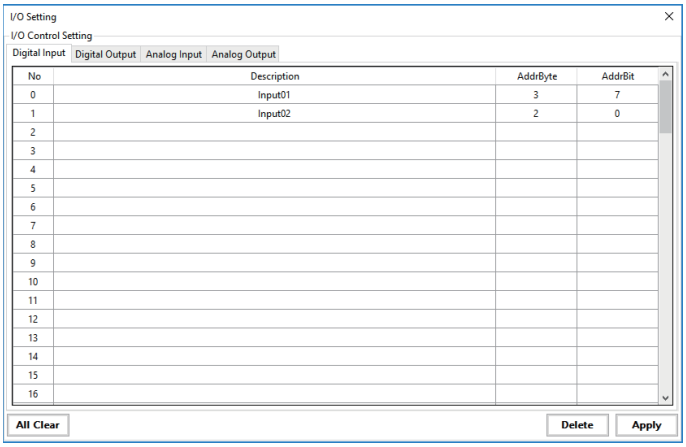
1. Click the [Input Setting] button or [Output Setting] button to display the "I/O Setting" screen.
2. Set "Description", "AddrByte", and "AddrBit" of the digital input signals and digital output signals to be registered.

- Select the corresponding line and click the [Delete] button to delete the selected line.
- Click the [All Clear] button to delete all the registered contents in the displayed tab.

3. When the setting is completed, click the [Apply] button to register.

Ex.

When registering bit 7 of the 3rd byte in the input address space as "Analog Input 01" and bit 0 of the 2nd byte as "Analog Input 02"



Point

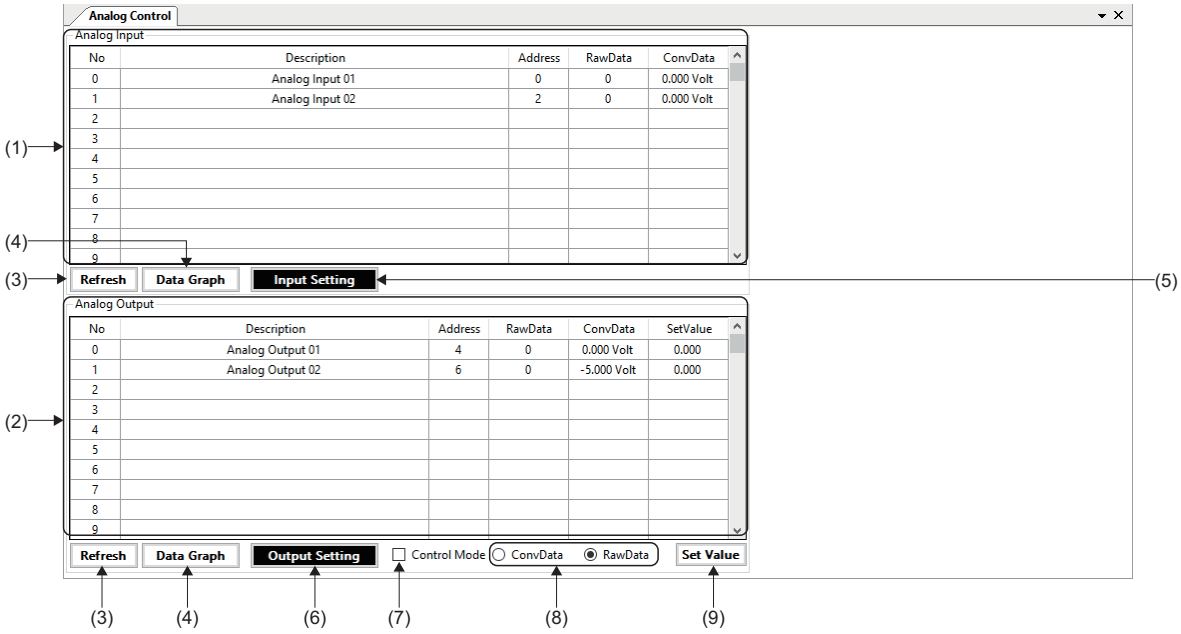
To delete the registered contents, click the [Delete] button or [All Clear] button.
Even if the signal name or address data is deleted with Delete and the [Apply] button is clicked, "0" is displayed in the address and bit fields of the digital input/digital output display area and the data is not deleted.

Analog I/O control

Set the name and start address of the analog I/O to perform I/O control.
It is used to check the analog value or perform an output test by registering the frequently-used analog I/O during the test operation.

Window

Navigation window ⇨ [SWMOS] ⇨ [I/O] ⇨ [AnalogControl]



Displayed items

Item	Description
(1) Analog Input	Displays the registered analog input signals. Analog input signals for up to 100 points can be registered. ■No Displays the registration order of the analog input signals. ■Description Displays the analog input signal names. ■Byte Displays the input addresses. • 0 to 7999 ■RawData Displays the analog input values (raw values). ■ConvData Displays the converted input values.
(2) Analog Output	Displays the registered analog output signals. Analog output signals for up to 100 points can be registered. ■No Displays the registration order of the analog output signals. ■Description Displays the analog output signal names. ■Byte Displays the output addresses. • 0 to 7999 ■RawData Displays the analog output values (raw values). • 0 to 7 ■ConvData Displays the converted output values. ■SetValue Displays the analog output setting values.
(3) [Refresh] button	Reads the setting and apply it to the screen.
(4) [Data Graph] button	Displays the "Analog User Interface" screen. An analog input signal or analog output signal is displayed in a graph. (☞ Page 142 Analog graph display)

Item	Description
(5) [Input Setting] button	Click the [Input Setting] button or [Output Setting] button to display the "I/O Setting" screen. Digital input signals and digital output signals are registered. (☞ Page 141 Registration method of the analog I/O signal)
(6) [Output Setting] button	
(7) Control Mode	When this item is selected, the analog output value setting mode is enabled and [SetValue] becomes settable. If it becomes settable, the cell is displayed in yellow.
(8) ConvData/RawData	Select whether to set the value in [SetValue] as "ConvData" or "RawData".
(9) [Set Value] button	Sets the value in [SetValue] as the analog output value.

Registration method of the analog I/O signal

The following shows the procedure for registering analog input signals and analog output signals.

Operating procedure

1. Click the [Input Setting] button or [Output Setting] button to display the "I/O Setting" screen.
2. Set "Description", "StartAddrByte", "RawDataMin", "RawDataMax", and "ConvDataRange" for the analog input signals and analog output signals to be registered.

- Select the corresponding line and click the [Delete] button to delete the selected line.
- Click the [All Clear] button to delete all the registered contents in the displayed tab.
- The access size (1 byte/2 bytes/4 bytes) is automatically determined according to the setting of "RawDataMin" and "RawDataMax".

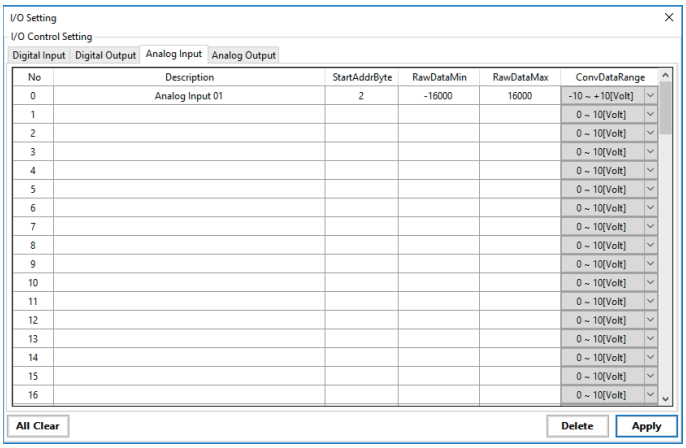
Setting value		I/O value	
Max. value - Min. value	**Min. value**	**Access size**	**I/O value range**
255 or less	Less than 0	Signed 1-byte	-128 to 127
	0 or more	Unsigned 1-byte	0 to 255
256 to 65535	Less than 0	Signed 2-byte	-32768 to 32767
	0 or more	Unsigned 2-byte	0 to 65535
65536 or more	Less than 0	Signed 4-byte	-2147483648 to 2147483647
	0 or more	Unsigned 4-byte	0 to 4294967295

3. When the setting is completed, click the [Apply] button to register.

Ex.

When registering signals with the following settings

- Register a few bytes of the input address space as a 16-bit analog input "Analog Input 01".
- Convert the analog input range "-10 to +10[Volt]" as "-16000 to +16000".



Point

To delete the registered contents, click the [Delete] button or [All Clear] button.
Even if the signal name or address data is deleted with [Delete] and the [Apply] button is clicked, "0" is displayed in the address and bit fields of the analog input/analog output display area and the data is not deleted.

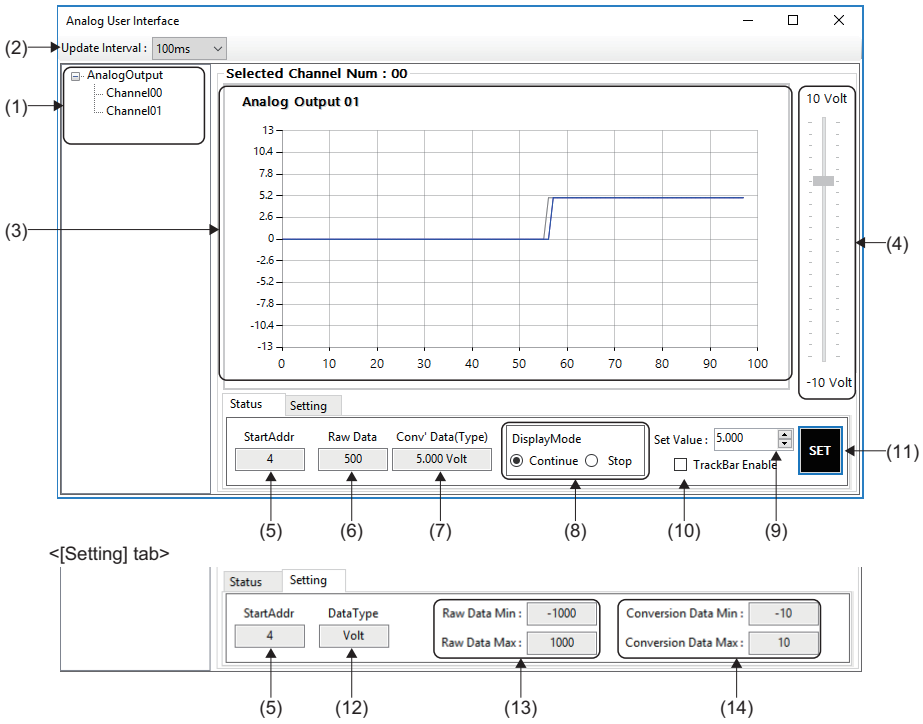
Analog graph display

An analog input signal or analog output signal is displayed in a graph.

Select a signal (Channel00 to Channel99) to be displayed in the graph to start graph display.

In the analog output graph display, the converted output value can be output in [Setting] as test output.

Window



<[Setting] tab>

Displayed items

Item	Description
(1) Signal selection tree	Select the signal to be displayed in the graph.
(2) Update Interval	Select the graph update interval from the pull-down list. 10ms, 20ms, 50ms, 100ms, 200ms, 500ms, 1000ms
(3) Graph display	Displays the graph of the selected signal. • Horizontal axis: Updated count • Vertical axis: Converted analog value
(4) Trackbar*1	The output value can be changed by using the trackbar. To enable the trackbar, select [TrackBar Enable].
(5) StartAddr	Displays the input address or output address.
(6) Raw Data	Displays the analog value (raw value).
(7) Conv' Data(Type)	Displays the converted analog value.
(8) DisplayMode	Select the graph display mode. • Continue: Plotting execution • Stop: Plotting stopped
(9) Set Value*1	Set the analog output value (converted value).
(10) TrackBar Enable*1	When this item is selected, the trackbar is enabled.
(11) [SET] button*1	Changes the output value (converted value) to the value set in [Set Value].
(12) DataType	Displays the unit after conversion.
(13) Raw Data Min/Raw Data Max	Displays the minimum value and maximum value of the analog value (raw value).
(14) Conversion Data Min/Conversion Data Max	Displays the minimum value and maximum value of the converted analog value.

*1 For analog output signal only

4.7 Axis Control (PM Motion)

The single-axis control of the axis (profile mode) is performed.

To perform control in the axis control (PM motion), select [SWMOS] ⇨ [System] ⇨ [Engine] in the navigation window, select [Add PMMotion] in [Module Setting] in the [Module Setting] tab, and add a PM motion module. For details of the setting method, refer to the following.

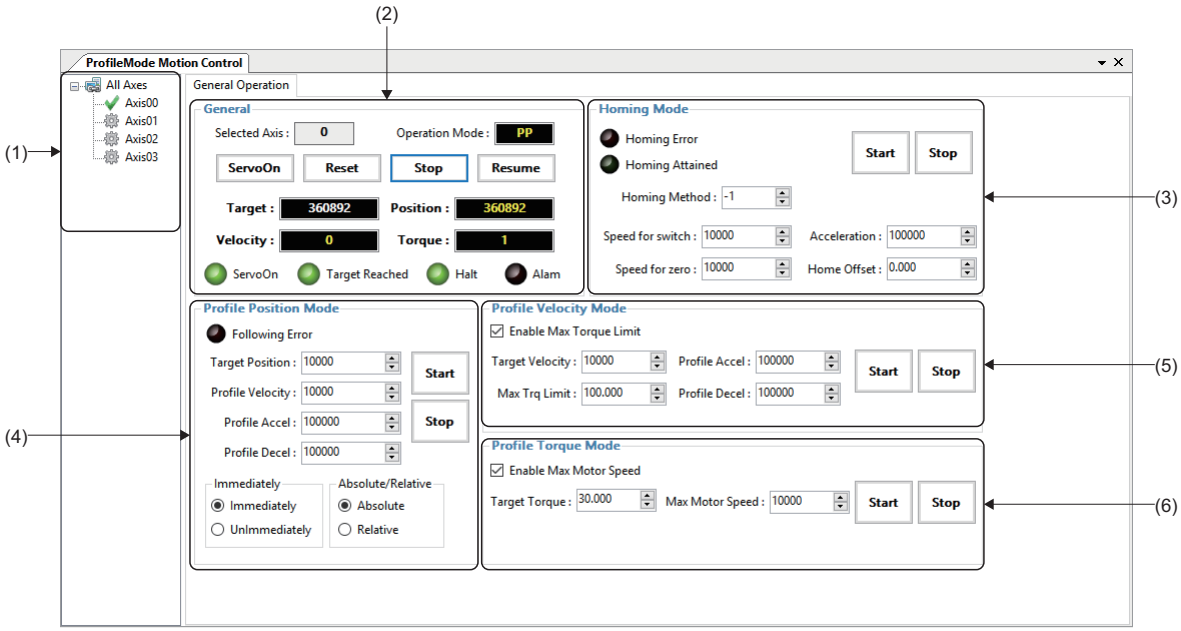
☞ Page 165 PM Motion Function

PM motion axis control

The PM motion axis control is tested.

Window

Navigation window ⇨ [SWMOS] ⇨ [Motor(ProfilePos)] ⇨ [DriveControl]



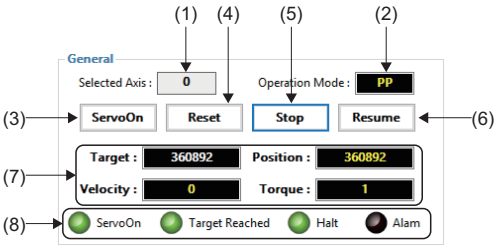
Displayed items

Item	Description
(1) Axis tree	Select the axis for which the test operation is performed.
(2) General	Displays the axis position and status. Servo ON/OFF, alarm reset, and operation stop/resume are performed. (☞ Page 144 Axis status)
(3) Homing Mode	The home position return is performed. (☞ Page 144 Home position return mode)
(4) Profile Position Mode	The positioning operation is performed. (☞ Page 145 Profile position mode)
(5) Profile Velocity Mode	The speed control is performed. (☞ Page 145 Profile speed mode)
(6) Profile Torque Mode	The torque control is performed. (☞ Page 146 Profile torque mode)

■ Axis status

The current position and axis status are checked, servo ON/OFF, home position return, stop, and alarm reset are performed, and synchronous setting is configured.

Window



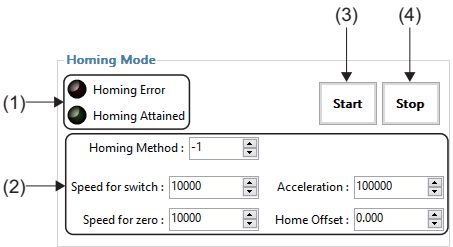
Displayed items

Item	Description
(1) Selected Axis	Displays the axis number of the PM motion axis.
(2) Operation Mode	Displays the control mode.
(3) [ServoOn] button	Switches servo ON/OFF.
(4) [Reset] button	Resets the alarm.
(5) [Stop] button	Stops the operation.
(6) [Resume] button	Resumes the operation.
(7) Axis status	Displays the axis status. • Target: Displays the target position. • Position: Displays the current position. • Velocity: Displays the speed. • Torque: Displays the toque.
(8) Axis control status	Displays the axis control status with lamps. • ServoOn: In servo ON • Target Reached: The target position reached • Halt: Stopped • Alarm: Alarm occurring

■ Home position return mode

The home position return operation is performed.

Window



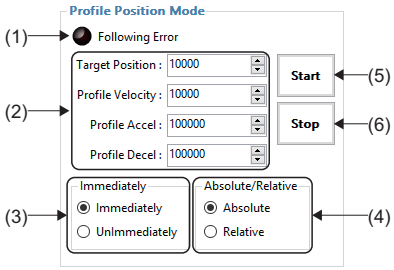
Displayed items

Item	Description
(1) Home position return status	Displays the home position return status with lamps. • Homing Error: Home position return failure • Homing Attained: Home position return complete
(2) Home position return parameter	Set the home position return parameters. • Homing Method: Home position return method • Speed for switch: Speed for switch detection • Speed for zero: Speed for zero position detection • Acceleration: Acceleration/deceleration time constant for home position return • Home Offset: Home position return offset value
(3) [Start] button	Starts the home position return.
(4) [Stop] button	Stops the home position return.

■ Profile position mode

The operation to the set position is performed in the position mode.

Window



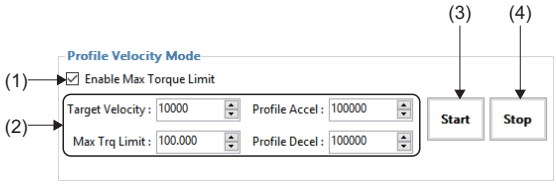
Displayed items

Item	Description
(1) Axis status	Displays the following error status with a lamp. • : Error not occurred • : Error occurred
(2) Target position control	Set the command position, speed, and acceleration/deceleration. • Target Position: Set the command position. • Profile Velocity: Set the speed. • Profile Accel: Set the acceleration. • Profile Decel: Set the deceleration.
(3) Command change	Set the change method of the position command. • Immediately: The position command is immediately executed. When the axis is executing another position command, the position command is overwritten. • UnImmediately: The position command is executed after the position command which is currently being executed is completed.
(4) Absolute position/relative position	Select the absolute position command or relative position command. • Absolute: The axis operates with the absolute position command. • Relative: The axis operates with the relative position command.
(5) [Start] button	Starts the positioning operation.
(6) [Stop] button	Stops the positioning operation.

■ Profile speed mode

The operation to the set position is performed in the speed mode.

Window



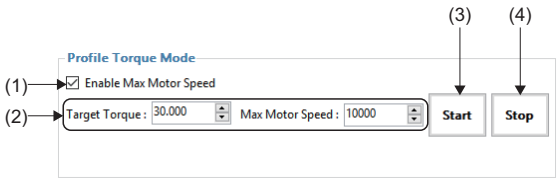
Displayed items

Item	Description
(1) Torque limit value specification	Set whether to use the maximum torque limit value. • Selected: The maximum torque limit value is used. • Not selected: The maximum torque limit value is not used.
(2) Speed control parameter	Set the command speed. • Target Velocity: Set the command speed. • Max Trq Limit: Set the maximum torque limit value. • Profile Accel: Set the acceleration. • Profile Decel: Set the deceleration.
(3) [Start] button	Starts the speed control.
(4) [Stop] button	Stops the speed control.

■ Profile torque mode

The operation to the set position is performed in the torque mode.

Window



Displayed items

Item	Description
(1) Motor speed specification	Set whether to use the maximum motor speed. • Selected: The maximum motor speed is used. • Not selected: The maximum motor speed is not used.
(2) Torque control parameter	Set the command torque. • Target Torque: Set the command torque. • Max Motor Velocity: Set the maximum motor speed.
(3) [Start] button	Starts the torque control.
(4) [Stop] button	Stops the torque control.

PART 2 BASICS OF WAVEFORM DATA COLLETION/ ANALYSIS TOOL

This part describes the basic operation of the waveform data collection/analysis tool.

5 DATA LOGGING FUNCTION

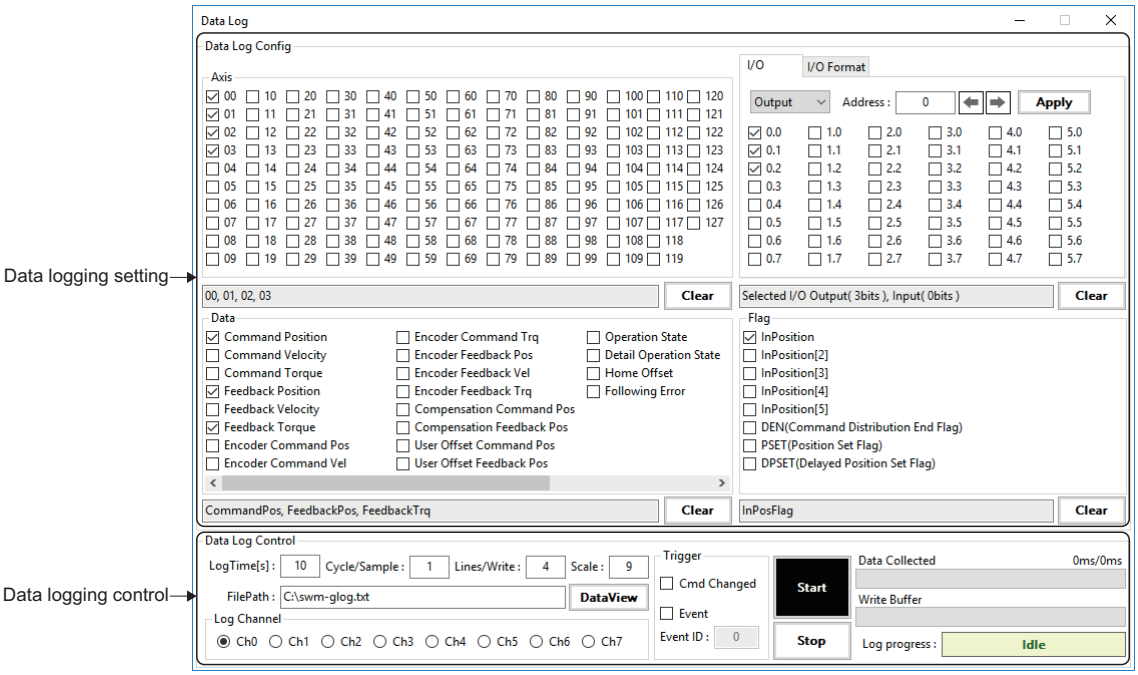
By using the data logging function of SWM-G, the collected data can be set and controlled easily.
The collected log data is saved in a log file. The log file can be displayed in a table format to check the data.

5.1 Data Log Collection

By using the data logging function of SWM-G, log files are generated.

Window

[Analyzer] ⇨ [DataLog] ( )



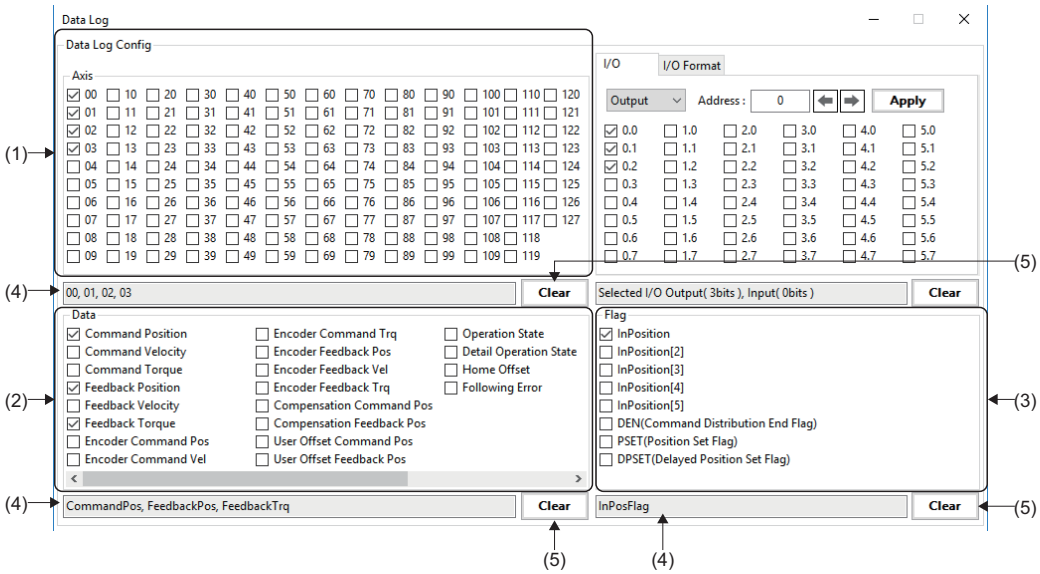
Data log collection setting

Set the data items to be collected.

■ Axis data setting

Window

[Analyzer] ⇨ [DataLog] ( )



Displayed items

Item	Description
(1) Axis	Set the target axes from which the data logs are to be collected. The selected items are displayed in the selected item display column. • 00 to 127: Axis 0 to 127
(2) Data*1	Set the axis data items from which the data logs are to be collected. The selected items are displayed in the selected item display column. • Command Position: Command position • Command Velocity: Command speed • Command Torque: Command torque • Feedback Position: Feedback position • Feedback Velocity: Feedback speed • Feedback Torque: Feedback torque • Encoder Command Pos: Encoder command position • Encoder Command Vel: Encoder command speed • Encoder Command Trq: Encoder command torque • Encoder Feedback Pos: Encoder feedback position • Encoder Feedback Vel: Encoder feedback speed • Encoder Feedback Trq: Encoder feedback torque • Compensation Command Pos: Command position after applying compensation offset • Compensation Feedback Pos: Feedback position after applying compensation offset • User Offset Command Pos: Command position after applying user offset • User Offset Feedback Pos: Axis feedback position after applying user offset • Operation State: Axis status • Detail Operation State: Detailed axis status • Home Offset: Home offset • Following Error: Following error
(3) Flag*1	Set the axis status items (bit data) from which the data logs are to be collected. The selected items are displayed in the selected item display column. • InPosition: In-position • InPosition[2]: In-position 2 • InPosition[3]: In-position 3 • InPosition[4]: In-position 4 • InPosition[5]: In-position 5 • DEN(Command Distribution End Flag): The position command reaches the target position. • PSET(Position Set Flag): The feedback position reaches the target range. • DPSET(Delayed Position Set Flag): The feedback position is held within the target range for the specified time.

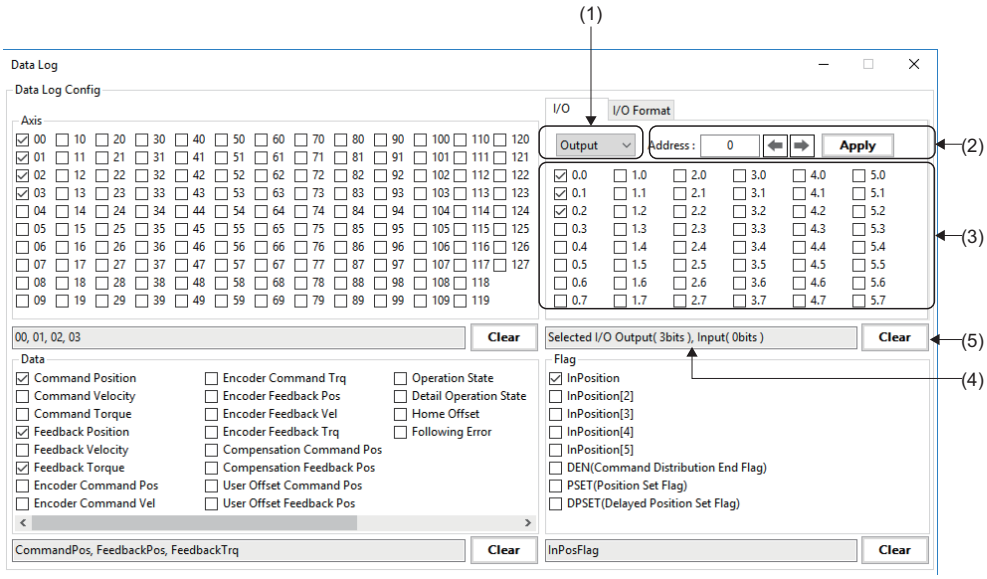
Item	Description
(4) Selected item display column	The items selected in "Axis", "Data", and "Flag" are displayed.
(5) [Clear] button	Used to deselect all the items selected in each section. Click the [Clear] buttons in "Axis", "Data", and "Flag" to deselect the items.

*1 For details of each item, refer to the following.
SWM-G User Manual

■ I/O bit setting

Window

[Analyzer] ⇨ [DataLog] ( ) ⇨ [I/O] tab



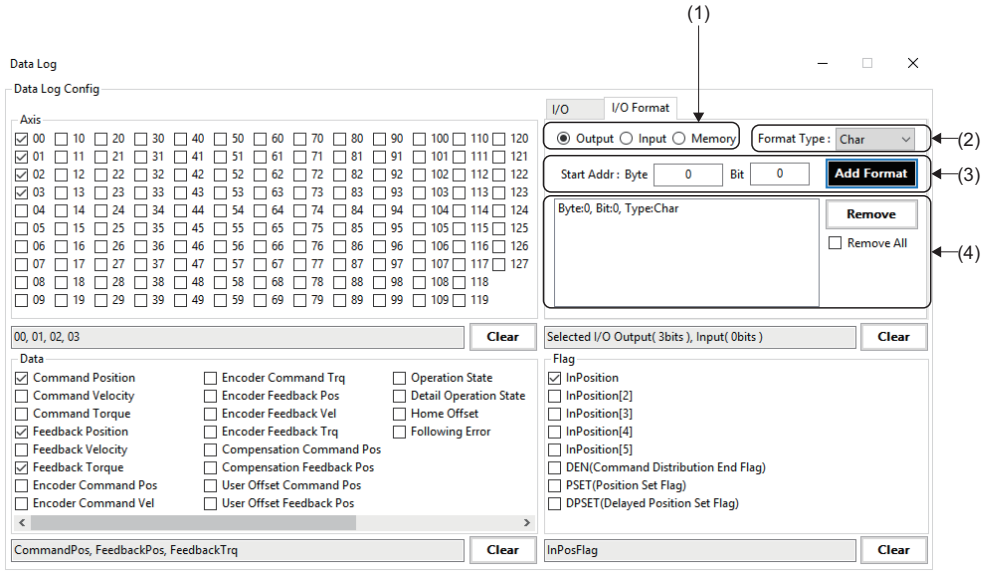
Displayed items

Item	Description
(1) I/O setting	Set the address I/O. • Output: Output • Input: Input
(2) Address setting	Set the address to be displayed in the I/O selection area. Enter the address in the address entry column, and click the [Apply] button or click the [←]/[→] button to switch the display. • Address setting range: 0 to 7999 • [←] button: Used to switch the display to the address 6 bytes before. • [→] button: Used to switch the display to the address 6 bytes after. • [Apply] button: Used to display the address entered in the address entry column in the I/O selection area.
(3) I/O selection area	Set the I/O bits from which the data logs are to be collected. The selected items are displayed in the selected item display column.
(4) Selected item display column	Displays the number of I/O bits selected in the I/O selection area.
(5) [Clear] button	Used to deselect all the items selected in the I/O selection area. Click the [Clear] button to deselect the items.

■ I/O bit arbitrary data setting

Window

[Analyzer] ⇨ [DataLog] ( ) ⇨ [I/O Format] tab



Displayed items

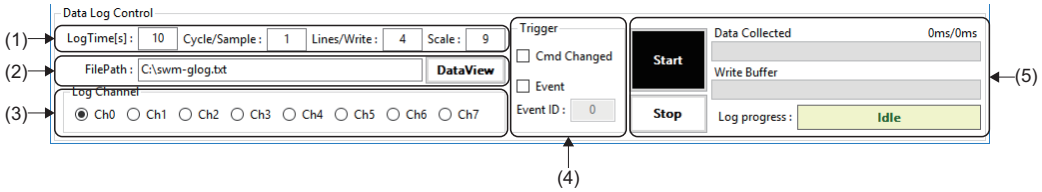
Item	Description
(1) I/O setting	Select "Output"/"Input"/"Memory" of the address. • Output: Output • Input: Input • Memory: User memory
(2) Data format setting*1	Set the address data format. • Char: Signed 1-byte • Uchar: Unsigned 1-byte • Short: Signed 2-byte • Ushort: Unsigned 2-byte • Int: Signed 4-byte • Uint: Unsigned 4-byte • Long: Signed 4-byte • Ulong: Unsigned 4-byte • Float: 4-byte floating point number • Double: 8-byte floating point number
(3) Address setting	Set the address to be displayed in the collected data list. Enter values in Byte (start address) and Bit (start bit), and click the [Add Format] button. • Byte setting range: 0 to 7999 • Bit setting range: 0 to 7
(4) Collected data list	Displays the data from which the data logs are to be collected for each of "Output", "Input", and "Memory". Select "Output", "Input", or "Memory" in the I/O setting to switch the display. Select data displayed in the collected data list, and click the [Remove] button to delete it from the list. Select [Remove All], and click the [Remove] button to delete all the data displayed in the collected data list.

*1 For details of the data format, refer to the following.
SWM-G User Manual

Data log collection control

Set the data log collection conditions to start/stop the data log collection.

Window



Displayed items

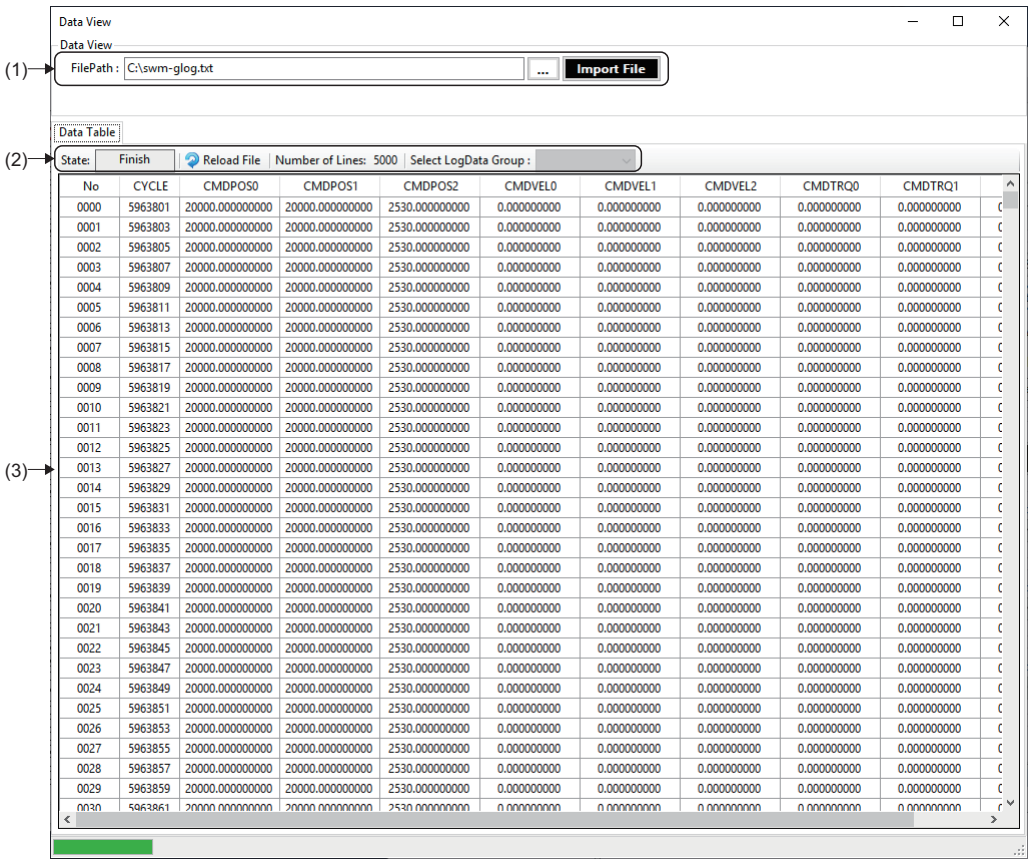
Item	Description
(1) Data log collection condition	Set the data collection conditions of the data log. • LogTime: Set the time (second) at which the log data is to be collected. • Cycle/Sample: Set the interval (communication cycle) at which the log data is to be collected. • Lines/Write: Set the writing frequency (number of lines per writing) of the log file. • Scale: Set the number of decimal places (0 to 9) of the floating point data at the time of log output.
(2) FilePath	Specify the log file name with the absolute path. Click the [DataView] button to display the "Data View" screen. (☞ Page 153 Data log display)
(3) Log Channel	Select the log channel to be used.
(4) Trigger	Select the trigger condition for starting data logging. When selecting "Event", enter "Event ID". • Cmd Changed: Starts data logging along with the command value change of the axis from which the data log is to be collected. • Event: Starts data logging at the completion of the event condition for the set [Event ID].
(5) Data logging start/stop	Starts/stops the data log collection. • [Start] button: Used to start the data log collection. • [Stop] button: Used to stop the data log collection. • Data Collected: Displays the data logging progress. • Write Buffer: Displays the written buffer usage. • Log progress: Displays the log operation status (Idle (standby)/Running (data collection in progress)/Finished (collection completed)).

5.2 Data log display

The log file generated with the data log collection function of SWM-G is displayed in a table format.

Window

[Analyzer] ⇨ [DataView] ( )



No	CYCLE	CMDPOS0	CMDPOS1	CMDPOS2	CMDVEL0	CMDVEL1	CMDVEL2	CMDTRQ0	CMDTRQ1
0000	5963801	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0001	5963803	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0002	5963805	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0003	5963807	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0004	5963809	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0005	5963811	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0006	5963813	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0007	5963815	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0008	5963817	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0009	5963819	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0010	5963821	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0011	5963823	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0012	5963825	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0013	5963827	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0014	5963829	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0015	5963831	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0016	5963833	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0017	5963835	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0018	5963837	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0019	5963839	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0020	5963841	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0021	5963843	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0022	5963845	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0023	5963847	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0024	5963849	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0025	5963851	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0026	5963853	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0027	5963855	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0028	5963857	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0029	5963859	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0030	5963861	20000.000000000	20000.000000000	2530.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000

Displayed items

Item	Description
(1) FilePath	Reads the specified log file. Enter the log file name with the absolute path and click the [Import File] button to read the log file. Click the [...] button to display the "Open" screen and set the log file to be read.
(2) Log data information	Displays the log data status. • State: Displays the log data reading status (Idle (standby)/Reading (reading)/Finish (reading completed)). • [Reload File] button: Reads the log file again. • Number of Lines: Displays the number of all the lines in the log data. • Select LogData Group: Switches the display range of the log data that is divided and displayed every 20 lines. Select the range of the lines to be displayed from the pull-down list.
(3) Data list	Reads the data selected in the "Data Log" screen and displays the log data. For the log data to be displayed, refer to the following. ☞ Page 154 Log file format

Point

If the log file size is large, the "Reading" state (file reading state) may continue for a while.

■ Log file format

The columns in the log file are arranged in the order shown in the table below. For details of each data, refer to the following.

📖SWM-G User Manual

Order	Character string*1	Description	Axis data/axis status item
1	CYCLE	Number of cycles	—
2	CMDPOS[0 to 127]	Command position	Command Position
3	FBPOS[0 to 127]	Feedback position	Feedback Position
4	CMPCMDPOS[0 to 127]	Command position after applying compensation offset	Compensation Command Pos
5	CMPFBPOS[0 to 127]	Feedback position after applying compensation offset	Compensation Feedback Pos
6	ENCCMDPOS[0 to 127]	Encoder command position	Encoder Command Pos
7	ENCFBPOS[0 to 127]	Encoder current feedback position	Encoder Feedback Pos
8	CMDVEL[0 to 127]	Command speed	Command Velocity
9	FBVEL[0 to 127]	Feedback speed	Feedback Velocity
10	ENCCMDVEL[0 to 127]	Encoder command speed	Encoder Command Vel
11	ENCFVVEL[0 to 127]	Encoder feedback speed	Encoder Feedback Vel
12	CMDTRQ[0 to 127]	Command torque	Command Torque
13	FBTRQ[0 to 127]	Feedback torque	Feedback Torque
14	ENCCMDTRQ[0 to 127]	Encoder command torque	Encoder Command Trq
15	ENCFBTRQ[0 to 127]	Encoder feedback torque	Encoder Feedback Trq
16	FOLERR[0 to 127]	Following error	Following Error
17	HOMEOFFSET[0 to 127]	Home offset	Home Offset
18	INPOSITION[0 to 127]	In-position	InPosition
19	DEN[0 to 127]	The position command reaches the target position.	DEN(Command Distribution End Flag)
20	PSET[0 to 127]	The feedback position reaches the target range.	PSET(Position Set Flag)
21	DPSET[0 to 127]	The feedback position is held within the target range for the specified time.	DPSET(Delayed Position Set Flag)
22	INPOS(2)[0 to 127]	In-position 2	InPosition[2]
23	INPOS(3)[0 to 127]	In-position 3	InPosition[3]
24	INPOS(4)[0 to 127]	In-position 4	InPosition[4]
25	INPOS(5)[0 to 127]	In-position 5	InPosition[5]
26	OPSTATE[0 to 127]	Axis status	Operation State
27	D.OPSTATE[0 to 127]	Detailed axis status	Detail Operation State
28	UOCMDPOS[0 to 127]	Command position after applying user offset	User Offset Command Pos
29	UOFBPOS[0 to 127]	Axis feedback position after applying user offset	User Offset Feedback Pos
30	out_[0 to 7999].[0 to 7]	Output bit	—
31	in_[0 to 7999].[0 to 7]	Input bit	—
32	out_[type][0 to 7999].[0 to 7]	Output bit	—
33	in_[type][0 to 7999].[0 to 7]	Input bit	—
34	m_[type][0 to 7999].[0 to 7]	User memory data	—

*1 The value in brackets in the character string indicates the following.
- [0 to 127]: Axis number
- [0 to 7999]: Address
- [0 to 7]: Bit
- [Type]: Data format

6 CHART DISPLAY FUNCTION

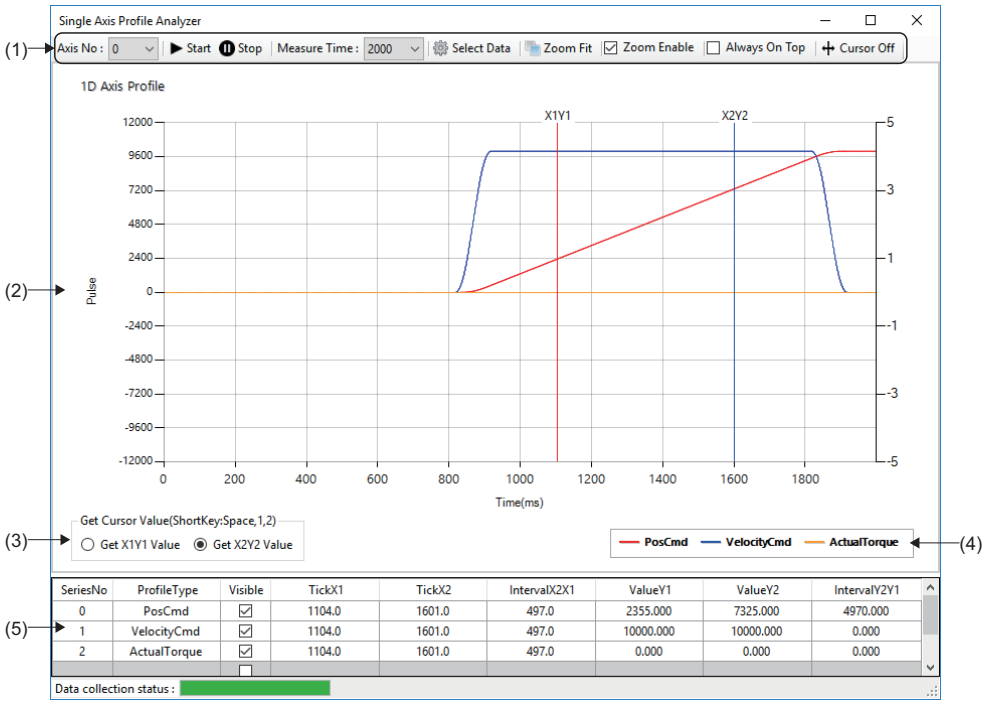
Whether the intended control is performed can be visually checked by displaying the position/speed/torque of one axis or the paths of two axes in a chart.

6.1 One Axis Chart Display Function

The time series data of one axis is displayed in a chart.

Window

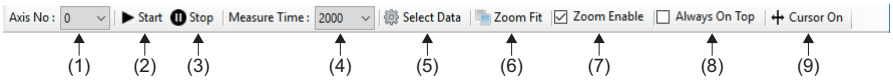
[Analyzer] ⇨ [Chart1D] ( )



Displayed items

Item	Description
(1) Chart display operation	Configure the settings for displaying the chart and operate the data. (☞ Page 156 Chart display operation)
(2) Chart display area	Displays the sampled data in a chart. The scale values on the horizontal and vertical axes are as follows. • Horizontal axis: Elapsed time from sampling start [ms] • Vertical axis (left side): Position [user unit], speed [U/s] • Vertical axis (right side): Torque [%]
(3) Get X1Y1 Value/Get X2Y2 Value	Select "Get X1Y1 Value" (red) or "Get X2Y2 Value" (blue) to be set. Pressing Space with "Get X1Y1 Value" or "Get X2Y2 Value" selected enables the cursor position to be set.
(4) Data item display	Displays the data items selected in the "Single Chart Config" screen that is displayed by clicking the [Select Data] button.
(5) Cursor position data	Displays the position data on cursor 1/cursor 2 which is displayed when the cursor display is enabled. • ProfileType: Axis data items selected in [Single Chart Config] • Visible: Set whether to display or hide the chart displayed in the chart display area. • TickX1: Time (X1) of cursor 1 on the horizontal axis [ms] • TickX2: Time (X2) of cursor 2 on the horizontal axis [ms] • IntervalX2X1: Time difference between cursor 1 and cursor 2 (X2-X1)[ms] • ValueY1: Value (Y1) of cursor 1 on the vertical axis • ValueY2: Value (Y2) of cursor 2 on the vertical axis • IntervalY2Y1: Difference value between cursor 1 and cursor 2 (Y2-Y1)[ms] ■Unit of values (Y1, Y2) on the vertical axis • Position data: [User unit] • Speed data: [U/s] • Torque data: [%]

■ Chart display operation

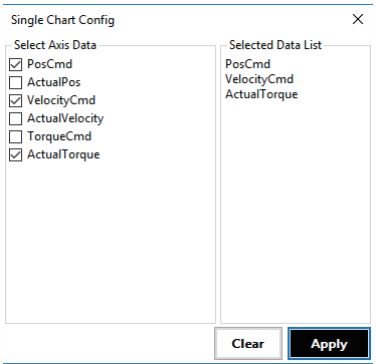


Item	Description
(1) Axis No	Select the number of the axis whose data is sampled. • 0 to 127: Axis 0 to 127
(2) [▶Start] button	Starts sampling.
(3) [⏸Stop] button	Stops sampling.
(4) Measure Time	Set the sampling time. • 2000[ms]/5000[ms]/10000[ms]/20000[ms]
(5) [Select Data] button	Used to set the data to be displayed in a chart. Click the [Select Data] button to set the data on the "Single Chart Config" screen.
(6) [Zoom Fit] button	Optimizes the display scale. If the chart display is zoomed, click the [Zoom Fit] button to cancel the zoom display.
(7) Zoom Enable	Set whether to enable the zoom function that zooms in on the range selected by dragging the mouse. • Selected: The zoom function is enabled. • Not selected: The zoom function is disabled.
(8) Always On Top	Set whether to display the "Single Axis Profile Analyzer" screen on the top. When this setting is enabled, the "1D Axis Profile Analyzer" screen is displayed on the top even if it is overlapped with another screen. • Selected: Displayed on the top. • Not selected: Not displayed on the top.
(9) [Cursor On/Off] button	Displays/hides the cursor.

Operating procedure

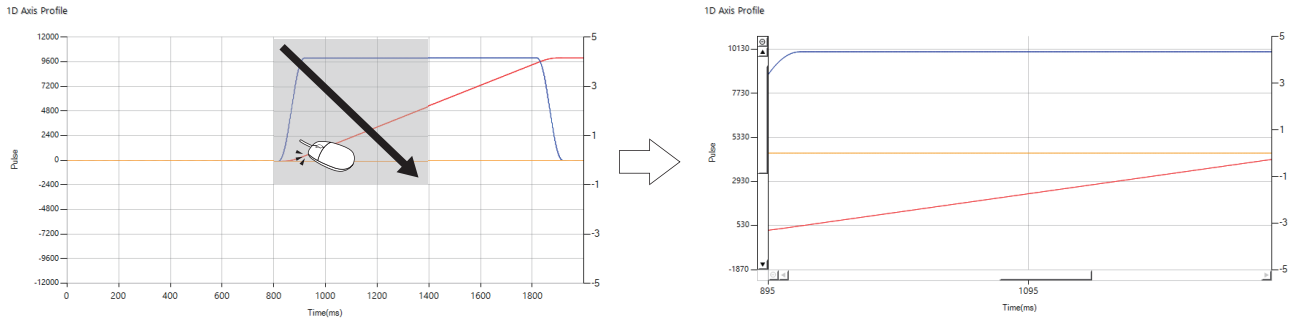
1. Select the axis whose data is sampled, and click the [Select Data] button.
2. In the "Single Chart Config" screen, select the data items to be displayed in a chart and click the [Apply] button. The following items can be selected. The selected data items are displayed in "Selected Data List".

- PosCmd (Command position)
- ActualPos (Feedback position)
- VelocityCmd (Speed command)
- ActualVelocity (Feedback speed)
- TorqueCmd (Command torque)
- ActualTorque (Feedback torque)



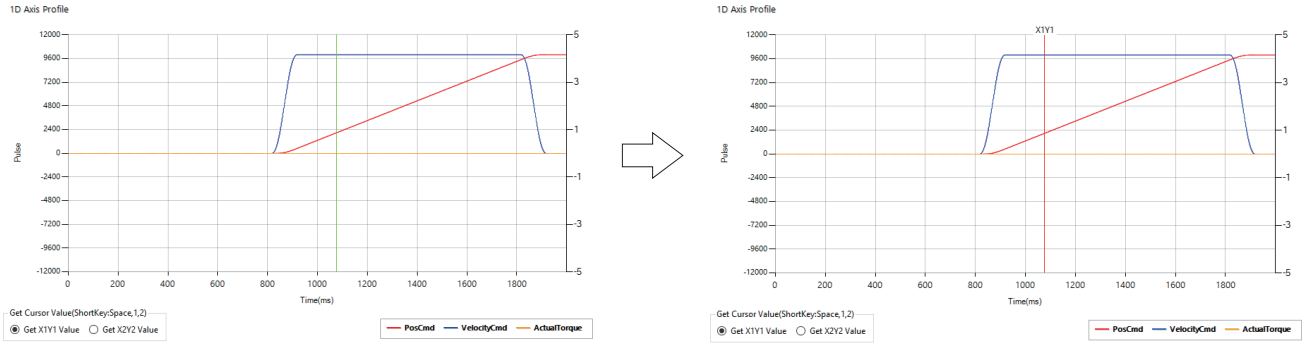
3. Select the sampling time, and click the [▶Start] button to start sampling.
4. When the sampling time has elapsed, the sampling is completed and the sampled data is displayed in the chart on the chart display screen. (If the [⏸Stop] button is clicked during sampling, the sampling is stopped.)

5. Select [Zoom Enable] and drag the mouse on the chart display area to zoom in on the selected range. To cancel the zoom display, click the [Zoom Fit] button.



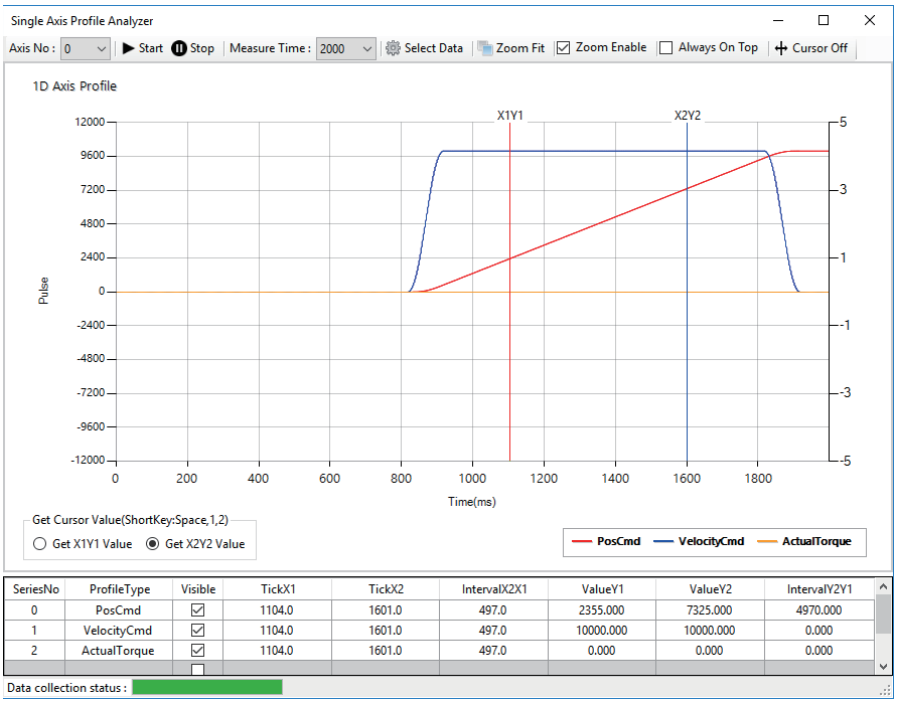
6. Click the [Cursor On] button to display a green cursor on the chart display area and radio buttons for cursor selection on the bottom left.

7. Select [Get X1Y1 Value] and press Space after adjusting the green cursor position with a mouse to set the red cursor 1 (X1Y1).



8. After adjusting the green cursor position with a mouse again, select [Get X2Y2 Value] and press Space to set the blue cursor 2 (X2Y2).

9. The values on cursor 1/cursor 2 can be checked with the cursor position data at the bottom.

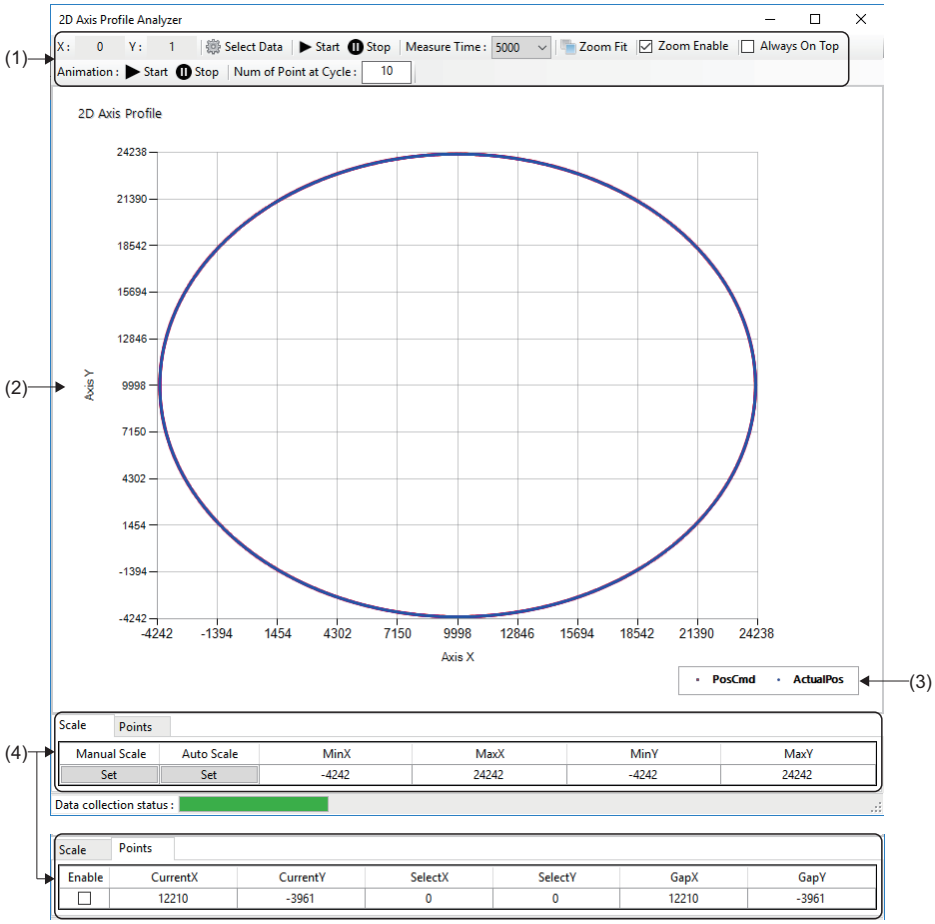


6.2 Two Axes Chart Display Function

The path data of two axes is displayed in a chart.

Window

[Analyzer] ⇨ [Chart2D] ( )

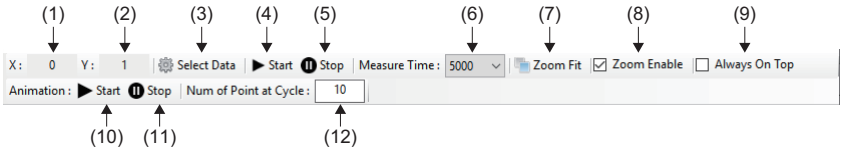


Displayed items

Item	Description
(1) Chart display operation	Configure the settings for displaying the chart and operate the data. For details, refer to the following. ☞ Page 159 Chart display operation
(2) Chart display area	Displays the sampled data with the XY paths in a chart. The values on the horizontal and vertical axes are as follows. • Horizontal axis: X-axis position • Vertical axis: Y-axis position
(3) Data display	Displays the data items selected in the "Single Chart Config" screen that is displayed by clicking the [Select Data] button.

Item		Description
(4) Cursor position data	Scale tab	Set the scale of the chart display area. • Manual Scale: Click the [Set] button to change the scale to the values set as the maximum values (X/Y) and minimum values (X/Y). • Auto Scale: Click the [Set] button to automatically adjust the scale so that the entire chart is displayed. • MinX: Set the minimum X-axis display value at the time of manual scale setting [User unit] • MaxX: Set the maximum X-axis display value at the time of manual scale setting [User unit] • MinY: Set the minimum Y-axis display value at the time of manual scale setting [User unit] • MaxY: Set the maximum Y-axis display value at the time of manual scale setting [User unit]
	Points tab	When point selection is enabled, the values of the XY path position selected with the point are displayed. • Enable: Enables/disables the point selection. • CurrentX: X-axis coordinate value on the current point [User unit] • CurrentY: Y-axis coordinate value on the current point [User unit] • SelectX: Selected X-coordinate value [User unit] • SelectY: Selected Y-coordinate value [User unit] • GapX: Difference value of X-coordinates (CurrentX - SelectX) [User unit] • GapY: Difference value of Y-coordinates (CurrentY - SelectY) [User unit]

■ Chart display operation

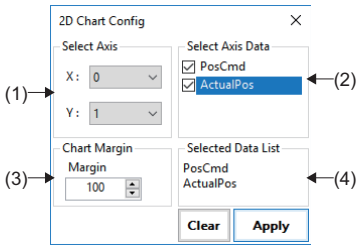


Item	Description
(1) X-axis No.	Displays the number of the X-axis whose data is sampled. Click the [Select Data] button to set the X-axis on the "2D Chart Config" screen.
(2) Y-axis No.	Displays the number of the Y-axis whose data is sampled. Click the [Select Data] button to set the Y-axis on the "2D Chart Config" screen.
(3) [Select Data] button	Used to select the X-axis and Y-axis and set the data to be displayed in a chart. Click the [Select Data] button to configure the settings on the "2D Chart Config" screen.
(4) [Start] button	Starts sampling.
(5) [Stop] button	Stops sampling.
(6) Measure Time	Set the sampling time. • 2000[ms]/5000[ms]/10000[ms]/20000[ms]
(7) [Zoom Fit] button	Optimizes the display scale. If the chart display is zoomed, click the [Zoom Fit] button to cancel the zoom display.
(8) Zoom Enable	Set whether to enable the zoom function that zooms in on the range selected by dragging the mouse. • Selected: The zoom function is enabled. • Not selected: The zoom function is disabled.
(9) Always On Top	Set whether to display the "2D Axis Profile Analyzer" screen on the top. When this setting is enabled, the "2D Axis Profile Analyzer" screen is displayed on the top even if it is overlapped with another screen. • Selected: Displayed on the top. • Not selected: Not displayed on the top.
(10) [Animation Start] button	Starts the animation display of the chart.
(11) [Animation Stop] button	Stops the animation display of the chart.
(12) Num of Point at Cycle	Set the animation display cycle of the chart. If the value is increased, the animation is displayed at high speed, however, the plot cycle becomes rough.

Operating procedure

1. Click the [Select Data] button.

2. In the "2D Chart Config" screen, select the axis numbers and data items to be displayed in the chart and click the [Apply] button.

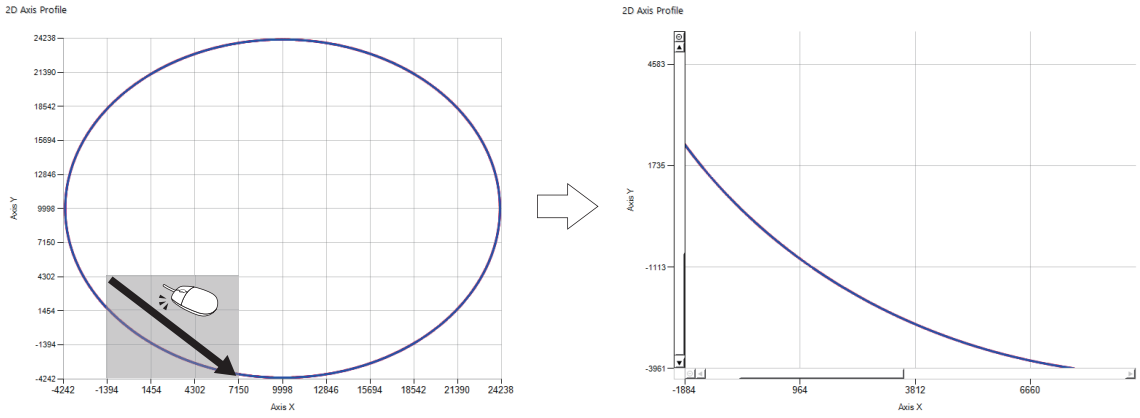


Item	Description
(1) Select Axis	Set the axis numbers of the X-axis and Y-axis. • X: X-axis number (0 to 127: Axis 0 to 127) • Y: Y-axis number (0 to 127: Axis 0 to 127)
(2) Select Axis Data	Set the axis data items to be displayed in a chart. • PosCmd: Command position • ActualPos: Feedback position
(3) Chart Margin	Set the margin value to be added to the maximum/minimum value of the chart display. [User unit]
(4) Selected Data List	The selected data items are displayed.

3. Select the sampling time, and click the [Start] button to start sampling.

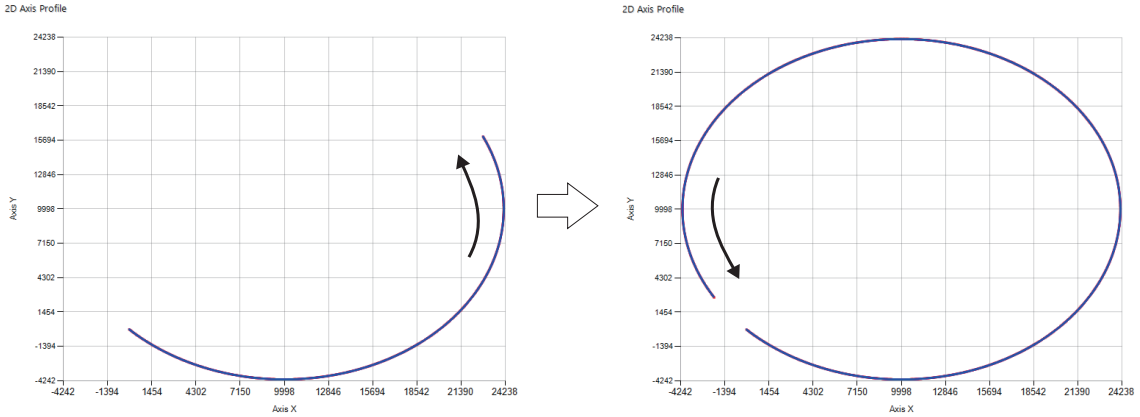
4. When the sampling time has elapsed, the sampling is completed and the sampled data is displayed in the chart on the chart display screen. (If the [Stop] button is clicked during sampling, the sampling is stopped.)

5. Select [Zoom Enable] and drag the mouse on the chart display area to zoom in on the selected range. To cancel the zoom display, click the [Zoom Fit] button.



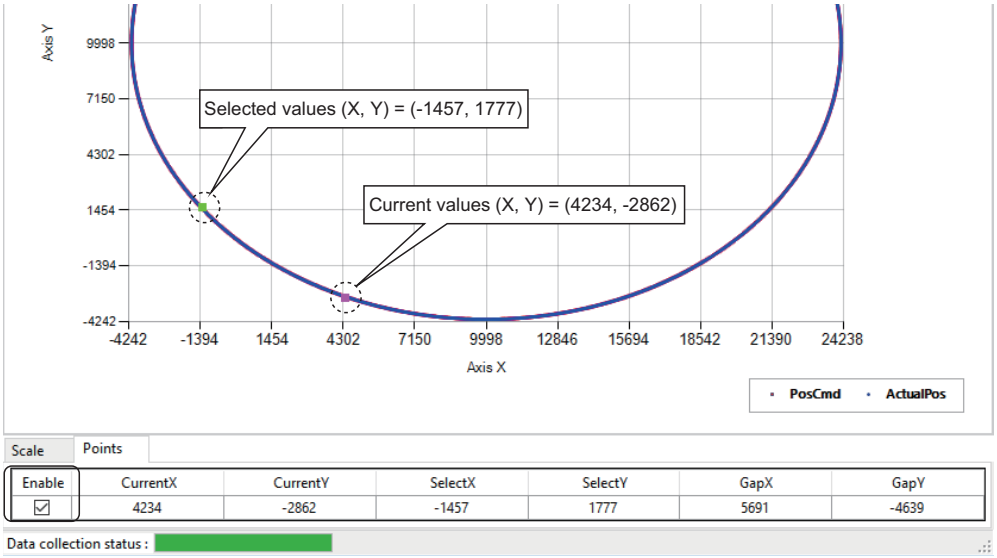
6. When the [Animation Start] button is clicked, the path data is displayed as an animation based on the sampled data.

*: Clicking the [Animation Stop] button while animation is running stops the animation display.



7. Select the [Data] tab ⇨ [Enable] to display the current value point (■). Set the current value point and selected value point (■) with a mouse, and check the current value and selected value. The values are displayed in the list in the [Data] tab.

- Click a point in the chart display area to display the current value point (■) and set it as the current value.
- Right-click the set current value to display the selected value point (■) and set it as the selected value.



Scale | Points

Enable	CurrentX	CurrentY	SelectX	SelectY	GapX	GapY
☑	4234	-2862	-1457	1777	5691	-4639

Data collection status :

Point

The selected value point (■) is not set even if the current value point (■) is right-clicked. Shift the focus from the current value point (■) and right-click it.

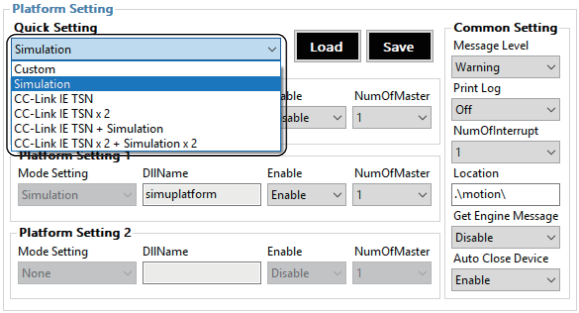
APPENDIX

Appendix 1 Simulation Function

By using the simulator platform (SimuPlatform), the motion control can be verified without servo amplifiers.

Operating procedure

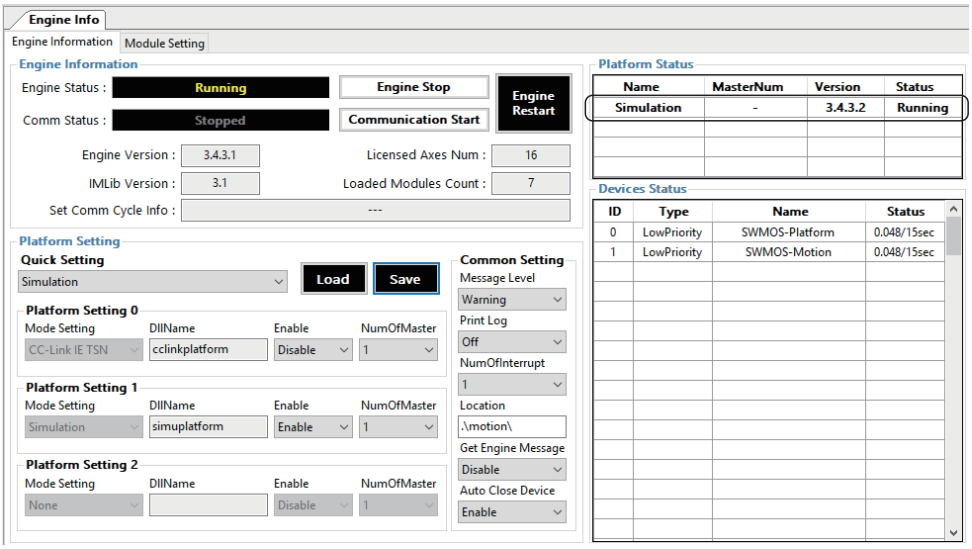
1. Select [SWMOS] ⇨ [System] ⇨ [Engine] in the navigation window, select the [Engine Information] tab, select "Simulation" from the pull-down list in [Quick Setting] under [Platform Setting], and click the [Save] button.



2. The confirmation message "Do you want to save Module.ini?" appears. Click the [Yes] button to save the module configuration file (Module.ini).

3. Then, the confirmation message "Do you want to restart the SWM-GEngine?" appears. Click the [Yes] button to restart the SWM-G engine.

4. When the SWM-G engine is restarted, "Simulation" is displayed in [Platform Status] and the simulator platform is enabled.



5. When the [Communication Start] button is clicked, all the axes enter the "IDLE" state and the test operation of the motion control can be performed with virtual axes.

Axis command mode	Operation
Position control (Position)	• Feedback position = Command position • Feedback speed = Command speed • Command torque/feedback torque = Always 0
Speed control (Velocity)	• Feedback position = Updated based on the command speed • Feedback speed = Command speed • Command torque/feedback torque = Always 0
Torque control (Torque)	• Feedback position/command position = Not updated • Feedback speed/command speed = Not updated • Feedback torque = Command torque

Point

- The motion control is performed with the communication cycle "1000μs" by default. To change the communication cycle, set a value for "CommCycle" in the simulation definition file (simu_network.def).
- To limit the axes to be simulated to the specified axes, set "UserDef" to "1 (Enable)" in the simulation definition file (simu_network.def) and set the axis number in the "Index" setting in the "[Axis □[*1]]" section.
  *1: □ = Axis number
- For details of the simulation definition file (simu_network.def), refer to the following.
  SWM-G User Manual
- The simulation definition file (simu_network.def) is stored in the following.
  - File storage destination: C:\Program Files\MotionSoftware\SWM-G\Platform\Simu\simu_network.def

Ex.

When performing simulation only on "Axis 3, axis 5, axis 9, axis 15" with the communication cycle "500μs"

```
CommCycle=500
PrintLog=0

[Master 0]
UserDef = 1

[axis 0]
index = 3
[axis 1]
index = 5
[axis 2]
index = 9
[axis 3]
index = 15
```

A

Appendix 2 Diagnostic Result

The diagnostic function of SWMOS collects the following information and diagnoses the system status.

Type	Item	Detailed information	Error cause
Windows	OS Information	Windows version information	— (Information display only)
	Processor Information	CPU information, number of cores	— (Information display only)
	Hyper-Threading	Enabling/disabling Hyper-Threading	When Hyper-Threading is enabled
	RAM Information	Memory information	— (Information display only)
	Update	Runtime information	Runtime not installed
Setting	RTX Information	Runtime OS RTX information	RTX installation error
	SWM-G Information	SWM-G engine information	SWM-G installation error
	SWM-G Module Information	SWM-G module information	Module.ini setting error
	SWM-G NIC Device Information	NIC setting information	NIC for CC-Link IE TSN not set
Files	SWM-G Header Files	File existence	No header file
	SWM-G Lib Files	File existence	No library file
	SWM-G CLRLib Dll Files	File existence	No CLRLib DLL file
	SWM-G Module Dll Files	File existence	No module DLL
	SWM-G Platform Dll Files	File existence	No platform DLL
	NIC Driver Dll Files	File existence	No NIC driver DLL
License	Dongle Key	USB license key information	USB license key error/not inserted
	SWM-G LicenseCode	License code information	License code not registered
State	Check RTX Services	RTX service status	RTX service not started
	IMDll.dll Infromation	IMDll information	IMDll.dll does not exist
	Start collecting engine message	Message collection result	— (Message output test to the message window)
	Try to create Device	CreateDevice execution result	Device generation failure
	Engine Message	Message collection result	License error Platform start error Module cannot be started due to license inconsistency

Appendix 3 PM Motion Function

The PM motion module can control axes using the PP, HM, PV, and TQ command modes. It is compatible with only platforms that support these command modes.

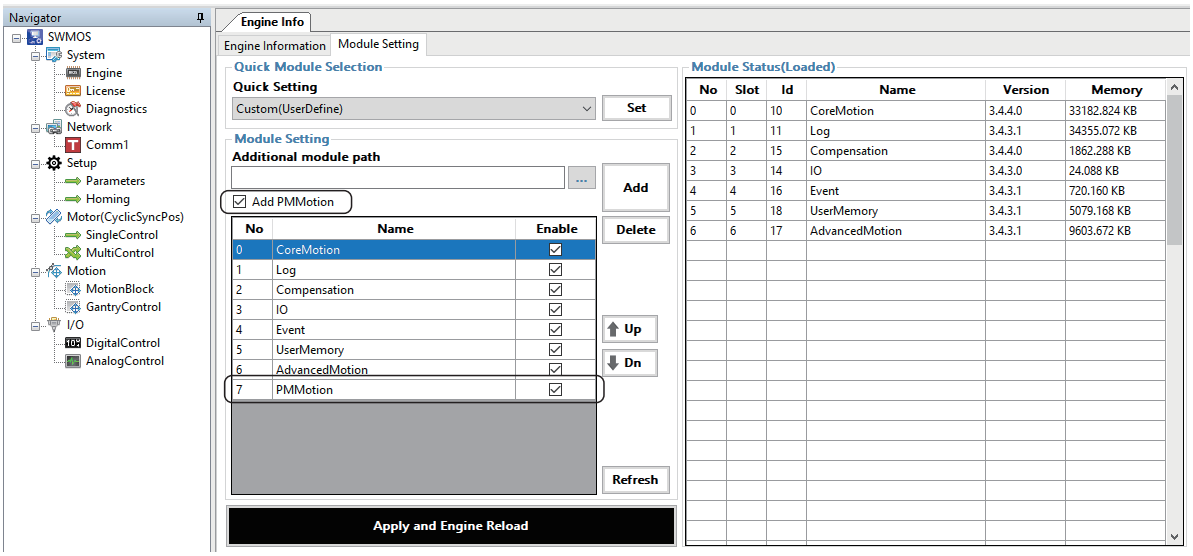
The PM motion axes cannot be controlled by other platforms including the simulator platform.

When using the PM motion function, enable "PPMode".

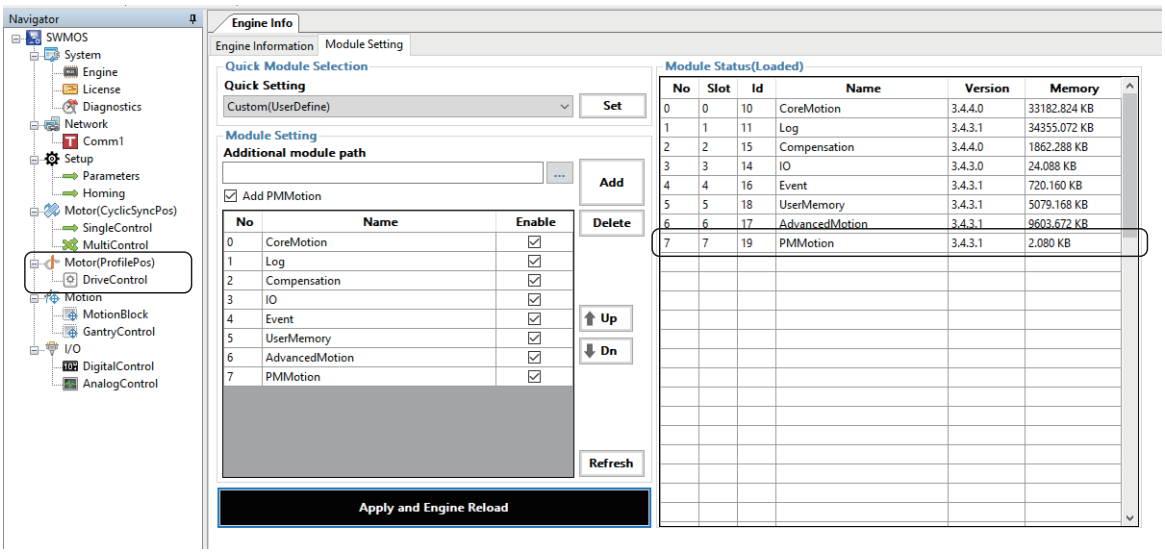
The following shows the procedure for using the PM motion.

Operating procedure

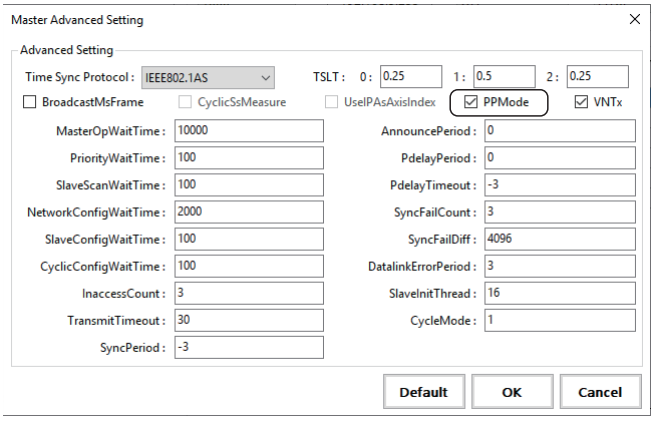
1. Select [SWMOS] ⇨ [System] ⇨ [Engine] in the navigation window, select the [Module Setting] tab, and select [Add PMMotion] in [Module Setting].
2. Add "PMMotion" to the module list.



3. Click the [Apply and Engine Reload] button. The SWM-G engine is restarted and PMMotion is enabled.
4. When PMMotion is enabled, [Motor(ProfilePos)] is displayed in the navigation window.



5. Select [SWMOS] ⇨ [Network] ⇨ [Comm1/Comm2] in the navigation window, select [CC-Link IE TSN], and click the [Advanced Setting] button in [Master Setting] to display the "Master Advanced Setting" window. Select "PPMode", and click the [OK] button to close the "Master Advanced Setting" window.



6. Change the CUI file setting so that the PDO mapping of the servo drive is for the PM motion.
Select [SWMOS] ⇨ [Network] ⇨ [Comm1/Comm2] in the navigation window, select [CC-Link IE TSN], and click a [Detail Setting] cell in [Slave Setting] to display the "Detail Setting" window. Set the PDO objects for TXPDO and RXPDO.

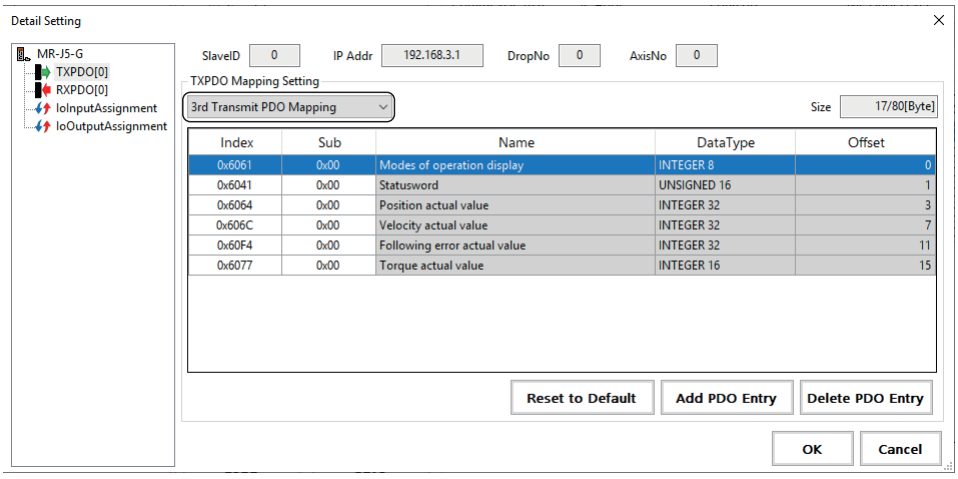
Ex.

For MR-J5-G

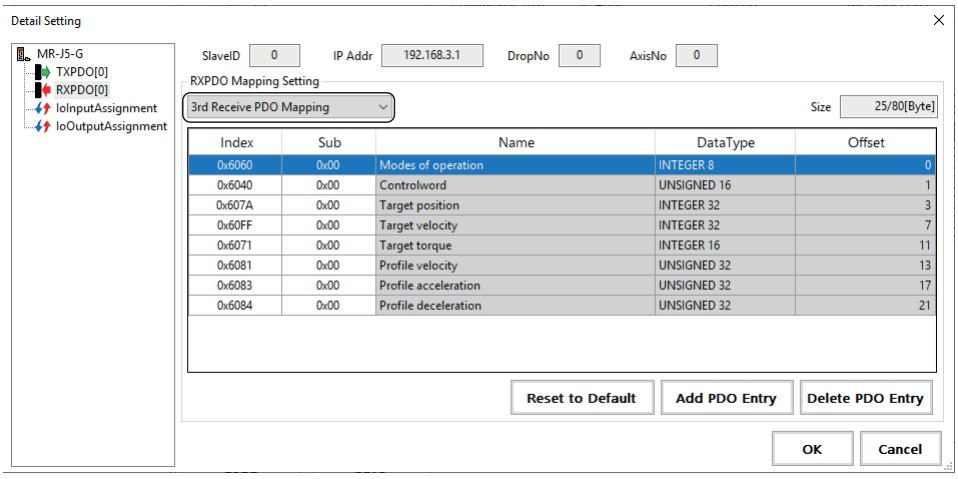
Set "3rd Transmit PDO Mapping" for TXPDO and "3rd Receive PDO Mapping" for RXPDO.

*: Configure the same setting for all the axes set in the slave setting.

• TXPDO



• RXPDO



7. Click the [OK] button to close the "Detail Setting" window.
8. Start the communication in SWMOS and check the connection.
9. Select [SWMOS] ⇨ [Motor(ProfilePos)] ⇨ [DriveControl] in the navigation window to display the PM motion axis control window. The PM motion axis control can be tested. For the operations of the PM motion axis control, refer to the following.
☞ Page 143 Axis Control (PM Motion)

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Appendix 4 Troubleshooting

This section describes errors that may occur in SWM-G and actions to be taken.

Description	Cause	Action
The tool does not start.	• The setup has not been completed. • The license has not been registered.	Run the installer and set up the incomplete items. For details, refer to the following. 📖Motion Control Software SWM-G User's Manual (Installation)
Only the "System" tree is displayed in the navigation window of SWMOS.	• The SWM-G engine is stopped. • The license of SWM-G has not been registered.	Register the license of SWM-G and start the SWM-G engine.
The parameters of the SWM-G engine are initialized immediately after SWMOS is started.	When SWMOS is used alone, the SWM-G engine is restarted. Therefore, the parameters are initialized.	Read the parameter file after SWMOS is started or select [Home] ⇨ [Option (🛠)] ⇨ [System] tab ⇨ [SWM-G Parameter Auto Load(Default: Project Folder)]. For details, refer to the following. ☞ Page 25 System
The error occurs repeatedly even after it is reset with the sub payload of the slave PDU information in IETSN Configurator.	The action load becomes high due to a large amount of calculation and communication, resulting in a jitter.	This error may be improved with the following actions. • Change the time slot allocation. • Increase the communication cycle.

Appendix 5 CC-Link IE TSN Configuration Tool

This section describes the screen configuration and basic operation of IETSN Configurator.

Precautions

- IETSN Configurator configures the same network setting as the SWMOS network setting, but they are not compatible. When the network setting is configured using SWMOS, do not configure the setting with IETSN Configurator. If the network setting is configured using IETSN Configurator, it is recommended to switch to the SWMOS network setting.

MAIN FUNCTION OF IETSN Configurator

IETSN Configurator is a tool for diagnosing and managing CC-Link IE TSN network.
Start this tool when SWMOS is started and the engine is being executed.
If this tool is started when SWMOS is not started or the engine is stopped, it is set to the offline mode. The mode cannot be switched once the tool is started. The communication scan, hot connect, or SDO access function cannot be used in the offline mode.

Outline of CC-Link IE TSN Setting

Prepare the following files for connection to the CC-Link IE TSN compatible devices.
These files can be easily created in IETSN Configurator.

Item	Description
Network definition file	A file in which the communication cycle, time synchronization, initialization sequence, axis number definition, and IP communication mixed function are configured. For details of creating the network definition file, refer to the following. ☞ Page 180 Export Def ■Storage destination folder Default: C:\Program Files\MotionSoftware\SWM-G\Platform\CCLink ■File name cclink_network.def
CUI file	A file used for initializing and setting slave devices. Define objects to be used, I/O mapping, and others according to the information in the CC-Link Family System Profile Plus (CSP+) file. When starting the communication with any slave devices, search the storage destination folder for the corresponding CUI file to use. For details of creating the CUI file, refer to the following. ☞ Page 192 CUI Editor Tab ■Storage destination folder • C:\cui ■File name The first match file in a search in the following order. (1) Vendor code_Model code_Extension model code_Device version.txt (2) Vendor code_Model code_Extension model code.txt (3) Vendor code_Model code.txt Create a CUI file for each model instead of making it for each slave device. The CUI file (absolute path) can be individually specified with the cclink_network.def file.

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SCREEN CONFIGURATON AND BASIC OPERATION

This chapter describes the screen configuration and basic operation of IETSN Configurator.

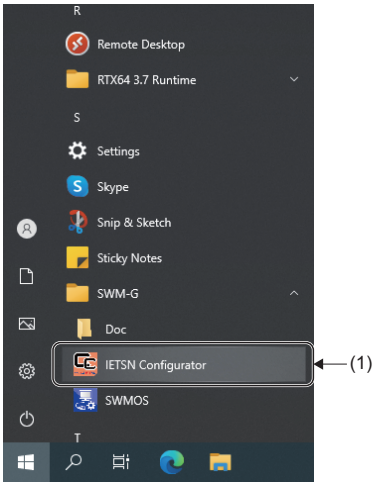
Start and End

The following describes how to start/end SWMOS.

■ Start

Operating procedure

Select [SWM-G] ⇨ [IETSN Configurator] (1) from the Windows start menu.



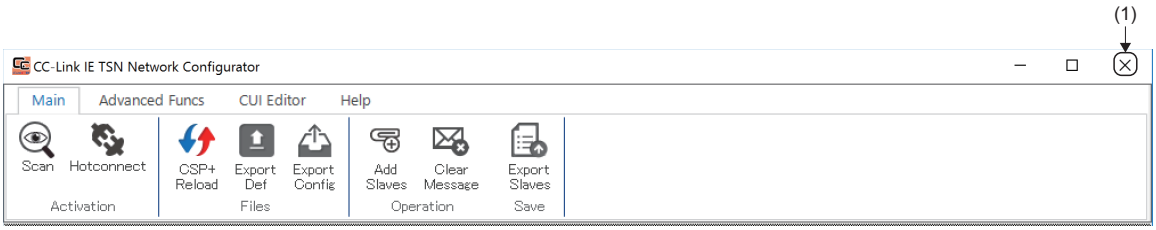
Precautions

- To use IETSN Configurator, it must be installed separately from SWMOS. For details, refer to "Installing IETSN Configurator" in the following manual.
  Motion Control Software SWM-G User's Manual (Startup)
- Since IETSN Configurator uses the SWM-G engine, SWMOS must be started in advance. IETSN Configurator will not operate normally if SWMOS is started after IETSN Configurator is started.

■ End

Operating procedure

Click the [×] button (1) at the top right of the CC-Link IE TSN Network Configurator screen.



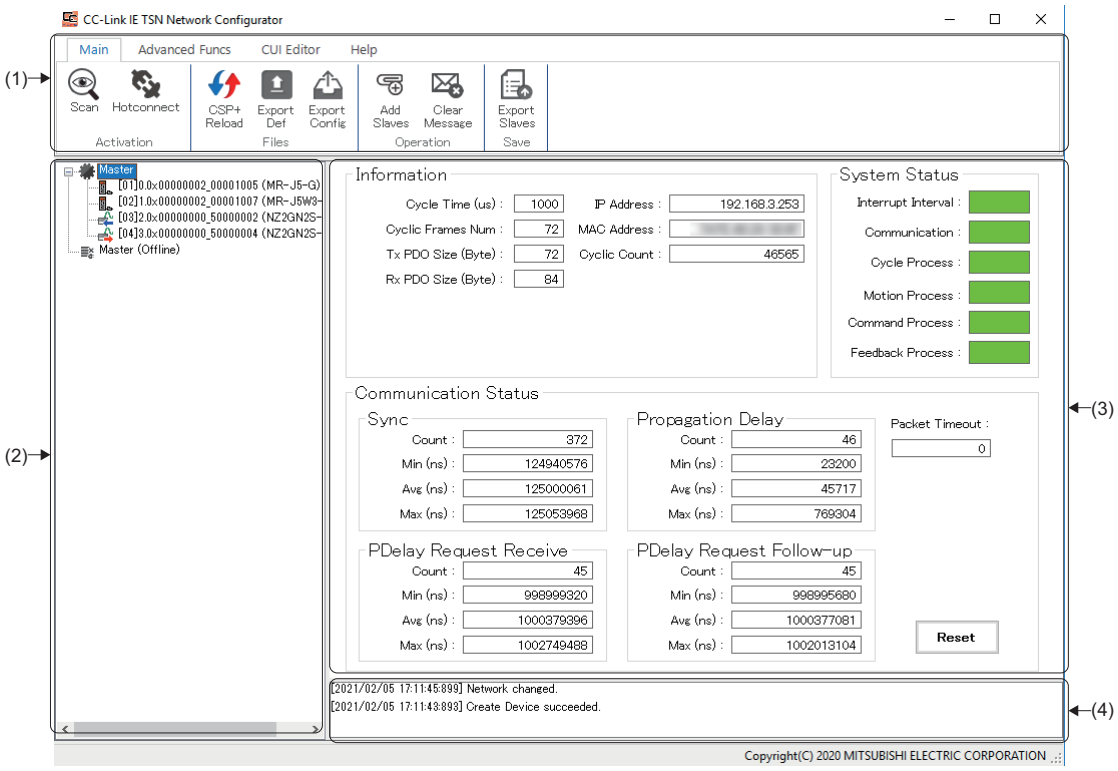
Screen Configuration

This section describes the screen configuration when IETSN Configurator is started.

■ Overall screen

The following shows the overall screen configuration.

Window

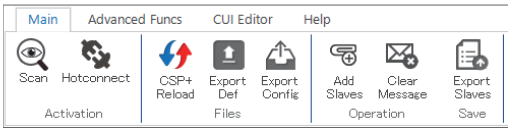


Displayed items

Name	Description
(1) Ribbon	Operation can be performed by switching the Main, Advanced Funcs, CUI Editor, and Help tabs. Operations such as displaying the status of IETSN Configurator, establishing SDO communication with the slave devices, and creating the CUI file are conducted from the ribbon.
(2) Network window	Displays the slaves connected to the master.
(3) Communication information display area	Displays the master communication information and slave communication information.
(4) Message window	Displays messages about the current network status.

Main Tab

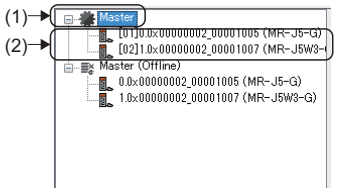
The integrated management function and status information of IETSN Configurator are displayed.



Item		Description	Reference
Activation	Scan ( )	Scans through the network.	☞ Page 179 Scan
	Hotconnect ( )	Reconnects the added slave device.	☞ Page 179 Hotconnect
Files	CSP+ Reload ( )	Loads the list of registered CSP+ files.	☞ Page 180 CSP+ Reload
	Export Def ( )	Set the parameters for the master setting.	☞ Page 180 Export Def
	Export Config ( )	Configure the settings of IETSN Configurator.	☞ Page 187 Export Config
Operation	Add Slaves ( )	Adds the slave devices.	☞ Page 188 Add Slaves
	Clear Message ( )	Clears the message displayed in the message window.	☞ Page 188 Clear Message
Save	Export Slaves ( )	Saves the message about the current network status.	☞ Page 189 Export Slaves

- Network window

  When the [Main] tab is selected in the ribbon, the communication information of the master or slave device can be checked by selecting [Master] or a slave device displayed in the tree of the network window.



Item	Description	Reference
(1) Master	Displays the communication information of the master.	☞ Page 173 Master communication information
(2) Slave device*1	Displays the communication information of the slave device.	☞ Page 176 Slave communication information

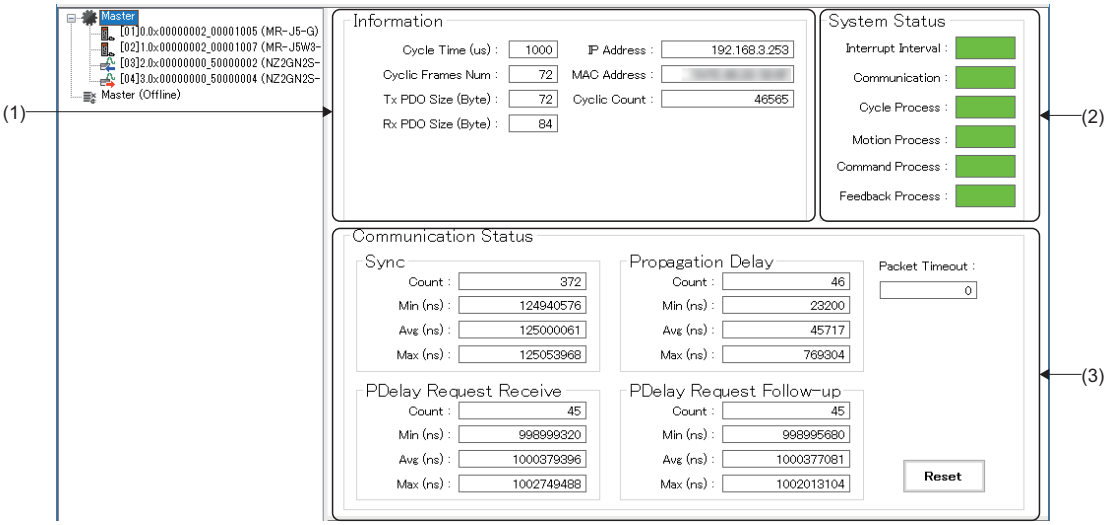
*1 The model name of the connected slave device

Master communication information

By selecting [Master] in the network window, the communication information of the master can be checked.

Window

[Master] in the network window



Displayed items

Item	Description
(1) Information	Displays the communication information of the master. (☞ Page 173 Information)
(2) System Status	Displays the system status. (☞ Page 174 System Status)
(3) Communication Status	Displays the communication status of the master. (☞ Page 175 Communication status)

■ Information

The communication information of the master is displayed.

Item	Description
Cycle Time (us)	Displays the communication cycle set in the master.
Cycle Frames Num	Displays the number of frames sent at each communication cycle.
Tx PDO Size (Byte)	Displays the overall Tx PDO data amount (master → slave).
Rx PDO Size (Byte)	Displays the overall Rx PDO data amount (slave → master).
IP Address	Displays the IP address of the master.
MAC Address	Displays the MAC address of the master.
Cyclic Count	Displays the number of communication cycles after the SWM-G engine is started.

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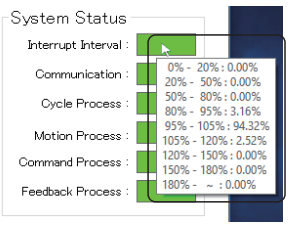
■ System Status

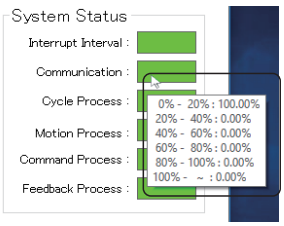
The system status is displayed. The stability of the system can be checked.

Hovering the cursor on the bar with a color displays the detailed data.

• Interrupt Interval



• Communication/Cycle Process/Motion Process/Command Process/Feedback Process



Item	Description
Interrupt Interval	Displays the statistics of the ratio of the interrupt interval to nominal communication cycle. The nominal communication cycle is the communication cycle specified in the master.
Communication	Displays the statistics of the ratio of the communication processing time to nominal communication cycle.
Cycle Process	Displays the statistics of the ratio of the cycle processing time to nominal communication cycle.
Motion Process	Displays the statistics of the ratio of the processing time of the motion module to nominal communication cycle.
Command Process	Displays the statistics of the ratio of the command processing time to nominal communication cycle.
Feedback Process	Displays the statistics of the ratio of the feedback processing time to nominal communication cycle.

The following table lists the display colors of the bar. For details, refer to the following.

SWM-G User Manual

• Interrupt Interval

Item	Description
Green	The status is normal.
Yellow	Although there is a little processing load, it is not a problem.
Orange	The processing load is high. It may be improved by adjusting the communication cycle or others.
Red	The processing load is too high and the communication may be disconnected. Review the settings such as the communication cycle.

• Communication/Cycle Process/Motion Process/Command Process/Feedback Process

Item	Description
Green	Indicates that the rate of data between 0% and 40% is 90% or more.
Yellow	Indicates that the rate of data between 0% and 40% is between 60% and 90%.
Orange	Indicates that the rate of data between 0% and 40% is between 30% and 60%.
Red	Indicates that the rate of data between 0% and 40% is less than 30%.

■ Communication status

Check the communication status of the master. For details of each frame, refer to the following.

SWM-G User Manual

Item	Description
Sync	Displays the statistical information of the sending interval of the Sync frame. • Count: Statistics of Sync • Min (ns): Minimum value of Sync • Avg (ns): Average value of Sync • Max (ns): Maximum value of Sync
Propagation Delay	Displays the statistical information of the interval between the PDelayReq frame is received and the PDelayRespFollowUp frame is sent. • Count: Statistics of Propagation Delay • Min (ns): Minimum value of Propagation Delay • Avg (ns): Average value of Propagation Delay • Max (ns): Maximum value of Propagation Delay
PDelay Request Receive	Displays the statistical information of the receiving interval of the PDelayReq frame. • Count: Statistics of PDelay Request Receive • Min (ns): Minimum value of PDelay Request Receive • Avg (ns): Average value of PDelay Request Receive • Max (ns): Maximum value of PDelay Request Receive
PDelay Request Follow-up	Displays the statistical information of the sending interval of the PDelayRespFollowUp frame. • Count: Statistics of PDelay Request Follow-up • Min (ns): Minimum value of PDelay Request Follow-up • Avg (ns): Average value of PDelay Request Follow-up • Max (ns): Maximum value of PDelay Request Follow-up
Packet Timeout	Displays the number of packet timeouts.
[Reset] button	Resets the display information.

Point

- Since the communication amount is relatively high and a jitter tends to occur immediately after the communication start, a packet timeout may occur. When the settings of "MessageLevel" and "PrintLog" under [Basic Setting] in [Master Setting] on the "Master Settings" window displayed by selecting [Main] ⇨ [Export Def] ( ) are as follows, the log output at the communication stop may temporarily become a processing load and a packet timeout may occur. It should not be a problem unless a packet timeout occurs at normal times.
  · MessageLevel: 3 (Error message, warning message, setting message, debug message)
  · PrintLog: Selected (Log is output.)

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Slave communication information

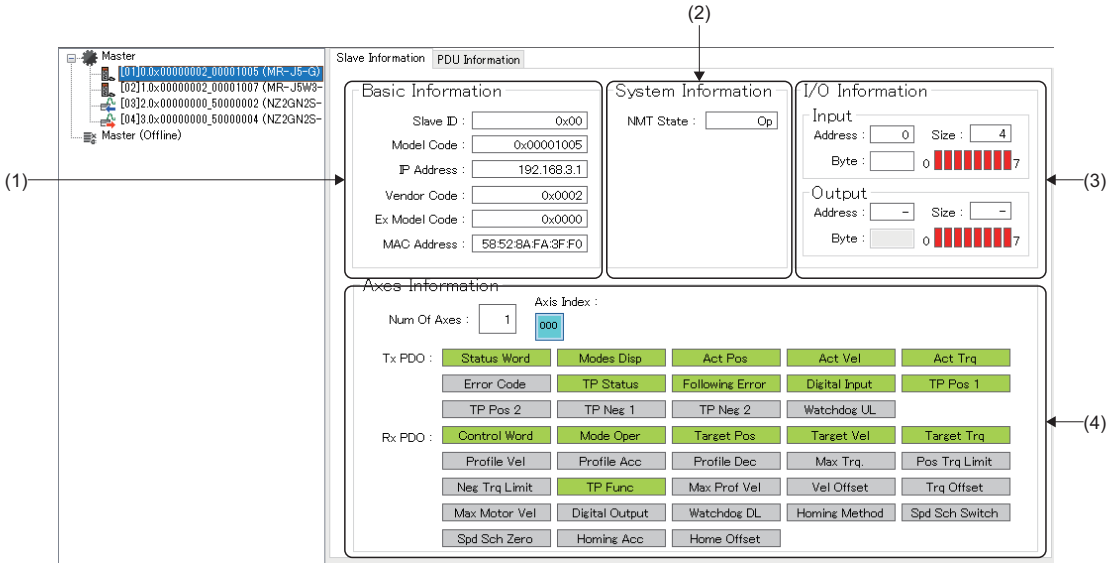
Select [Master] ⇨ a slave device*1 in the network window to check the communication information of the slave device.

*1 The model name of the connected slave device

Window

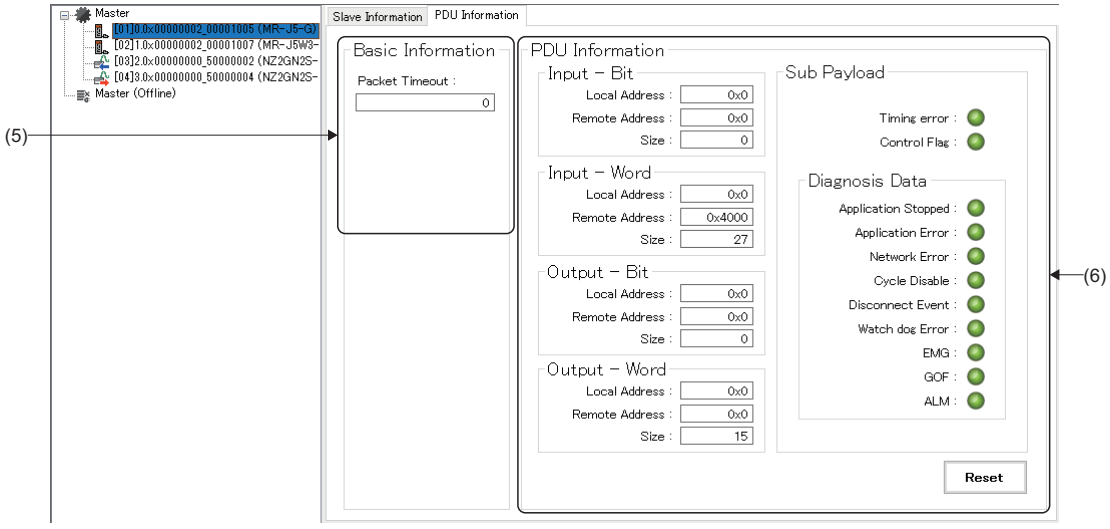
- Slave Information

  Select [Master] ⇨ a slave device*1 in the network window and select the [Slave Information] tab.



- PDU Information

  Select [Master] ⇨ a slave device*1 in the network window and select the [PDU information] tab.



*1 The model name of the connected slave device

Displayed items

Item	Description
(1) Basic Information	Displays the basic information of the slave. (☞ Page 177 Basic Information)
(2) System Information	Displays the system information. (☞ Page 177 System Information)
(3) I/O Information	Displays the I/O information when the slave is I/O. (☞ Page 177 I/O Information)
(4) Axes Information	Displays the axes information of the slave. (☞ Page 177 Axes Information)
(5) Basic Information	Displays the basic information of the PDU. • Packet Timeout: Displays the number of packet timeouts.
(6) PDU Information	Displays the PDU information. (☞ Page 178 PDU information)

■ Basic Information

Item	Description
Slave ID	Displays the slave ID. The number is assigned from "0" in the order of connection.
Model Code	Displays the model code of the slave device.
IP Address	Displays the IP address set in the slave device.
Vendor Code	Displays the vendor code of the slave device.
Ex Model Code	Displays the extension model code of the slave device.
MAC Address	Displays the MAC address of the Ethernet port assigned to the slave device.

■ System Information

Item	Description
NMT State	Displays the communication status of the NMT state machine. • None: Not connected • Init: Initial communication state • Preop (Pre-Operational): SDO communication state by transient transmission • Safeop (Safe-Operational): PDO communication state by cyclic transmission (Servo motor driving is impossible) • Op (Operational): PDO communication state by cyclic transmission (Servo motor driving is possible)

■ I/O Information

Item	Description
Input/Output	Displays the input information and output information. • Address: Displays the address of the I/O. • Size: Displays the size of the I/O. • Byte: Set the byte position to be displayed in bit. • Bit display: Indicates the ON/OFF status of the I/O position specified in byte. Bit 0 to Bit 7 0 7 • Red: OFF • Green: ON

■ Axes Information

Item	Description
Num Of Axes	Displays the number of axes of the slave device.
Axis Index	Displays the axis index for multiple axes.
Tx PDO	Displays the status of Tx PDO mapping of the axis specified with CANopen object required for PDO of the axis. • Gray: PDO mapping disabled • Green: PDO mapping enabled
Rx PDO	Displays the status of Rx PDO mapping of the axis specified with CANopen object required for PDO of the axis. • Gray: PDO mapping disabled • Green: PDO mapping enabled

■ PDU information

Item		Description
Input - Bit		Displays the input bit information. • Local Address: Displays the I/O address of SWM-G. • Remote Address: Displays the I/O address of the slave. • Size: Displays the size of the I/O.
Input - Word		Displays the input word information. • Local Address: Displays the I/O address of SWM-G. • Remote Address: Displays the I/O address of the slave. • Size: Displays the size of the I/O.
Output - Bit		Displays the output bit information. • Local Address: Displays the I/O address of SWM-G. • Remote Address: Displays the I/O address of the slave. • Size: Displays the size of the I/O.
Output - Word		Displays the output word information. • Local Address: Displays the I/O address of SWM-G. • Remote Address: Displays the I/O address of the slave. • Size: Displays the size of the I/O.
Sub Payload		Indicates the sub payload information with lamps. ■Timing error Indicates the timing error information with the lamp. • Green: Timing error not detected • Red: Timing error detected ■Control Flag Indicates the control flag information with the lamp. • Green: Cyclic transmission can be performed • Red: Cyclic transmission cannot be performed
Diagnosis Data	Application Stopped	Indicates the application stop information with the lamp. • Green: Application operating • Red: Application stopped
	Application Error	Indicates the application error information with the lamp. • Green: Application error not detected • Red: Application error detected
	Network Error	Indicates the network error information with the lamp. • Green: Network error not detected • Red: Network error detected
	Cycle Disable	Indicates the cyclic control data information with the lamp. • Green: Cyclic data enabled • Red: Cyclic data disabled
	Disconnect Event	Indicates the existence of the disconnection event of the slave with the lamp. • Green: Disconnection event not detected • Red: Disconnection event detected
	Watch dog Error	Indicates the watchdog error information with the lamp. • Green: Watchdog error not detected • Red: Watchdog error detected
	EMG	Indicates the system emergency stop information with the lamp. • Green: EMG signal not detected • Red: EMG signal detected
	GOF	Indicates the gate off request information of the power supply module with the lamp. • Green: GOF signal not detected • Red: GOF signal detected
	ALM	Indicates the alarm occurrence information with the lamp. • Green: ALM signal not detected • Red: ALM signal detected
[Reset] button		Clears the errors in the sub payload information of the slave. When any of these errors turns on, the error display is not cleared until reset. Click the [Reset] button to acquire the latest error information.

Point

Since the communication amount is relatively high and a jitter tends to occur immediately after the communication start, an error may occur. When an error occurs at the communication start, click the [Reset] button to clear the error. These errors are not problems unless they occur at the normal state.

Communication

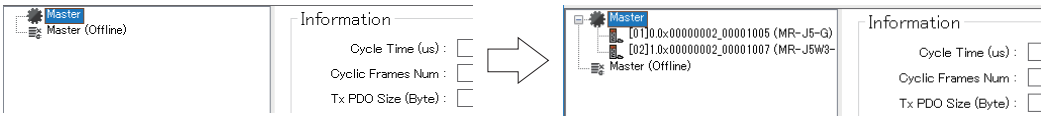
■ Scan

Scan through the network.

When a slave device is connected after IETSN Configurator is started, load the information of the connected slave device.

Operating procedure

1. Click [Main] ⇨ [Scan] ( ) in the ribbon.
2. The scanned slave device is added to the tree under [Master] in the network window.



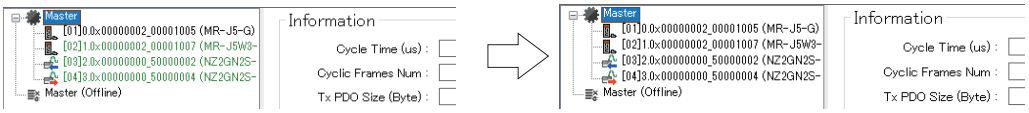
■ Hotconnect

Reconnect the added slave device.

When a slave device is added to the network connection, use the hot connect function to connect it without affecting the other slave devices.

Operating procedure

1. Click [Main] ⇨ [Hotconnect] ( ) in the ribbon.
2. The network is connected again.



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File

■ CSP+ Reload

Load the list of registered CSP+ files.

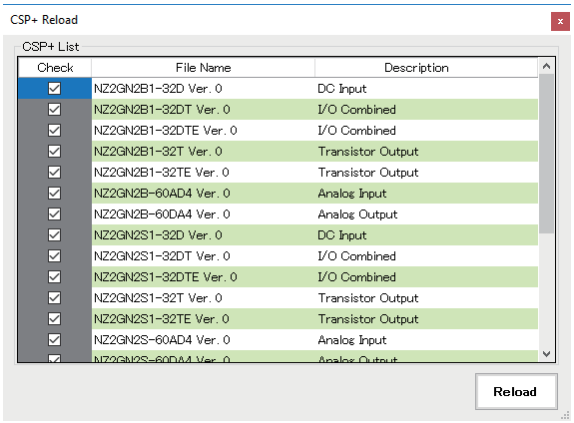
Typically, when the automatic loading setting is enabled, the CSP+ file is automatically loaded at the startup of IETSN Configurator.

When the automatic loading setting is disabled or when the CSP+ list is updated, perform the CSP+ reloading.

Configure the automatic loading setting in the "Auto Load CSP+ File" of "Utility Configuration" screen. (☞ Page 187 Export Config)

Operating procedure

1. Click [Main] ⇨ [CSP+ Reload] ( ) in the ribbon to display the "CSP+ Reload" screen.
2. The CSP+ information loaded at the startup can be checked. The selection columns of the loaded files are displayed in gray.



3. Click the [Reload] button to reload the files displayed in the CSP+ list and to update the list.
4. Click the [×] button in the upper right of the screen to close the "CSP+ Reload" screen.

■ Export Def

Set the parameters for the master setting in the "Master Settings" screen.

The network definition file (cclink_network.def) can be easily created by changing the parameters as necessary and saving it.

The default settings are displayed for all the parameters in the "Master Settings" screen. To update the network definition file (cclink_network.def), change the required parameters and click the [Save] button.

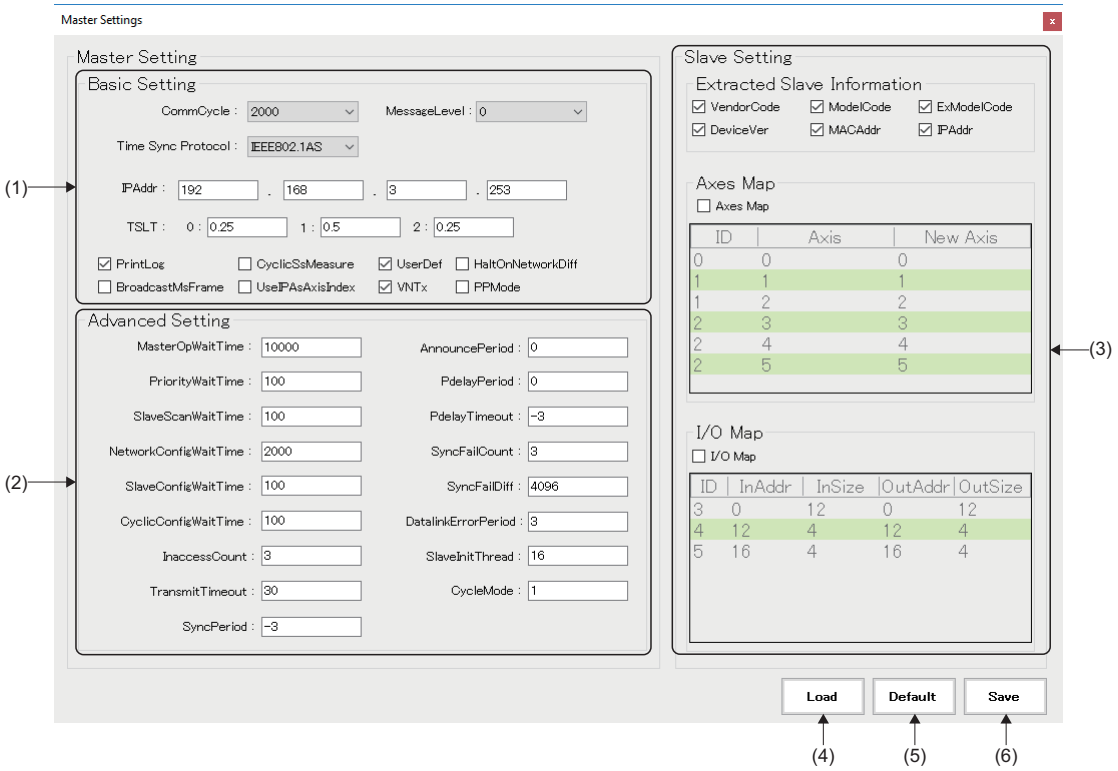
Although the changed parameters are retained until IETSN Configurator is ended, the settings are not applied unless the saving operation is performed.

Point

- The network definition file (cclink_network.def) of the master setting to be saved by [Export Def] ( ) of IETSN Configurator is the same as the file to be generated by writing to the SWMOS engine (clicking the [Save to Engine] button displayed by selecting [SWMOS] ⇨ [Network] ⇨ [Comm1/Comm2] in the navigation window) and is stored in the same folder (C:\Program Files\MotionSoftware\SWM-G\Platform\CCLink). Therefore, it operates with the setting of the last writing operation ([Save to Engine] button or [Create DEF file] ( )).
- The setting written to the SWM-G engine is applied at the communication start.
- If an error occurs when a network definition file is loaded by clicking the [Load] button, the file may be the one written by SWMOS. To load the file with IETSN Configurator, recreate a network definition file with IETSN Configurator.

Window

[Main] ⇨ [Export Def] ( )



Displayed items

Item	Description
(1) Basic Setting	Set the communication cycle and IP address. (☞ Page 182 Basic Setting)
(2) Advanced Setting	Configure the detailed settings related to the CC-Link IE TSN network. *: Normally, use the default settings. For details of the settings, refer to "CC-Link IE TSN Platform ⇨ Network Define (cclink_network.def)" in the following manual. SWM-G User Manual
(3) Slave Setting	Select [UserDef] in [Master Setting] ⇨ [Basic Setting] to configure the slave settings. The parameter settings to be applied to each slave are separated within the network definition (cclink_network.def). (☞ Page 183 Slave Setting)
(4) [Load] button	Loads the parameters from the saved network definition file (cclink_network.def).
(5) [Default] button	Discards the changed parameter settings and restores the default settings.
(6) [Save] button	Saves the set parameters in the network definition file (cclink_network.def).

A

■ Basic Setting

Set the communication cycle and IP address. Set the other parameters as necessary.

Item	Description	Default
Communication cycle (CommCycle)	Set the communication cycle. • Setting value: 125/250/500/1000/2000/4000/8000/16000[μs]	1000[μs]
Message level (MessageLevel)	Set the message level. • 0: Error message only • 1: Error message, warning message • 2: Error message, warning message, setting message • 3: Error message, warning message, setting message, debug message *: This setting overwrites the settings configured in Modules.ini.	0
Time synchronous protocol (Time Sync Protocol)	Select the time synchronous protocol. • IEEE1588v2 • IEEE802.1AS	IEEE802.1AS
IP address (IPAddr)	Set the IP address of the master.	192.168.3.253
Time slot (TSLT)	Set the division ratio of the time slot. • TSLT0: IP communication • TSLT1: CC-Link IE TSN network • TSLT2: Time synchronization	TSLT 0 = 0.25 TSLT 1 = 0.5 TSLT 2 = 0.25
Log output (PrintLog)	Select whether to output the log after the communication stop. • Selected: Log is output. • Not selected: Log is not output.	Selected
CyclicSs frame log output (CyclicSsMeasure)	Select whether to output the log of CyclicSs frame after the communication stop. When this item is enabled, PrintLog is enabled as well. • Selected: Log is output. • Not selected: Log is not output.	Not selected
Network configuration definition (UserDef)	Select whether to load the information of the network configuration defined in the network definition file (cclink_network.def). • Selected: The information of the network configuration is loaded. • Not selected: The information of the network configuration is not loaded.	Not selected
Network configuration discrepancy restriction (HaltOnNetworkDiff)	Select whether to restrict the start of the communication when the defined network configuration is different from the actual network. • Selected: The start of the communication is restricted. • Not selected: The start of the communication is not restricted.	Not selected
Ms frame broadcast setting (BroadcastMsFrame)	Select whether to broadcast the CyclicMs frame. • Selected: The frame is broadcasted. • Not selected: The frame is not broadcasted.	Not selected
Axis index selection (UseIPAsAxisIndex)	Select whether to use the fourth octet in the IP address of the slave as the start value of the axis number. • Selected: Used • Not selected: Not used	Not selected
IP communication selection (VNTx)	Select whether to use the IP communication mixed function. • Selected: Used • Not selected: Not used	Selected
PM motion function selection (PPMode)	Select whether to use the PM motion function. • Selected: Used • Not selected: Not used	Not selected

■ Slave Setting

The communication information of the master is displayed.

Select [UserDef] in [Master Setting] ⇨ [Basic Setting] to configure the slave settings.

The parameter settings applied to each slave can be separated within the network definition (cclink_network.def).

Each displayed item indicates the attribute of the slave information. The master scans through the network and compares it with the defined network configuration when the communication is started. The slave is considered as a match only when all the specified attribute (VendorCode, ModelCode, ExModelCode, DeviceVer, MACAddr, IPAddr) and actual information match (attributes that are not specified are not compared).

Item	Description	Default
VendorCode	Select whether to specify the vendor code of the slave. • Selected: Used • Not selected: Not used	Not selected
ModelCode	Select whether to specify the model code of the slave. • Selected: Specified • Not selected: Not specified	Not selected
ExModelCode	Select whether to specify the extension model code of the slave. • Selected: Specified • Not selected: Not specified	Not selected
DeviceVer	Select whether to specify the device version of the slave. • Selected: Specified • Not selected: Not specified	Not selected
MACAddr	Select whether to specify the MAC address of the slave. • Selected: Specified • Not selected: Not specified	Not selected
IPAddr	Select whether to specify the IP address of the slave. • Selected: Specified • Not selected: Not specified	Not selected
Axes Map	Select whether to enable the axis mapping. • Selected: Enabled • Not selected: Disabled	Not selected
New Axis	Specify the axis numbers when the axis mapping is enabled.	Scanned axis numbers
I/O Map	Select whether to enable the I/O mapping. • Selected: Enabled • Not selected: Disabled	Not selected
InAddr/OutAddr	Specify the address of the input or output.	Assigned from the start in the order of connection
InSize/OutSize	Specify the size of the input or output.	I/O size set in the CUI file

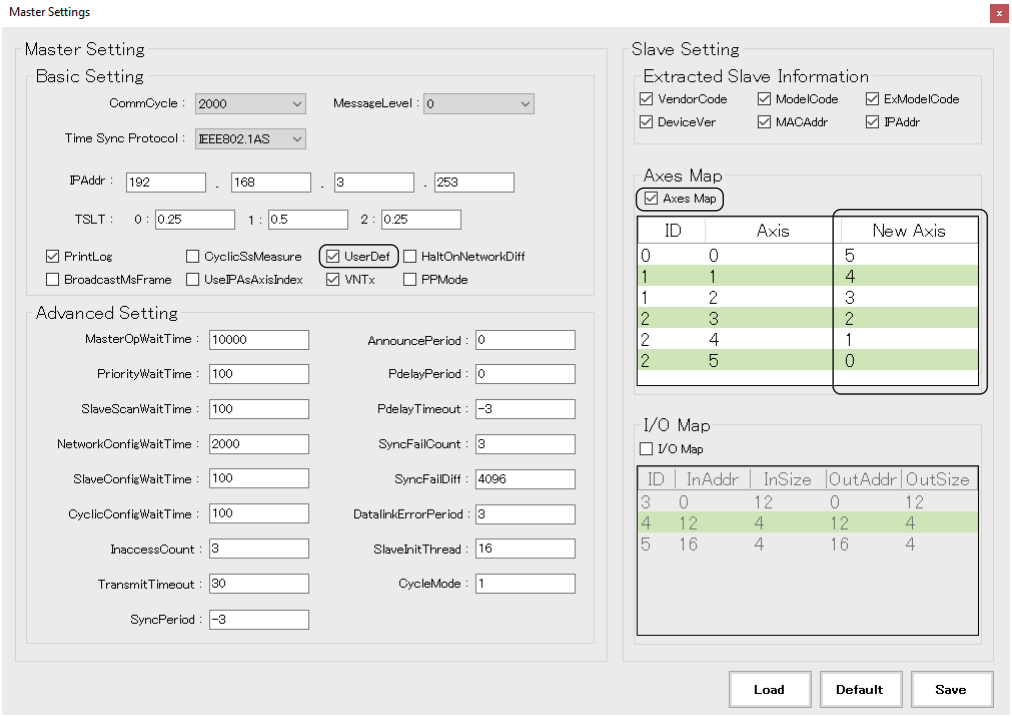
- How to use the axis mapping

  The axis mapping can be used when the communication with the slave device is established.

  Click [Export Def] ( ) to display the "Master Settings" screen.

  Select [UserDef] in "Basic Setting". Selecting [Axes Map] in the slave setting enables editing the list of connected slaves (servo amplifiers) and specifying a number to a new axis.

  Click the [Save] button to update the network definition (cclink_network.def). The settings are applied at the next communication start.



Axes with the same ID in the axis map indicate a multi-axis servo amplifier. The order is in A-axis, B-axis, and C-axis from the top.

In the example in the screen above, the axes are as follows.

ID	Servo amplifier	Axis No.
0	MR-J5-G(-RJ)	5
1	MR-J5W2-G A-axis	3
1	MR-J5W2-G B-axis	4
2	MR-J5W3-G A-axis	2
2	MR-J5W3-G B-axis	1
2	MR-J5W3-G C-axis	0

Set the slave information definition in the network definition (cclink_network.def) as follows.

```
[Slave 0]
IPAddr=192.168.3.1
Axis0=5
[Slave 1]
IPAddr=192.168.3.2
Axis0=3
Axis1=4
[Slave 2]
IPAddr=192.168.3.3
Axis0=2
Axis1=1
Axis2=0
```

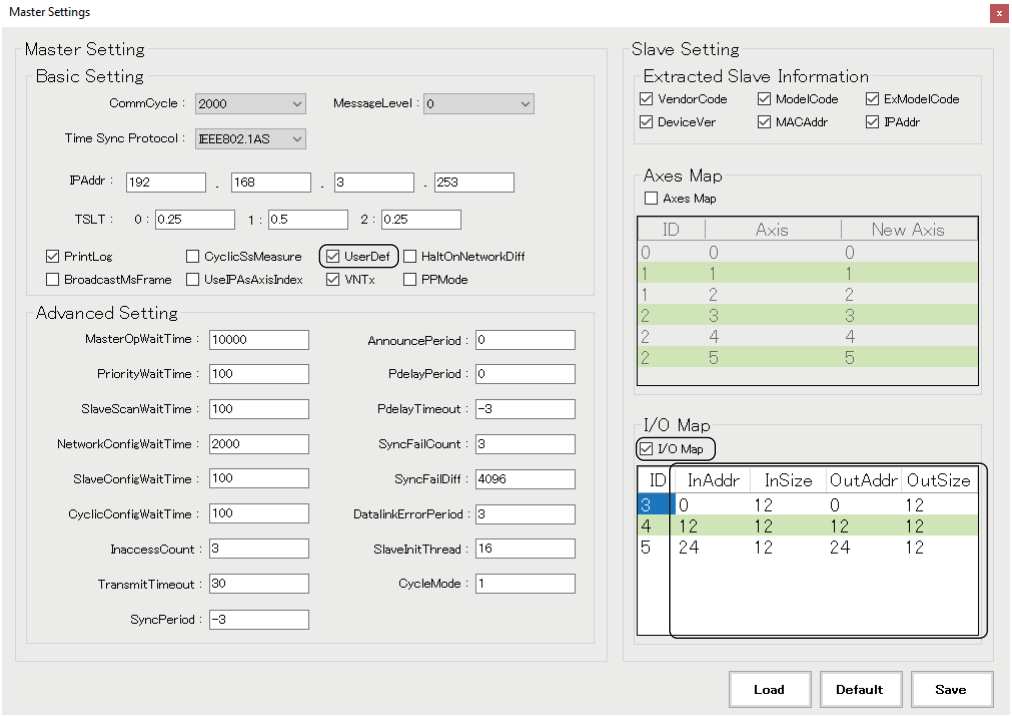
- How to use the I/O mapping

  The I/O mapping can be used when the communication with the slave device is established.

  Click [Export Def] ( ) to display the "Master Settings" screen.

  Select [UserDef] in "Basic Setting". Selecting [I/O Map] in the slave setting enables editing the list of connected slaves (I/O) and specifying a new address and size.

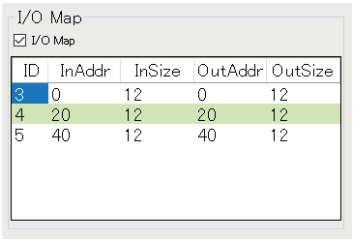
  Click the [Save] button to update the network definition (cclink_network.def). The settings are applied at the next communication start.



In the screen above, the addresses are assigned with the default sizes (bit 4 bytes, word 8 bytes).
The input/output data of each slave can be accessed from the defined addresses.

Ex.

When the addresses are assigned in "20-byte" increments

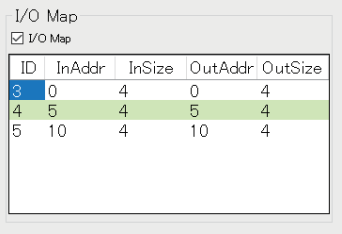


Set the slave information definition in the network definition (cclink_network.def) as follows.

```
[Slave 3]
IPAddr=192.168.3.4
InAddr=0
InSize=12
OutAddr=0
OutSize=12
[Slave 4]
IPAddr=192.168.3.5
InAddr=20
InSize=12
OutAddr=20
OutSize=12
[Slave 5]
IPAddr=192.168.3.6
InAddr=40
InSize=12
OutAddr=40
OutSize=12
```

Ex.

When only the bit data is used (the 8-byte word data is not used) and the addresses are set in "5-byte" increments



ID	InAddr	InSize	OutAddr	OutSize
3	0	4	0	4
4	5	4	5	4
5	10	4	10	4

Set the slave information definition in the network definition (cclink_network.def) as follows.

```
[Slave 3]
IPAddr=192.168.3.4
InAddr=0
InSize=4
OutAddr=0
OutSize=4
[Slave 4]
IPAddr=192.168.3.5
InAddr=5
InSize=4
OutAddr=5
OutSize=4
[Slave 5]
IPAddr=192.168.3.6
InAddr=10
InSize=4
OutAddr=10
OutSize=4
```

Point

For details of the setting by directly editing the network definition (cclink_network.def), refer to "CC-Link IE TSN Platform ⇨ Network Define (cclink_network.def)" in the following manual.

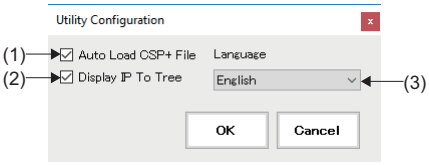
📖SWM-G User Manual

■ Export Config

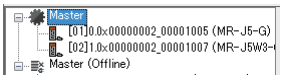
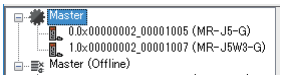
Configure the settings of IETSN Configurator.

Displayed items

[Main] ⇨ [Export Config] ( )



Displayed items

Item	Description
(1) Auto Load CSP+ File	Select whether to load "CSP+ file" stored in the "CSPP" folder automatically when IETSN Configurator is started. • Selected: Loaded automatically • Not selected: Not loaded automatically
(2) Display IP To Tree	Set whether to display IP addresses of slave devices. When this item is selected, the value in the fourth octet of the IP address is displayed at the beginning of each slave name. • Selected: Displayed  • Not selected: Not displayed 
(3) Language	Set the display language of IETSN Configurator. • English: English • 日本語(Japanese): Japanese • 한국어(Korean): Korean • 中文(Chinese): Chinese (Simplified)

A

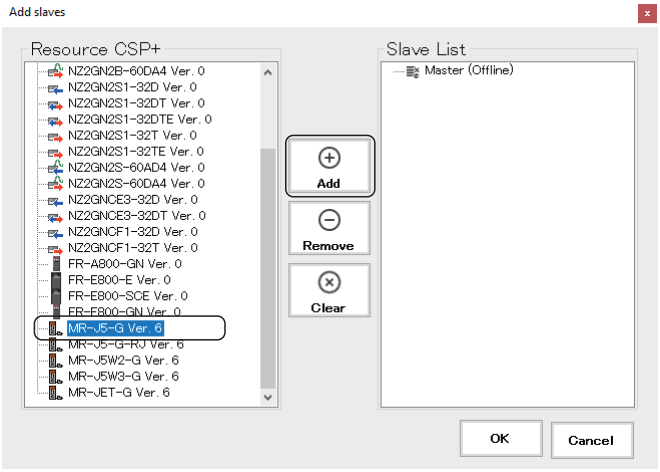
Operation

■ Add Slaves

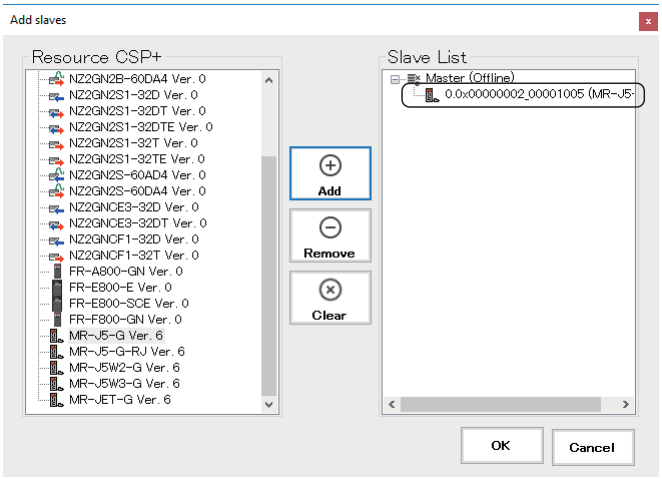
Add an offline slave. The added slave is displayed in the tree under [Master (Offline)] in the network window.

Operating procedure

1. Click [Main] ⇨ [Add Slaves] ( ) in the ribbon to display the "Add slaves" screen.
2. Select the slave to be added (Example: MR-J5-G) from "Resource CSP+", and click the [⊕Add] button.



3. The selected slave is added to "Slave List".



- Select a slave added to "Slave List" and click the [⊖Remove] button to remove it from "Slave List".
- Click the [⊗Clear] button to remove all the slaves added to the slave list.

4. After adding slave devices, click the [OK] button to close the "Add slaves" screen.

■ Clear Message

Clear the message displayed in the message window.

Operating procedure

1. Click [Main] ⇨ [Clear Message] ( ) in the ribbon.
2. The message displayed in the message window is cleared.

Saving

■ Export Slaves

Save the current online slave configuration in a file (.xml).

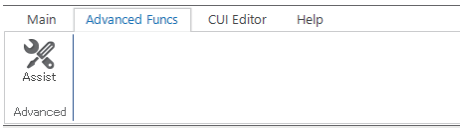
Operating procedure

1. Click [Main] ⇨ [Export Slaves] ( ) in the ribbon to display the "Save As" screen.
2. Set the saving destination and file name of the slave configuration file, and click the [Save] button to save.

A

Advance Funcs Tab

Perform the SDO communication with the slave device.

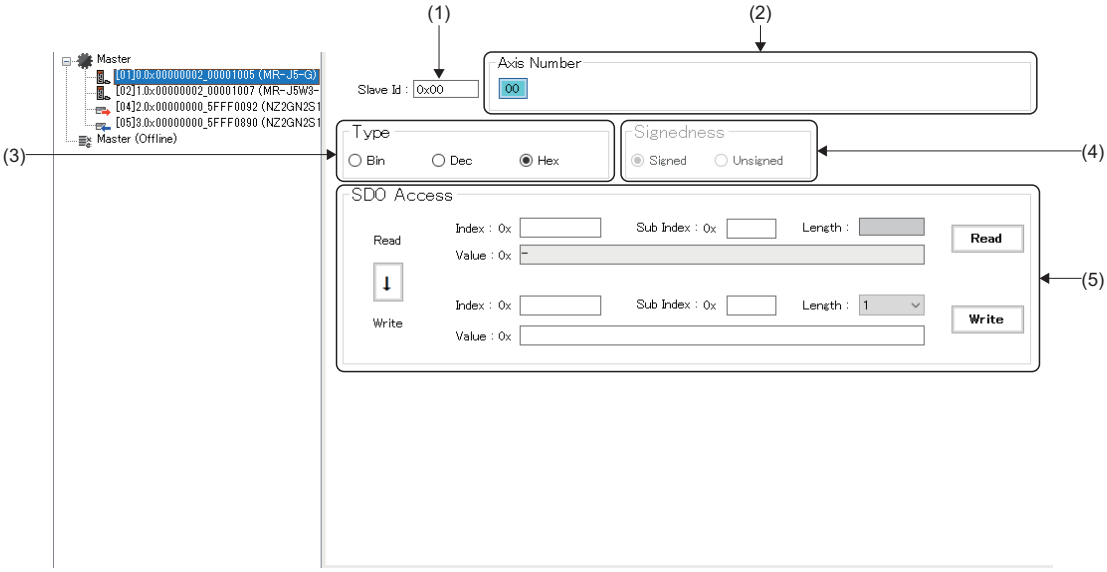


Settings

The information of the slave device is displayed, and the object is read/written.

Window

[Advanced Funcs]



Displayed items

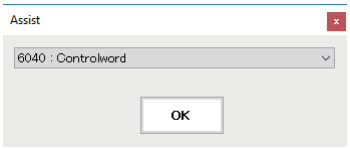
Item	Description
(1) Slave Id	Displays the slave ID of the slave device selected in the network window.
(2) Axis Number	Displays the axis number when a servo amplifier is selected. When a multi-axis servo amplifier is selected, axis numbers for the number of axes are displayed.
(3) Type	Select the data format for values. • Bin • Dec • Hex
(4) Signedness	Select the signedness of values when "Dec" is selected as the type. • Signed • Unsigned
(5) SDO Access	The object is read or written. • Index: Specify the index of the object. • Sub Index: Specify the sub index of the object. • [↓] button: Copies the object information (index/sub index/length) on the reading side to the writing side. • [Read] button: Reads the object specified with the index and sub index. • [Write] button: Writes the specified value to the object specified with the index and sub index.

■ Assist

From the pull-down list in the "Assist" screen, select the object from/to which the SDO value is read/written.

Operating procedure

1. Click [Advanced Funcs] ⇨ [Assist] ( ) in the ribbon to display the "Assist" screen.



2. Select the object from/to which the SDO value is read/written from the pull-down list, and click the [OK] button.

3. The values of the selected object are displayed in the index and sub index on the reading side.

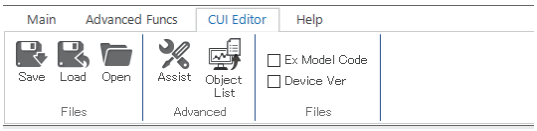
Point

- The index and sub index can be directly entered as well.
- Before writing a value, click the [↓] button to copy the value to the writing side, and click the [Write] button to write the value. Writing a value may fail when the object length is different.

A

CUI Editor Tab

Create a CUI file required for the connection with the slave.



Item		Description	Reference
Files	Save ( )	Generates a CUI file with the set configuration.	☞ Page 197 Saving the CUI file
	Load ( )	Loads a file to check the settings in an existing CUI file.	☞ Page 194 Loading a CUI file
	Open ( )	Opens an existing CUI file.	☞ Page 197 Opening a CUI file
Advanced	Assist ( )	Select the required control functions and perform the PDO mapping.	☞ Page 194 Editing the PDO entry list
	Object List ( )	The object list can be checked when the PDO list is added.	
Files	Ex Model Code	Select whether to add the extension model code to the file name, extension model code, and CUI file name.	☞ Page 197 Saving the CUI file
	Device Ver	Select whether to add the device version to the CUI file name. When selecting this item, select "Ex Model Code" as well.	

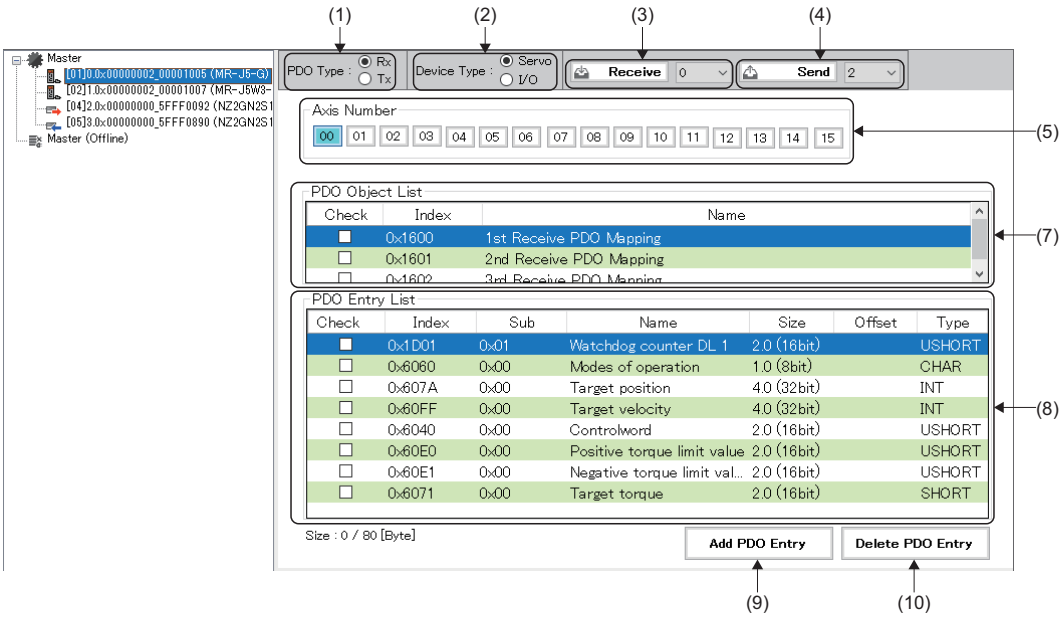
CUI Editor

Select a slave device displayed in the tree of the network window, and edit data to generate a CUI file.

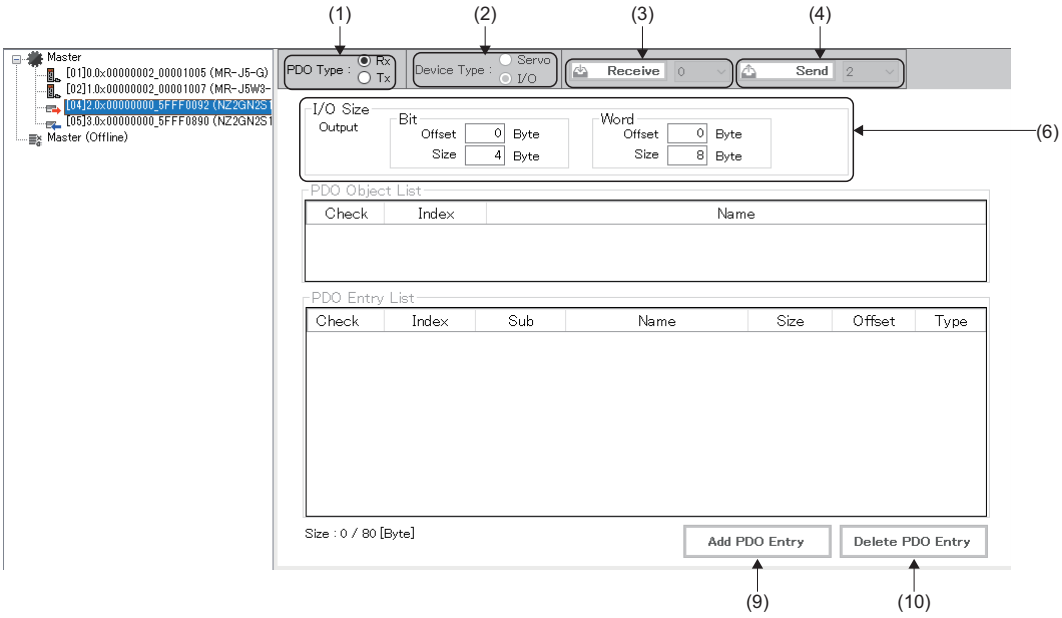
Window

[CUI Editor]

- When a servo amplifier is selected



• When an I/O is selected



Displayed items

Item	Description
(1) PDO Type	Select the PDO type. • Rx: Data received by the slave • Tx: Data sent from the slave
(2) Device Type	Select the device type. • Servo • I/O
(3) Receive	Receives (copies) the PDO mapping information from another axis number in the slave station. The PDO mapping information of the axis number (0 to 15) selected from the pull-down list is received by the PDO mapping information of the axis number (0 to 15) selected in (5).
(4) Send	Sends (copies) the PDO mapping information to another axis number in the slave station. The PDO mapping information of the axis number (0 to 15) selected in (5) is sent to the PDO mapping information of the axis number (0 to 15) selected from the pull-down list.
(5) Axis Number	Select the axis number (0 to 15) to be displayed. For a multi-axis module, use this item to switch the axis when configuring settings for each axis.
(6) I/O Size	Specify the offset and size of the I/O bit and word of the slave to be mapped in the I/O address.
(7) PDO Object List	Displays a list of the PDO mapping objects. Selecting an object from the displayed list switches the PDO entry list.
(8) PDO Entry List	Displays a list of the PDO object list items. PDO entries are added and deleted.
(9) [Add PDO Entry] button	Adds an object to the PDO entry list. Click the [Add PDO Entry] button and add an object from the "PDO Entry List" screen displayed.
(10) [Delete PDO Entry] button	Deletes the selected PDO entry from the PDO entry list.

Creating a CUI file

■ Selecting a slave

Select a slave to create its CUI file.

Operating procedure

1. From the network tree, select a slave to edit its CUI file.

- When the slave is recognized in the online mode, select the corresponding slave.
- When the slave is not recognized or is in offline mode, add the online slave with [Add Slaves] ( ) in the main tab, and select the slave.

■ Loading a CUI file

Load a CUI file that has been created in advance.

When there is no CUI file created in advance, create one by editing the PDO entry list.

Operating procedure

1. Click [CUI Editor] ⇨ [Load] ( ) in the ribbon to display the "Please select a CUI file." screen.
2. Select the CUI file to be loaded, and click the [Open] button.

■ Editing the PDO entry list

Switch "Rx" and "Tx" in "PDO Type", and set the PDO object list and PDO entry list.

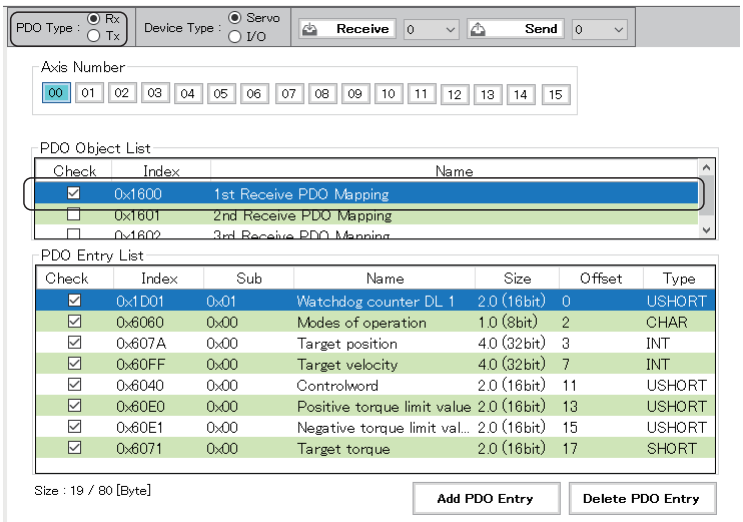
The following describes the example when the items listed below are selected.

PDO Type	PDO Object List
Rx	1st Receive PDO Mapping
Tx	1st Transmit PDO Mapping

Operating procedure

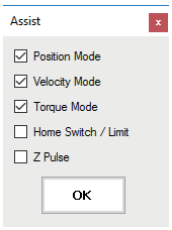
< When editing the PDO entry list is not required (creating it with the default setting) >

1. Select the PDO object lists for the PDO types Rx and Tx.
2. Select all the items in the PDO entry list.

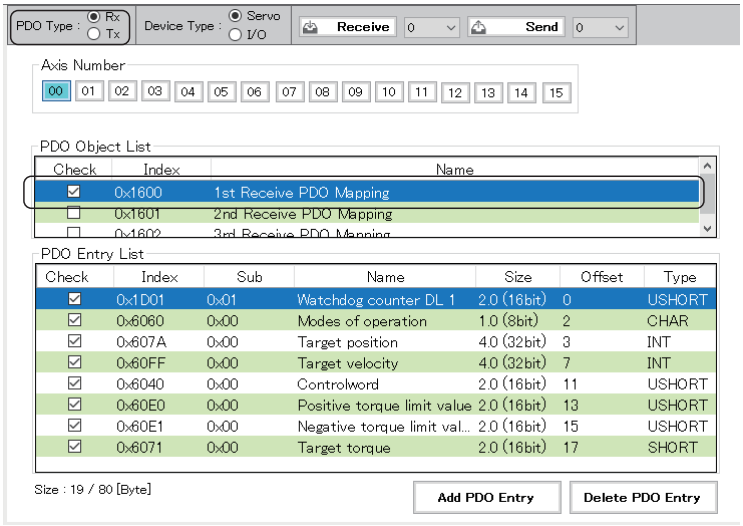


< When configuring settings in the "Assist" screen >

1. Click [CUI Editor] ⇨ [Assist] ( ) in the ribbon to display the "Assist" screen.
2. Select the necessary items and click the [OK] button.

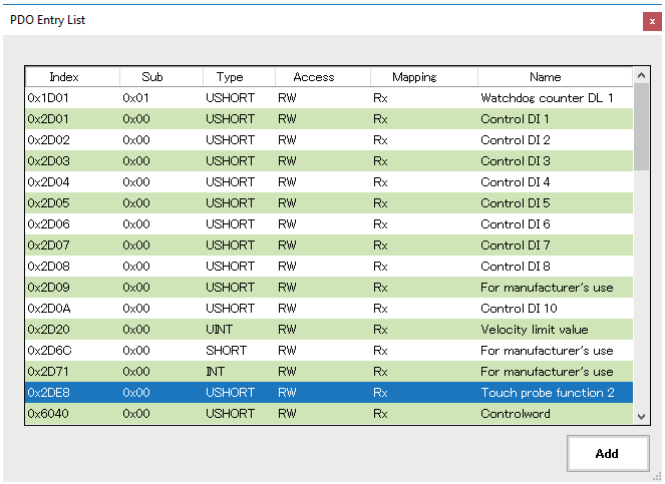


3. Only the objects for the items that selected in the "Assist" screen are selected.



< When individually configuring settings >

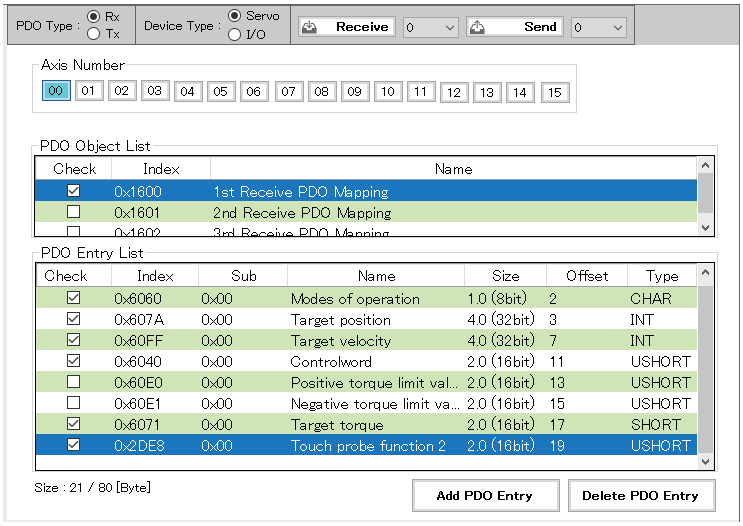
1. Click [CUI Editor] ⇨ [Object List] ( ) in the ribbon, or click the [Add PDO Entry] button to display the "PDO Entry List" screen.
2. Select an object to be added from the "PDO Entry List" screen, and click the [Add] button. When adding objects is completed, click the [×] button in the upper right of the "PDO Entry List" screen.



A

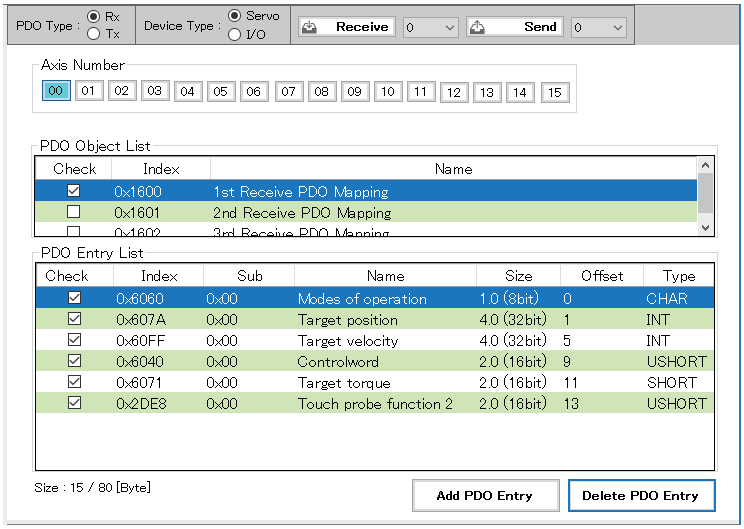
3. Add the objects to the PDO entry list. Select the objects to be used and added objects.

4. Select an object that is not selected in the PDO entry list, and click the [Delete PDO Entry] button.



5. The object is deleted from the PDO entry list. The objects cannot be deleted in a batch. Select the items one by one to delete.

- The objects in the PDO entry list are mapped even when they are not selected, and "0" is always output depending on the object.



■ Saving the CUI file

Save the edited CUI file.

• The saved CUI file is stored in the following folder.

Storage destination folder
C:\cui

• The CUI file is saved with the following file name.
Selecting [CUI Editor] ⇨ [Ex Model Code]/[Device Ver] in the ribbon enables specifying the model code and device code.

○: Selected, ×: Not selected

Ex Model Code	Device Ver	CUI file name
×	×	Vendor code_Model code.txt
○	×	Vendor code_Model code_Extension model code.txt
○	○	Vendor code_Model code_Extension model code_Device version.txt

The CUI file cannot be rewritten during the communication. Rewrite it after the communication is stopped.

The absolute path of the CUI file can be specified in the network definition file (cclink_network.def) when the CUI file is individually defined for each slave device.

For details of the settings, refer to "CC-Link IE TSN Platform ⇨ Network Define (cclink_network.def)" in the following manual.

📖SWM-G User Manual

Operating procedure

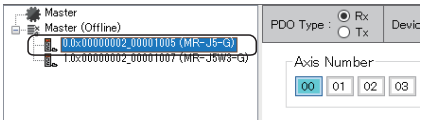
1. Click [CUI Editor] ⇨ [Save] ( ) in the ribbon.
2. If the CUI file has already existed, the confirmation message "Already exists. Do you want to replace it?" appears. Click the [Yes] button to save the CUI file (.txt).
3. When saving the file is completed, the completion message "CUI File is generated successfully." appears. Click the [OK] button to close the screen.

■ Opening a CUI file

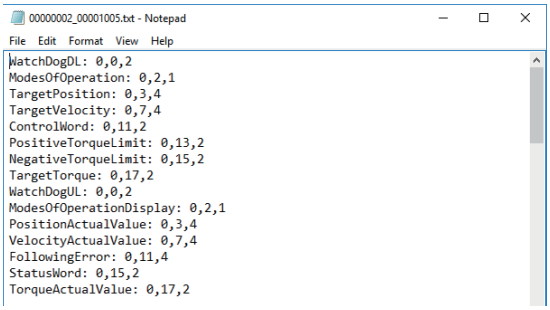
Open a CUI file that has been created in advance.

Operating procedure

1. Select a slave device (example: 0.0x00000002_00001005 (MR-J5-G)) from the network tree.



2. Click [CUI Editor] ⇨ [Open] ( ) in the ribbon.
3. Open the CUI file of the slave device (example: 0.0x00000002_00001005 (MR-J5-G)).



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How to create a CUI file for each device

The following describes how to create a CUI file for each device. The default parameters are described for each setting.

■ For a multi-axis servo amplifier

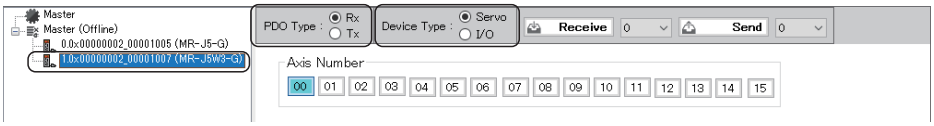
The following describes creating a CUI file for a servo amplifier (MR-J5W3-G).

The following PDO object lists are set in this example.

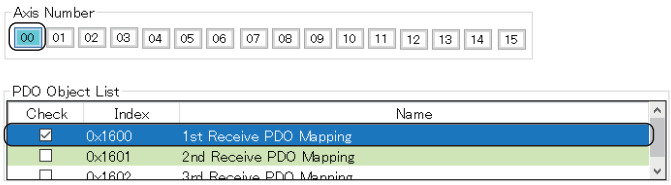
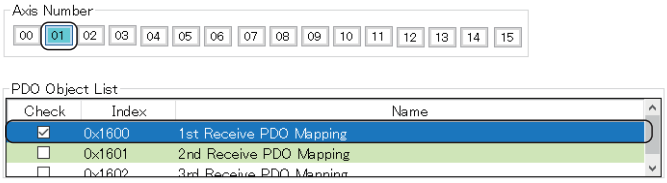
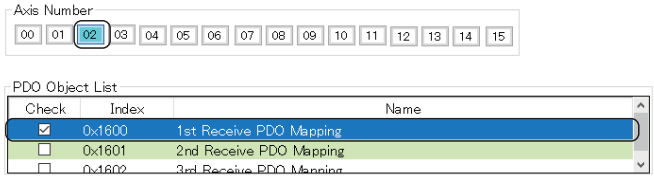
PDO Type	PDO Object List
Rx	1st Receive PDO Mapping
Tx	1st Transmit PDO Mapping

Operating procedure

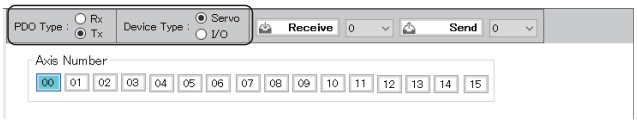
1. Select a slave device (example: 0.0x00000002_00001007 (MR-J5W3-G)) from the network tree.
2. Select "Rx" for the PDO type, and "Servo" for the device type.



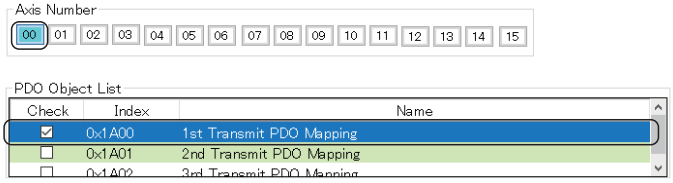
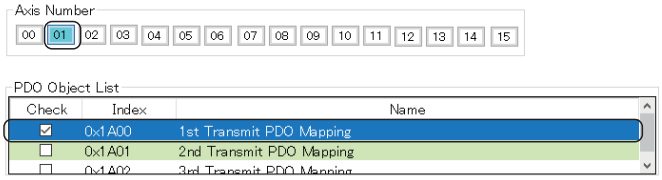
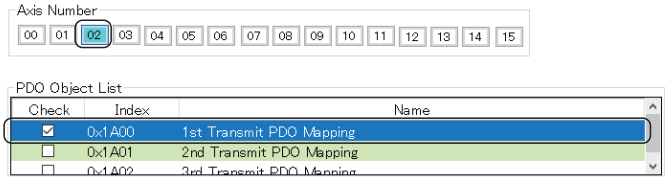
3. Select the axis number, and select the index "0x1600" from the PDO object list.
   Configure the setting for each axis.

Axis number	PDO object list setting
00 (A-axis)	
01 (B-axis)	
02 (C-axis)	

4. Select "Tx" for the PDO type.



5. Select the axis number, and select the index "0x1A00" from the PDO object list.
Configure the setting for each axis.

Axis number	PDO object list setting
00 (A-axis)	
01 (B-axis)	
02 (C-axis)	

6. When the setting is completed, click [CUI Editor] ⇨ [Save] ( ) in the ribbon.

7. If the CUI file has already existed, the confirmation message "Already exists. Do you want to replace it?" appears. Click the [Yes] button to save the CUI file (.txt).

8. When the saving is completed, the completion message "CUI File is generated successfully." appears. Click the [OK] button to close the screen.

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■ For an input/output/IO

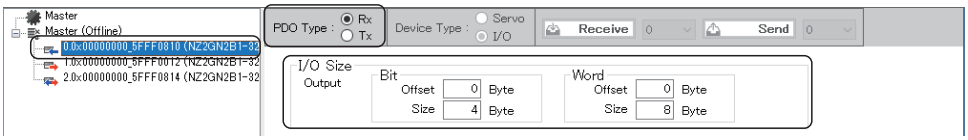
For the cyclic transmission specification, set the number of RX/RY usage to 32 points (4 bytes) and number of RWr/RWw usage to 4 points (8 bytes) in the CUI file.

Operating procedure

1. Select a slave device (example: 0.0x00000000_5FFF0810 (NZ2GN2B1-32D)) from the network tree.

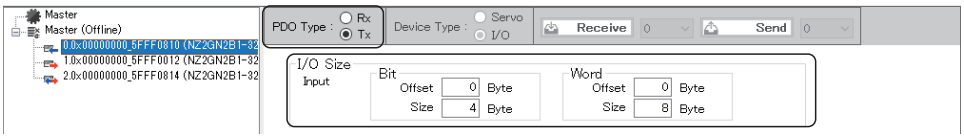
2. Select "Rx" for the PDO type.

3. Set the numbers of points for RX/RY and RWr/RWw in bytes. Set the size of the bit to "4 Byte" and size of word to "8 Byte". Set the offset to "0 Byte".



4. Select "Tx" for the PDO type.

5. Set the numbers of points for RX/RY and RWr/RWw in bytes. Set the size of the bit to "4 Byte" and size of word to "8 Byte". Set the offset to "0 Byte".



6. When the setting is completed, click [CUI Editor] ⇨ [Save] ( ) in the ribbon.

7. If the CUI file has already existed, the confirmation message "Already exists. Do you want to replace it?" appears. Click the [Yes] button to save the CUI file (.txt).

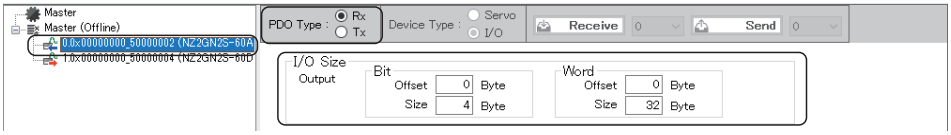
8. When the saving is completed, the completion message "CUI File is generated successfully." appears. Click the [OK] button to close the screen.

■ For an analog input/analog output

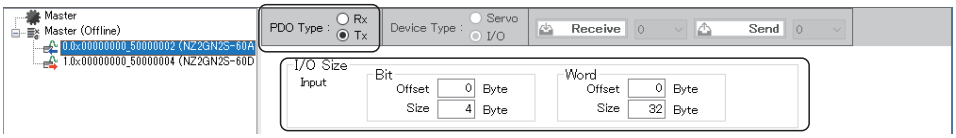
For the cyclic transmission specification, set the following numbers of usage in the CUI file.

Slave device	Number of RX/RY usage	Number of RWr/RWw usage
Analog input	32 points (4 bytes)	16 points (32 bytes)
Analog output	32 points (4 bytes)	32 points (64 bytes)

1. Select a slave device (example: 0.0x00000000_50000002 (NZ2GN2S-60AD4)) from the network tree.
2. Select "Rx" for the PDO type.
3. Set the numbers of points for RX/RY and RWr/RWw in bytes.
   For an analog input, set the size of the bit to "4 Byte" and size of word to "32 Byte". Set the offset to "0 Byte".
   For the analog output, set the size of the bit to "4 Byte" and size of word to "64 Byte". Set the offset to "0 Byte".



4. Select "Tx" for the PDO type.
5. Set the numbers of points for RX/RY and RWr/RWw in bytes.
   For an analog input, set the size of the bit to "4 Byte" and size of word to "32 Byte". Set the offset to "0 Byte".
   For the analog output, set the size of the bit to "4 Byte" and size of word to "64 Byte". Set the offset to "0 Byte".



6. When the setting is completed, click [CUI Editor] ⇨ [Save] ( ) in the ribbon.
7. If the CUI file has already existed, the confirmation message "Already exists. Do you want to replace it?" appears. Click the [Yes] button to save the CUI file (.txt).
8. When the saving is completed, the completion message "CUI File is generated successfully." appears. Click the [OK] button to close the screen.

Connection order of devices

In SWM-G, an ID number is assigned to a slave detected in the network.

The ID number assignment differs depending on the connection method as listed below.

Connection method	ID number
Line topology	ID numbers are assigned in the slave connection order. (From the closest slave to the master)
Star topology	When the slaves are connected in series, ID numbers are assigned in the slave connection order.
Hub connected	In the slave that is directly connected to the output port of the hub, ID numbers are assigned in the ascending order of the IP addresses and the slave connection order.

Axis numbers are assigned to the slaves in the connection order when they are not defined.

The user can specify these slave numbers by defining the slave information with the "UserDef" parameters in the network definition (cclink_network.def). Therefore, the ID number of the slave and the axis number assigned to the slave may not match.

For how to set the axis mapping in "UserDef", refer to the following.

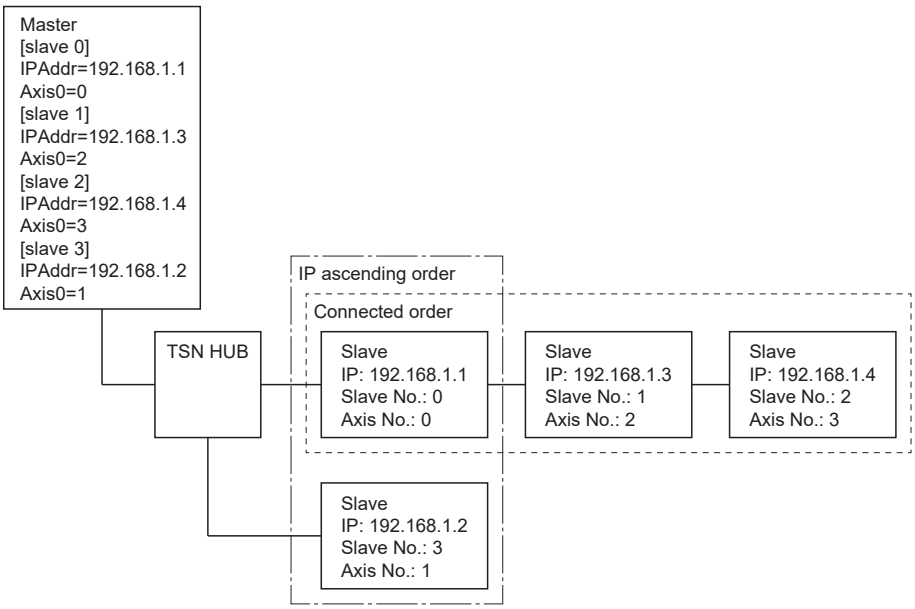
☞ Page 180 Export Def

For details of "UserDef", refer to the following.

📖SWM-G User Manual

Ex.

When the axis numbers are specified



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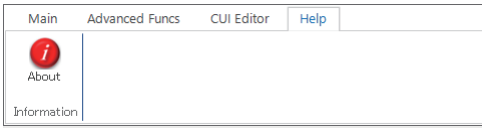
Help Tab

The version of IETSN Configurator can be checked.



Information

■ About

The versions of IETSN Configurator, SSC Api, and CCLink Api can be checked.

Window

[Help] ⇨ [About] ( )

Appendix 6 Adding/Updating a Profile (CSP+) of the Remote Station

A profile is data in which the information (such as model) of the connected device is stored.
The following describes how to add and update a profile.

How to add/update a profile

Add/Update a profile with the following procedure.

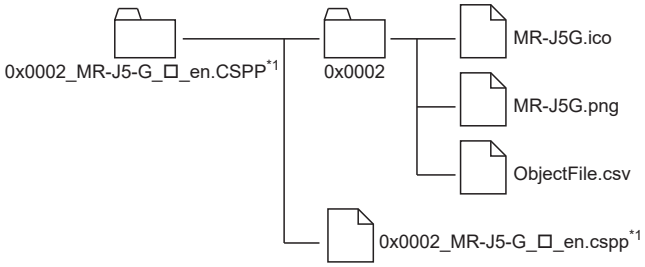
Operating procedure

The profile of the servo amplifier (MR-J5-G) is used as an example.

1. Download the profile of the remote station from the Mitsubishi Electric Factory Automation Global Website.
2. Unzip the downloaded zip file to an arbitrary location. A profile (.zip) for each supported language is stored in the "CSP+" folder.

*1 ☐=Profile version

3. Unzip the profile of the supported language (example: English profile (0x0002_MR-J5-G_☐_en.CSPP.zip*1)) in the "CSP+" folder to an arbitrary location. In the "CSP+" folder, store "CSP+ file(.cspp)" and a sub folder in which "icon file (.ico)", "image file (.png)", and "object file (.csv)" are stored.



*1 ☐=Profile version

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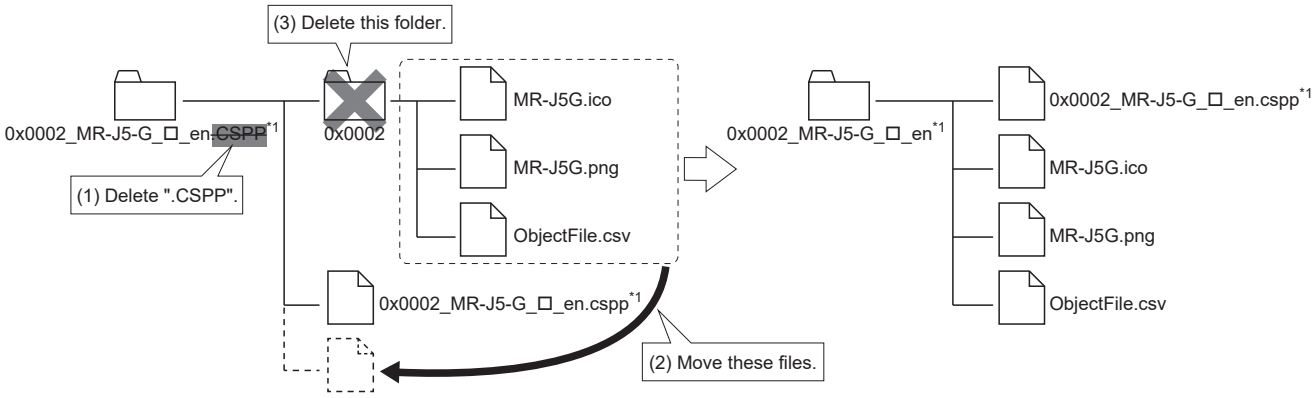
4. Create a folder for registration. Delete ".CSPP" from the name of the folder unzipped and created in step 3. Move all the files in the sub folder to the same hierarchy as the CSP+ file (.cspp), and delete the sub folder "0x0002".



*1 ☐=Profile version

5. Store the CSP+ file. Store the folder created in step 4 in "C:\Program Files\MotionSoftware\SWM-G\CSPP". The added CSP+ file is read at the startup of SWMOS.

Precautions

- Profiles that can be used with SWM-G are automatically added at installation. Profiles can be added manually, but if a profile of a version not supported by SWM-G is added, it will not operate normally. For the supported profiles, contact our sales representative.

MEMO

REVISIONS

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

Revision date	*Manual number	Description
February 2021	IB(NA)-0300563ENG-A	First edition
November 2021	IB(NA)-0300563ENG-B	■Added or modified parts Chapter 1, 4, 5, Section 1.1, 2.3, 3.1, 4.2, 4.3, 7.1, 7.2, 8.1, 8.2, 9.2, Appendix 2, 3
February 2023	IB(NA)-0300563ENG-C	■Added or modified parts Chapter 1, 4, Section 2.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, Appendix 1, 3, 5, 6 ■Delete parts Part 2, Chapter 5, 6, 7
May 2023	IB(NA)-0300563ENG-D	■Added or modified parts Appendix 6

Japanese manual number: IB-0300560-E

WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

For terms of warranty, please contact your original place of purchase.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:

(1) Damages caused by any cause found not to be the responsibility of Mitsubishi.

(2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.

(3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.

(4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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IB(NA)-0300563ENG-D(2305)
MODEL: SWMG-O-E

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS: 1-14, YADA-MINAMI 5-CHOME, HIGASHI-KU, NAGOYA 461-8670, JAPAN