

Personal Computer Embedded Type Servo System Controller

Motion Control Software SWM-G Operating Manual (EcConfigurator)

- MR-SWMG16N1-U
- MR-SWMG32N1-U
- MR-SWMG64N1-U
- MR-SWMG128N1-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. For the safety precautions of the programmable controller system, refer to the user's manual for the module used.

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 ELECTRIC 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 ELECTRIC 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 Electric 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 Electric 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 Electric representative in your region.
- (3) Mitsubishi Electric shall have no responsibility or liability for any problems involving Motion control software trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

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 Motion Control Software SWM-G to handle the product correctly.

Please make sure that the end users read this manual.

Relevant products

MR-SWMG16N1-U, MR-SWMG32N1-U, MR-SWMG64N1-U, MR-SWMG128N1-U

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RELEVANT MANUALS

The following manuals are relevant to this product.

Manual name [manual number]	Description	Available form
Motion Control Software SWM-G Operating Manual (EcConfigurator) [IB-0300617ENG] (this manual)	This manual explains the methods for diagnosing and managing EtherCAT networks of Motion Control Software SWM-G.	e-Manual PDF
Motion Control Software SWM-G User's Manual (Installation) [IB-0300561ENG]	This manual explains the required procedures and settings for installing Motion Control Software SWM-G in a personal computer.	e-Manual PDF
Motion Control Software SWM-G User's Manual (Startup) [IB-0300562ENG]	This manual explains the specifications, procedures before operation, and settings of Motion Control Software SWM-G.	e-Manual PDF
Motion Control Software SWM-G Operating Manual (SWMOS) [IB-0300563ENG]	This manual explains the system configuration, parameter settings, and online function operations of Motion Control Software SWM-G.	e-Manual PDF
SWM-G-N1 User Manual ^{*1} [BCN-B62005-1165ENG]	This manual explains the functions of Motion Control Software SWM-G-N1 (CC-Link IE TSN + EtherCAT edition).	CHM ^{*2}

*1 SWM-G-N1 User Manual is available on the MITSUBISHI ELECTRIC Factory Automation Global Website.

Motion Control Software	Download page
SWM-G-N1	www.mitsubishielectric.com/fa/download/software/detailsearch.page?mode=software&kisyu=/ssc&shiryoid=1000000957&lang=2&select=0&softid=1&infostatus=9_1_3&viewradio=0&viewstatus=&viewpos=

*2 CHM (Microsoft Compiled HTML Help) is a help file manual.

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(W)-G	A generic term for MR-J5-□G(-RJ), MR-J5W□-□G, MR-J5-□G(-RJ)N1, MR-J5W□-□G-N1, MR-JET-□G, and MR-JET-□G-N1 servo amplifiers.
MR-J5-G	An MR-J5-□G□(-RJ) servo amplifier.
MR-J5W-G	An MR-J5W□-□G servo amplifier.
MR-J5-G-N1	An MR-J5-□G(-RJ)N1 servo amplifier.
MR-J5W-G-N1	An MR-J5W□-□G-N1 servo amplifier.
MR-JET-G	An MR-JET-□G servo amplifier.
MR-JET-G-N1	An MR-JET-□G-N1 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	RTX64 is compatible with 64-bit natively.
SWM-G	A generic product name for Motion Control Software SWM-G and Motion Control Software SWM-G (CC-Link IE TSN edition).
SWM-G-N1	A generic product name for Motion Control Software SWM-G-N1 (CC-Link IE TSN + EtherCAT edition).
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 μ s). 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.

1 MAIN FUNCTIONS OF EcConfigurator

EcConfigurator is a tool for diagnosing and managing EtherCAT 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.

1.1 Outline of EtherCAT Setting

Prepare the following files for connection to the EtherCAT compatible devices.

The following files can be easily created in EcConfigurator.

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 22 Export DEF file  Storage destination folder Default: C:\Program Files\MotionSoftware\SWM-G\Platform\EtherCAT  File name ec_network.def
ENI file	A file used for initializing and setting slave devices Define objects, I/O mapping, and others to be used according to the information in the ESI (EtherCAT Slave Information) file. When starting the communication with any slave devices, search the storage destination folder for the corresponding ENI file to use. For details of creating the ENI file, refer to the following.  Page 36 ENI Editor Tab  Storage destination folder C:\eni  File name The matching file found with the following search order (1) Vendor ID_Product code_Revision No._Serial No.txt (2) Vendor ID_Product code_Revision No.txt (3) Vendor ID_Product code_alias_Alias No.txt (4) Vendor ID_Product code.txt Create an ENI file for each product code instead of making it for each slave device. The ENI file (absolute path) can be individually specified with the ec_network.def file.

2 SCREEN CONFIGURATION AND BASIC OPERATION

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

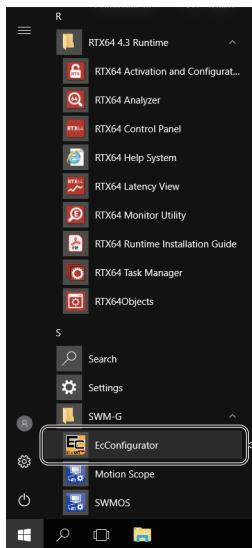
2.1 Start and End

The following describes how to start/end EcConfigurator.

Start

Operating procedure

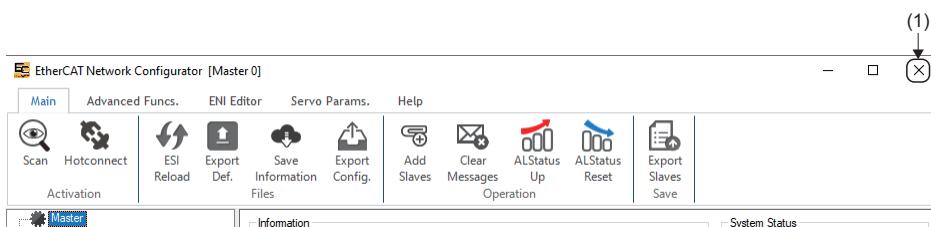
Select [SWM-G] ⇒ [EcConfigurator] (1) from the Windows start menu.



End

Operating procedure

Click the [×] button (1) at the top right of the EtherCAT Network Configurator screen.



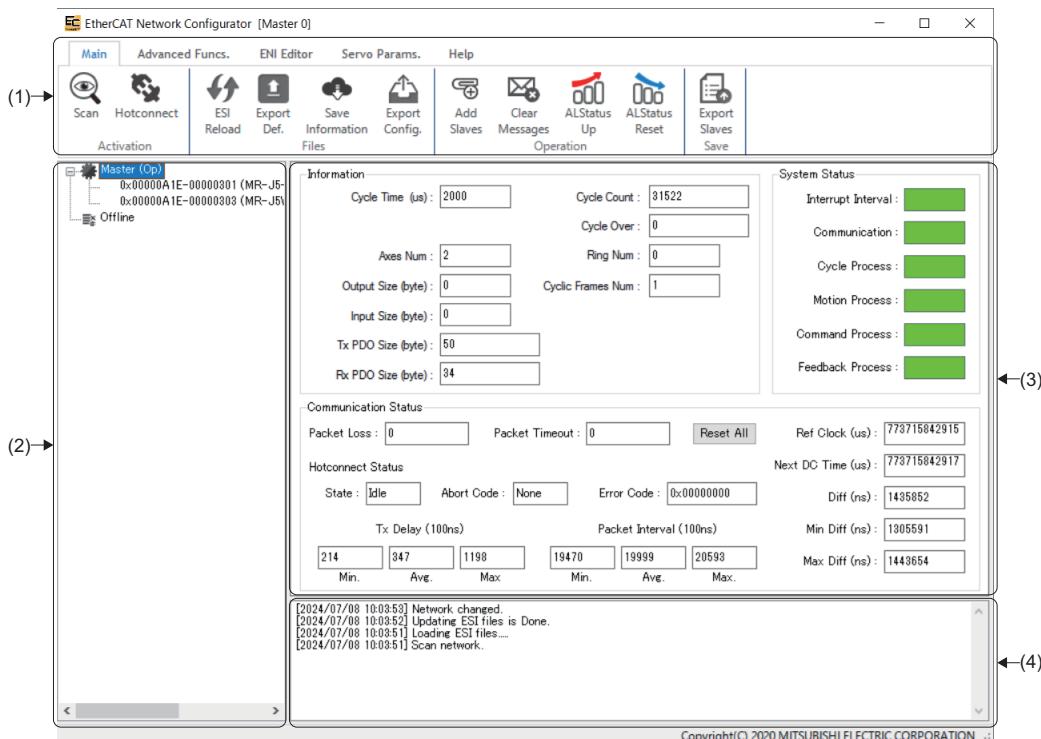
2.2 Screen Configuration

This section describes the screen configuration when EcConfigurator is started.

Overall screen

The following shows the overall screen configuration.

Window



Displayed items

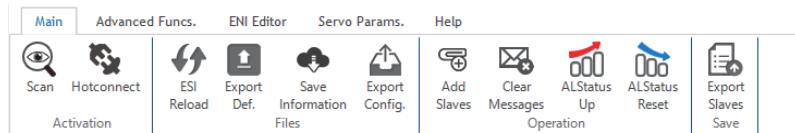
Name	Description
(1) Ribbon	Operation can be performed by switching the Main, Advanced Funcs., ENI Editor, Servo Params., and Help tabs. Operations such as displaying the status of EcConfigurator, establishing SDO communication with the slave devices, and creating the ENI file are conducted from the 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.

3 FUNCTION OF RIBBON

The ribbon enables displaying the status information of EcConfigurator, SDO communication with the slave device, and creating ENI files.

3.1 Main Tab

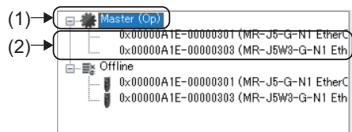
The integrated management function and status information of EcConfigurator are displayed.



Item	Description	Reference
Activation	Scan (🔍)	Page 20 Scan
	Hotconnect (🔗)	Page 20 Hotconnect
Files	ESI Reload (🔄)	Page 21 ESI reload
	Export Def. (📄)	Page 22 Export DEF file
	Save Information (☁️)	Page 25 Save information
	Export Config. (📤)	Page 26 Export configuration file
Operation	Add Slaves (➕)	Page 27 Add slaves
	Clear Messages (✖)	Page 28 Clear messages
	ALStatus Up (⬆️)	Page 28 AL status up
	ALStatus Reset (⬇️)	Page 28 AL status reset
Save	Export Slaves (💾)	Page 28 Export slaves

Network window

When selecting [Main] on the ribbon, the communication information of master or slave devices can be confirmed by selecting [Master] or [Slave device] displayed in the tree of the network window.



Item	Description	Reference
(1) Master	The communication information of the master is displayed.	Page 13 Master communication information
(2) Slave device ^{*1}	The communication information of the slave devices is displayed.	Page 16 Slave communication information

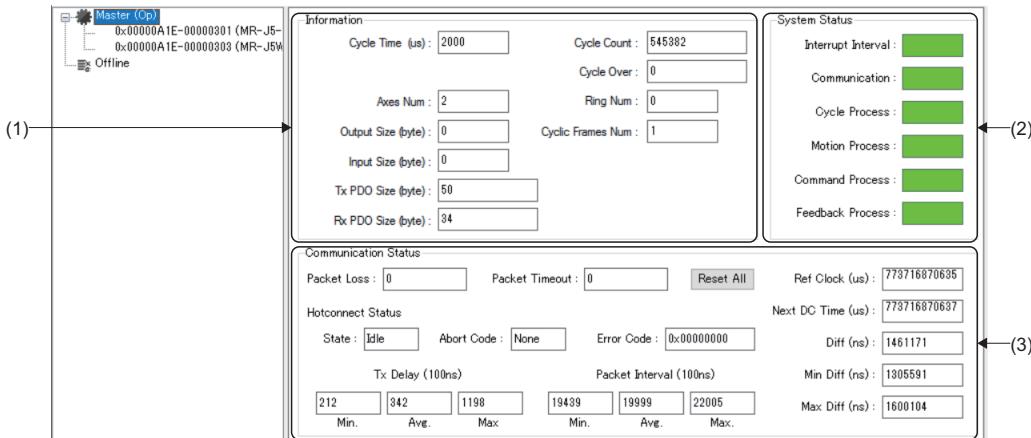
*1 Connected slave device model

Master communication information

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

Window

[Master] in the network window



*: The above shows a screen in the communicating state.

Displayed items

Item	Description
(1) Information	The communication information of the master is displayed. (Page 13 Information)
(2) System Status	The system status is displayed. (Page 14 System status)
(3) Communication Status	The communication status of the master can be checked. (Page 15 Communication status)

Information

Item	Description
Cycle Time (us)	Displays the communication cycle set in the master.
Axes Num	Displays the number of connected axes.
Output Size (byte)	Displays the size of the overall output.
Input Size (byte)	Displays the size of the overall input.
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).
Cycle Count	Displays the number of communication cycles after the SWM-G engine is started.
Cycle Over	Displays the number of cycles in which processing could not be completed within one cycle in the communication cycle.
Ring Num	Displays the number of rings.
Cyclic Frames Num	Displays the number of frames sent at each communication cycle.

■System status

The system status is displayed. Users can check the stability of the system.

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.

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- Interrupt interval

Item	Description
Green	The status is normal.
Yellow	Packet timeouts, etc. may have occurred. It is not a problem if these are temporary.
Orange	The communication load is high. Fix this by reviewing the communication cycle.
Red	Communication is not possible. Fix this by reviewing the settings.

- Communication/Cycle process/Motion process/Command process/Feedback process

Item	Description
Green	Indicates that the rate of data between 0% or more and less than 40% is 90% or more.
Yellow	Indicates that the rate of data between 0% or more and less than 40% is between 60% or more and less than 90%.
Orange	Indicates that the rate of data between 0% or more and less than 40% is between 30% or more and less than 60%. The communication load is high. Fix this by reviewing the communication cycle.
Red	Indicates that the rate of data between 0% or more and less than 40% is less than 30%. Communication is not possible. Fix this by reviewing the settings.

■Communication status

The communication status of the master can be checked. For the meaning of each frame, refer to the following.

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Item		Description
Packet Loss		Displays the number of packet loss.
Packet Timeout		Displays the number of packet timeouts.
Hotconnect Status	State	<p>Displays the current Hotconnect status.</p> <ul style="list-style-type: none"> • Idle: Standby • Running: Executing • Abort: Aborting • Unknown: Unknown
	Abort Code	<p>Displays the Hotconnect error end code.</p> <ul style="list-style-type: none"> • None: No errors occurred • PortOpenError: Port open error occurred • Timeout: The processing time was exceeded • ScanNetworkFailed: Network scan failed • ApplyNewTopologyError: Application of new network topology failed • InitNewSlavesError: Initialization of new slave failed • RecalculateDcError: DC recalculation error • ClearDLEventError: DL event clear error • Unknown: Unknown error
	Error Code	<p>Displays the hotconnect error code.</p> <p>For details of error codes, refer to the following.</p>  SWM-G-N1 User Manual
	Tx Delay (100 ns)	<p>Displays the Tx Delay.</p> <ul style="list-style-type: none"> • Min.: Minimum transmission delay [100 ns] • Avg.: Average transmission delay [100 ns] • Max.: Maximum transmission delay [100 ns]
	Packet Interval (100 ns)	<p>Displays the interval between packets.</p> <ul style="list-style-type: none"> • Min.: Minimum packet interval • Avg.: Average packet interval • Max.: Maximum packet interval
Ref Clock (us)		Displays the Reference Clock.
Next DC time (us)		Displays the Next DC time.
Diff (ns)		Displays the difference between the Ref Clock and the Next DC time.
Min Diff (ns)		Displays the minimum Diff.
Max Diff (ns)		Displays the maximum Diff.
[Reset All] button		Display information can be reset.

Slave communication information

By selecting [Master] ⇒ [Slave device^{*1}] in the network window, the communication information of the slave device^{*1} can be checked.

*1 Connected slave device model

Basic information

Window

[Master] ⇒ [Slave device^{*1}] ⇒ [Basic Information] tab in the network window

*1 Connected slave device model



*: The above shows a screen in the communicating state.

Displayed items

Item	Description
(1) Basic Information	Displays the basic information of the slave device. (参照 Page 16 Basic information)
(2) Status Information	Displays the status information. (参照 Page 17 Status information)
(3) I/O Information	Displays I/O Information when the slave is I/O. (参照 Page 17 I/O information)
(4) Dynamic Information	Displays dynamic information. (参照 Page 17 Dynamic information)
(5) Axes Information	Displays the axes information of the slave device. (参照 Page 17 Axes information)

■Basic information

Item	Description
Slave ID	Displays the slave ID. The number is assigned from "0" in the order of connection.
Vendor ID	Displays the vendor code of the slave device.
Product Code	Displays the product code of the slave device.
Revision No.	Displays the revision number of the slave device.
Serial No.	Displays the serial number of the slave device.
Alias No.	Displays the alias number assigned to make distinguishing between slaves easier.

■Status information

Item	Description
AL Status	Displays the Application layer status. • Boot, Init, PreOp, SafeOp, Op
AL Status Code	Displays the AL status code.
[Boot] button	Sets to the Bootstrap status.
[Init] button	Sets to the Init status.
[PreOp] button	Sets to the PreOp status.
[SafeOp] button	Sets to the SafeOp status.
[Op] button	Sets to the Op status.

■I/O information

Item	Description
Input/Output	<p>Displays the Input/Output address.</p> <ul style="list-style-type: none"> • Addr: Displays the I/O address. • Size: Displays the I/O size. • 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. <p>bit 0 to bit 7</p> <ul style="list-style-type: none"> • Red: OFF • Green: ON

■Dynamic information

Item	Description
Auto Incr.	Displays the physical connection number of the network.
Address	Displays the communication address.
DC Support	Displays whether DC mode is supported or not.
DC Width	Displays the DC width.
Propagation Delay (ns)	Displays the transmission delay time.

■Axes information

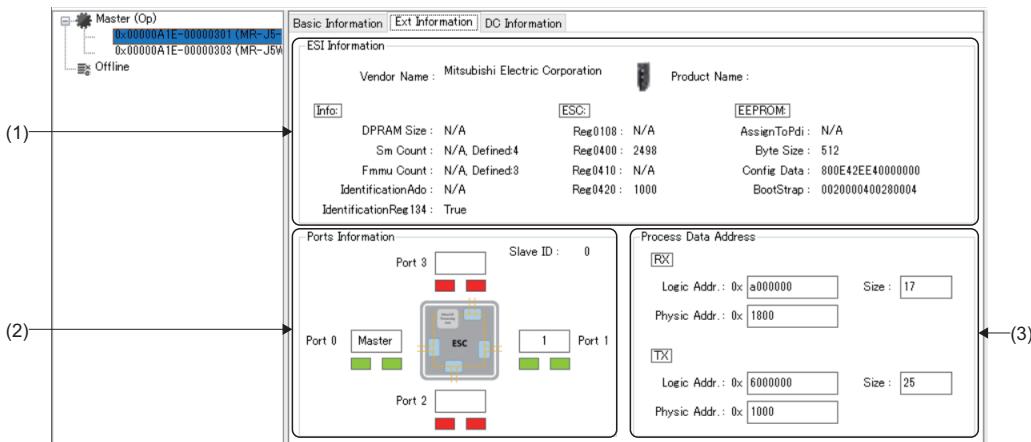
Item	Description															
Axis Num	Displays the number of axes of the slave device.															
Axis Index	Displays the axis index for multiple axes.															
Tx PDO (upper)	<p>Displays the status of Tx PDO mapping of the axis.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Status Word</td> <td>Modes Disp.</td> <td>Act Pos</td> <td>Act Vel</td> <td>Act Trq</td> </tr> <tr> <td>Error Code</td> <td>TP Status</td> <td>TP Pos 1</td> <td>TP Pos 2</td> <td>Following Error</td> </tr> <tr> <td colspan="5" style="text-align: center;">Digital Input</td> </tr> </table> <ul style="list-style-type: none"> • Red: PDO mapping disabled • Green: PDO mapping enabled 	Status Word	Modes Disp.	Act Pos	Act Vel	Act Trq	Error Code	TP Status	TP Pos 1	TP Pos 2	Following Error	Digital Input				
Status Word	Modes Disp.	Act Pos	Act Vel	Act Trq												
Error Code	TP Status	TP Pos 1	TP Pos 2	Following Error												
Digital Input																
Rx PDO (lower)	<p>Displays the status of Rx PDO mapping of the axis.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Control Word</td> <td>Mode Oper.</td> <td>Target Pos</td> <td>Target Vel</td> <td>Target Trq</td> </tr> <tr> <td>Max Trq</td> <td>Pos Trq Limit</td> <td>Neg Trq Limit</td> <td>TP Func</td> <td>Vel Offset</td> </tr> <tr> <td>Trq Offset</td> <td>Max Motor Vel</td> <td>Digital Output</td> <td colspan="2"></td> </tr> </table> <ul style="list-style-type: none"> • Red: PDO mapping disabled • Green: PDO mapping enabled 	Control Word	Mode Oper.	Target Pos	Target Vel	Target Trq	Max Trq	Pos Trq Limit	Neg Trq Limit	TP Func	Vel Offset	Trq Offset	Max Motor Vel	Digital Output		
Control Word	Mode Oper.	Target Pos	Target Vel	Target Trq												
Max Trq	Pos Trq Limit	Neg Trq Limit	TP Func	Vel Offset												
Trq Offset	Max Motor Vel	Digital Output														

Ext information

Window

[Master] ⇒ [Slave device *1] ⇒ [Ext Information] tab in the network window

*1 Connected slave device model



*: The above shows a screen in the communicating state.

Displayed items

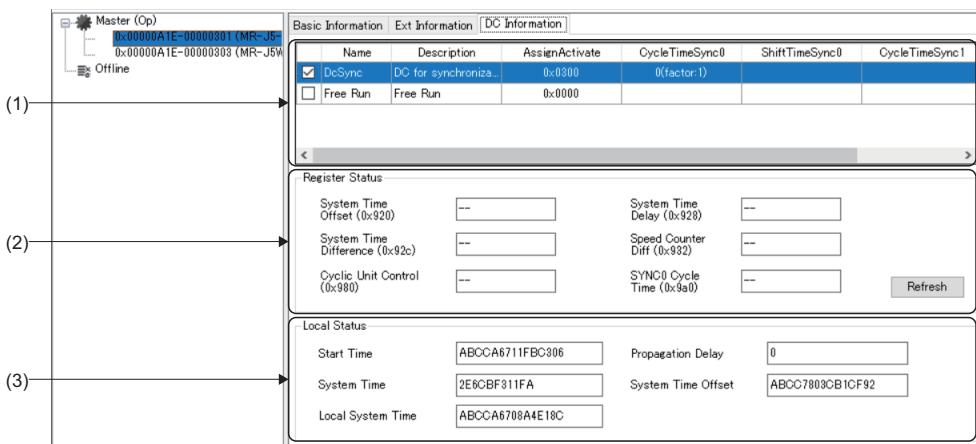
Item	Description
(1) ESI Information	Displays the ESI information.
(2) Ports Information	The communication status between the slave number and the next connected slave is displayed here. <ul style="list-style-type: none"> Red: Unconnected port Green: Connected port
(3) Process Data Address	Displays PDO data related information.

DC information

Window

[Master] ⇒ [Slave device *1] ⇒ [DC Information] tab in the network window

*1 Connected slave device model



*: The above shows a screen in the communicating state.

Displayed items

Item	Description
(1) Information	Displays the synchronized and unsynchronized status.
(2) Register Status	Displays the register status. Click the [Refresh] button to refresh the register status.
(3) Local Status	Displays statuses for start time, system time, etc.

Activation

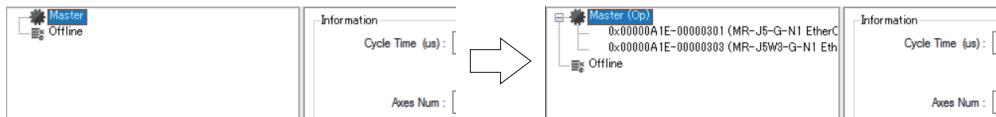
Scan

This function performs a scan through the network.

If a slave device is connected after EcConfigurator is started, load the information of the connected slave device.

Operating procedure

1. Click [Main] ⇄ [Scan] (🔍) on the ribbon.
2. The scanned slave devices are added under the [Master] tree on the network window.



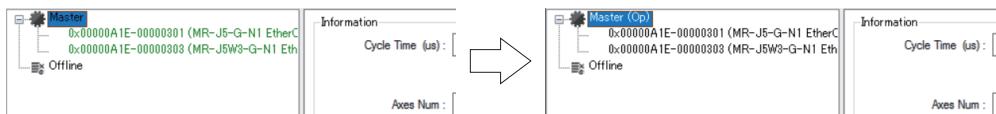
Hotconnect

This function reconnects any added slave devices.

If the slave device is added in the network connection, use the Hotconnect function to connect it without affecting the other slave devices.

Operating procedure

1. Click [Main] ⇄ [Hotconnect] (🔗) on the ribbon.
2. Reconnect the network.



Files

3

ESI reload

This function loads a list of registered ESI files.

Normally when automatic loading is enabled, ESI files are loaded automatically when EcConfigurator is started.

Perform ESI loading when automatic loading is disabled or when updating the ESI file list.

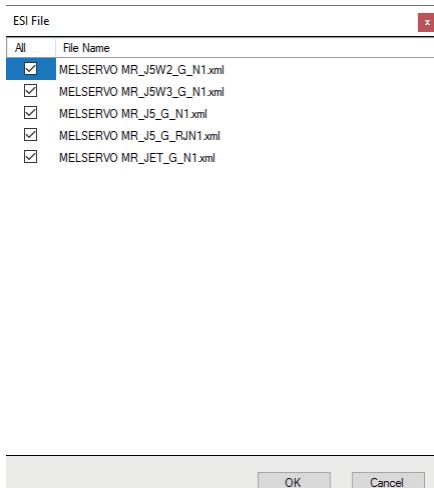
Set automatic load on "Auto Load ESI File" on the "Utility Configuration" screen. (☞ Page 26 Export configuration file)



The ESI file is data definition file related to EtherCAT communication, and is provided by the slave manufacturer.

Operating procedure

1. Click [Main] ⇄ [ESI Reload] (⟳) on the ribbon to display the "ESI File" screen.
2. ESI file information which is loaded at the start can be confirmed.



3. Check the ESI files to be loaded, then click the [OK] button. The checked ESI files will be reloaded.

■How to add/update ESI files

This section describes how to add and update ESI files.

Operating procedure

The following describes the example of adding ESI files of servo amplifier (MR-J5(W)-G).

1. Download ESI files of the slave devices from the MITSUBISHI ELECTRIC Factory Automation Global Website.

<Example>

- For MR-J5-G-N1
 - MELSERVO MR_J5_G_N1.xml
 - MELSERVO MR_J5_G_RJN1.xml
 - MELSERVO MR_J5W2_G_N1.xml
 - MELSERVO MR_J5W3_G_N1.xml
- For MR-JET-G-N1
 - MELSERVO MR_JET_G_N1.xml

2. Save the ESI file obtained in step 1 to the following folder.

Storage destination folder

C:\Program Files\MotionSoftware\SWM-G\ESI

3. Click [Main] ⇄ [ESI Reload] (⟳) on the ribbon to reload the file.

Export DEF file

Set the parameters of the network definition file on the "Network Definition" screen.

Network definition files (ec_network.def) can be easily created by changing parameters as required and saving the changes.

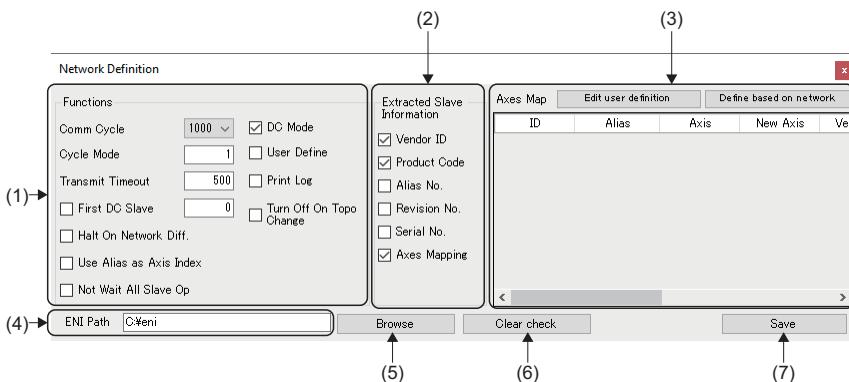
All parameters in the "Network Definition" screen are displayed in their default status. The network definition file

(ec_network.def) can be updated by changing the necessary parameters and pressing the [Save] button.

Any changed parameters will be maintained until EcConfigurator is closed, but if these parameters are not saved, they will not be reflected.

Window

[Main] ⇒ [Export Def.] (↑)



Displayed items

Item	Description
(1) Functions	Set the communication cycle. (☞ Page 22 Functions)
(2) Extracted Slave Information	Obtain the slave information to display on the axis map list. (☞ Page 23 Extracted slave information)
(3) Axes Map	Check the [User Define] box and set the axis map. (☞ Page 23 Axes map)
(4) ENI Path	Displays the storage destination of the ENI files.
(5) [Browse] button	Set the folder to save the ENI file. Set the folder to save ENI file on the "Browse For Folder" screen displayed after clicking the [Browse] button.
(6) [Clear check] button	Unchecks all the items selected on the "Network Definition" screen.
(7) [Save] button	Saves the set parameters to the network definition file (ec_network.def).

Functions

Set the communication cycle. Set the other parameters when required.

Item	Description	Default
Comm Cycle	Set the communication cycle. • Setting value: 125, 250, 500, 1000, 2000, 4000 [μs]	1000 [μs]
Cycle Mode	Set the number of cycles until frame processes sent by the master starts. • Setting value: 0 to 3	1
Transmit Timeout	Set the wait time before a packet is considered timed out. Set to 500 [μs] or more. • Setting value: 500 to 2147748364 [μs]	500 [μs]
First DC Slave	Specify the slave to be the DC master. The index counts from 0 in the order of the EtherCAT network slaves. • Setting value: 0 to number of axes of the licensed product	0
Halt On Network Diff.	Select whether to restrict the start of the communication when the defined network configurations are 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
Use Alias as Axis Index	Select whether to assign slave axis numbers based on alias numbers instead of slave IDs. • Selected: Based on alias numbers • Not selected: Based on Slave IDs	Not selected

Item	Description	Default
Not Wait All Slave Op	Select whether to have the communication start even if all slaves are not operational. The communication starts normally even if all slaves are not operational after waiting time has elapsed. If unchecked, communication will not be possible unless slaves have become operational after the wait time has elapsed. • Selected: Communication starts. • Not selected: Communication does not start.	Not selected
DC Mode	Select enable/disable for DC synchronization. • Selected: DC enabled • Not selected: DC disabled	Selected
User Define	Select whether to load the network information definition defined in the network definition file (ec_network.def). • Selected: Network information definition is loaded. • Not selected: Network information definition is not loaded.	Not selected
Print Log	Select whether to output logs after communication stops. • Selected: Logs are output. • Not selected: Logs are not output.	Not selected
Turn Off On Topo Change	Select whether to turn OFF the communication automatically if network topology changes while communication is in progress. • Selected: Communication is turned OFF. • Not selected: Communication is not turned OFF.	Not selected

■Extracted slave information

Obtain slave information to display on the axis mapping list.

Parameter settings can be divided so that they can be applied to each slave in the network definition (ec_network.def).

Each displayed item represents an attribute of slave information. When a master starts communication, it scans the network and compares it to the defined network configuration. The specified attributes (Vendor ID, Product Code, Alias No., Revision No., Serial No.) are checked against actual information and only when they all match will the slave be considered matching.

Item	Description	Default
Vendor ID	Select whether to obtain the Vendor ID of the slave. • Selected: Specified • Not selected: Not specified	Selected
Product Code	Select whether to obtain the product code of the slave. • Selected: Specified • Not selected: Not specified	Selected
Alias No.	Select whether to obtain the alias of the slave. • Selected: Specified • Not selected: Not specified	Not selected
Revision No.	Select whether to obtain the revision number of the slave. • Selected: Specified • Not selected: Not specified	Not selected
Serial No.	Select whether to obtain the serial number of the slave. • Selected: Specified • Not selected: Not specified	Not selected
Axes Mapping	Select whether to enable the axes mapping. • Selected: Enabled • Not selected: Disabled *: This cannot be used for configurations including multi-axis servo amplifier. This requires the network definition file (ec_network.def) to be directly edited.	Selected

■Axes map

Check [User Define] on the "Network Definition" screen to set the axis mapping.

Item	Description
Axes Map	Edits the network definition (ec_network.def).
[Edit user definition] button	Loads the saved network definition (ec_network.def).
[Define based on network] button	Loads the connection statuses of the connected slaves.

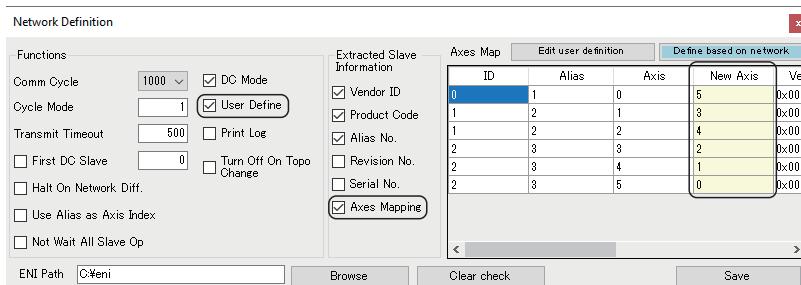
- How to use the axes map

Click [Export Def.] () to display the "Network Definition" screen.

Clicking the [Define based on network] button when communication has been established with the slave devices loads the status of connected slaves, allowing for the statuses of the slaves to be confirmed.

Stop the communication with the slave devices and select the check box of [User Define] of Functions. Checking [Axes Mapping] of Extracted Slave Information allows the list of the slave (servo amplifier) to be edited and axis number can be specified in "New Axis".

Click the [Save] button to update the network definition (cclink_network.def). This is reflected when communication is started next time.



Axis mapping with the same Slave IDs represents the multi-axis servo amplifier and the order is A-axis, B-axis, and C-axis from the top.

The following shows the example above.

ID	Alias	Servo Amplifier	Axis No.
0	1	MR-J5-G(-RJ)N1	5
1	2	MR-J5W2-G-N1 A-axis	3
1	2	MR-J5W2-G-N1 B-axis	4
2	3	MR-J5W3-G-N1 A-axis	2
2	3	MR-J5W3-G-N1 B-axis	1
2	3	MR-J5W3-G-N1 C-axis	0

The slave information definition inside the network definition (ec_network.def) is as described below.

[Slave 0]
Axis0=5

[Slave 1]
Axis0=3
Axis1=4

[Slave 2]
Axis0=2
Axis1=1
Axis2=0



For details of settings when directly editing the network definition (ec_network.def), refer to "EtherCAT Platform ⇒ Network Definition (ec_network.def)" in the following manual.

SWM-G-N1 User Manual

Save information

This function saves the communication information to the file (.txt) during communication.

The communication information cannot be saved if communication has not started.

Master communication information, slave basic information, and network information are saved in the communication information file.

Operating procedure

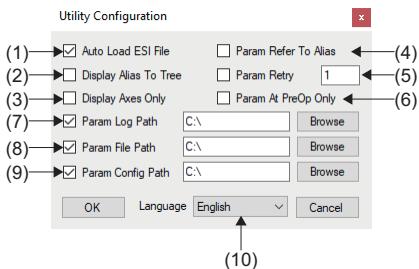
1. Click [Main] ⇄ [Save Information] (저장) on the ribbon to display the "Save as" screen.
2. Set the destination to save the communication information and the file name, then click the [Save] button to save it.

Export configuration file

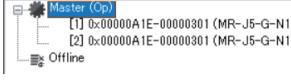
Set up EcConfigurator.

Window

[Main] ⇄ [Export Config.] (↑)



Displayed items

Item	Description
(1) Auto Load ESI File	Select whether to load the "ESI file" saved in the "ESI" folder automatically when EcConfigurator is started. <ul style="list-style-type: none">Selected: Automatically loadedNot selected: Not automatically loaded
(2) Display Alias To Tree	Set whether to display the IP of the slave devices. When "Selected", the alias No. will be displayed before the slave. <ul style="list-style-type: none">Selected: DisplayedNot selected: Not displayed  
(3) Display Axes Only	Set whether to turn OFF all display of devices other than the servo drive in the network window. <ul style="list-style-type: none">Selected: Devices other than the servo drive are not displayed.Not selected: Devices other than the servo drive are displayed.
(4) Param Refer To Alias	Select whether to display an error message on the message window based on axis numbers or alias numbers. Set to generate messages using the alias number instead of the axis number when an error message appears on the screen. <ul style="list-style-type: none">Selected: Displays based on alias numbers.Not selected: Displays based on axis numbers.
(5) Param Retry	Set the number of retries for parameter write. <ul style="list-style-type: none">Setting range: 0 to 10
(6) Param At PreOp Only	Select whether to write [Parameters] when the master status is other than OP. <ul style="list-style-type: none">Selected: Write only when master status is OP.Not selected: Write when master status is anything other than OP.
(7) Param Log Path	Set the path of the parameter log. The execution log of the parameter is recorded. <ul style="list-style-type: none">Default: C:\
(8) Param File Path	Set the storage path of the parameter file. This is the path that opens when the parameter [Read] button is pressed. <ul style="list-style-type: none">Default: C:\
(9) Param Config Path	Set the storage path of the parameter setting file (*.cfg) <ul style="list-style-type: none">Default: C:\
(10) Language	Select the display language of EcConfigurator. <ul style="list-style-type: none">English: English日本語(Japanese): Japanese한국어(Korean): Korean中文(Chinese): Chinese (Simplified)

Operation

3

Add slaves

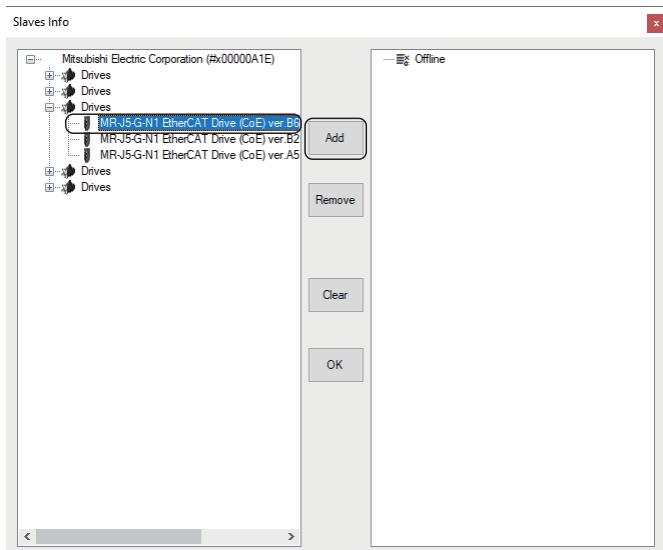
This function adds offline slaves.

The added slaves are displayed under the [Offline] tree on the network window.

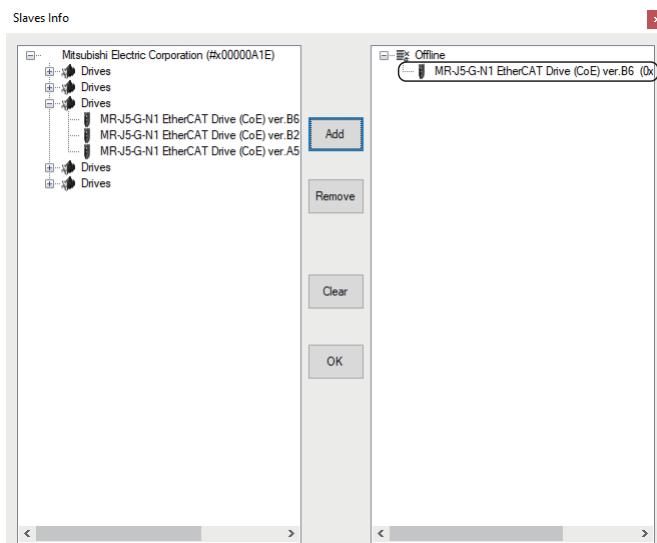
When multiples of the same connected slave device exist, add only one of them from the slave device selection and the settings are reflected to the same slave devices.

Operating procedure

1. Click [Main] ⇒ [Add Slaves] (⊕) on the ribbon to display the "Slaves Info" screen.
2. Select the slave to add (example: MR-J5-G) from the list on the left and click the [Add] button.



3. The selected slave is added to the list on the right.



- Selecting the added slave on the list on the right and clicking the [Remove] button deletes the slave from the list.
- Clicking the [Clear] button deletes all slaves added from the list on the right.

4. After the addition has completed, click the [OK] button to close the "Slaves Info" screen.

Clear messages

This function clears the message in the message window ( Page 11 Overall screen).

Operating procedure

1. Click [Main] ⇒ [Clear Messages] () on the ribbon.
2. The messages in the message window are cleared.

AL status up

This function advances the AL status of the slave.

Operating procedure

1. Click [Main] ⇒ [ALStatus Up] () on the ribbon.
2. Advance the AL status from "Boot" → "Init" → "PreOp" → "SafeOp" by clicking on [AL Status Up] () each time.

AL status reset

This operation returns the AL status of the slave to "Init".

Operating procedure

1. Click [Main] ⇒ [ALStatus Reset] () on the ribbon.
2. Return the AL status to "Init".

Save

Export slaves

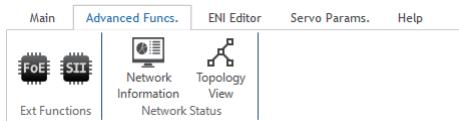
This operation saves the current online slave configuration to a file (.xml).

Operating procedure

1. Click [Main] ⇒ [Export Slaves] () on the ribbon to display the "Save as" screen.
2. Set the destination to save the slave configuration file and the file name, then click the [Save] button to save it.

3.2 Advanced Funcs. Tab

This function allows communication with the slave devices.

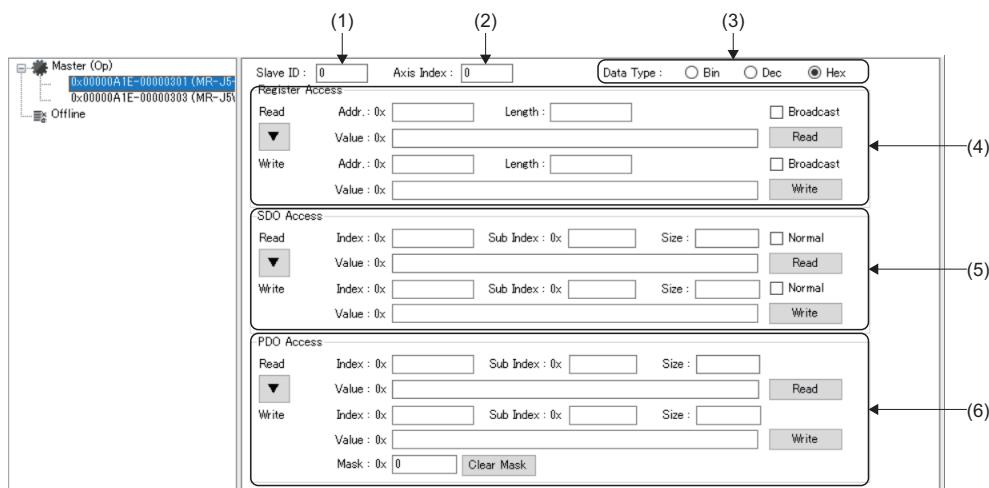


Item	Description	Reference
Ext Functions	FoE (FoE)	Page 31 FoE
	SII (SII)	Page 33 SII
Network Status	Network Information (Network Information)	Page 34 Network information
	Topology View (Topology View)	Page 35 Topology view

3

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 Index	Displays the slave axis index.
(3) Data Type	Select the data format for values. <ul style="list-style-type: none"> • Bin (Binary) • Dec (Decimal) • Hex (Hexadecimal)
(4) Register Access	The address of the slave register can be read or written. <ul style="list-style-type: none"> • Addr.: Specifies the register address. • Length: Specifies the data size. • Broadcast: Writes/reads data to/from all slave register address. • [▼] button: Copies all reading side address information (address/size) to the writing side. • [Read] button: Reads data from the specified slave register address. • [Write] button: Writes data to the specified slave register address.
(5) SDO Access	Objects can be read or written. <ul style="list-style-type: none"> • Index: Specifies the index of the object. • Sub Index: Specifies the sub index of the object. • Size: Displays the size of the object. • Value: Specifies the value to write to the object. • Normal: Select the check box when the object size to access exceeds 4 bytes. • [▼] button: Copies the object information (Index/Sub Index/Size) 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.

Item	Description
(6) PDO Access	<p>Objects can be read or written.</p> <ul style="list-style-type: none"> • Index: Specifies the index of the object. • Sub Index: Specifies the sub index of the object. • Size: Displays the size of the object. • Value: Specifies the value to write to the object. • Mask: Set when changing only the specified bit. • [▼] button: Copies the object information (Index/Sub Index/Size) on the reading side to the writing side. • [Read] button: Reads the object specified with Index and Sub Index. • [Write] button: Writes the specified value to the object specified with Index and Sub Index. • [Clear Mask] button: Stops writing data.

Ext Functions

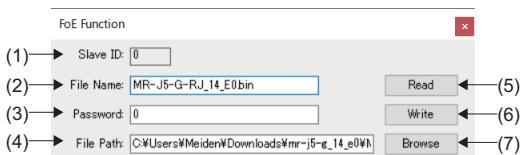
3

FoE

Files can be read and written via EtherCAT.

Window

[Advanced Funcs.] ⇒ [FoE] (FoE)



Displayed items

Item	Description
(1) Slave ID	Displays the ID of the slave device selected in the network window.
(2) File Name	Displays the name of the selected file. The file can be selected using the [Browse] button.
(3) Password	Set a password. *: Set "0" for the password.
(4) File Path	Displays the location to store the selected file. The storage location of the file can be selected using the [Browse] button.
(5) [Read] button	Executes reading.
(6) [Write] button	Executes writing.
(7) [Browse] button	Select a file to be set. Select a location to save the file and the file name in the "Save As" screen that is displayed by clicking the [Browse] button.

■Update procedure for servo amplifier firmware by FoE (File Access over EtherCAT)

By using FoE, servo amplifier firmware can be updated via EtherCAT.

Servo amplifier firmware can be downloaded on the MITSUBISHI ELECTRIC Factory Automation Global Website.

The target servo amplifier model names and the system file names are shown below.

Servo amplifier	System file name *1*2
MR-J5-□G-N1	MR-J5-G_*_□.bin
MR-J5-□G-RJN1	MR-J5-G-RJ_*_□.bin
MR-J5W2-□G-N1	MR-J5W2-G_*_□.bin
MR-J5W3-□G-N1	MR-J5W3-G_*_□.bin
MR-JET-□G-N1	MR-JET-G_*_□.bin

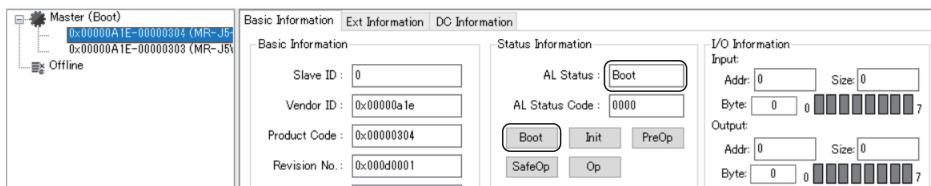
*1 □ = indicates the version of the servo amplifier firmware

*2 * = indicates the number corresponding to the version

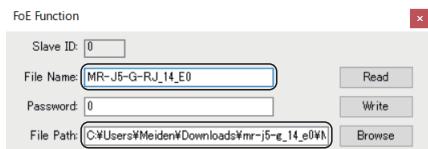
Operating procedure

The operations to update the firmware of the servo amplifier (MR-J5-□G-RJN1) to version "E0" is explained as an example. A single-axis servo amplifier is shown as an example of the amplifier display (7-segment LED).

1. Select the servo amplifier (MR-J5-□G-RJN1) to update the firmware in the network window.
2. Click [Main] on the ribbon \Rightarrow [Basic Information] tab \Rightarrow [Boot] button under [Status Information] in order so that the EtherCAT state changes to "Bootstrap". The AL status display will switch to "Boot", and "Y" will be displayed in the servo amplifier display.



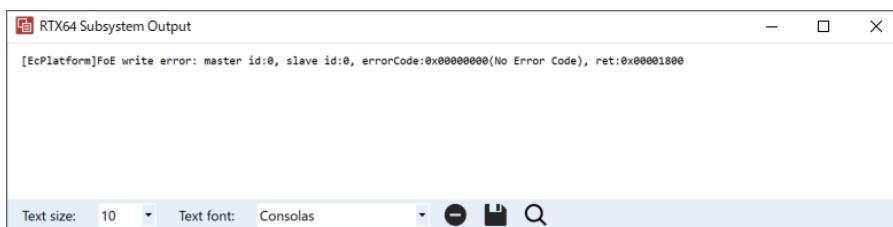
3. Click [Advanced Funcs.] on the ribbon \Rightarrow [FoE] (FoE) to display the "FoE Function" screen.
4. Click the [Browse] button in the "FoE Function" screen, and the "Save As" screen will be displayed. Select the system file for update (example: for MR-J5-□G-RJN1 (MR-J5-G-RJ_14_E0.bin)), and click the [Save] button.
5. The screen will return to the "FoE Function" screen. The file name and file path of the selected system file for update will be displayed.



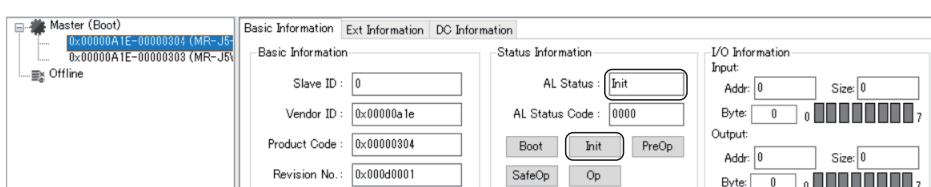
6. Add the extension ".bin" to the file name since selecting the file does not enter the extension. Enter the extension ".bin" (MR-J5-G-RJ_14_E0.bin) at the end of the file name (MR-J5-G-RJ_14_E0), and set "0" for the password. After the settings are completed, click the [Write] button.



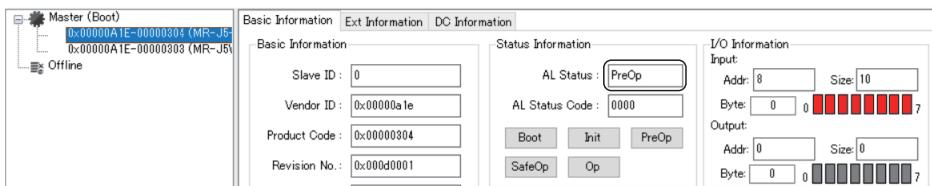
7. The system file will be transferred to the servo amplifier.
8. When the transfer is completed, the message of the FoE writing results will be displayed in the "RTX64 Subsystem Output" screen.



9. Click [Main] on the ribbon \Rightarrow [Basic Information] tab \Rightarrow [Init] button under [Status Information] in order so that the EtherCAT state changes to "Init". When the state has changed, the servo amplifier firmware will be updated automatically. The AL status display will switch to "Init", and "UPd" will be displayed in the servo amplifier display.



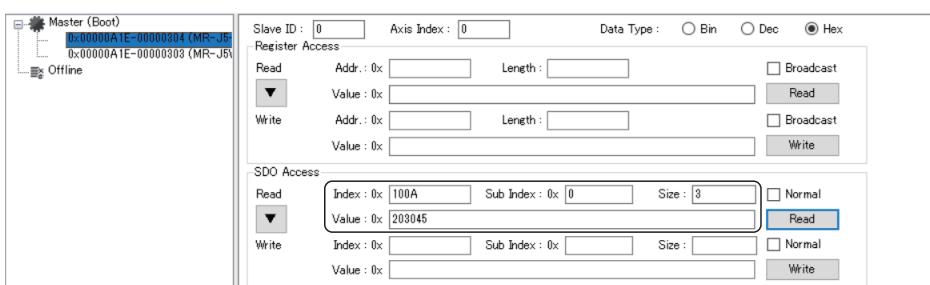
- 10.** When the firmware update is completed, the servo amplifier will be reset, and "A" will be displayed in the servo amplifier display.
- 11.** Click [Main] on the ribbon \Rightarrow [ALStatus Up] (PreOp) to set to the "Pre-Operational" status. The AL status display will switch to "PreOp".



- 12.** Click [Advanced Funcs.] on the ribbon \Rightarrow [SDO Access] \Rightarrow [Read] and set [Obj.100Ah Manufacturer Software Version]. Set "100A" for [Index] and "0" for [Sub Index], and click the [Read] button.

- 13.** The read data will be displayed in [Value]. Check that the firmware version of the servo amplifier is "203045 (20: space, 30: 0, 45: E)*1", which is the value of the updated version "E0".

*1 Firmware versions are displayed in ASCII code.

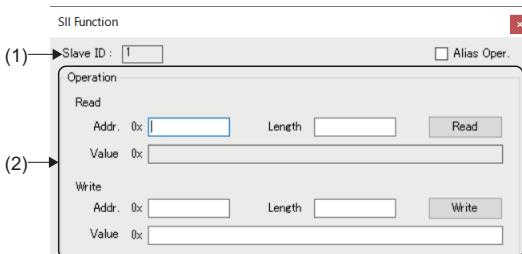


SII

Access is possible to a non-volatile memory such as EEPROM.

Window

[Advanced Funcs.] \Rightarrow [SII] (SII)



Displayed items

Item	Description
(1) Slave ID	Displays the ID of the slave device selected in the network window.
(2) Operation	Reads from or writes to a non-volatile memory such as EEPROM. <ul style="list-style-type: none"> • Addr: Specify the address. • Length: Specify the size. • Value: Specify the value to be written. • [Read] button: Reads the address specified in the Read setting. • [Write] button: Writes to the address specified in the Write setting.

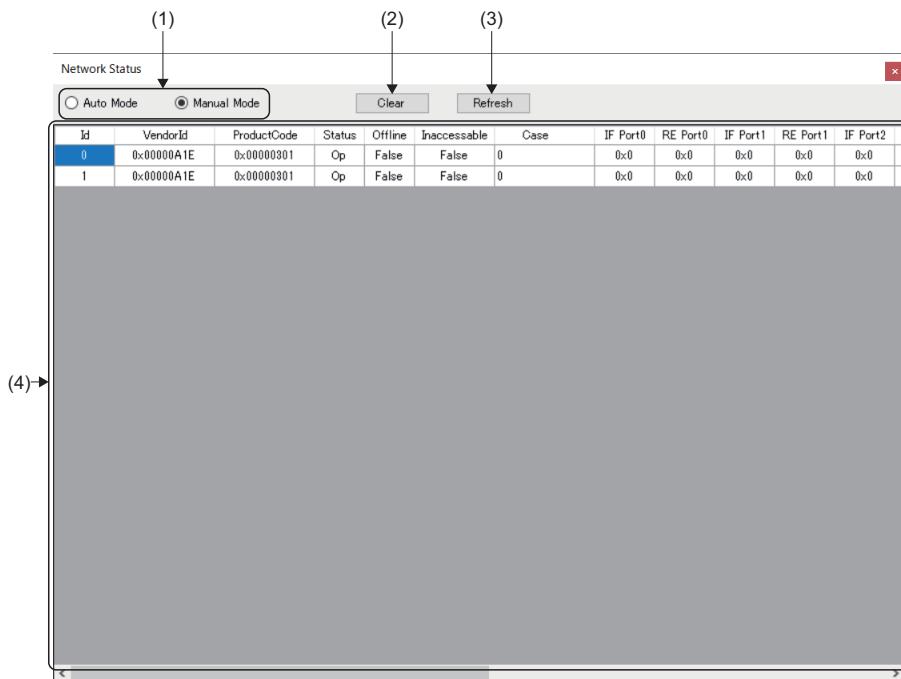
Network status

Network information

Network communication error counts are displayed.

Window

[Advanced Funcs.] ⇒ [Network Information] (💻)



Displayed items

Item	Description
(1) Mode selection	Select the refresh mode of error counts. <ul style="list-style-type: none">• Auto Mode: Error counts will be refreshed automatically.• Manual Mode: Error counts will be refreshed by clicking the "Refresh" button.
(2) [Clear] button	Clears error counts for all slaves.
(3) [Refresh] button	Updates error counts.
(4) Slave display area	Displays the network communication information of the connected slaves.

Topology view

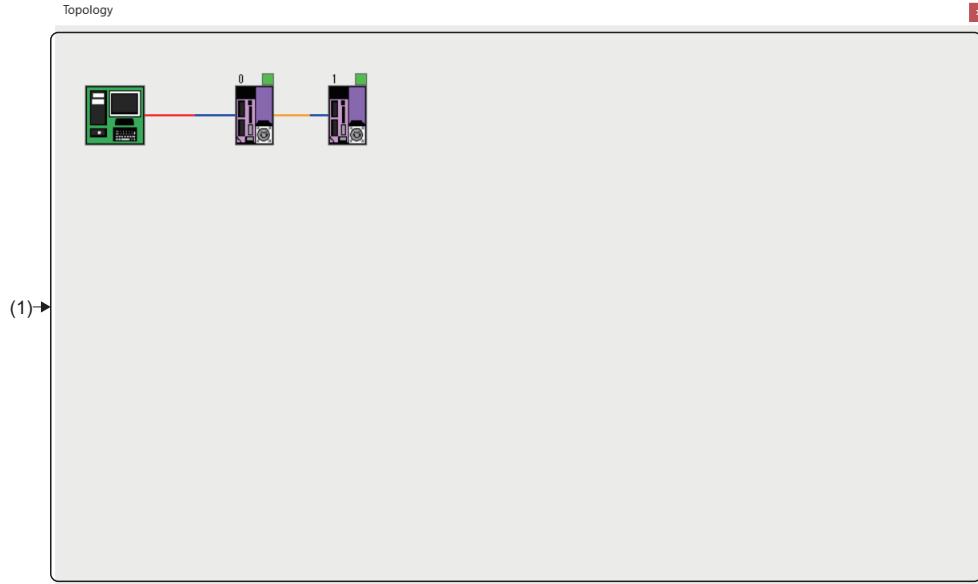
A graphic of connected slaves is displayed.

Window

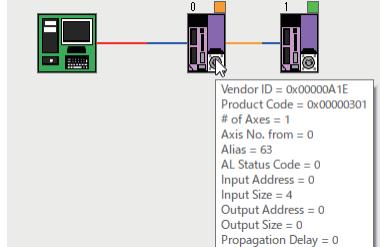
[Advanced Funcs.] \Rightarrow [Topology View] (

Topology

3

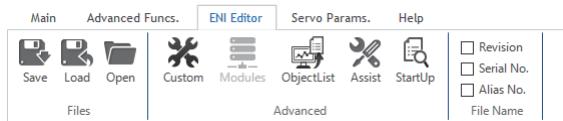


Displayed items

Item	Description
(1) Slave display area	Displays connected slaves. Hovering the cursor on the icon displays the slave information.  <p>Vendor ID = 0x00000A1E Product Code = 0x00000301 # of Axes = 1 Axis No. from = 0 Alias = 63 AL Status Code = 0 Input Address = 0 Input Size = 4 Output Address = 0 Output Size = 0 Propagation Delay = 0</p>

3.3 ENI Editor Tab

Create an ENI file required for the connection with the slave.



Item	Description	Reference
Files	Save (disk)	Page 39 Saving the ENI file
	Load (floppy disk)	Page 38 Loading an ENI file
	Open (file folder)	Page 39 Opening an ENI file
Advanced	Custom (crossed wrenches)	Page 40 Custom
	ObjectList (list icon)	Page 41 Object list
	Assist (wrench and gear)	Page 43 Assist
	StartUp (document icon)	Page 44 Startup info
File Name	Revision	Page 39 Saving the ENI file
	Serial No.	Allows the user to select whether to add a serial number to the ENI file name. A revision number and serial number cannot be selected at the same time.
	Alias No.	

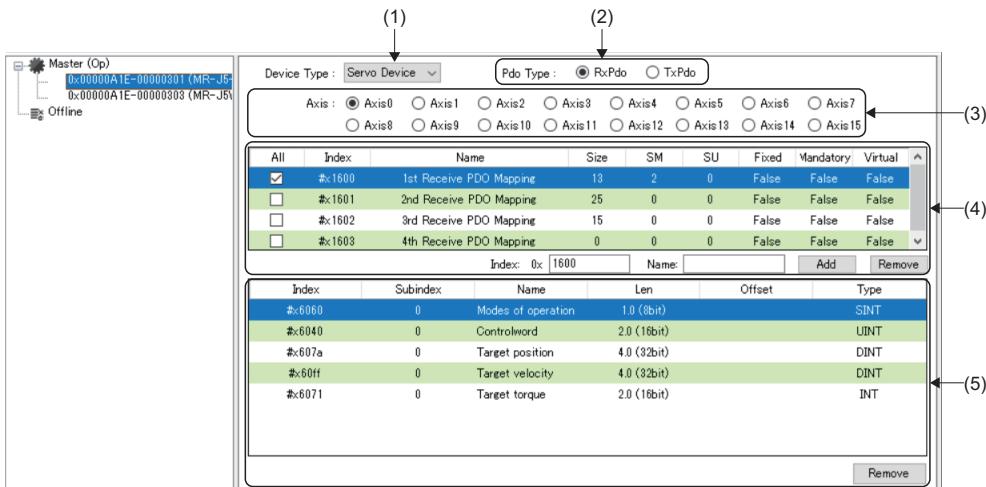
ENI editor

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

Window

[ENI Editor]

- When Servo device is selected



Displayed items

Item	Description
(1) Device Type	Select a device type. <ul style="list-style-type: none">Servo DeviceI/O DeviceSerial Device
(2) Pdo Type	Select the PDO type. <ul style="list-style-type: none">RxPDO: Data received by the slaveTxPDO: Data sent from the slave
(3) Axis	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.
(4) PDO Object List	Displays a list of the PDO mapping objects. Selecting an object from the displayed list switches the PDO entry list. <ul style="list-style-type: none">Index: Specifies the index to be added.Name: Specifies the index name to be added.[Add] button: Adds the index to the PDO object list.[Remove] button: Removes the selected index from the PDO object list.
(5) PDO Entry List	Displays a list of the PDO object list items. PDO entries are added and deleted. <ul style="list-style-type: none">[Remove] button: Removes selected indexes from the PDO entry list.

Creating an ENI file

This section describes the procedure for creating ENI files.

■Selecting a slave

Select a slave to create its ENI file.

Operating procedure

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

- When a slave is recognized in online mode, select the corresponding slave.
- When a slave is not recognized or is in offline mode, add the offline slave with [Main] ⇒ [Add Slaves] (⊕) on the ribbon, then select the slave.

■Loading an ENI file

Load a previously created ENI file.

When there is no previously created ENI file, create an ENI file by editing the PDO entry list.

Operating procedure

1. Click [ENI Editor] ⇒ [Load] (napshot) on the ribbon.

2. When loading has completed, "ENI file has been loaded Successful." message will be displayed. Click the [OK] button to finish.

■Editing the PDO entry list

Switch "RxPDO" and "TxPDO" in the PDO type, and set each 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

The following describes the example of where the PDO entry list does not need to be edited (created with default settings).

1. Switch "RxPDO" and "TxPDO" in the PDO type, and select the PDO object list.

2. A list of objects selected in the PDO object list will be displayed in the PDO entry list.

The PDO entry list can also be edited with the following methods.

- When setting and adding objects from the custom object (参照 Page 40 Custom)
- When selecting and adding objects from the object list (参照 Page 41 Object list)
- When selecting a mode from the "Setting Assist" screen and reflecting to the PDO entry list (参照 Page 43 Assist)

■Saving the ENI file

Save the edited ENI file.

- The saved ENI file is stored in the following folder.

Storage destination folder
C:\eni

- The ENI file is saved with the following file name.

The revision number, serial number, and alias number can be specified by going to [ENI Editor] on the ribbon ⇒ [Revision]/[Serial No.]/[Alias No.]

○: Selected, ×: Not selected

Revision	Serial No.	Alias No.	ENI file name
×	×	×	Vendor ID_Product code.txt
○	×	×	Vendor ID_Product code_Revision No.txt
○	○	×	Vendor ID_Product code_Revision No._Serial No.txt
×	×	○	Vendor ID_Product code_alias_Alias No.txt

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

The absolute path of the ENI file can be specified in the network definition file (ec_network.def) when the ENI file is individually defined for each remote station.

For details of settings, refer to "CC-Link IE TSN Platform ⇒ Network Definition (ec_network.def)" in the following manual.

ISWM-G-N1 User Manual

Operating procedure

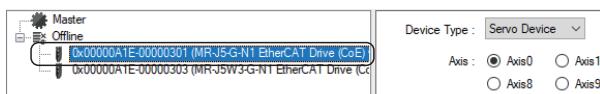
- Click [ENI Editor] ⇒ [Save] () on the ribbon.
- When an ENI file already exists, a "Already exists. Do you want to replace it?" confirmation message is displayed. Click the [Yes] button to save the ENI file (.txt).
- When saving the file is completed, the completion message "ENI File is generated successfully." appears. Click the [OK] button to close the screen.

■Opening an ENI file

Open a previously created ENI file.

Operating procedure

- Select a remote station (example: 0x00000301(MR-J5-G-N1 EtherCAT Drive (CoE) ver.B6)) from the network window tree.



- Click [ENI Editor] ⇒ [Open] () on the ribbon.
- Open the ENI file of the slave (example: 0x00000301(MR-J5-G-N1 EtherCAT Drive (CoE) ver.B6)).

```

IdentificationReg134: 1
DcAssignActive: 0x0300
ModesOfOperation: 0, 0, 1
ControlWord: 0, 2, 2
TargetPosition: 0, 10, 4
TargetVelocity: 0, 14, 4
TargetTorque: 0, 22, 2
ModesOfOperationDisplay: 0, 0, 1
StatusWord: 0, 2, 2
PositionActualValue: 0, 10, 4
VelocityActualValue: 0, 14, 4
FollowingError: 0, 18, 4
TorqueActualValue: 0, 22, 2

```

Settings

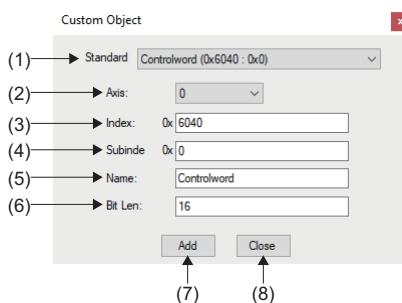
Custom

Set and add objects from the custom object.

The details of the object list displayed under Standard differs depending on the selected PDO type.

Window

[ENI Editor] ⇄ [Custom] (☒)

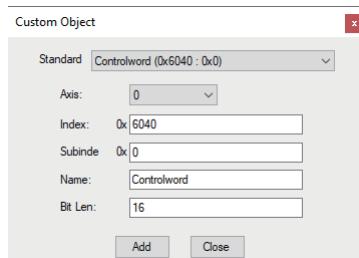


Displayed items

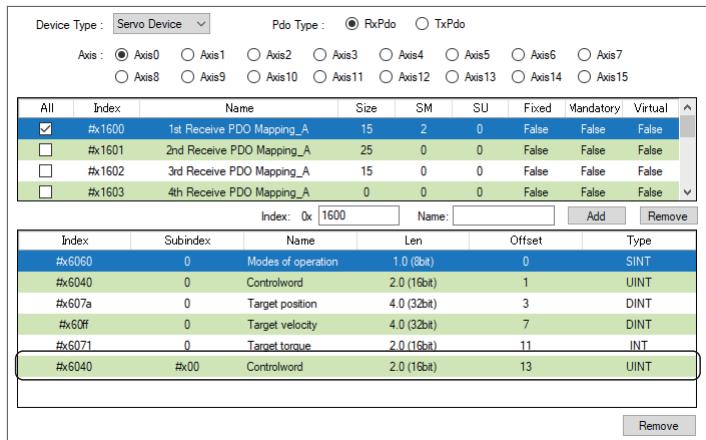
Item	Description
(1) Standard	Select the PDO object.
(2) Axis	Select the axes to add the object.
(3) Index	Specify the index.
(4) Subindex	Specify the subindex.
(5) Name	Specify the name of the object.
(6) Bit Len	Specify the bit length.
(7) [Add] button	Adds the set object to the PDO entry list.
(8) [Close] button	Closes the "Custom Object" screen.

Operating procedure

1. Click [ENI Editor] ⇄ [Custom] (☒) on the ribbon to display the "Custom Object" screen.
2. Select the standard PDO from the "Custom Object" screen, set the index, subindex, name, and bit length, and click the [Add] button. When the object setting has completed, click the [Close] button to close the screen.



3. Add the object to the PDO entry list.



Object list

Set and add objects from the object list.

The details of the object list displayed differs depending on the selected PDO type.

Window

[ENI Editor] ⇒ [ObjectList] (

Displayed items

Item	Description
(1) PDO type selection	Select a PDO object type displayed in the object list. • ALL: All objects are displayed. • PDOMapping R: Displays the PDO object of the PDO type "RxPDO". • PDOMapping T: Displays the PDO object of the PDO type "TxPDO".
(2) [Add] button	Adds a set object to the PDO entry list.
(3) PDO object list	Displays the PDO object list.

Operating procedure

1. Click [ENI Editor] ⇔ [ObjectList] (list icon) on the ribbon to display the "Object List" screen.
2. Select an object to add from the "Object List" screen, and click the [Add] button. When object selection is completed, click the [x] button at the top right of the screen to close it.

Object List

Index	Subindex	Name	Size	Type	Access	PdoMapping	Category
#x2d07	#x00	Control DI 7	2.0	UINT	rw	r	
#x2d08	#x00	Control DI 8	2.0	UINT	rw	r	
#x2d09	#x00	For manufacturer's use	2.0	UINT	rw	r	
#x2d0a	#x00	Control DI 10	2.0	UINT	rw	r	
#x2d20	#x00	Velocity limit value	4.0	UDINT	rw	r	
#x2d60	#x00	For manufacturer's use	2.0	INT	rw	r	
#x2d6c	#x00	For manufacturer's use	2.0	INT	rw	r	
#x2d71	#x00	For manufacturer's use	4.0	DINT	rw	r	
#x2de8	#x00	Touch probe function 2	2.0	UINT	rw	r	
#x3d01	#x00	Control DI 1	2.0	UINT	rw	r	
#x3d02	#x00	Control DI 2	2.0	UINT	rw	r	
#x3d03	#x00	Control DI 3	2.0	UINT	rw	r	
#x3d04	#x00	Control DI 4	2.0	UINT	rw	r	
#x3d05	#x00	Control DI 5	2.0	UINT	rw	r	
#x3d06	#x00	Control DI 6	2.0	UINT	rw	r	
#x3d07	#x00	Control DI 7	2.0	UINT	rw	r	

3. Add the object to the PDO entry list.

Device Type : Servo Device Pdo Type : RxPdo

Axis : Axis0 Axis1 Axis2 Axis3 Axis4 Axis5 Axis6 Axis7
 Axis8 Axis9 Axis10 Axis11 Axis12 Axis13 Axis14 Axis15

All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual
<input checked="" type="checkbox"/>	#x1600	1st Receive PDO Mapping_A	15	2	0	False	False	False
<input type="checkbox"/>	#x1601	2nd Receive PDO Mapping_A	25	0	0	False	False	False
<input type="checkbox"/>	#x1602	3rd Receive PDO Mapping_A	15	0	0	False	False	False
<input type="checkbox"/>	#x1603	4th Receive PDO Mapping_A	0	0	0	False	False	False

Index: 0x 1600 Name: Add Remove

Index	Subindex	Name	Len	Offset	Type
#x6060	0	Modes of operation	1.0 (8bit)	0	SINT
#x6040	0	Controlword	2.0 (16bit)	1	UINT
#x607a	0	Target position	4.0 (32bit)	3	DINT
#x60ff	0	Target velocity	4.0 (32bit)	7	DINT
#x6071	0	Target torque	2.0 (16bit)	11	INT
#x2de8	0	Custom Entry: Tou...	2.0 (16bit)	13	UINT

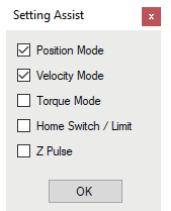
Remove

Assist

Select the mode from the "Setting Assist" screen and reflect it to the PDO entry list.

Operating procedure

1. Click [ENI Editor] ⇒ [Assist] (🔧) on the ribbon to display the "Setting Assist" screen.
2. Select the required items, and click the [OK] button.



3

3. Only the objects of the items of the selected modes will be displayed in the PDO entry list.

All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual
<input checked="" type="checkbox"/>	#x1600	1st Receive PDO Mapping_A	11	2	0	False	False	False
<input type="checkbox"/>	#x1601	2nd Receive PDO Mapping_A	25	0	0	False	False	False
<input type="checkbox"/>	#x1602	3rd Receive PDO Mapping_A	15	0	0	False	False	False
<input type="checkbox"/>	#x1603	4th Receive PDO Mapping_A	0	0	0	False	False	False

Index	Subindex	Name	Len	Offset	Type
#x6040	0	Controlword	2.0 (16bit)	0	UINT
#x6060	0	Modes of operation	1.0 (8bit)	2	SINT
#x607a	0	Target position	4.0 (32bit)	3	DINT
#x60ff	0	Target velocity	4.0 (32bit)	7	DINT

Startup info

From the "StartUp Info" screen, set whether to allow PDO reading/writing and enable/disable commands.

Generally this setting does not need to be configured.

Window

[ENI Editor] ⇔ [StartUp Info] (🔍)

StartUp Info								
Command	Id/Index	Addr/Subindex	Size	Data	Enable	Execute	Comment	
SMConfig	0x0	0x2000	276	0x26	True	Init->Preop		(1)→
SMConfig	0x1	0x2800	276	0x22	True	Init->Preop		
SMConfig	0x2	0x1000	51	0x64	True	Init->Preop		
SMConfig	0x3	0x1800	49	0x20	True	Init->Preop		
FMMUConfig	0x0	0x1000	51	2	True	Init->Preop		
FMMUConfig	0x1	0x1800	49	1	True	Init->Preop		
SDO Download	0x1c12	0x0	1	0x00	True	Preop->Safeop		
SDO Download	0x1c13	0x0	1	0x00	True	Preop->Safeop		
SDO Download	0x1600	0x0	1	0x00	True	Preop->Safeop		
SDO Download	0x1600	0x1	4	0x60400010	True	Preop->Safeop		
SDO Download	0x1600	0x2	4	0x60600008	True	Preop->Safeop		
SDO Download	0x1600	0x3	4	0x607a0020	True	Preop->Safeop		
SDO Download	0x1600	0x4	4	0x60ff0020	True	Preop->Safeop		
SDO Download	0x1600	0x0	1	0x04	True	Preop->Safeop		
SDO Download	0x1611	0x0	1	0x00	True	Preop->Safeop		
SDO Download	0x1611	0x1	4	0x68600008	True	Preop->Safeop		
SDO Download	0x1611	0x2	4	0x68400010	True	Preop->Safeop		
SDO Download	0x1611	0x3	4	0x687a0020	True	Preop->Safeop		
SDO Download	0x1611	0x4	4	0x68ff0020	True	Preop->Safeop		
SDO Download	0x1611	0x5	4	0x68710010	True	Preop->Safeop		
SDO Download	0x1611	0x6	4	0x68810020	True	Preop->Safeop		
SDO Download	0x1611	0x7	4	0x68830020	True	Preop->Safeop		
SDO Download	0x1611	0x8	4	0x68840020	True	Preop->Safeop		

Displayed items

Item	Description
(1) Allow Pdo Read/Write	Set whether or not to allow PDO reading/writing. <ul style="list-style-type: none">• Selected: Reading/Writing are allowed.• Not selected: Reading/Writing are not allowed.
(2) Command display area	Displays the command list. Only the enable column can be switched between "True" and "False" by clicking. <ul style="list-style-type: none">• True: Sent to the slave when communication starts.• False: Not sent to the slave when communication starts.

Procedure for creating ENI files for each device

This section explains the method for creating ENI files for each device. The settings described are the default parameter settings.

When using a multi-axis servo amplifier

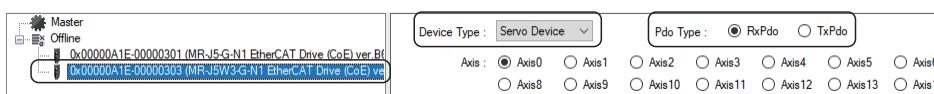
This will explain how to create ENI files for a servo amplifier (MR-J5W3-G-N1).

The PDO object list is explained using the following setting example.

PDO type	PDO object list
Rx	1st Receive PDO Mapping
Tx	1st Transmit PDO Mapping

Operating procedure

1. Select a remote station (example: 0x00000A1E_00000303 (MR-J5W3-G-N1 EtherCAT Drive (CoE) ver.B6)) from the network window tree.
2. Select "Servo Device" for the Device Type and "RxPdo" for the Pdo Type.



3. Select an Axis No. then the index from the PDO object list by checking the box.

Configure the settings for each axis.

Axis No.	Index	PDO object list setting																																													
Select Axis0 (A-axis)	Select "#x1600"	<p>Device Type : Servo Device Pdo Type : <input checked="" type="radio"/> RxPdo <input type="radio"/> TxPdo</p> <p>Axis : <input checked="" type="radio"/> Axis0 <input type="radio"/> Axis1 <input type="radio"/> Axis2 <input type="radio"/> Axis3 <input type="radio"/> Axis4 <input type="radio"/> Axis5 <input type="radio"/> Axis6 <input type="radio"/> Axis7 <input type="radio"/> Axis8 <input type="radio"/> Axis9 <input type="radio"/> Axis10 <input type="radio"/> Axis11 <input type="radio"/> Axis12 <input type="radio"/> Axis13 <input type="radio"/> Axis14 <input type="radio"/> Axis15</p> <table border="1"> <thead> <tr> <th>All</th><th>Index</th><th>Name</th><th>Size</th><th>SM</th><th>SU</th><th>Fixed</th><th>Mandatory</th><th>Virtual</th></tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/></td><td>#x1600</td><td>1st Receive PDO Mapping_A</td><td>13</td><td>2</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> <tr> <td><input type="checkbox"/></td><td>#x1601</td><td>2nd Receive PDO Mapping_A</td><td>25</td><td>0</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> <tr> <td><input type="checkbox"/></td><td>#x1602</td><td>3rd Receive PDO Mapping_A</td><td>15</td><td>0</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> <tr> <td><input type="checkbox"/></td><td>#x1603</td><td>4th Receive PDO Mapping_A</td><td>0</td><td>0</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> </tbody> </table>	All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual	<input checked="" type="checkbox"/>	#x1600	1st Receive PDO Mapping_A	13	2	0	False	False	False	<input type="checkbox"/>	#x1601	2nd Receive PDO Mapping_A	25	0	0	False	False	False	<input type="checkbox"/>	#x1602	3rd Receive PDO Mapping_A	15	0	0	False	False	False	<input type="checkbox"/>	#x1603	4th Receive PDO Mapping_A	0	0	0	False	False	False
All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual																																							
<input checked="" type="checkbox"/>	#x1600	1st Receive PDO Mapping_A	13	2	0	False	False	False																																							
<input type="checkbox"/>	#x1601	2nd Receive PDO Mapping_A	25	0	0	False	False	False																																							
<input type="checkbox"/>	#x1602	3rd Receive PDO Mapping_A	15	0	0	False	False	False																																							
<input type="checkbox"/>	#x1603	4th Receive PDO Mapping_A	0	0	0	False	False	False																																							
Select Axis1 (B-axis)	Select "#x1610"	<p>Device Type : Servo Device Pdo Type : <input checked="" type="radio"/> RxPdo <input type="radio"/> TxPdo</p> <p>Axis : <input type="radio"/> Axis0 <input checked="" type="radio"/> Axis1 <input type="radio"/> Axis2 <input type="radio"/> Axis3 <input type="radio"/> Axis4 <input type="radio"/> Axis5 <input type="radio"/> Axis6 <input type="radio"/> Axis7 <input type="radio"/> Axis8 <input type="radio"/> Axis9 <input type="radio"/> Axis10 <input type="radio"/> Axis11 <input type="radio"/> Axis12 <input type="radio"/> Axis13 <input type="radio"/> Axis14 <input type="radio"/> Axis15</p> <table border="1"> <thead> <tr> <th>All</th><th>Index</th><th>Name</th><th>Size</th><th>SM</th><th>SU</th><th>Fixed</th><th>Mandatory</th><th>Virtual</th></tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td><td>#x1603</td><td>4th Receive PDO Mapping_A</td><td>0</td><td>0</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>#x1610</td><td>1st Receive PDO Mapping_B</td><td>13</td><td>2</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> <tr> <td><input type="checkbox"/></td><td>#x1611</td><td>2nd Receive PDO Mapping_B</td><td>25</td><td>0</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> <tr> <td><input type="checkbox"/></td><td>#x1612</td><td>3rd Receive PDO Mapping_B</td><td>15</td><td>0</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> </tbody> </table>	All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual	<input type="checkbox"/>	#x1603	4th Receive PDO Mapping_A	0	0	0	False	False	False	<input checked="" type="checkbox"/>	#x1610	1st Receive PDO Mapping_B	13	2	0	False	False	False	<input type="checkbox"/>	#x1611	2nd Receive PDO Mapping_B	25	0	0	False	False	False	<input type="checkbox"/>	#x1612	3rd Receive PDO Mapping_B	15	0	0	False	False	False
All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual																																							
<input type="checkbox"/>	#x1603	4th Receive PDO Mapping_A	0	0	0	False	False	False																																							
<input checked="" type="checkbox"/>	#x1610	1st Receive PDO Mapping_B	13	2	0	False	False	False																																							
<input type="checkbox"/>	#x1611	2nd Receive PDO Mapping_B	25	0	0	False	False	False																																							
<input type="checkbox"/>	#x1612	3rd Receive PDO Mapping_B	15	0	0	False	False	False																																							
Select Axis2 (C-Axis)	Select "#x1620"	<p>Device Type : Servo Device Pdo Type : <input checked="" type="radio"/> RxPdo <input type="radio"/> TxPdo</p> <p>Axis : <input type="radio"/> Axis0 <input type="radio"/> Axis1 <input checked="" type="radio"/> Axis2 <input type="radio"/> Axis3 <input type="radio"/> Axis4 <input type="radio"/> Axis5 <input type="radio"/> Axis6 <input type="radio"/> Axis7 <input type="radio"/> Axis8 <input type="radio"/> Axis9 <input type="radio"/> Axis10 <input type="radio"/> Axis11 <input type="radio"/> Axis12 <input type="radio"/> Axis13 <input type="radio"/> Axis14 <input type="radio"/> Axis15</p> <table border="1"> <thead> <tr> <th>All</th><th>Index</th><th>Name</th><th>Size</th><th>SM</th><th>SU</th><th>Fixed</th><th>Mandatory</th><th>Virtual</th></tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td><td>#x1613</td><td>4th Receive PDO Mapping_B</td><td>0</td><td>0</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>#x1620</td><td>1st Receive PDO Mapping_C</td><td>13</td><td>2</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> <tr> <td><input type="checkbox"/></td><td>#x1621</td><td>2nd Receive PDO Mapping_C</td><td>25</td><td>0</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> <tr> <td><input type="checkbox"/></td><td>#x1622</td><td>3rd Receive PDO Mapping_C</td><td>15</td><td>0</td><td>0</td><td>False</td><td>False</td><td>False</td></tr> </tbody> </table>	All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual	<input type="checkbox"/>	#x1613	4th Receive PDO Mapping_B	0	0	0	False	False	False	<input checked="" type="checkbox"/>	#x1620	1st Receive PDO Mapping_C	13	2	0	False	False	False	<input type="checkbox"/>	#x1621	2nd Receive PDO Mapping_C	25	0	0	False	False	False	<input type="checkbox"/>	#x1622	3rd Receive PDO Mapping_C	15	0	0	False	False	False
All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual																																							
<input type="checkbox"/>	#x1613	4th Receive PDO Mapping_B	0	0	0	False	False	False																																							
<input checked="" type="checkbox"/>	#x1620	1st Receive PDO Mapping_C	13	2	0	False	False	False																																							
<input type="checkbox"/>	#x1621	2nd Receive PDO Mapping_C	25	0	0	False	False	False																																							
<input type="checkbox"/>	#x1622	3rd Receive PDO Mapping_C	15	0	0	False	False	False																																							

4. Select "TxPdo" for the Pdo Type.



- 5.** Select an Axis No. then the index from the PDO object list by checking the box.

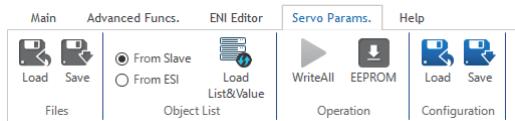
Configure the settings for each axis.

Axis No.	Index	PDO object list setting																																													
Select Axis0 (A-axis)	Select "#x1a00"	<p>Device Type : Servo Device Pdo Type : <input type="radio"/> RxPdo <input checked="" type="radio"/> TxPdo</p> <p>Axis : <input checked="" type="radio"/> Axis0 <input type="radio"/> Axis1 <input type="radio"/> Axis2 <input type="radio"/> Axis3 <input type="radio"/> Axis4 <input type="radio"/> Axis5 <input type="radio"/> Axis6 <input type="radio"/> Axis7 <input type="radio"/> Axis8 <input type="radio"/> Axis9 <input type="radio"/> Axis10 <input type="radio"/> Axis11 <input type="radio"/> Axis12 <input type="radio"/> Axis13 <input type="radio"/> Axis14 <input type="radio"/> Axis15</p> <table border="1"> <thead> <tr> <th>All</th> <th>Index</th> <th>Name</th> <th>Size</th> <th>SM</th> <th>SU</th> <th>Fixed</th> <th>Mandatory</th> <th>Virtual</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/></td> <td>#x1a00</td> <td>1st Transmit PDO Mapping_A</td> <td>15</td> <td>3</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> <tr> <td><input type="checkbox"/></td> <td>#x1a01</td> <td>2nd Transmit PDO Mapping_A</td> <td>17</td> <td>0</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> <tr> <td><input type="checkbox"/></td> <td>#x1a02</td> <td>3rd Transmit PDO Mapping_A</td> <td>0</td> <td>0</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> <tr> <td><input type="checkbox"/></td> <td>#x1a03</td> <td>4th Transmit PDO Mapping_A</td> <td>0</td> <td>0</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> </tbody> </table>	All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual	<input checked="" type="checkbox"/>	#x1a00	1st Transmit PDO Mapping_A	15	3	0	False	False	False	<input type="checkbox"/>	#x1a01	2nd Transmit PDO Mapping_A	17	0	0	False	False	False	<input type="checkbox"/>	#x1a02	3rd Transmit PDO Mapping_A	0	0	0	False	False	False	<input type="checkbox"/>	#x1a03	4th Transmit PDO Mapping_A	0	0	0	False	False	False
All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual																																							
<input checked="" type="checkbox"/>	#x1a00	1st Transmit PDO Mapping_A	15	3	0	False	False	False																																							
<input type="checkbox"/>	#x1a01	2nd Transmit PDO Mapping_A	17	0	0	False	False	False																																							
<input type="checkbox"/>	#x1a02	3rd Transmit PDO Mapping_A	0	0	0	False	False	False																																							
<input type="checkbox"/>	#x1a03	4th Transmit PDO Mapping_A	0	0	0	False	False	False																																							
Select Axis1 (B-axis)	Select "#x1a10"	<p>Device Type : Servo Device Pdo Type : <input type="radio"/> RxPdo <input checked="" type="radio"/> TxPdo</p> <p>Axis : <input type="radio"/> Axis0 <input checked="" type="radio"/> Axis1 <input type="radio"/> Axis2 <input type="radio"/> Axis3 <input type="radio"/> Axis4 <input type="radio"/> Axis5 <input type="radio"/> Axis6 <input type="radio"/> Axis7 <input type="radio"/> Axis8 <input type="radio"/> Axis9 <input type="radio"/> Axis10 <input type="radio"/> Axis11 <input type="radio"/> Axis12 <input type="radio"/> Axis13 <input type="radio"/> Axis14 <input type="radio"/> Axis15</p> <table border="1"> <thead> <tr> <th>All</th> <th>Index</th> <th>Name</th> <th>Size</th> <th>SM</th> <th>SU</th> <th>Fixed</th> <th>Mandatory</th> <th>Virtual</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td>#x1a03</td> <td>4th Transmit PDO Mapping_A</td> <td>0</td> <td>0</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>#x1a10</td> <td>1st Transmit PDO Mapping_B</td> <td>17</td> <td>3</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> <tr> <td><input type="checkbox"/></td> <td>#x1a11</td> <td>2nd Transmit PDO Mapping_B</td> <td>17</td> <td>0</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> <tr> <td><input type="checkbox"/></td> <td>#x1a12</td> <td>3rd Transmit PDO Mapping_B</td> <td>0</td> <td>0</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> </tbody> </table>	All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual	<input type="checkbox"/>	#x1a03	4th Transmit PDO Mapping_A	0	0	0	False	False	False	<input checked="" type="checkbox"/>	#x1a10	1st Transmit PDO Mapping_B	17	3	0	False	False	False	<input type="checkbox"/>	#x1a11	2nd Transmit PDO Mapping_B	17	0	0	False	False	False	<input type="checkbox"/>	#x1a12	3rd Transmit PDO Mapping_B	0	0	0	False	False	False
All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual																																							
<input type="checkbox"/>	#x1a03	4th Transmit PDO Mapping_A	0	0	0	False	False	False																																							
<input checked="" type="checkbox"/>	#x1a10	1st Transmit PDO Mapping_B	17	3	0	False	False	False																																							
<input type="checkbox"/>	#x1a11	2nd Transmit PDO Mapping_B	17	0	0	False	False	False																																							
<input type="checkbox"/>	#x1a12	3rd Transmit PDO Mapping_B	0	0	0	False	False	False																																							
Select Axis2 (C-axis)	Select "#x1a20"	<p>Device Type : Servo Device Pdo Type : <input type="radio"/> RxPdo <input checked="" type="radio"/> TxPdo</p> <p>Axis : <input type="radio"/> Axis0 <input type="radio"/> Axis1 <input checked="" type="radio"/> Axis2 <input type="radio"/> Axis3 <input type="radio"/> Axis4 <input type="radio"/> Axis5 <input type="radio"/> Axis6 <input type="radio"/> Axis7 <input type="radio"/> Axis8 <input type="radio"/> Axis9 <input type="radio"/> Axis10 <input type="radio"/> Axis11 <input type="radio"/> Axis12 <input type="radio"/> Axis13 <input type="radio"/> Axis14 <input type="radio"/> Axis15</p> <table border="1"> <thead> <tr> <th>All</th> <th>Index</th> <th>Name</th> <th>Size</th> <th>SM</th> <th>SU</th> <th>Fixed</th> <th>Mandatory</th> <th>Virtual</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td>#x1a12</td> <td>3rd Transmit PDO Mapping_B</td> <td>0</td> <td>0</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> <tr> <td><input type="checkbox"/></td> <td>#x1a13</td> <td>4th Transmit PDO Mapping_B</td> <td>0</td> <td>0</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>#x1a20</td> <td>1st Transmit PDO Mapping_C</td> <td>17</td> <td>3</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> <tr> <td><input type="checkbox"/></td> <td>#x1a21</td> <td>2nd Transmit PDO Mapping_C</td> <td>17</td> <td>0</td> <td>0</td> <td>False</td> <td>False</td> <td>False</td> </tr> </tbody> </table>	All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual	<input type="checkbox"/>	#x1a12	3rd Transmit PDO Mapping_B	0	0	0	False	False	False	<input type="checkbox"/>	#x1a13	4th Transmit PDO Mapping_B	0	0	0	False	False	False	<input checked="" type="checkbox"/>	#x1a20	1st Transmit PDO Mapping_C	17	3	0	False	False	False	<input type="checkbox"/>	#x1a21	2nd Transmit PDO Mapping_C	17	0	0	False	False	False
All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual																																							
<input type="checkbox"/>	#x1a12	3rd Transmit PDO Mapping_B	0	0	0	False	False	False																																							
<input type="checkbox"/>	#x1a13	4th Transmit PDO Mapping_B	0	0	0	False	False	False																																							
<input checked="" type="checkbox"/>	#x1a20	1st Transmit PDO Mapping_C	17	3	0	False	False	False																																							
<input type="checkbox"/>	#x1a21	2nd Transmit PDO Mapping_C	17	0	0	False	False	False																																							

- 6.** When the setting is completed, click on [ENI Editor] ⇒ [Save] (💾) on the ribbon.
- 7.** When an ENI file already exists, a "Already exists. Do you want to replace it?" confirmation message is displayed. Click the [Yes] button to save the ENI file (.txt).
- 8.** When the save is completed, the completion message "ENI file created successfully." appears.

3.4 Servo Params. Tab

Load the parameters of the slave device.



Item	Description	
Files	Load (Load icon)	Loads the parameter file.
	Save (Save icon)	Saves the parameters to a file.
Object List	From Slave/From ESI	Select whether to make the slave or ESI file the load target.
	Load List&Value (List icon)	Loads parameters from the slave or ESI file.
Operation	EEPROM (EEPROM icon)	Writes from the slave RAM to EEPROM.
Configuration	Load (Load icon)	Loads the parameter setting details.
	Save (Save icon)	Saves the parameter setting details.

3

Window

[Servo Params.]

All	Index	Subindex	Name	ObjectAccess	Val
<input checked="" type="checkbox"/>	#x2001	#x0	·PA01	rww	122
<input checked="" type="checkbox"/>	#x2002	#x0	·PA02	rww	0
<input checked="" type="checkbox"/>	#x2003	#x0	·PA03	rww	0
<input checked="" type="checkbox"/>	#x2004	#x0	·PA04	rww	8440
<input checked="" type="checkbox"/>	#x2005	#x0	·PA05	rww	1000
<input checked="" type="checkbox"/>	#x2006	#x0	·PA06	rww	1
<input checked="" type="checkbox"/>	#x2007	#x0	·PA07	rww	1
<input checked="" type="checkbox"/>	#x2008	#x0	·PA08	rww	1
<input checked="" type="checkbox"/>	#x2009	#x0	·PA09	rww	16
<input checked="" type="checkbox"/>	#x200a	#x0	·PA10	rww	2560
<input checked="" type="checkbox"/>	#x200b	#x0	·PA11	rww	1000
<input checked="" type="checkbox"/>	#x200c	#x0	·PA12	rww	1000
<input checked="" type="checkbox"/>	#x200d	#x0	·PA13	rww	0
<input checked="" type="checkbox"/>	#x200e	#x0	·PA14	rww	0
<input checked="" type="checkbox"/>	#x200f	#x0	·PA15	rww	4000
<input checked="" type="checkbox"/>	#x2010	#x0	·PA16	rww	1

Displayed items

Item	Description
(1) Data Type	Select the value data type. • Bin (Binary) • Dec (Decimal) • Hex (Hexadecimal)
(2) Product Info	Displays the product information of the slave device.
(3) Parameter display area	Displays the parameters loaded from the slave device.

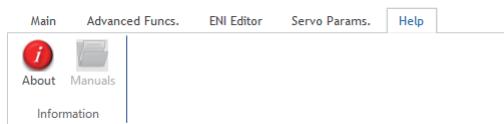
Operating procedure

1. Select the slave to display parameters from the tree in the network window.
2. Click [Servo Params.] \Rightarrow [Load List&Value] () on the ribbon.
3. A list of parameters is displayed in the parameter display area. Selecting a data type will switch the values in the value column to the selected data type.

All	Index	Subindex	Name	ObjectAccess	Val
<input checked="" type="checkbox"/>	\$x.2001	#x.0	·PA01	rww	1223
<input checked="" type="checkbox"/>	\$x.2002	#x.0	·PA02	rww	0
<input checked="" type="checkbox"/>	\$x.2003	#x.0	·PA03	rww	0
<input checked="" type="checkbox"/>	\$x.2004	#x.0	·PA04	rww	8448
<input checked="" type="checkbox"/>	\$x.2005	#x.0	·PA05	rww	1000
<input checked="" type="checkbox"/>	\$x.2006	#x.0	·PA06	rww	1
<input checked="" type="checkbox"/>	\$x.2007	#x.0	·PA07	rww	1
<input checked="" type="checkbox"/>	\$x.2008	#x.0	·PA08	rww	1
<input checked="" type="checkbox"/>	\$x.2009	#x.0	·PA09	rww	16
<input checked="" type="checkbox"/>	\$x.200a	#x.0	·PA10	rww	2560
<input checked="" type="checkbox"/>	\$x.200b	#x.0	·PA11	rww	1000
<input checked="" type="checkbox"/>	\$x.200c	#x.0	·PA12	rww	1000
<input checked="" type="checkbox"/>	\$x.200d	#x.0	·PA13	rww	0
<input checked="" type="checkbox"/>	\$x.200e	#x.0	·PA14	rww	0
<input checked="" type="checkbox"/>	\$x.200f	#x.0	·PA15	rww	4000
<input checked="" type="checkbox"/>	\$x.2010	#x.0	·PA16	rww	1

3.5 Help Tab

The EcConfigurator version can be confirmed.



Information

■About

The EcConfigurator version, the SSC Api version, and the Ec Api version can be confirmed here.

Window

[Help] ⇒ [About] (i)



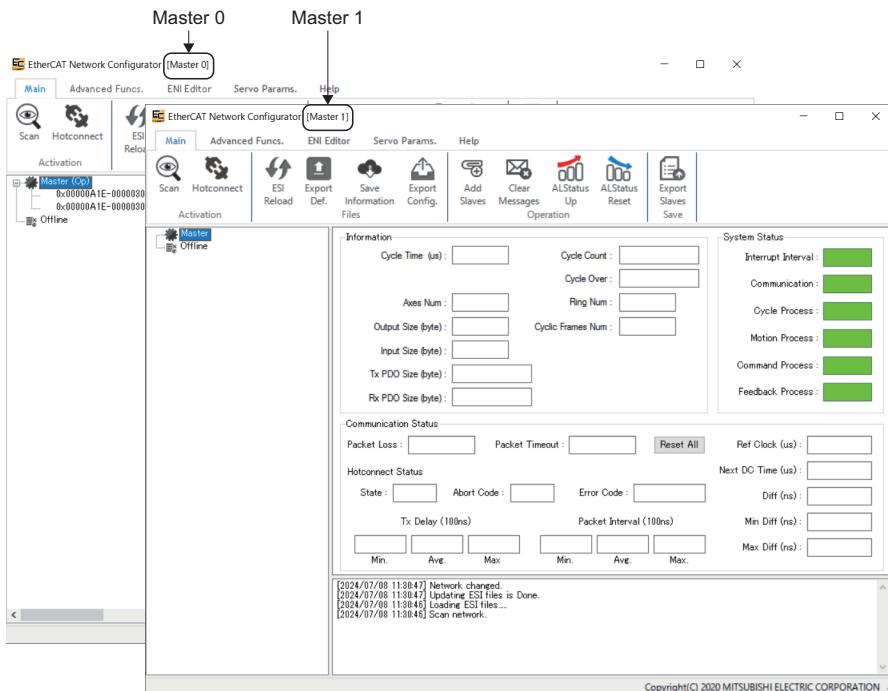
APPENDIX

Appendix 1 How to Create ENI Files when Using EtherCAT Communication with Two Ports

When using EtherCAT communication with two ports, create the ENI and DEF files in the same way as with one port. This section describes how to create ENI files for the second port.

Operating procedure

1. Select [SWM-G] ⇒ [EcConfigurator] from the Windows start menu to start EcConfigurator. Select twice to open two instances of EcConfigurator. ([Page 10 Start](#))
2. Opening two instances of EcConfigurator will display two EcConfigurator screens, which correspond to the master numbers [Master 0] and [Master 1].



3. Create the ENI file and DEF file on the [Master 1] EcConfigurator screen. Refer to the following for how to create ENI and DEF files.
 - How to create ENI files ([Page 38 Creating an ENI file](#))
 - How to create DEF files ([Page 22 Export DEF file](#))



The NIC corresponding to the master numbers can be checked on the "NIC setting" screen of SWMOS. Refer to the following for details on NIC setting.

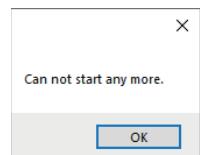
Motion Control Software SWM-G Operating Manual (SWMOS)

Appendix 2 Maximum Number of EcConfigurator Instances

The maximum number of EcConfigurator instances, which can be running at the same time, varies depending on the number of ports and the platform being used.

Number of ports used and platform details	Maximum number of instances
One port or EtherCAT not included	1
Two ports and EtherCAT included	2

When EcConfigurator is started and the maximum number of instances is exceeded, the following message appears.



A

Appendix 3 Network Configuration Setting with EcConfigurator

Connect the personal computer and slaves such as servo amplifiers with Ethernet cables.

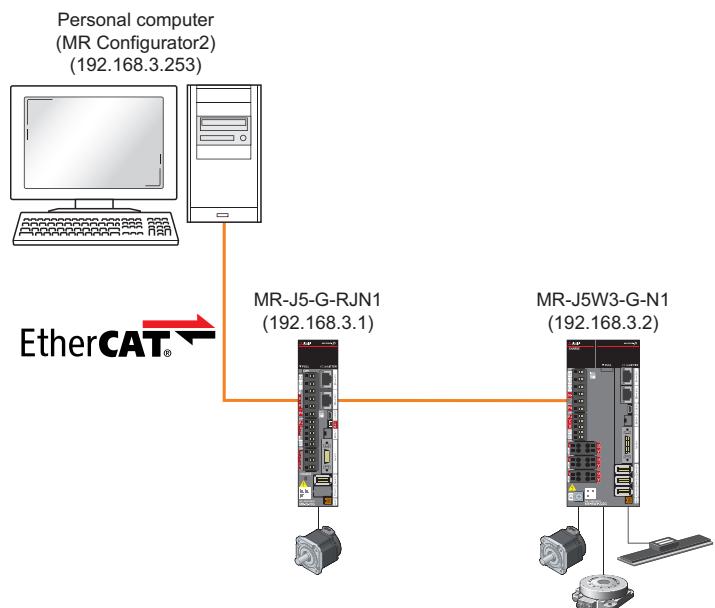
Set the rotary switches of the servo amplifiers.

In the initial state of the servo amplifiers, the rotary switches (SW1/SW2) correspond to the fourth octet of the IP address.

System configuration example

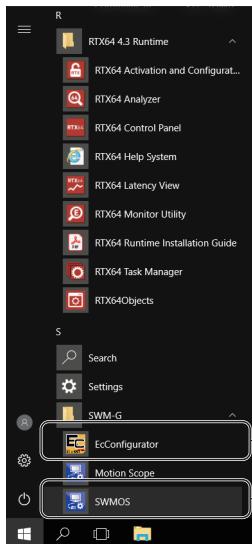
In the following system configuration example, the initial values of the IP addresses are used.

Applicable device	IP address
Personal computer (master)	192.168.3.253
MR-J5-G-RJN1	192.168.3.1
MR-J5W3-G-N1	192.168.3.2

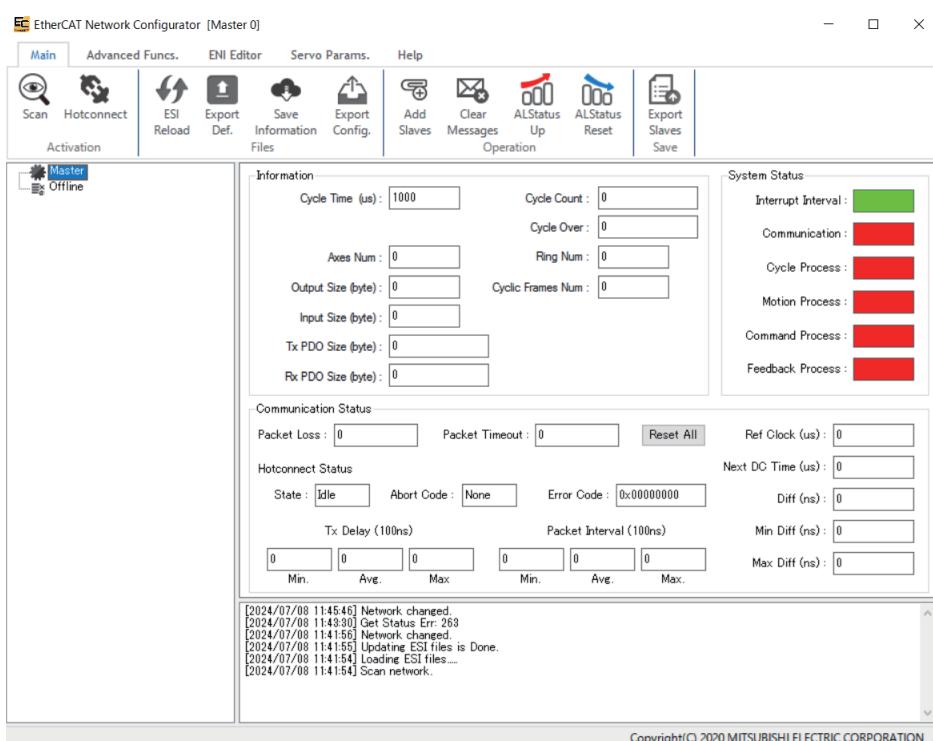


Starting SWMOS and EcConfigurator

1. Select [SWM-G] ⇒ [SWMOS] (1) from the Windows start menu to start SWMOS.
2. Select [SWM-G] ⇒ [EcConfigurator] (2) from the Windows start menu.



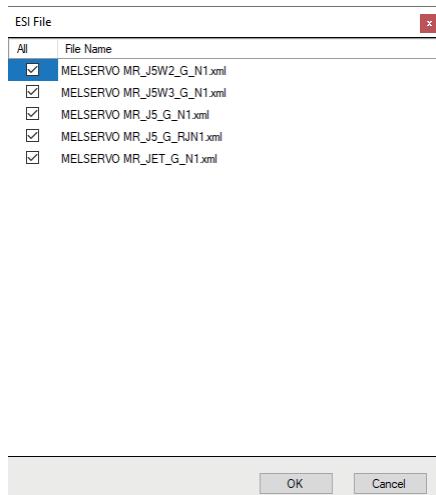
3. After starting EcConfigurator, the "EcConfigurator" screen appears.



Since EcConfigurator uses the SWM-G engine, SWMOS must be started in advance.
EcConfigurator will not operate normally if SWMOS is started after EcConfigurator is started.

Loading ESI (EtherCAT Slave Information)

1. Click [Main] ⇒ [ESI Reload] (↻) on the ribbon.
2. The "ESI File" screen appears. The ESI information loaded at the startup can be checked.



3. After selecting the ESI files to be loaded, click the [OK] button. The selected ESI files will be reloaded.

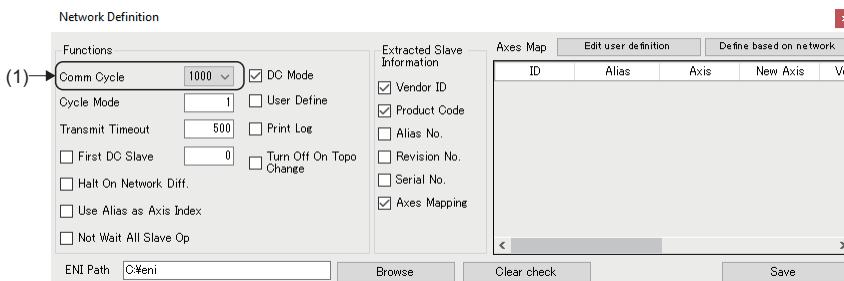


If no ESI files are displayed in the list, add ESI files. For details of how to add and update the ESI files, refer to the following.

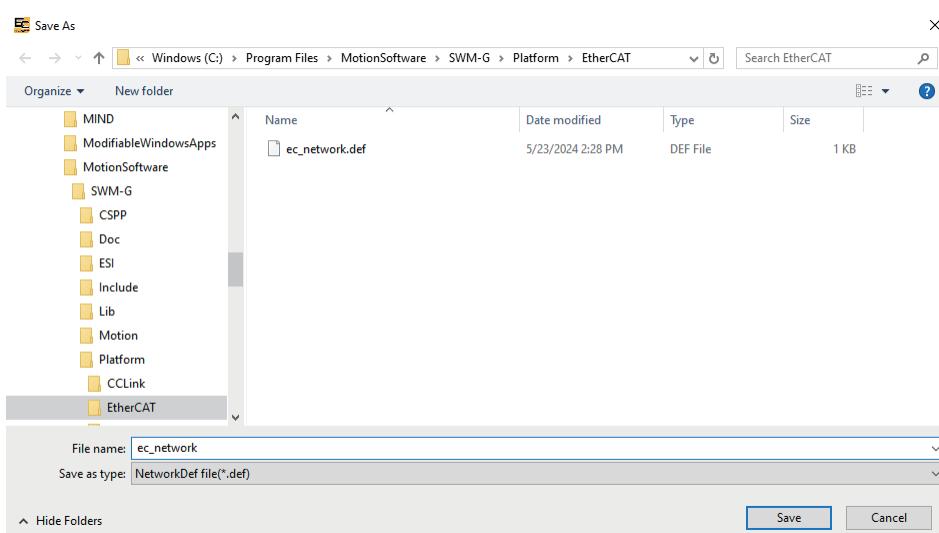
Page 21 How to add/update ESI files

Master setting

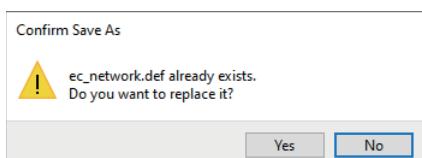
1. Click [Main] ⇒ [Export Def.] () on the ribbon.
2. The "Network Definition" screen appears. Initial values are displayed for each parameter. Set [Comm Cycle] (1) of the basic settings and click the [Save] button. (In the explanation of this section, the initial values are set.)
 - Comm Cycle (Communication cycle): 1000 [μs]



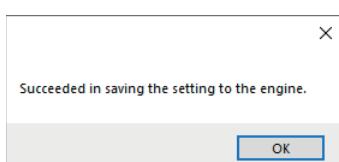
3. The "Save As" screen appears. Click the [Save] button without changing the file name (ec_network.def).



4. If the definition file already exists, the message "ec_network.def already exists." appears. Click the [Yes] button.



5. When the setting is updated, the message "Succeeded in saving the setting to the engine." appears. Click the [OK] button.

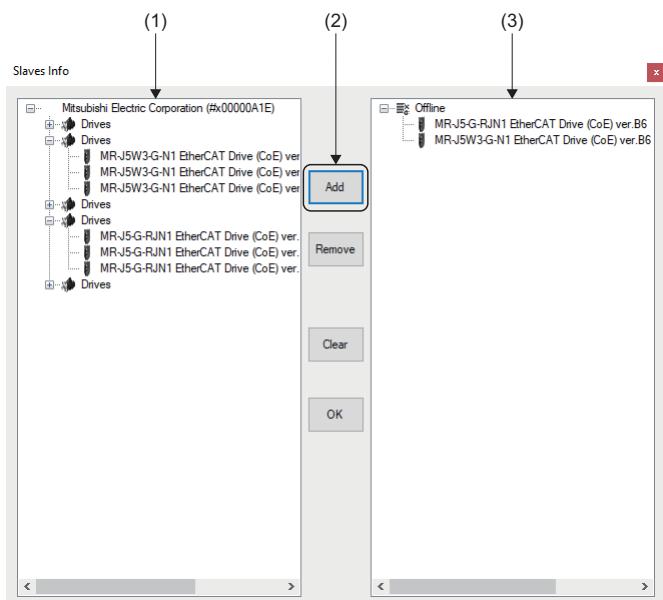


6. When the setting is completed, click the [×] button at the top right of the screen to close the "Network Definition" screen. The definition file is loaded and used when the next communication starts.

A

Adding slaves

- Click [Main] ⇒ [Add Slaves] (>Add) on the ribbon.
- The "Slaves Info" screen appears. Select the slaves to be connected from the list on the left (1), and click the [Add] button (2) to add them to the slave list (3)^{*1}. After adding slave devices to the slave list, click the [OK] button. (In the explanation of this section, "MR-J5-G-RJN1" and "MR-J5W3-G-N1" are added.)



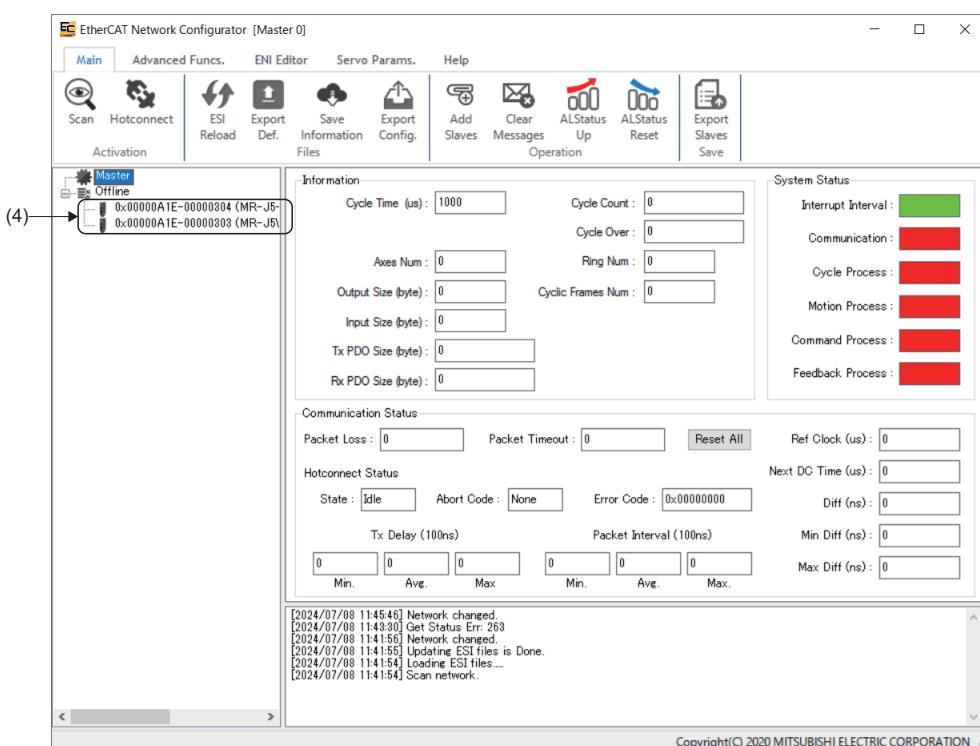
*1 When there are multiple slaves that are the same, select only one ESI file to add, as there is no need to add multiple ESI files.

Ex.

When configuring a system with multiple units of the following slaves

System configuration	ESI file to be added
<ul style="list-style-type: none"> • MR-J5-10G-RJ-N1 • MR-J5-20G-RJ-N1 • MR-J5W3-222G-N1 	<ul style="list-style-type: none"> • MR-J5-G-RJN1 • MR-J5W3-G-N1

- The slaves (4) are added in the tree on the "EtherCAT Network Configurator" screen.



ENI (EtherCAT Network Information) setting

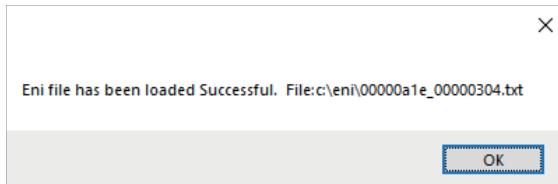
Create an ENI file used to initialize the slaves or set the PDO mapping at the start of communication.

The ENI file can be manually created but it is generally recommended to create the ENI file by loading the ESI files with "EcConfigurator" and editing the PDO.

Set an ENI file for each slave. The setting is loaded and used the next time communication with the slave starts.

■For MR-J5-G-RJN1

1. Select the slave added from the tree on the "EcConfigurator" screen, and click [ENI Editor] ⇒ [Load] (USB) on the ribbon.
2. When the loading is completed, the message "Eni file has been loaded Successful." appears. Click the [OK] button.



3. When the loading is completed successfully, the set PDO object list and PDO entry list appear.

For a single-axis servo amplifier, set only the axis number [0].

4. In Pdo Type (1), switch between "RxPdo" or "TxPdo" and set the PDO object lists^{*1} for "Rx" and "Tx".
In the initial value setting, "1st Receive PDO Mapping" is set for Rx and "1st Transmit PDO Mapping" is set for Tx. When the setting is changed, click the [Save] (USB) button to update the ENI file.

*1 For the PDO object list, set only one object each for Rx and Tx.

(1)

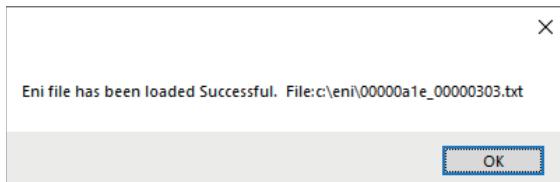
All	Index	Name	Size	SM	SU	Fixed	Mandatory	Virtual
<input checked="" type="checkbox"/>	#x1600	1st Receive PDO Mapping	13	2	0	False	False	False
<input type="checkbox"/>	#x1601	2nd Receive PDO Mapping	25	0	0	False	False	False
<input type="checkbox"/>	#x1602	3rd Receive PDO Mapping	15	0	0	False	False	False
<input type="checkbox"/>	#x1603	4th Receive PDO Mapping	0	0	0	False	False	False

A large arrow labeled '(1)' points down to the PDO entry list table.

A

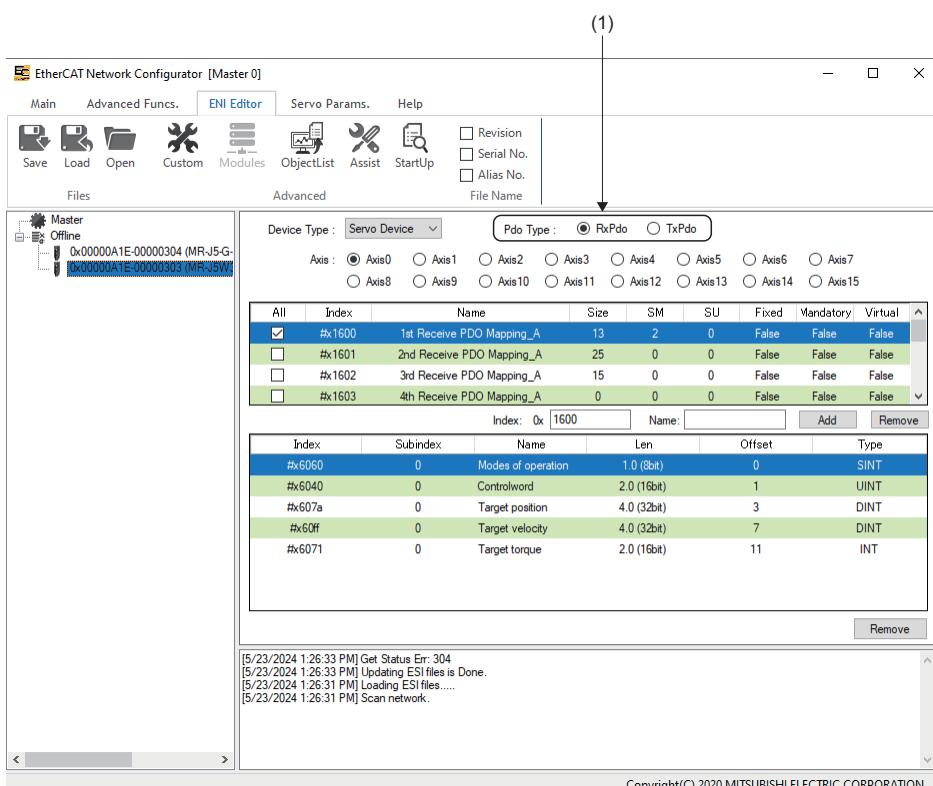
■For MR-J5W3-G-N1

1. Select the slave added from the tree on the "EcConfigurator" screen and click [ENI Editor] ⇒ [Load] (Import) on the ribbon.
2. When the loading is completed, the message "Eni file has been loaded Successful." appears. Click the [OK] button.



3. When the loading is completed successfully, the set PDO object list and PDO entry list appear.
4. In Pdo Type (1), switch between "RxPdo" or "TxPdo" and set the PDO object lists ^{*1} for "Rx" and "Tx".
In the initial value setting, "1st Receive PDO Mapping" is set for Rx and "1st Transmit PDO Mapping" is set for Tx. When the setting is changed, click the [Save] (Save) button to update the ENI file.
For a 3-axis servo amplifier, switch to the axis to be set and set the axis numbers for multiple axes. The axis numbers are as follows.
 - [Axis0]: A-axis
 - [Axis1]: B-axis
 - [Axis2]: C-axis

*1 For the PDO object list, set only one object each for Rx and Tx.

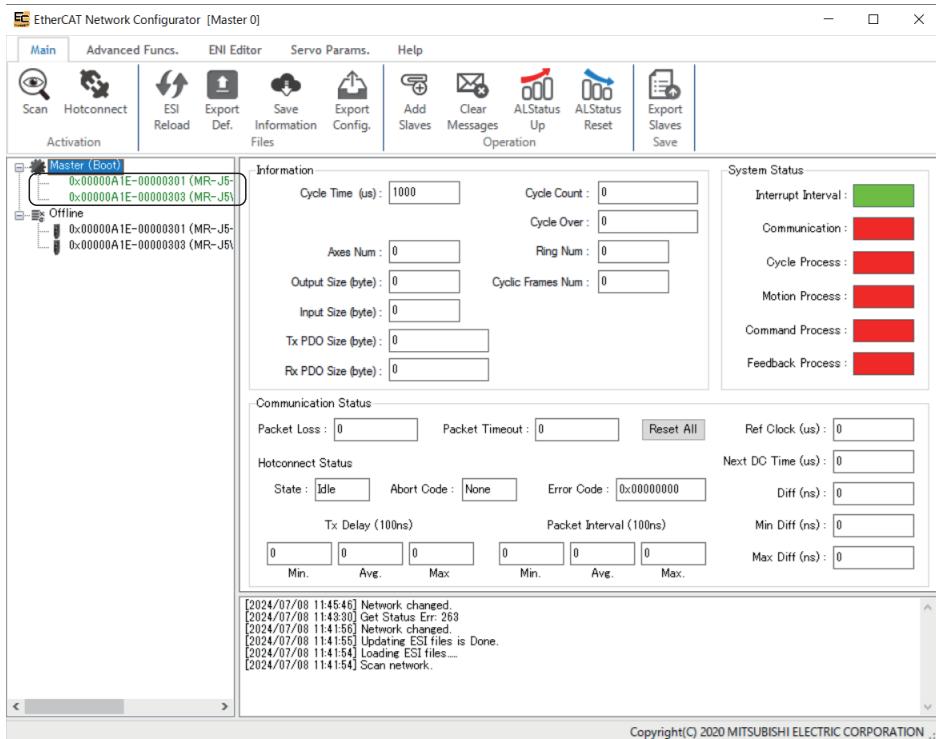


For details of the mapping change, refer to the following.

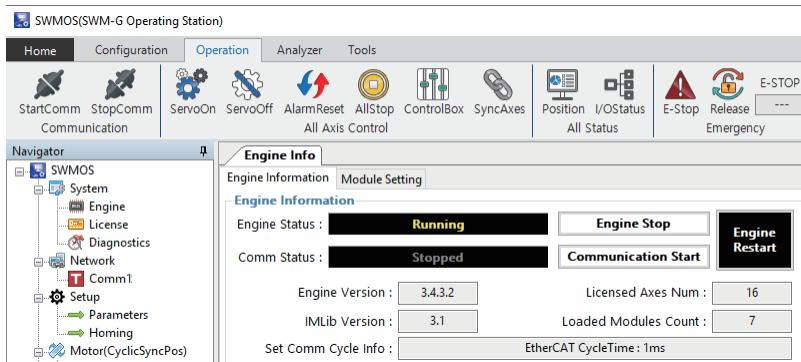
☞ Page 37 ENI editor

Connection check with the servo amplifier

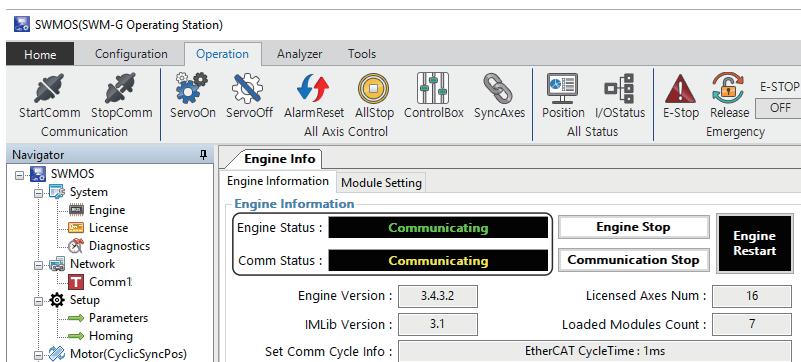
1. Turn ON the control circuit power supply of the servo amplifier.
2. Click [Main] \Rightarrow [Scan] (🔍) on the ribbon. The connected servo amplifiers are displayed in the tree on the "EtherCAT Network Configurator" screen.



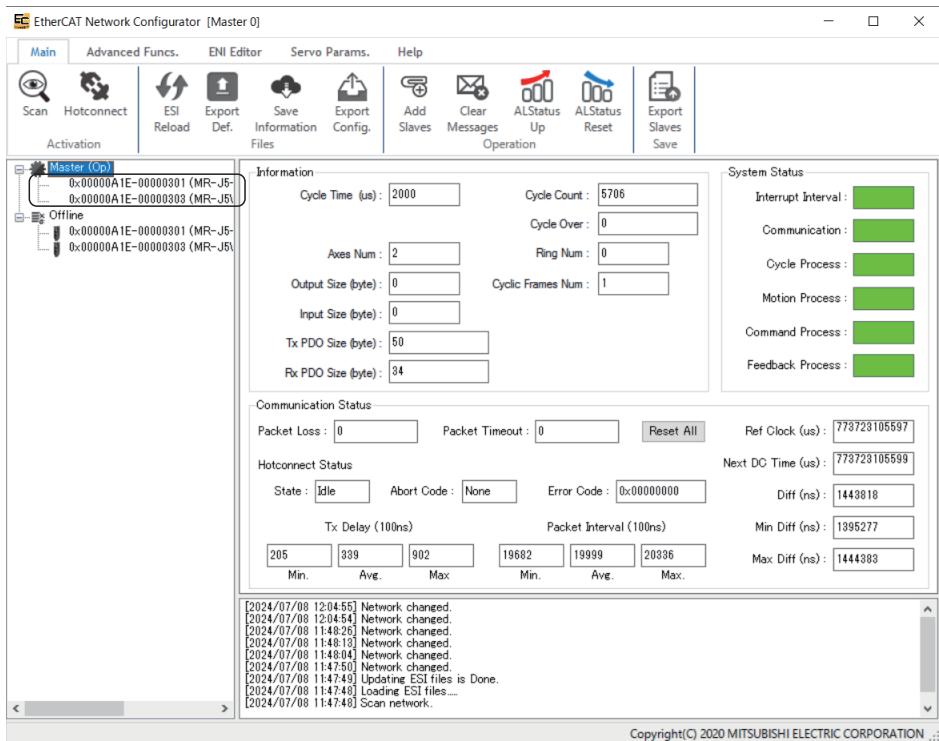
3. Switch to the "SWMOS" screen and click [Operation] \Rightarrow [StartComm] (🔊) on the ribbon to start the communication.



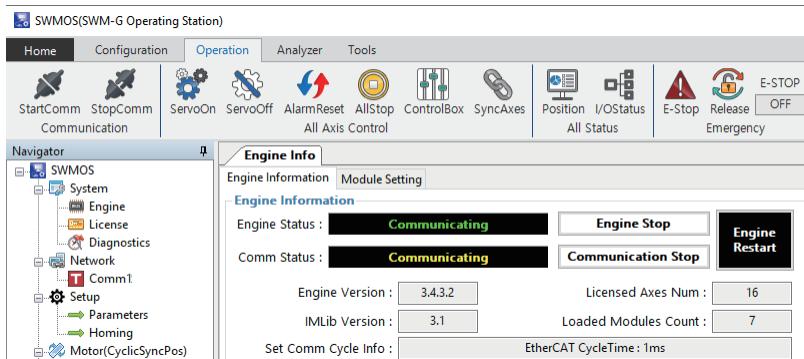
4. When the communication is started, the display of [Engine Status] and [Comm Status] in the [Engine Information] tab on the Engine Info window is switched to "Communicating".



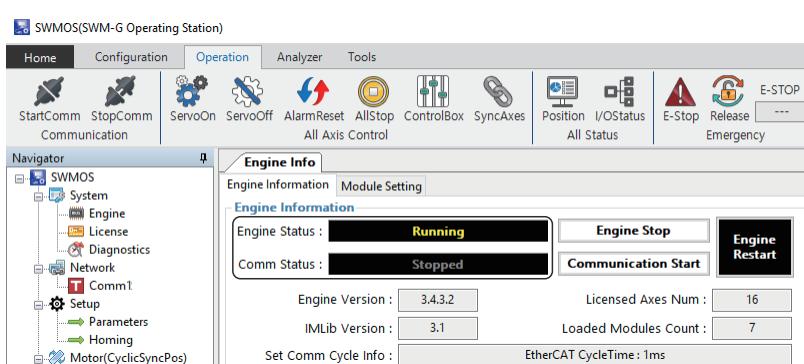
5. Switch to the "EtherCAT Network Configurator" screen, and select [Main] on the ribbon to check the connection status. When the communication with the servo amplifier is established, the display color of the tree changes from green to black. The system status, communication status, and other information can be checked.



6. After checking the communication status, switch to the "SWMOS" screen and click [Operation] ⇒ [StopComm] (🔗) on the ribbon to end the communication.



7. When the communication is ended, the display of [Engine Status] and [Comm Status] in the [Engine Information] tab on the Engine Info window switches to "Running" and "Stopped" respectively.



8. When the communication is ended and the servo amplifier is disconnected, turn OFF the control circuit power supply of the servo amplifier.

Appendix 4 MR Configurator2 Communication Connection using EoE Communication

This section describes how to connect MR Configurator2 to the servo amplifier using EoE (Ethernet over EtherCAT).

The procedure differs depending on whether there are slaves of the same model or not.

When there are no slaves of the same model

Connect the personal computer and slaves such as servo amplifiers with Ethernet cables.

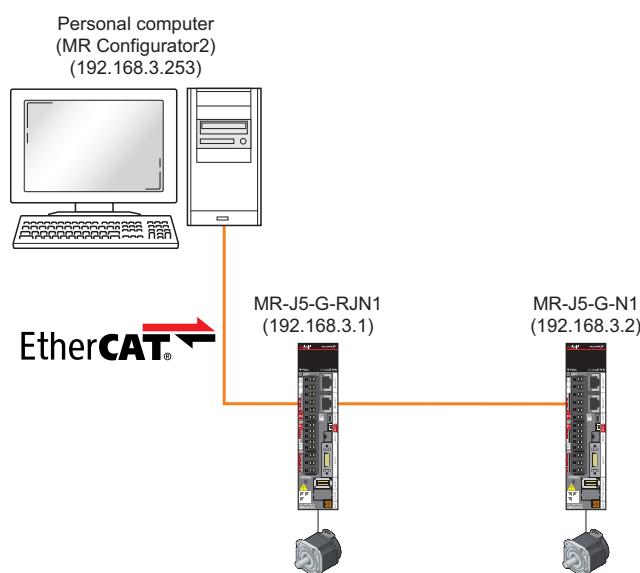
Set the rotary switches of the servo amplifiers.

In the initial state of the servo amplifiers, the rotary switches (SW1/SW2) correspond to the fourth octet of the IP address.

System configuration example

In the following system configuration example, the initial values of the IP addresses are used.

Applicable device	IP address
Personal computer (master)	192.168.3.253
MR-J5-G-RJN1	192.168.3.1
MR-J5-G-N1	192.168.3.2



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Connection via SWM-G is available with MR Configurator2 software version "1.130L" or later.

Operating procedure

1. Create an ENI file. For the procedure for creating ENI files for each slave, refer to the following.

☞ Page 38 Creating an ENI file

This section explains by using the default ENI file stored in the following folder.

Storage destination	Servo amplifier	ENI file
C:\leni	MR-J5-G-N1	00000a1e_00000301.txt
	MR-J5-G-RJN1	00000a1e_00000304.txt

2. Edit the ENI file. Add the following to the ENI file for each slave created in step 1.

- Add "EoEDevice"^{*1}, "EoElp"^{*1}, and "EoESubnetMask"^{*1} to the beginning.
- Add "InitEoEDevice"^{*1} to the [preop2safeop] section.

- For MR-J5-G-RJN1 (Axis 0) "00000a1e_00000304_0.txt"

```

{ EoEDevice: 1
  EoElp: 192.168.3.1
  EoESubnetMask: 255.255.255.0 }

IdentificationReg134: 1
DcAssignActive: 0x0300
ModesOfOperation: 0_0_1

;rvnrConfig:UX1,UX1800,17,1
RegWrite: 0x400,2,0x09c2
RegWrite: 0x420,2,0x03e8

[preop2init]

{ [preop2safeop]
  InitEoEDevice }

SDODownload: 0x1c12,0x0,1,0x00,1
SDODownload: 0x1c13,0x0,1,0x00,1
SDODownload: 0x1600,0x0,1,0x00,1
SDODownload: 0x1600_0x14,0x60600008,1

```

- For MR-J5-G-N1 (Axis 1) "00000a1e_00000301_0.txt"

```

{ EoEDevice: 1
  EoElp: 192.168.3.2
  EoESubnetMask: 255.255.255.0 }

IdentificationReg134: 1
DcAssignActive: 0x0300
ModesOfOperation: 0_0_1

;rvnrConfig:UX1,UX1800,24,1
RegWrite: 0x400,2,0x09c2
RegWrite: 0x420,2,0x03e8

[preop2init]

{ [preop2safeop]
  InitEoEDevice }

SDODownload: 0x1c12,0x0,1,0x00,1
SDODownload: 0x1c13,0x0,1,0x00,1
SDODownload: 0x1600,0x0,1,0x00,1
SDODownload: 0x1600_0x14,0x60600008,1

```

*1 The descriptions of the items are shown below.

Item	Description
EoEDevice	Specifies that the slave is an EoE device.
EoElp	Specifies the IP address of the EoE device.
EoESubnetMask	Specifies the subnet mask of the EoE device.
InitEoEDevice	Initializes the EoE device.

3. Edit the Module.ini file. Add "EoEVirtualnic = 1" to the EcPlatform definition.

```

MessageLevel = 1
PrintLog = 0
NumOfInterrupt = 2

Location = .\motion\

[Platform 0]
Location = .\platform\ethercat\
DINName = ecPlatform
{ EoEVirtualnic = 1
  disable = 1 }

```



The IP communication mixed function is available only for platforms set to "Platform Setting 0" which can be adjusted from the SWMOS navigation window by selecting [SWMOS] ⇒ [System] ⇒ [Engine] ⇒ [Engine Information] tab ⇒ [Platform Setting].

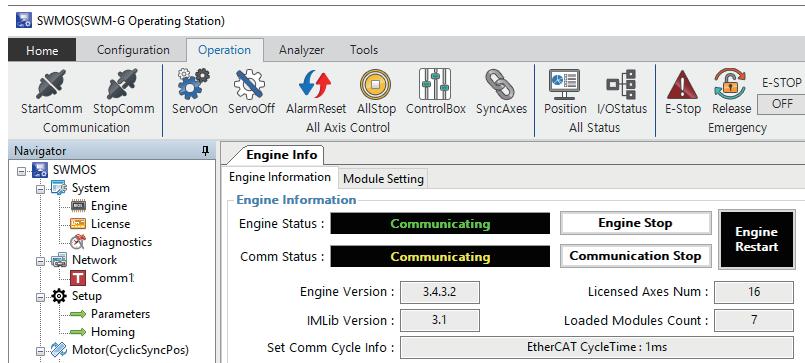
When the EtherCAT platform and the CC-Link IE TSN platform are used together, set the platform connected with MR Configurator2 to "Platform Setting 0".

4. Set the IP communication mixed function.

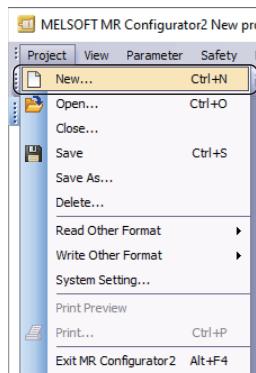
For how to set the IP communication mixed function, refer to [CC-Link IE TSN Platform] ⇒ [Network Define (cclink_network.def)] ⇒ [CC-link IE TSN/IP Communication Function] in the following manual.

SWM-G-N1 User Manual

5. In SWMOS, click [Operation] ⇒ [StartComm] () on the ribbon to start the communication.

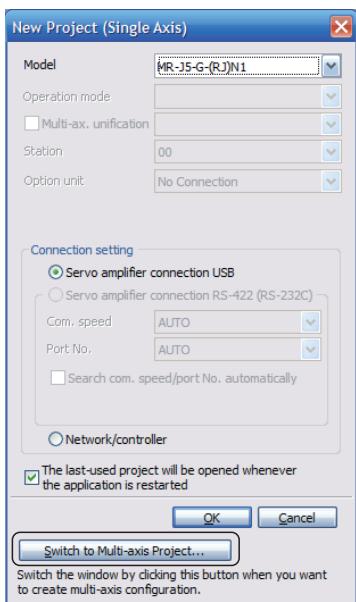


6. Start MR Configurator2. Select [Project] ⇒ [New] from the menu to create a new project.



A

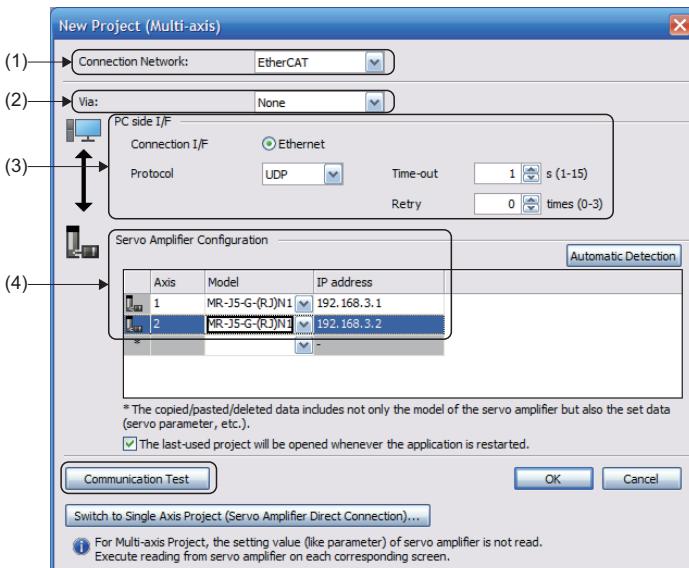
7. When a new project is created, the "New Project" screen appears. Select the model (example: MR-J5-G-(RJ)N1) and click the [Switch to Multi-axis Project] button.



8. The screen is switched to the "New Project" screen of the multi-axis project. Set each item.

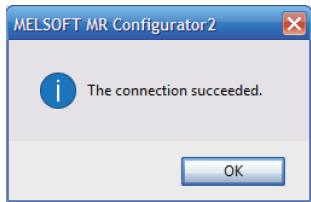
(Example) Set the following items.

	Item	Setting value	
(1)	Connection Network	EtherCAT	
(2)	Via	None	
(3)	PC side I/F	Connection I/F	Ethernet
		Protocol	UDP
		Time-out	1
		Retry	0
(4)	Servo Amplifier Configuration	Axis 1	Model: MR-J5G-(RJ)N1 IP address: 192.168.3.1
		Axis 2	Model: MR-J5G-(RJ)N1 IP address: 192.168.3.2



9. When the setting is completed, turn ON the control circuit power supply of the servo amplifier and click the [Communication Test] button.

10. When the communication is succeeded, the message "The connection succeeded" appears. Click the [OK] button.



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When there are slaves of the same model

Connect the personal computer and slaves such as servo amplifiers with Ethernet cables.

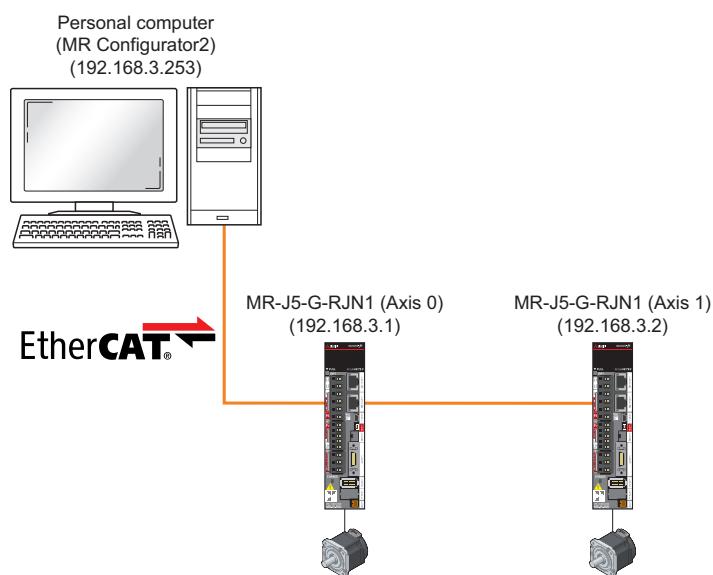
Set the rotary switches of the servo amplifiers.

In the initial state of the servo amplifiers, the rotary switches (SW1/SW2) correspond to the fourth octet of the IP address.

System configuration example

In the following system configuration example, the initial values of the IP addresses are used.

Applicable device	IP address
Personal computer (master)	192.168.3.253
MR-J5-G-RJN1	192.168.3.1
MR-J5-G-RJN1	192.168.3.2



Connection via SWM-G is available with MR Configurator2 software version "1.130L" or later.

Operating procedure

1. Create an ENI file. For the procedure for creating ENI files for each slave, refer to the following.

☞ Page 38 Creating an ENI file

When the EoE slaves have the same model name, the ENI file must be created as a separate file.

This section explains by copying the default file "00000a1e_00000304.txt" for MR-J5-G-RJN1 and using the following file names.

Storage destination	Servo amplifier	ENI file
C:\eni	MR-J5-G-RJN1 (Axis 0)	00000a1e_00000304_0.txt
	MR-J5-G-RJN1 (Axis 1)	00000a1e_00000304_1.txt

2. Edit the ENI file. Add the following to the ENI file for each slave created in step 1.

- Add "EoEDevice"^{*1}, "EoElp"^{*1}, and "EoESubnetMask"^{*1} to the beginning.
- Add "InitEoEDevice"^{*1} to the [preop2safeop] section.

- For MR-J5-G-RJN1 (Axis 0) "00000a1e_00000304_0.txt"

```

{ EoEDevice: 1
  EoElp: 192.168.3.1
  EoESubnetMask: 255.255.255.0 }

IdentificationReg134: 1
DcAssignActive: 0x0300
ModesOfOperation: 0_0_1

;#WwWConfig: UX1,UX1800,17,1
RegWrite: 0x400,2,0x09c2
RegWrite: 0x420,2,0x03e8

[preop2init]

{ [preop2safeop]
  InitEoEDevice }

SDODownload: 0x1c12,0x0,1,0x00,1
SDODownload: 0x1c13,0x0,1,0x00,1
SDODownload: 0x1601,0x0,1,0x00,1
SDODownload: 0x1601_0x1.4.0x60600008,1

```

- For MR-J5-G-RJN1 (Axis 1) "00000a1e_00000304_1.txt"

```

{ EoEDevice: 1
  EoElp: 192.168.3.2
  EoESubnetMask: 255.255.255.0 }

IdentificationReg134: 1
DcAssignActive: 0x0300
ModesOfOperation: 0_0_1

;#WwWConfig: UX1,UX1800,17,1
RegWrite: 0x400,2,0x09c2
RegWrite: 0x420,2,0x03e8

[preop2init]

{ [preop2safeop]
  InitEoEDevice }

SDODownload: 0x1c12,0x0,1,0x00,1
SDODownload: 0x1c13,0x0,1,0x00,1
SDODownload: 0x1601,0x0,1,0x00,1
SDODownload: 0x1601_0x1.4.0x60600008,1

```

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*1 The descriptions of the items are shown below.

Item	Description
EoEDevice	Specifies that the slave is an EoE device.
EoElp	Specifies the IP address of the EoE device.
EoESubnetMask	Specifies the subnet mask of the EoE device.
InitEoEDevice	Initializes the EoE device.

3. Edit the Module.ini file. Add "EoEVirtualnic = 1" to the EcPlatform definition.

```

MessageLevel = 1
PrintLog = 0
NumOfInterrupt = 2

Location = .\motion\

[Platform 0]
Location = .\platform\ethercat\
DINName = ecPlatform
{ EoEVirtualnic = 1
  disable = 1
}

```



The IP communication mixed function is available only for platforms set to "Platform Setting 0" which can be adjusted from the SWMOS navigation window by selecting [SWMOS] ⇒ [System] ⇒ [Engine] ⇒ [Engine Information] tab ⇒ [Platform Setting].

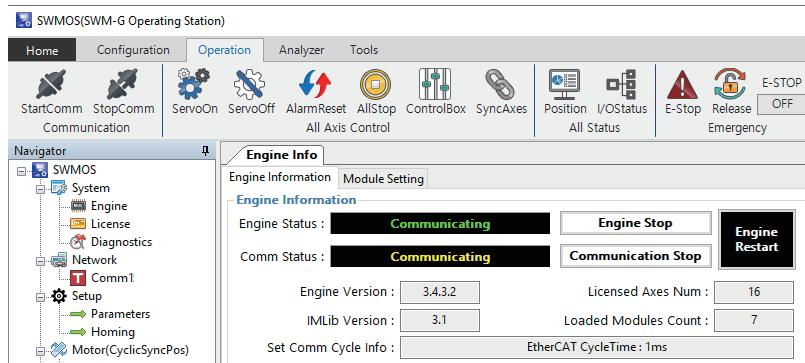
When the EtherCAT platform and the CC-Link IE TSN platform are used together, set the platform connected with MR Configurator2 to "Platform Setting 0".

4. Set the IP communication mixed function.

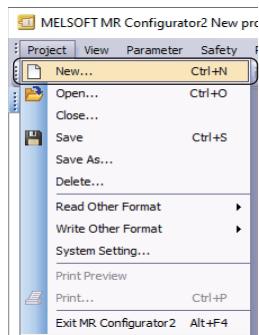
For how to set the IP communication mixed function, refer to [CC-Link IE TSN Platform] ⇒ [Network Define (cclink_network.def)] ⇒ [CC-link IE TSN/IP Communication Function] in the following manual.

SWM-G-N1 User Manual

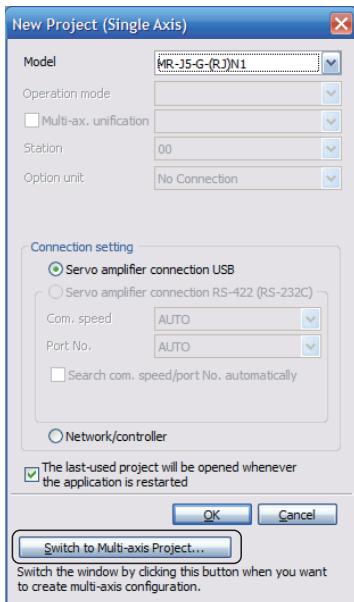
5. In SWMOS, click [Operation] ⇒ [StartComm] () on the ribbon to start the communication.



6. Start MR Configurator2. Select [Project] ⇒ [New] from the menu to create a new project.



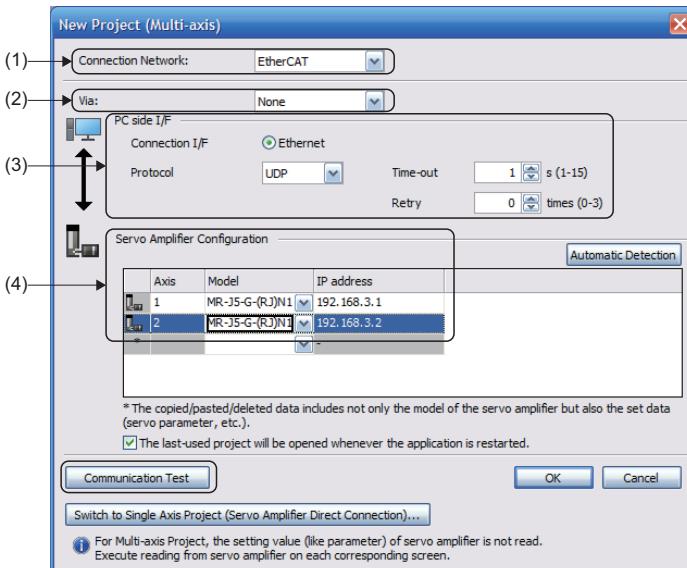
7. When a new project is created, the "New Project" screen appears. Select the model (example: MR-J5-G-(RJ)N1) and click the [Switch to Multi-axis Project] button.



8. The screen is switched to the "New Project" screen of the multi-axis project. Set each item.

(Example) Set the following items.

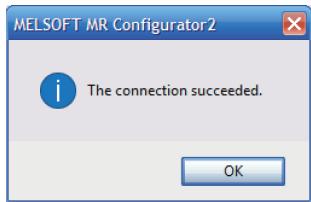
	Item	Setting value	
(1)	Connection Network	EtherCAT	
(2)	Via	None	
(3)	PC side I/F	Connection I/F	Ethernet
		Protocol	UDP
		Time-out	1
		Retry	0
(4)	Servo Amplifier Configuration	Axis 1	Model: MR-J5G-(RJ)N1 IP address: 192.168.3.1
		Axis 2	Model: MR-J5G-(RJ)N1 IP address: 192.168.3.2



9. When the setting is completed, turn ON the control circuit power supply of the servo amplifier and click the [Communication Test] button.

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10. When the communication is succeeded, the message "The connection succeeded" appears. Click the [OK] button.

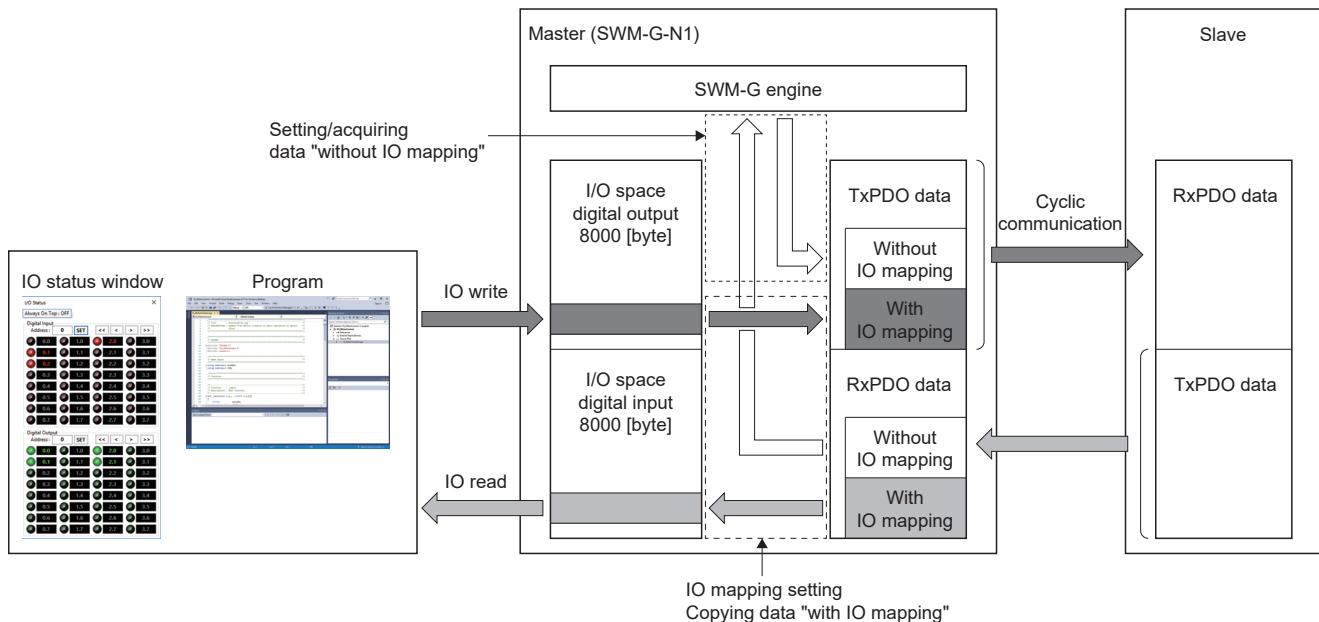


Appendix 5 IO Mapping Settings

This section describes how to configure the IO mapping and provides setting examples.

Overall view of the IO mapping

The following figure shows the overall view of the IO mapping.



Configuring the IO mapping settings enables rewriting TxPDO data and checking RxPDO data by IO operation for the PDO objects mapped in the ENI settings.

For example, by assigning "Digital inputs", the external signal status (LSP, LSN, and DOG) can be checked and acquired by IO operation.

IO operation can be performed in the following methods.

- Operating the I/O Status window of SWMOS (digital output, digital input)
- Executing IO control functions in the program (such as SetOutputBit and GetInputBit)

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How to configure the IO mapping

This section describes how to configure the IO mapping.

ENI settings/DEF file settings

Configure the ENI settings and DEF file settings to create an ENI file and DEF file.

For details of the ENI settings and DEF file settings, refer to the following.

- ENI settings ([Page 36 ENI Editor Tab](#))
- DEF file settings ([Page 22 Export DEF file](#))

Editing ENI file/DEF file

Edit the ENI file and DEF file created by configuring the ENI settings and DEF file settings.

■Editing an ENI file

1. Open the ENI file of the target slave. ([Page 39 Opening an ENI file](#))
2. Add the IO mapping declarations (IoInput, IoInputSeg, IoOutput, and IoOutputSeg) above the [boot2init] section in the ENI file. For details of each declaration, select [EtherCAT Platform] ⇒ [ENI File] ⇒ [General Statements] in the following manual.

[SWM-G-N1 User Manual](#)

```
IdentificationReg134: 1
DcAssignActive: 0x0300
ModesOfOperation: 0, 0, 1
ControlWord: 0, 1, 2
TargetPosition: 0, 3, 4
TargetVelocity: 0, 7, 4
TargetTorque: 0, 11, 2
ModesOfOperationDisplay: 0, 0, 1
StatusWord: 0, 1, 2
PositionActualValue: 0, 3, 4
VelocityActualValue: 0, 7, 4
FollowingError: 0, 11, 4
TorqueActualValue: 0, 15, 2
```

```
IoInput: 0, 21
IoInputSeg: 17, 4
IoInputSeg: 1, 2
```

```
IoOutput: 0, 21
IoOutputSeg: 13, 4
IoOutputSeg: 17, 4
```

```
[boot2init]
```

```
[init2boot]
```

```
[init2preop]
SMConfig: 0x0,0x2000,276,0x26,1
SMConfig: 0x1,0x2800,276,0x22,1
SMConfig: 0x0,0x2000,24,0x61,1
```

3. Save the edited ENI file.

■Editing a DEF file

1. Open the target DEF file (ec_network.def).
 - Storage destination folder (default) of the DEF file (ec_network.def)

Storage destination folder

C:\Program Files\MotionSoftware\SWM-G\Platform\EtherCAT

2. Add "UserDef = 1" to the [Master 0] section in the DEF file. If it has already been added, there is no need to add it again.

```
[Master 0]
CommCycle = 1000
DcMode = 1
CycleMode = 1
PrintLog = 0
UserDef = 1
HaltOnNetworkDiff = 0
TransmitTimeout = 500
UseAliasAsAxisIndex = 0
TurnOffOnTopoChange = 0
NotWaitAllSlaveOp = 0
EniFolder = C:\eni
Hotconnect = 1

[Master 1]
CommCycle = 1000
DcMode = 1
CycleMode = 1
PrintLog = 0
Hotconnect = 1
```

3. Add the IO mapping settings (InAddr, InSize, OutAddr, and OutSize) to the [Slave □^{*1}] section in the DEF file. For details of each setting, select [EtherCAT Platform] ⇒ [Network Define (ec_network.def)] in the following manual.

SWM-G-N1 User Manual

*1 □= Slave number

```
[Master 0]
CommCycle = 1000
DcMode = 1
CycleMode = 1
PrintLog = 0
UserDef = 1
HaltOnNetworkDiff = 0
TransmitTimeout = 500
UseAliasAsAxisIndex = 0
TurnOffOnTopoChange = 0
NotWaitAllSlaveOp = 0
EniFolder = C:\eni
Hotconnect = 1

[Slave 0]
InAddr = 10
InSize = 6
OutAddr = 10
OutSize = 8

[Slave 1]
InAddr = 20
InSize = 6
OutAddr = 20
OutSize = 8

[Master 1]
CommCycle = 1000
DcMode = 1
CycleMode = 1
PrintLog = 0
Hotconnect = 1
```

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4. Save the edited DEF file.

Precuations

- The IO mapping cannot be sorted in a mixed manner with PDO objects of other slaves.
Configure it for each slave.

Ex.

For "Slave 0" and "Slave 1"

Settable	Not settable
Statusword[Slave0], Digital inputs[Slave0], Statusword[Slave1], Digital inputs[Slave1]	Statusword[Slave0], Statusword[Slave1], Digital inputs[Slave0], Digital inputs[Slave1]

- If the size of IoInput/IoOutput is greater than InSize/OutSize, objects that cross the InSize/OutSize boundary will be excluded from the mapping. (Judged for each object)

Configure the setting so that the size of IoInput/IoOutput is equal to or smaller than InSize/OutSize.

Setting example of IO mapping

Creating TxPDO data and confirming RxPDO data by IO operation are possible in the following system configuration example.

Connect the personal computer and slaves such as servo amplifiers with Ethernet cables.

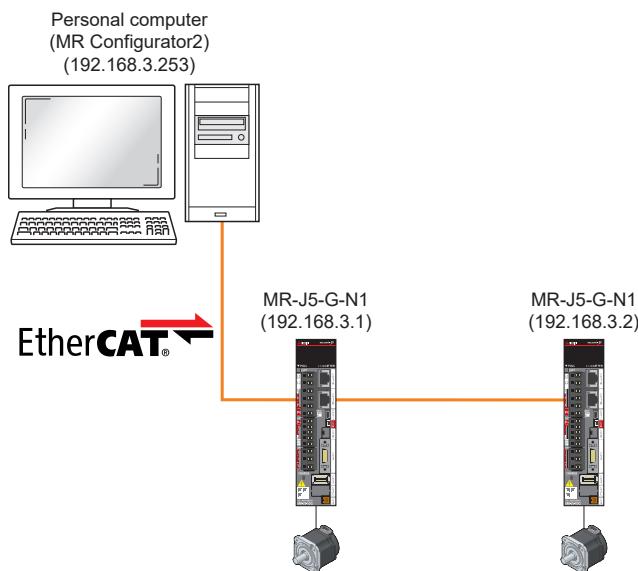
Set the rotary switches of the servo amplifiers.

In the initial state of the servo amplifiers, the rotary switches (SW1/SW2) correspond to the fourth octet of the IP address.

System configuration example

In the following system configuration example, the initial values of the IP addresses are used.

Applicable device	IP address
Personal computer (master)	192.168.3.253
MR-J5-G-N1 (Slave 0)	192.168.3.1
MR-J5-G-N1 (Slave 1)	192.168.3.2



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Overall configuration of IO mapping

Configure the following IO mapping.

The Tx/Rx column indicates whether the object is a transmitter or receiver in each slave. For details of each object, refer to the following.

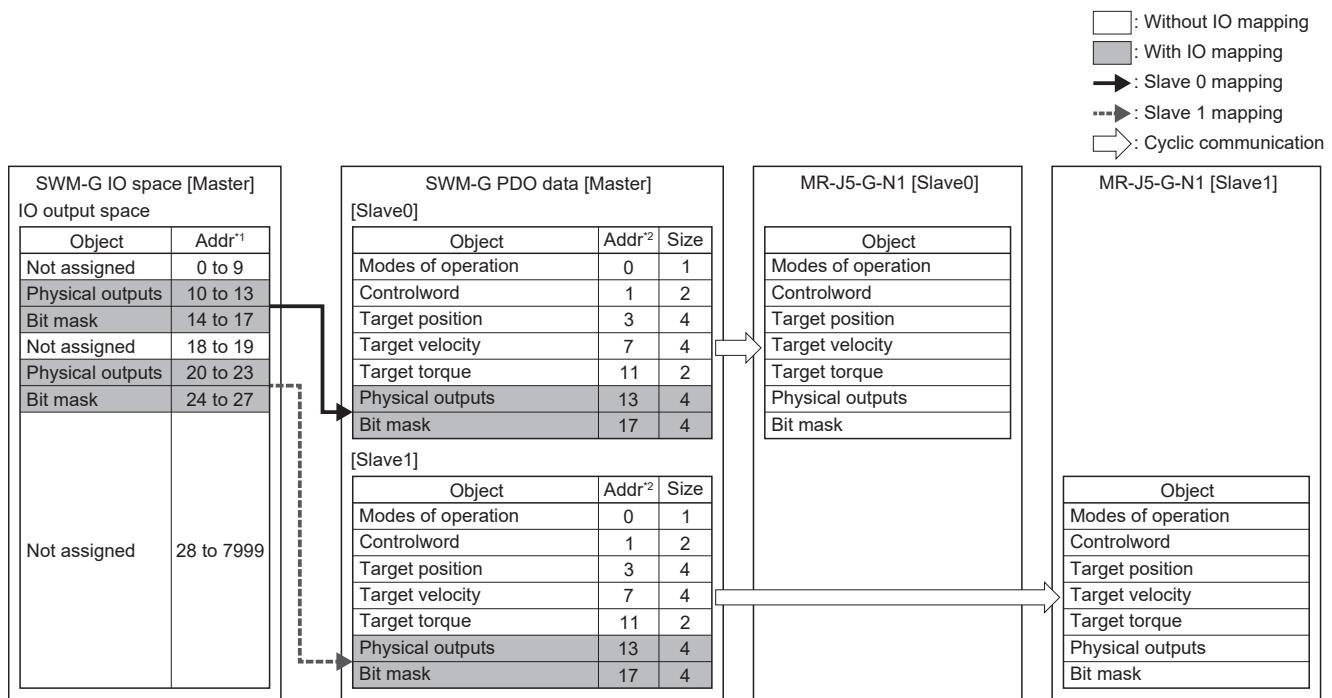
[MR-J5-G-N1/MR-J5W-G-N1 User's Manual \(Object Dictionary\)](#)

Target slave	Object				IO mapping destination	
	Object name	Index	Sub	Rx/Tx	Input/output	IO address
Slave 0	StatusWord	6041h	00	Tx	Input	14 to 15
	Digital Input	60FDh	00	Tx	Input	10 to 13
	Physical Output	60FEh	01	Rx	Output	10 to 13
	Bitmask	60FEh	02	Rx	Output	14 to 17
Slave 1	StatusWord	6041h	00	Tx	Input	24 to 25
	Digital Input	60FDh	00	Tx	Input	20 to 23
	Physical Output	60FEh	01	Rx	Output	20 to 23
	Bitmask	60FEh	02	Rx	Output	24 to 27

■Overall configuration of IO mapping

The following shows the overall configuration of the IO mapping.

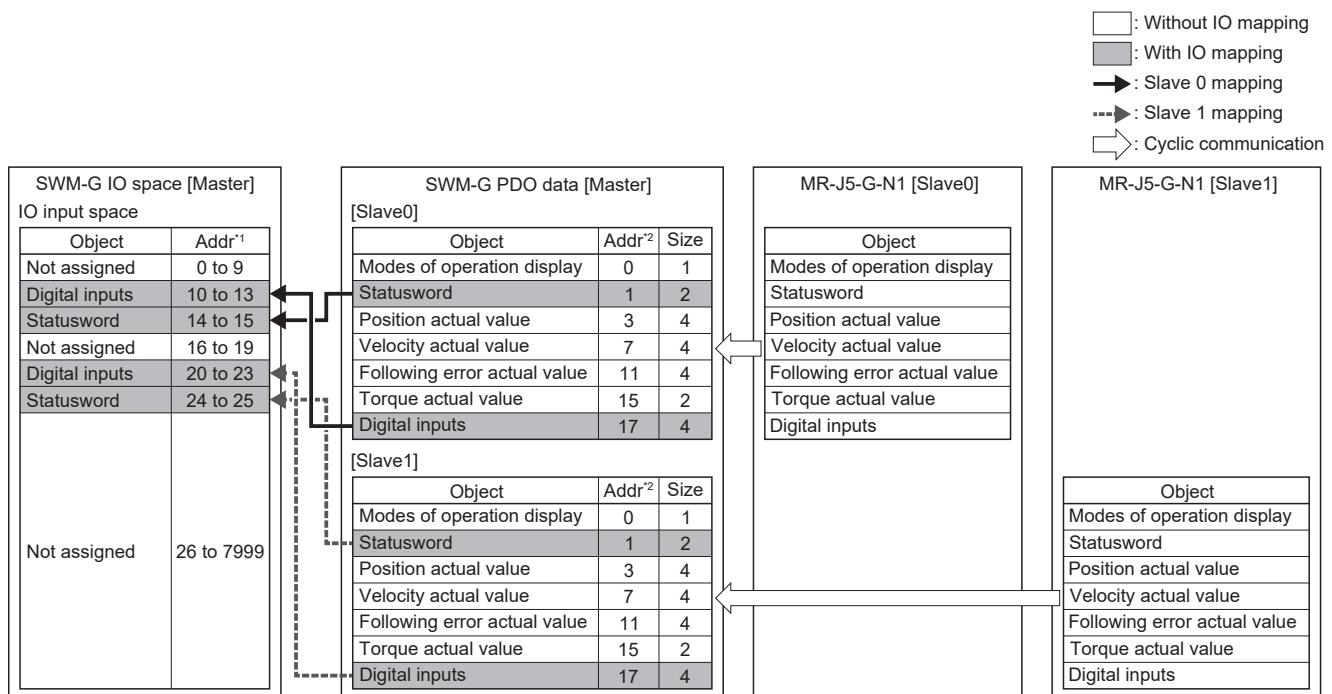
- Master → Slave



*1 Indicates the range where the object is allocated within each 8000-byte output space.

*2 Indicates the start address in each slave.

- Slave → Master



*1 Indicates the range where the object is allocated within each 8000-byte input space.

*2 Indicates the start address in each slave.

Details of ENI settings

Configure the IO mapping settings and servo amplifier settings according to how to configure the IO mapping (☞ Page 72 How to configure the IO mapping).

Operating procedure

1. Click [ENI Editor] on the ribbon and select the slave to be set from the tree on the "EcConfigurator" screen.

2. Add objects to RxPDO and TxPDO of the slave.

< Setting RxPDO >

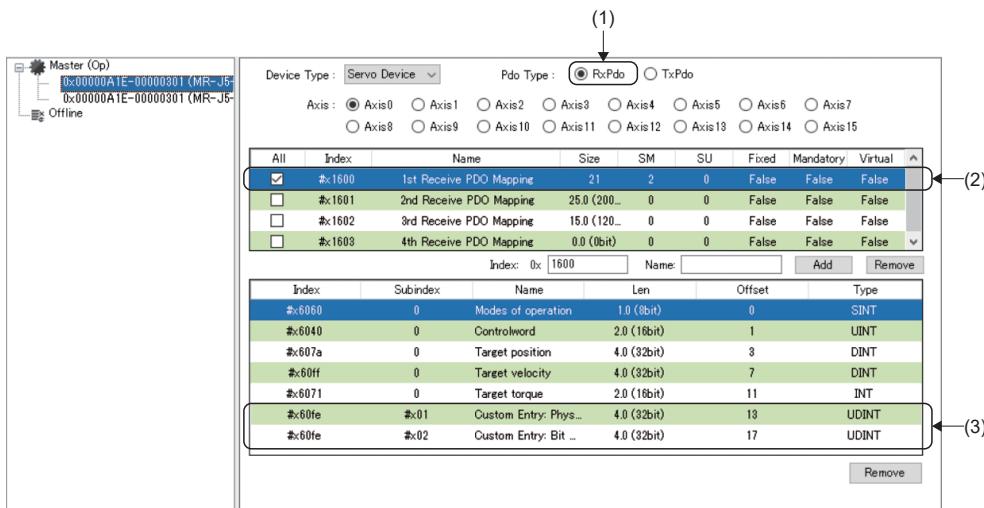
Select "RxPDO" (1) for the PDO type.

Select "1st Receive PDO Mapping" (2) from the PDO object list.

Click [ENI Editor] ⇒ [ObjectList] (☞ Page 41 Object list)

Select the following objects from the PDO object list on the "Object List" screen and add them to the PDO entry list (3).

Index	Sub	Name
60FEh	01	Physical outputs
60FEh	02	Bit mask



< Setting TxPDO >

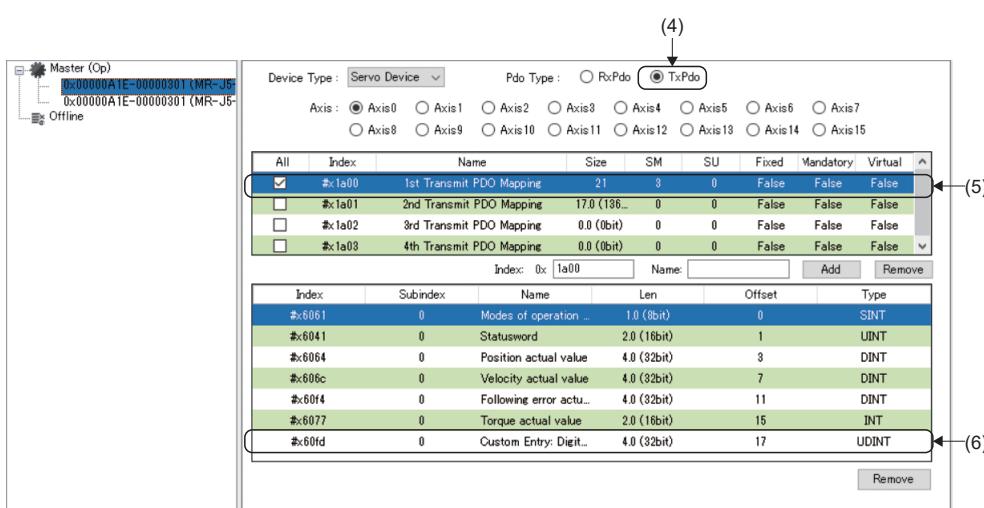
Select "TxPDO" (4) for the PDO type.

Select "1st Transmit PDO Mapping" (5) from the PDO object list.

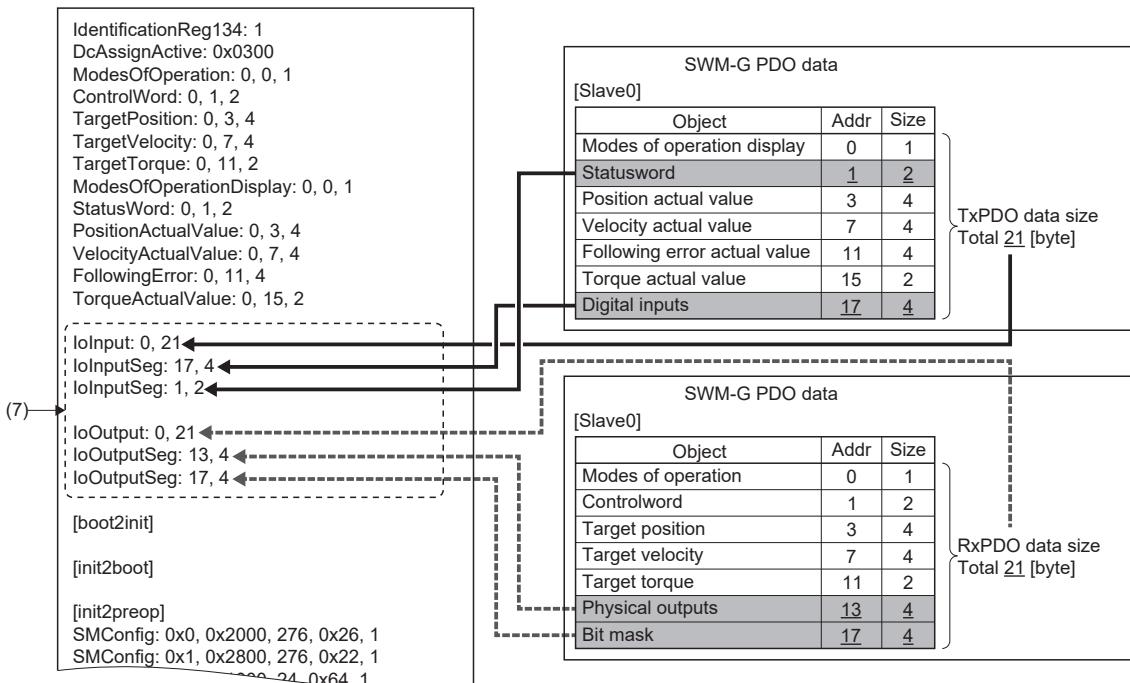
Click [ENI Editor] ⇒ [ObjectList] (☞ Page 41 Object list)

Select the following objects from the PDO object list on the "Object List" screen and add them to the PDO entry list (6).

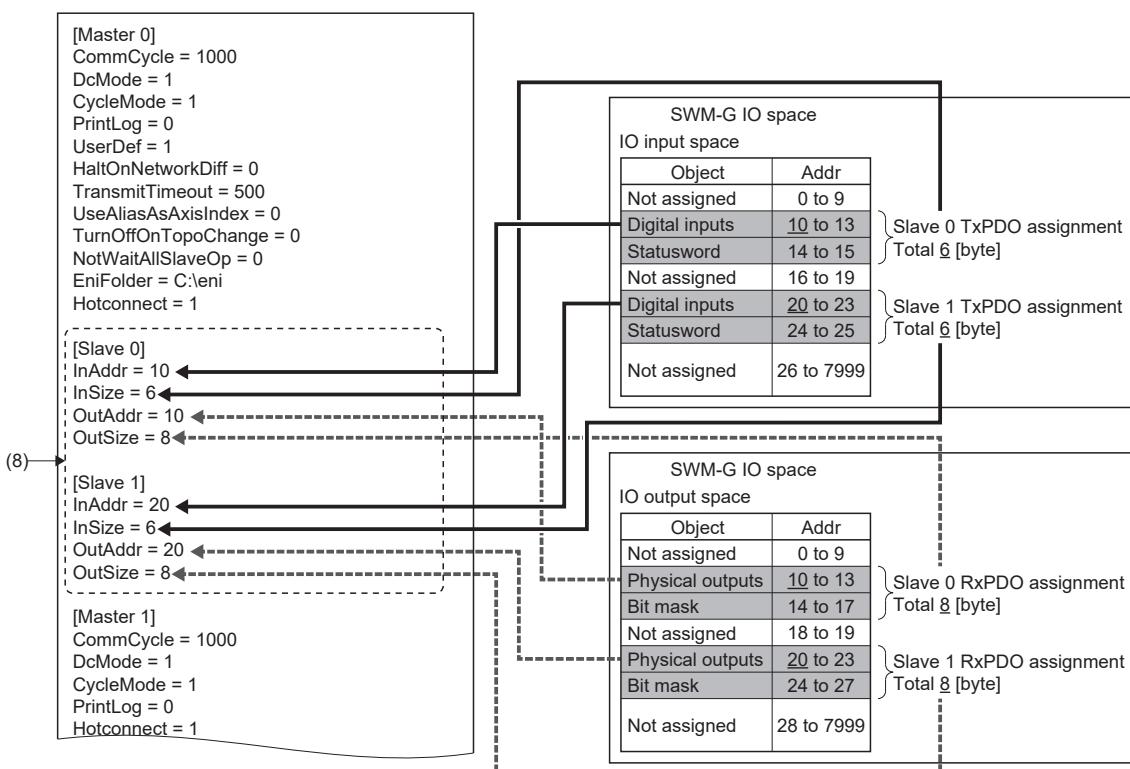
Index	Sub	Name
60FDh	00	Digital inputs



3. When the settings are completed, click [ENI Editor] \Rightarrow [Save] (disk) on the ribbon.
4. Click [ENI Editor] \Rightarrow [Open] (document) on the ribbon to open the ENI file. Then, add the IO mapping declarations (IoInput, IoInputSeg, IoOutput, and IoOutputSeg) (7) to the ENI file.
After adding them, save the ENI file.
 - If there are manually added settings above the [boot2init] section besides the IO mapping declaration settings added this time, delete the settings other than the ones added this time.
 - Each setting value corresponds to Addr and Size of PDO data.



5. Open the DEF file and add the IO mapping settings (InAddr, InSize, OutAddr, and OutSize) (8) to it.
After adding them, save the DEF file.
 - If there are settings in the [Slave 0] and [Slave 1] sections besides the IO mapping settings added this time, delete the settings other than the ones added this time.
 - Each setting value corresponds to Addr of the IO space.



MEMO

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REVISIONS

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

Revision date	*Manual number	Description
August 2024	IB(NA)-0300617ENG-A	First edition
November 2024	IB(NA)-0300617ENG-B	■Added or modified parts RELEVANT MANUALS, Section 2.1, 3.1, 3.2, Appendix 3, 5

Japanese manual number: IB-0300616-B

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[Gratis Warranty Term]

For terms of warranty, please contact your original place of purchase.

[Gratis Warranty Range]

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 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.
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The screens (screenshots) are used in accordance with the Microsoft Corporation guideline.

IB(NA)-0300617ENG-B(2411)

MODEL: SWMG-O-EC-E

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