



Programmable Automation Controllers
MELSEC MX Controller



Ezi-SERVO® CC-Link IE TSN
Closed Loop Stepping System **4X**

Connection Guide

MELSEC MX Controller and **Ezi-SERVO**® CC-Link IE TSN Closed Loop Stepping System **4X**

Mitsubishi Electric Products
MXR300-16 / MXR300-32 / MXR300-64
MXR300-128 / MXR300-256 / MXF100-8
MXF100-16

FASTECH Products
Ezi-SERVO CC-Link IE TSN 4X

Before you begin

- Thank you for using our company's products.
- The Ezi-SERVO CC-Link IE TSN 4X is a stepping motor unit consisting of a driver equipped with a 32-bit high-performance ARM processor and various motors. It is used as a remote station on a CC-Link IE TSN network.
- The Ezi-SERVO CC-Link IE TSN 4X is an industrial product. Please do not use it for any other purpose. Our company shall not be liable for any damages incurred due to non-compliance with this instruction.
- This connection guide provided by our company explains how to connect the Ezi-SERVO CC-Link IE TSN 4X to Mitsubishi Electric's MELSEC MX controller. It covers CSP+ file registration, system configuration, parameter settings, and programming methods.
- Before writing the PLC program, be sure to read this connection guide, understand its contents accurately, and use the product correctly.
- This connection guide is subject to change without notice. For the latest version, please refer to our company's CC-Link IE TSN website (<https://cltsn.fastech-motions.com/en>).

Manual Information

- The Ezi-SERVO CC-Link IE TSN 4X manual can be downloaded from the FASTECH website.

<https://cltsn.fastech-motions.com/download/quick>

Manual Name	Manual Number
[Manual][CC-Link IE TSN][Ezi-SERVO 4X] Closed Loop Stepping System	
[Connection Guide][CC-Link IE TSN][MELSEC MX Controller][Ezi-SERVO 4X]	

- The MELSEC MX Controller Manual can be downloaded from the Mitsubishi Electric website.

<https://www.MitsubishiElectric.co.jp/fa>

Manual Name	Manual Number
MELSEC MX Controller (MX-R Model) User's Manual	SH-082640
MELSEC MX Controller (MX-R Model) Programming Manual	SH-082643
GX Works3 Operating Manual	SH-081214

Terminology

- This section covers terms used in the connection guide.

Terminology	Description
CC-Link IE TSN	An open network that adopts 'TSN (Time-Sensitive Networking)', an extension of the standard Ethernet specification, enabling simultaneous processing of real-time control and information from other open networks.
Master station (Manager station)	The station that manages the entire network, capable of performing cyclic transmission and transient transmission with all stations. The MELSEC MX controller corresponds to this role.
Remote station	A station that performs cyclic transmission of bit-level I/O signals and word-level I/O data, and also supports transient transmission. The Ezi-SERVO CC-Link IE TSN 4X corresponds to this.
PDO	Abbreviation for Process Data Object. A collection of application objects periodically transmitted between multiple CANopen nodes.
Object	Various data held by device stations corresponding to CANopen.

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1. Overview

1-1. Overview

- **MELSEC MX Controller and Ezi-SERVO CC-Link IE TSN 4X Connection Guide**

- ◆ **Master station: MXR300-16 / MXR300-32 / MXR300-64 / MXR300-128 / MXR300-256
MXF100-8 / MXF100-16**

- PLCopen® Motion Control FB (Function Block)**

- Control programs can be easily written using the PLCopen Motion Control FB library, an international standard specification.
 - This program allows third parties to easily understand its contents, significantly reducing design and maintenance time.

- ◆ **Engineering software**

- GX Works3: Ver. 1.105K or higher
 - For the latest files, please refer to the Mitsubishi Electric website.
(<https://www.mitsubishielectric.com/fa/download/index.html>)

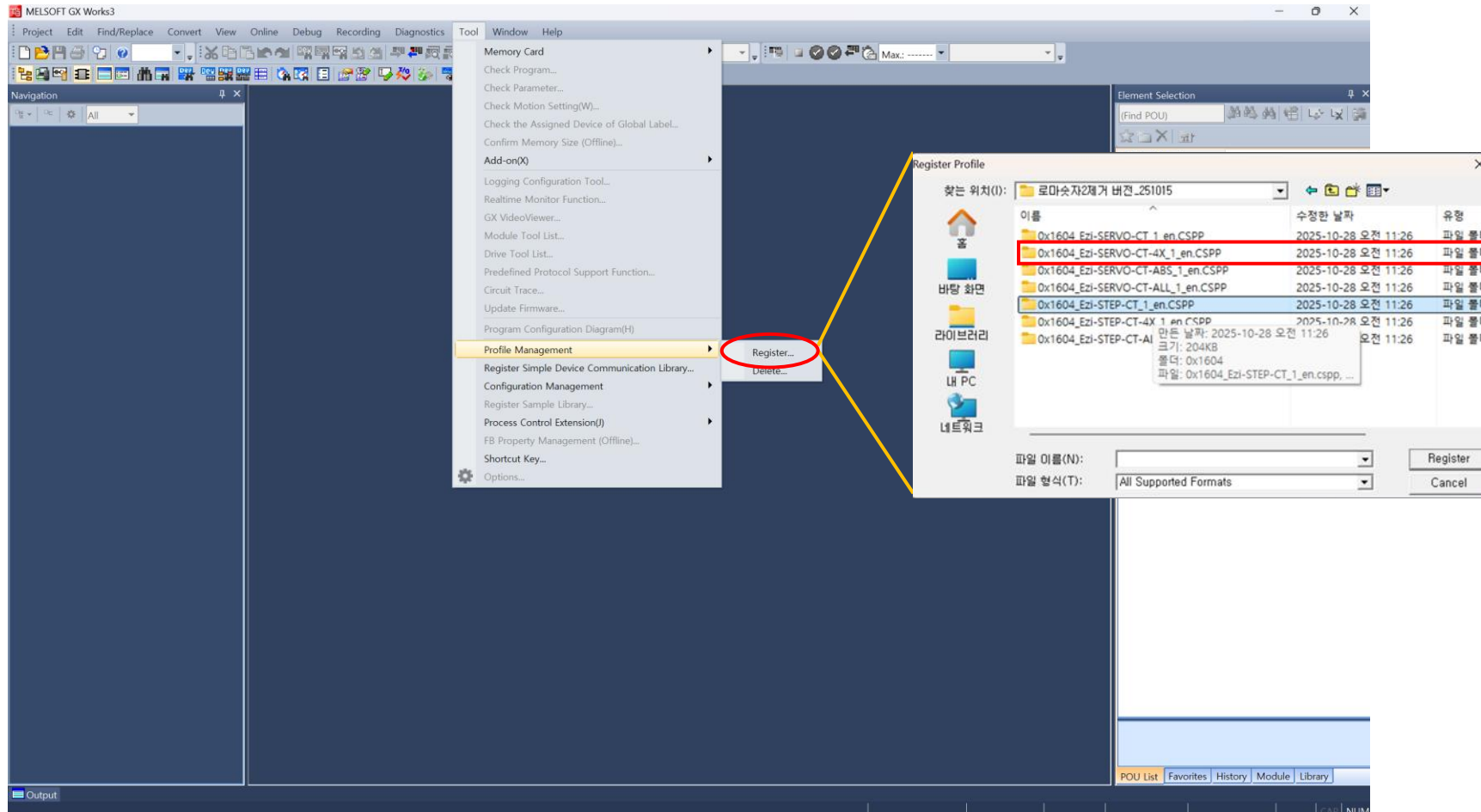
- ◆ **Remote station: Ezi-SERVO CC-Link IE TSN 4X**

- CSP+ File Download address: <https://cltsn.fastech-motions.com/en/download/quick>
 - File Name: 0x1604_Ezi-SERVO-CT-4X_1_en_CSPP

1-2. Ezi-SERVO CC-Link IE TSN 4X CSP+ File Registration

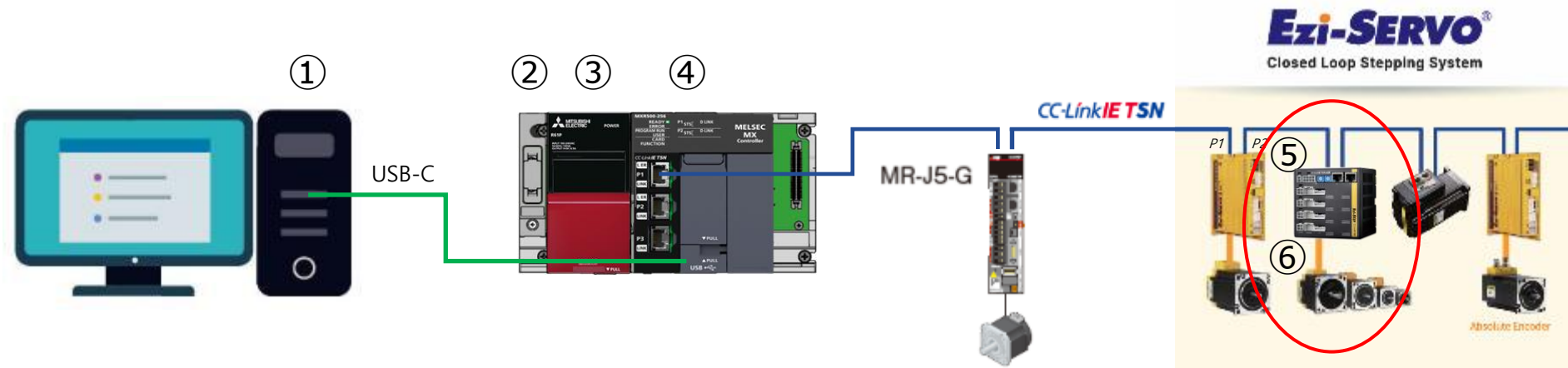
● CSP+ Registration

- [GX Works3] Tool / Profile Management / Register ※ Registration is only possible before opening a project.



1-3. CC-Link IE TSN Configuration

- System Configuration



Configuration		Product name	IP address
①	Engineering software	GX Works3	-
②	Main base	R33B	-
③	Power supply module	R61P	-
④	Controller	MXR300-16	192.168.3.253
⑤	Driver	EzS2-CT-4X	192.168.3.1
⑥	Motor	EzM2-42S-A	-

1-3. CC-Link IE TSN Configuration

- **Ezi-SERVO Specifications**

Item		Specifications
Communication protocol		CC-Link IE TSN Class B
Communication speed		1Gbps / 100Mbps
Modes of operation		CiA402 drive profile: cyclic Synchronous position Mode (CSP) / Profile position mode (PP) / Homing mode (HM)
Synchronizat ion method	Time synchronization method	IEEE1588 / IEEE802.1AS
	Communication cycle	Minimum 250 μ s
	Network synchronization communication	Synchronous Communication (CSP, PP, HM) / Asynchronous Communication (PP, HM)
Encoder type		Incremental type

1-4. Setup Sequence

- Ezi-SERVO, MX Controller Parameter Settings

No.	Item	Description
1	Ezi-SERVO Settings 	Configure parameters using the driver configuration program (Ezi-CT Manager). Please download the configuration program and its usage guide from the <u>FASTECH Co., Ltd.</u> website. ※ Address: https://cltsn.fastech-motions.com/en/download/quick
2	MX Controller Settings 	Create a project for the MX controller using GX-Works3, then configure the unit parameters (communication method, connection target) and axis parameters (for motion control).
3	Verify MX Controller + Ezi-SERVO Operation 	Write a program to verify that the MX Controller and Ezi-SERVO are configured correctly. Manipulate labels to verify the motor operates normally.

1-4. Setup Sequence

● Ezi-SERVO Setup Notes

Item	Details
IP address setting	① Set using the driver's rotary switch ② Rotary Switch → Setting value: '00', IP address (Index: 2101h, Subindex: 01~04h)
Driver homing method setting	① Homing method (Index: 6098h, Subindex:00h) setting - Set homing method: '0' (default) → '33', etc. ※ See [Appendix] Homing Method ② Home offset (Index: 607Ch, Subindex:00h) → Set to '0' Caution) Setting a value other than 0 may cause rapid acceleration or deceleration upon homing completion.
Limit stop method setting	① Limit stop method (Index:2003h, Subindex:00h) setting - 0: PP, HM → Quick stop / CSP → No stop - 1: PP, HM → Deceleration stop / CSP → Does not stop ② Setting a value other than '0' or '1' may cause '1ED0H: Drive error' when detecting the hardware stroke limit.
In-position range	① In-position range (Index:2B21h, Subindex:00h, Data type:Unsigned32) setting - Register a value within the In-position range (5 to 20000 pulses) considering the operating environment ② If [Md.102: Deviation counter value] is less than the setting value, [Md.108: Servo status 1: In-position] turns ON. As a rule, this object should not be made public. Please configure it using the servo transient transmission function of the FX5 CPU module.

1-5. Restrictions

● Motion Control Function Restrictions (MX Controller and Ezi-SERVO)

Item	Restriction
Torque limit function	The driver does not support the following object, so the Torque limit function cannot be used. • Positive torque limit value (Index:60E0h, Subindex:00h) • Negative torque limit value (Index:60E1h, Subindex:00h)
Absolute position system	The encoder is of the incremental type, so the absolute position system cannot be used.
Virtual servo amplifier function	Emulated by MR-J5-G.
Mark detection function	TPR1 (Touch probe 1) of the driver cannot be used for [Pr.800: Mark detection signal setting].
Optional data monitor function	When using the optional data monitor function, set the objects to monitor in [Pr.91~94: Optional data monitor: Data type setting 1~4] and [Pr.591~594: Optional data monitor: Data type expansion setting 1~4]. The default value is "0: Not set". Therefore, [Md.109~112: Optional data monitor output 1~4] will be '0'.

1-5. Restrictions

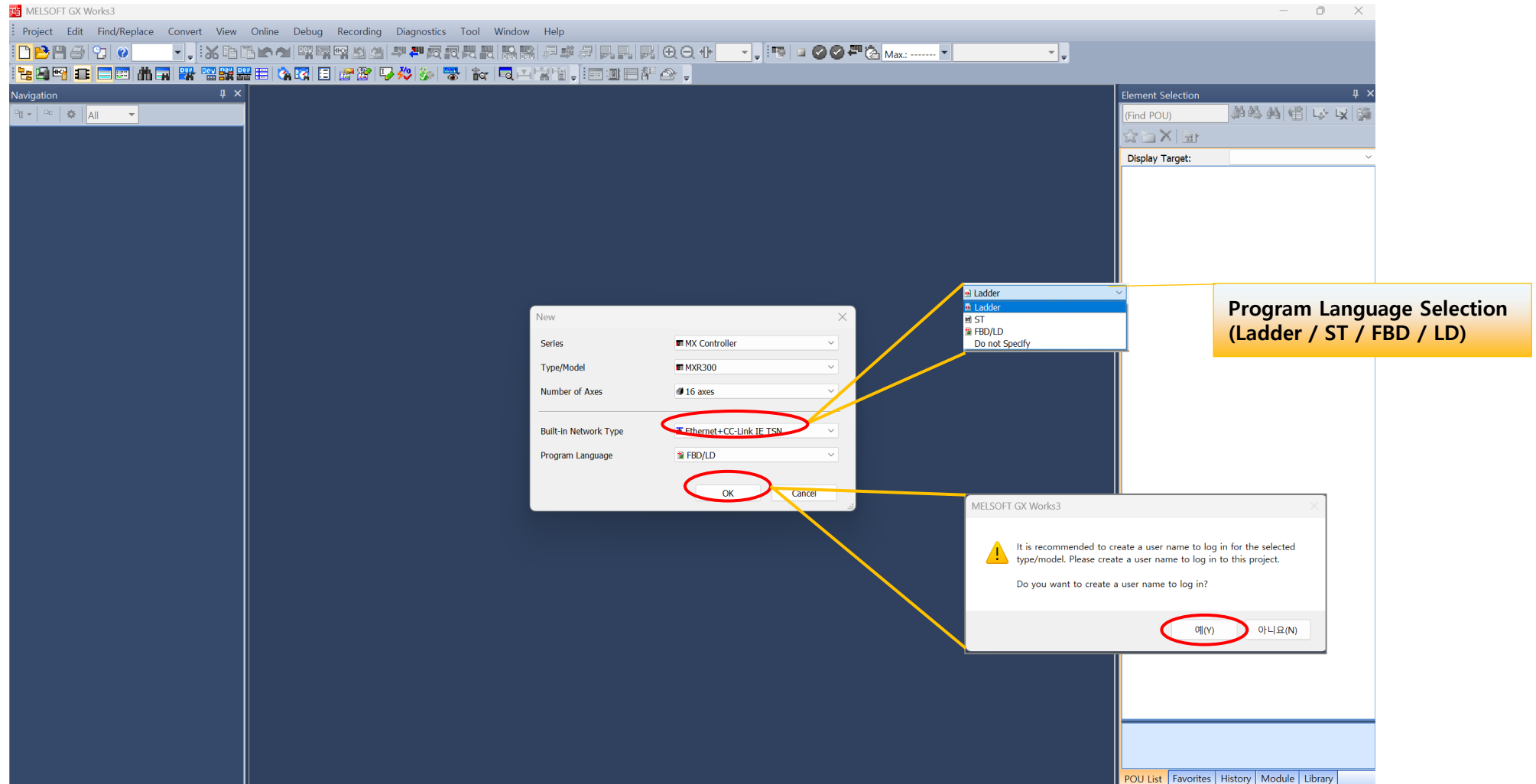
● Motion Control Function Constraints (MX Controller and Ezi-SERVO)

Item	Restriction
Md.103: Motor rotation speed	Since the driver does not support 'SI unit velocity (Index:60A9h, Subindex:00h)', it outputs the motor rotation speed in pulses per second.
Md.104: Motor current value	Since the driver does not support 'Torque actual value (Index:6077h, Subindex:00h)', it always displays "0".
Md.108: Servo status 1	The following bits in the monitor data are always in the 'OFF' state. · Gain switching (b4) · Fully closed control switching (b5) · Torque limit active (b13) · Absolute position lost (b14) · Servo warning (b15)
Md.119: Servo status 2	The following bits in the monitor data are always in the 'OFF' state. · Zero point pass (b0) · Zero speed (b3) · Speed limit active (b4) · PID control active (b8)
Md.115: Servo alarm detail number	Not supported. This monitor data is always displayed as '0'.
Cd.108: Gain switching command flag	Not supported. Only MELSERVO responds to this data.
Cd.133: Semi/Fully closed loop switching request	Not supported. Only MELSERVO supports this data.
Cd.136: PI-PID switching request	Not supported. Only MELSERVO supports this data.

2. MX Controller Settings

2-1. Project Creation

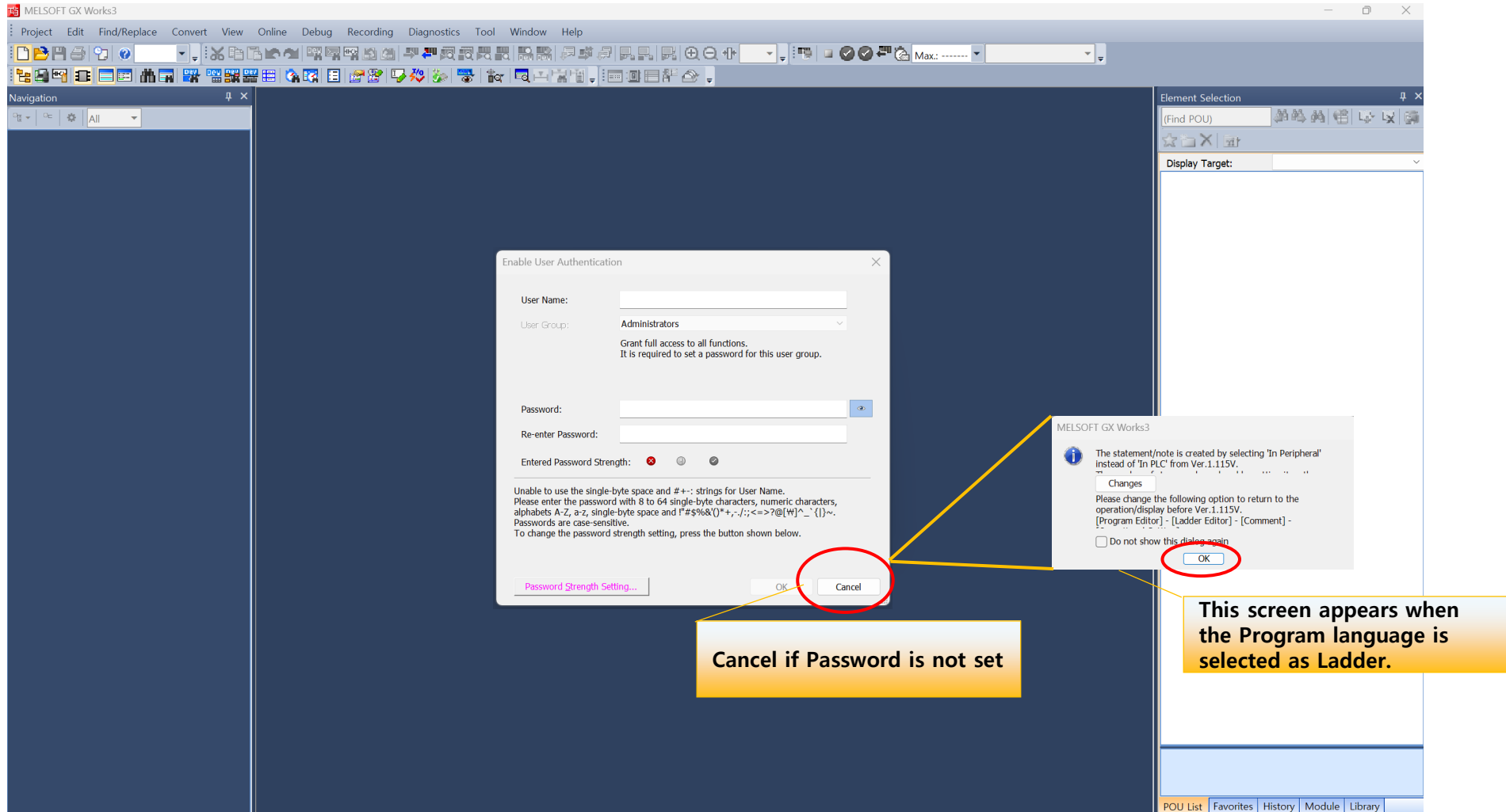
- When creating a new project, select the MX Controller, model name, number of axes used, and programming language



2-2. User Authentication Settings

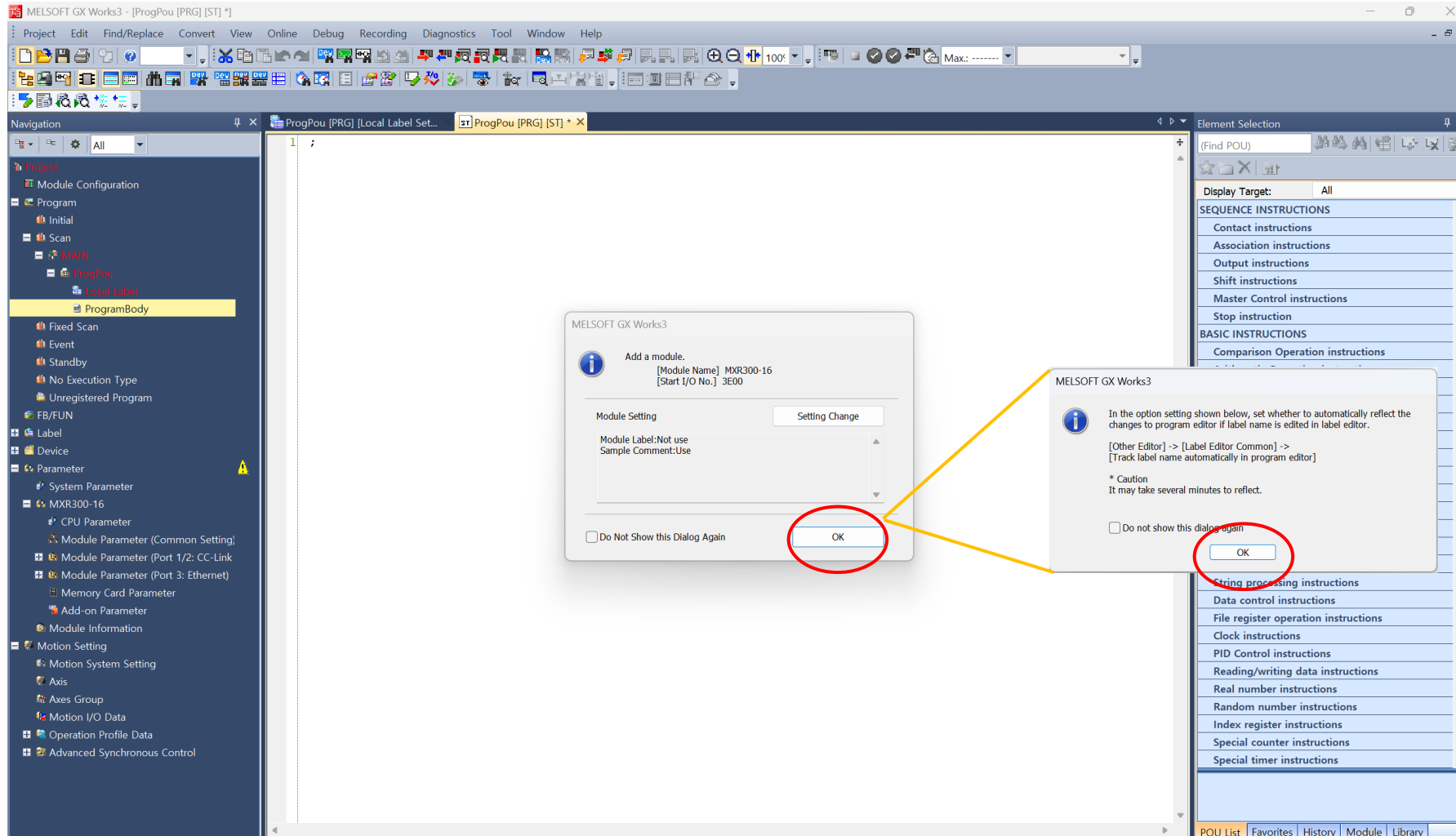
● Password Setting

※ In this chapter, Cancel is selected when no password is set.



2-3. Module Registration

- MXR300-xx Registration



2-4. Module Configuration – H/W

- Configure the Main Base, CPU Module, and Power Supply by clicking and dragging with the mouse

The screenshot shows the MELSOFT GX Works3 interface with the 'Module Configuration' window open. The window is divided into several panes:

- Navigation Pane (Left):** Shows a tree view of the project structure. A red box and arrow labeled '1' point to the 'Module Configuration' item.
- Element Selection Pane (Right):** Lists available modules. Red boxes and arrows labeled '2' and '3' point to the 'Main Base' and 'Power Supply' sections respectively.
- Work Area (Center):** A grid where modules are placed. A red box and arrow labeled '4' point to a 'CPU' module being placed.

A yellow box with the text '[Click & Drag] 1. Main Base 2. Power Supply 3. Install MX Controller' is positioned over the work area. A dashed line labeled 'Mouse Click & Drag' connects the 'Main Base' in the Element Selection pane to the work area.

A dialog box is visible in the bottom left corner with the following text:

MELSOFT GX Works3

When you finish editing Module Configuration, fix the parameters to reflect to their respective functions.

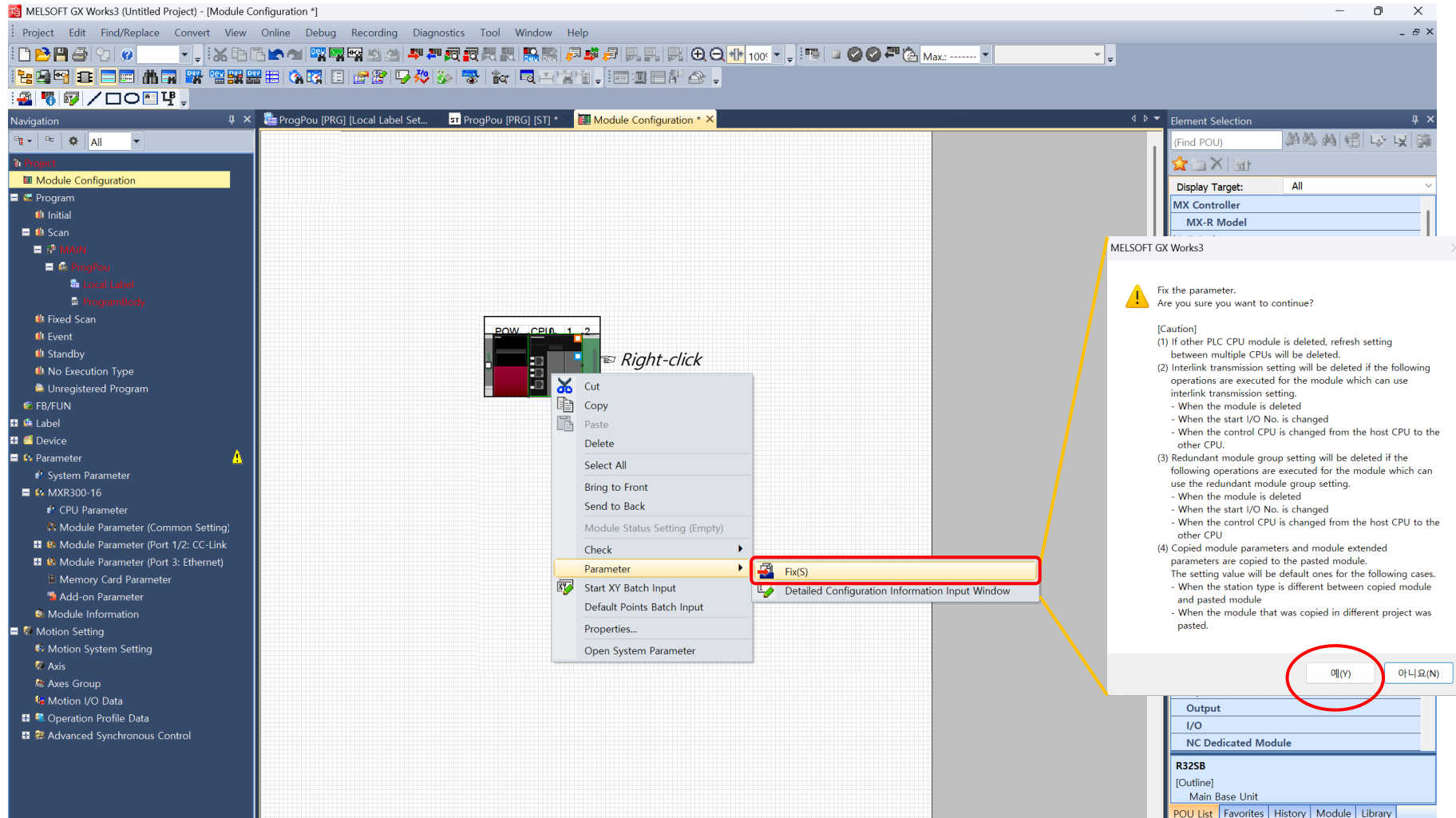
☐ Do not show this dialog again.

You are able to change this setting through the Options menu.

OK

2-4. Module Configuration – H/W

- Right-click the mouse and select Fix(S) to complete the module configuration



2-5. Module Parameters

- Station No./IP Address Setting : Example) IP Address → 192.168.3.253

MELSOFT GX Works3 (Untitled Project) - [MXR300-16 Module Parameter (Port 1/2: CC-Link IE TSN)]

Navigation: Project, Edit, Find/Replace, Convert, View, Online, Debug, Recording, Diagnostics, Tool, Window, Help

Setting Item List: Input the Setting Item to Search

Setting Item Table:

Item	Setting
Station Type	Master Station
Network No.	1
Parameter Setting Method	Parameter Editor
Station No./IP Address Setting Method	Parameter Editor
Station No.	0
IP Address Setting	192.168.3.253
Subnet Mask	
Default Gateway	

Element Selection: (Find POU), Display Target: All

IP Address: 192.168.3.253
※ Note: Ezi-SERVO-4X
Default IP: 192.168.3.xxx

Explanation: Set the IP address for the own node. Ensure that the own node and the external device to be communicated with have the same class and subnet address. Set the IP address to use for CC-Link IE TSN communication.

[Setting Range] 0.0.0.1 to 223.255.255.254 (00.00.00.01 to FF.FF.FF.FE)

Buttons: Check, Restore the Default, Apply

2-5. Module Parameter – Network Configuration

● Network Configuration Settings

The screenshot displays the MELSOFT GX Works3 interface for configuring the MXR300-16 module. The main window is titled "MELSOFT GX Works3 (Untitled Project) - [MXR300-16 Module Parameter (Port 1/2: CC-Link IE TSN)]".

Callout 1: Points to the "Module Parameter (Port 1/2: CC-Link)" entry in the Project tree on the left.

Callout 2: Points to the "Basic Settings" folder in the Setting Item List.

Callout 3: Points to the "<Detailed Setting>" link in the Setting table.

Setting Table:

Item	Setting
Network Configuration Settings (CC-Link IE TSN Configuration)	
Network Configuration Settings	
Refresh Settings	
Network Topology	
Communication Period Setting	
Basic Period Setting	
Setting in Units of 1us	Not Set
Communication Period Interval Setting (Do not Set it in Units of 1us)	2000.00 us
Communication Period Interval Setting (Set it in Units of 1us)	2000.00 us
System Reservation Time	20.00 us
Cyclic Transmission Time	1000.00 us
Transient Transmission Time	980.00 us
Multiple Period Setting	
Normal-Speed	x4
Low-Speed	x16
Connection Device Information	
CC-Link IE TSN Class Setting	CC-Link IE TSN Class B Only
CC-Link IE TSN Class A Group Send Upper Limit Size Setting	2K bytes
TSN HUB Setting	Not to Use TSN HUB
Device Station Setting	
Disconnection Detection Setting	4 times

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

Mode Settings: Online (Unicast Mode)

No.	Host Station	Model Name	STA#	Station Type
0	Host Station		0	Master Station

Module List

- General CO-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi Ele)
- Master/Local Module
- Motion Module
- GOT3000 Series
- GOT2000 Series
- General-Purpose AC Servo
- General purpose Inverter
- DC Input
- Transistor Output
- I/O Combined
- Analog Input

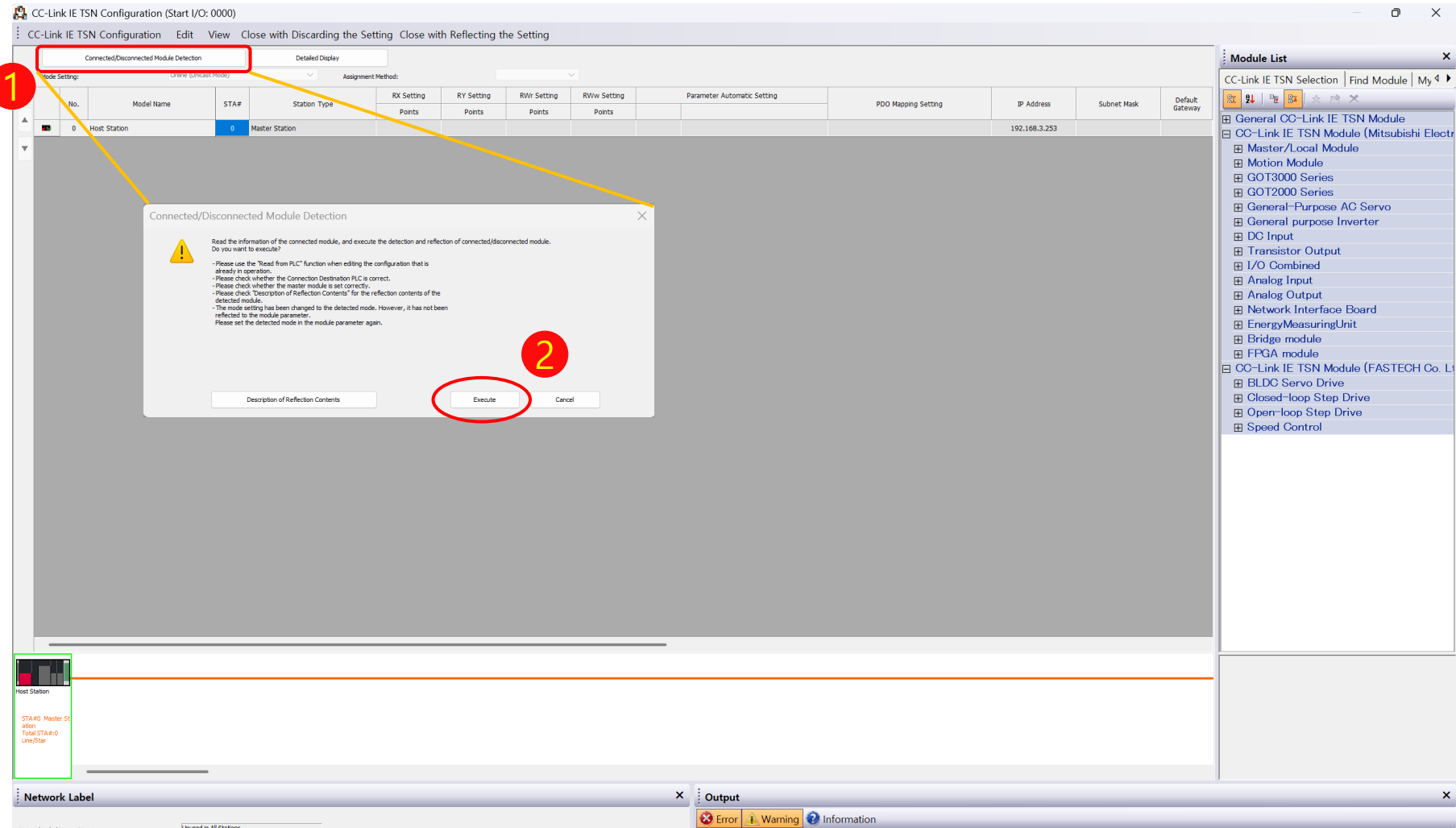
Network Label

Network Label Usage Status: Unused in All Stations

*The network label only can be used by the remote station.

2-5. Module Parameter – CC-Link IE TSN Configuration

- **Network Connected State:** Automatically detects and configures the CC-Link IE TSN Module



2-5. Module Parameter – CC-Link IE TSN Configuration

- **Network-connected state:** Automatically detects and configures the CC-Link IE TSN Module with the Ezi-SERVO CC-Link IE TSN 4X

The screenshot displays the 'CC-Link IE TSN Configuration' window. A table lists detected modules, with a red box highlighting the first four rows. A yellow starburst points to the table with the text 'Automatically detected Module'. A 'Module List' pane on the right shows a tree structure of modules. A 'MELSOFT GX Works3' dialog box is open, displaying a message about module detection completion and a '확인' (Confirm) button circled in red. A yellow callout box on the right provides an example of IP addresses for 4-axis configuration.

No.	Model Name	STA#	Station Type	RX Setting	RY Setting	RWr Setting	RWw Setting	Parameter Automatic Setting	PDO Mapping Setting	IP Address	Subnet Mask	Default Gateway
0	Host Station	0	Master Station							192.168.3.253		
1	Ezi-SERVO-CT-4X	1	Remote Station				16	16	<Detail Setting>	192.168.3.17		
2	Ezi-SERVO-CT-4X	2	Remote Station				16	16	<Detail Setting>	192.168.3.18		
3	Ezi-SERVO-CT-4X	3	Remote Station				16	16	<Detail Setting>	192.168.3.19		
4	Ezi-SERVO-CT-4X	4	Remote Station				16	16	<Detail Setting>	192.168.3.20		

**[Ezi-SERVO CC-Link IE TSN 4X 4-axis configuration example]
[IP Address Set in Ezi-SERVO CC-Link IE TSN 4X Driver]**

1. 192.168.3.17
2. 192.168.3.18
3. 192.168.3.19
4. 192.168.3.20

2-5. Module Parameter – CC-Link IE TSN Configuration

- **Network Unconnected Status:** **Manually** configure the CC-Link IE TSN Module (**click & drag**)

The screenshot shows the 'CC-Link IE TSN Configuration' software interface. The main window displays a table of modules with columns for No., Model Name, STA#, Station Type, RX Setting, RY Setting, RWr Setting, RWw Setting, Parameter Automatic Setting, PDO Mapping Setting, IP Address, Subnet Mask, and Default Gateway. A red box highlights the IP Address column for stations 1 through 4, with values 192.168.3.17, 192.168.3.18, 192.168.3.19, and 192.168.3.20. A yellow callout box with the number '2' points to this area, stating: '[Ezi-SERVO CC-Link IE TSN 4X IP Address modified arbitrarily]' and lists the four IP addresses. Below the list, it says '※ Power reset is required after changing the IP address'. A yellow callout box with the number '1' points to the 'Module List' on the right, which shows a list of modules including 'Ezi-SERVO-CT', 'Ezi-SERVO-CT-4X', 'Ezi-SERVO-CT-ABS', 'Ezi-SERVO-CT-ALL', 'Open-loop Step Drive', and 'Speed Control'. A red box highlights the 'Ezi-SERVO-CT-4X' module. A yellow callout box with the number '1' points to the 'Module List' on the right, stating: '[Note] Ezi-SERVO CC-Link IE TSN 4X IP Address Settings Hexadecimal Rotary Switch'. Below this, there are diagrams of the rotary switches for P2, P1, X16, and X1. The bottom of the interface shows a 'Network Label' section with a diagram of the network topology and a 'Station Type' dropdown menu set to 'Remote Station'.

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

Mode Setting: Online (Unicast Mode) Assignment Method:

No.	Model Name	STA#	Station Type	RX Setting	RY Setting	RWr Setting	RWw Setting	Parameter Automatic Setting	PDO Mapping Setting	IP Address	Subnet Mask	Default Gateway
0	Host Station	0	Master Station							192.168.3.253		
1	Ezi-SERVO-CT-4X	1	Remote Station				16	16	<Detail Setting>	192.168.3.17		
2	Ezi-SERVO-CT-4X	2	Remote Station				16	16	<Detail Setting>	192.168.3.18		
3	Ezi-SERVO-CT-4X	3	Remote Station				16	16	<Detail Setting>	192.168.3.19		
4	Ezi-SERVO-CT-4X	4	Remote Station				16	16	<Detail Setting>	192.168.3.20		

Created upon registration

2

[Ezi-SERVO CC-Link IE TSN 4X IP Address modified arbitrarily]

1. 192.168.3.17
2. 192.168.3.18
3. 192.168.3.19
4. 192.168.3.20

※ Power reset is required after changing the IP address

1

Mouse click & drag (repeated)

Module List

CC-Link IE TSN Selection Find Module My

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi Electr
- Master/Local Module
- Motion Module
- GOT3000 Series
- GOT2000 Series
- General-Purpose AC Servo
- General purpose Inverter
- DC Input
- Transistor Output
- I/O Combined
- Analog Input
- Analog Output
- Network Interface Board
- EnergyMeasuringUnit
- Bridge module
- FPGA module
- CC-Link IE TSN Module (FASTECH Co. L
- BLDC Servo Drive
- Closed-loop Step Drive
- Ezi-SERVO-CT Closed-Loop
- Ezi-SERVO-CT-4X Closed-Loop
- Ezi-SERVO-CT-ABS Closed-Loop
- Ezi-SERVO-CT-ALL Closed-Loop
- Open-loop Step Drive
- Speed Control

[Note] Ezi-SERVO CC-Link IE TSN 4X IP Address Settings Hexadecimal Rotary Switch

P2 P1 X16 X1

[Station Type] Remote Station

Network Label

Output

Error Warning Information

2-5. Module Parameter – CC-Link IE TSN Configuration

- CC-Link IE TSN Module PDO Mapping Setting (Per-Axis Setting)

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

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method:

No.	Model Name	STA#	Station Type	RX Setting Points	RY Setting Points	RW Setting Points	RWw Setting Points	Parameter Automatic Setting	PDO Mapping Setting	IP Address	Subnet Mask	Default Gateway
0	Host Station	0	Master Station							192.168.3.253		
1	Ea-SERVO-CT	1	Remote Station			16	16		<Detail Setting>	192.168.3.17		
2	Ea-SERVO-CT	2	Remote Station			16	16		<Detail Setting>	192.168.3.18		
3	Ea-SERVO-CT	3	Remote Station			16	16		<Detail Setting>	192.168.3.19		

Generated upon registration

PDO Mapping Setting

Link Device Points

PDO Mapping Parameter

PDO Mapping Pattern Selection (1/2)

Please select the TPDO mapping pattern assigned in link device (RWw).

Link Device (RWw) Points: 16

No.	Pattern Name	Used Points
1	1st TPDO (CSP Mode)	8 Points
2	2nd TPDO (ProfilePosition Mode)	10 Points

Back Next Cancel

PDO Mapping Pattern Selection (2/2)

Please select the RPDO mapping pattern assigned in link device (RWw).

Link Device (RWw) Points: 16

No.	Pattern Name	Used Points
1	1st RPDO (CSP Mode)	7 Points
2	2nd RPDO (ProfilePosition Mode)	13 Points

Back OK Cancel

Network Label

Host Station

STA#1 Master Station
Total STA#13
LineStar

STA#2
Ea-SERVO-CT-4K

STA#3
Ea-SERVO-CT-4K

STA#4
Ea-SERVO-CT-4K

[Outline]
Step Drive
[Specification]
Closed-Loop Step Drive
Motor: Max. NEMA 24
Mode: Homing, CSP, PP
CC-Link IE TSN Class B
[Manufacturer Name]
FASTECH Co. Ltd
[Station Type]
Remote Station

Output

Error:0 Warning:0 Information:0

2-5. Module Parameter – CC-Link IE TSN Configuration

- CC-Link IE TSN Module PDO Mapping Setting (Per-Axis Setting)

Generated upon registration

PDO Mapping Setting

Link Device Points

PDO Mapping Parameter

Link Device	Index [Hexadecimal]	Sub-Index [Hexadecimal]	Entry Name	Comment	Data Type
RW0000	1002	01	Watchdog counter UL 1		UNSIGNED16
RW0001	6041	00	Statusword		UNSIGNED16
RW0002	6061	00	Modes of operation display		INTEGER8
RW0003	603F	00	Error code		UNSIGNED16
RW0004	6064	00	Position actual value		INTEGER32
RW0005	6064	00	Position actual value		INTEGER32
RW0006	60F2	00	Digital Inputs		UNSIGNED32
RW0007	60F2	00	Digital Inputs		UNSIGNED32
RW0008					
RW0009					
RW000a					
RW000b					
RW000c					
RW000d					
RW000e					
RW000f					

PDO Mapping Pattern Selection...

OK Cancel

Module List

- CC-Link IE TSN Selection
- Find Module
- My 4
- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi Electr
- Master/Local Module
- Motion Module
- GOT3000 Series

Turns black when PDO setting is complete
<Detail Setting> → <Detail Setting>
Repeat for all axis PDO settings

[Outline]
Step Drive
[Specification]
Closed-Loop Step Drive
Motor: Max. NEMA 24
Mode: Homing, CSP, PP
CC-Link IE TSN Class B
[Manufacturer Name]
FASTECH Co. Ltd
[Station Type]
Remote Station

2-5. Module Parameter – CC-Link IE TSN Configuration

- CC-Link IE TSN Module Setting Applied

The screenshot displays the 'CC-Link IE TSN Configuration' software interface. A red circle highlights the 'Close with Reflecting the Setting' button in the top menu bar. A yellow arrow points from this button to a warning dialog box titled 'MELSOFT GX Works3'. The dialog box contains the text: 'Warning(s) in the CC-Link IE TSN Configuration. Are you sure you want to close the CC-Link IE TSN Configuration window?'. The '예(Y)' (Yes) button is circled in red. The background interface shows a table of module settings and a 'Module List' on the right.

No.	Model Name	Station Type	RX Setting	RY Setting	RW Setting	RWw Setting	Parameter Automatic Setting	PDO Mapping Setting	IP Address	Subnet Mask	Default Gateway
0	Host Station	Master Station							192.168.3.253		
1	Ezi-SERVO-CT	Remote Station				16		<Detail Setting>	192.168.3.17		
2	Ezi-SERVO-CT	Remote Station				16		<Detail Setting>	192.168.3.18		
3	Ezi-SERVO-CT	Remote Station				16		<Detail Setting>	192.168.3.19		

Generated upon registration

Module List:

- CC-Link IE TSN Selection
- Find Module
- My 4
- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi Electr
- Master/Local Module
- Motion Module
- GOT3000 Series
- GOT2000 Series
- General-Purpose AC Servo
- General purpose Inverter
- DC Input
- Transistor Output
- I/O Combined
- Analog Input
- Analog Output
- Network Interface Board
- EnergyMeasuringUnit
- Bridge module
- FPGA module
- CC-Link IE TSN Module (FASTECH Co. L
- BLDG Servo Drive
- Closed-loop Step Drive
- Ezi-SERVO-CT
- Ezi-SERVO-CT-4X
- Ezi-SERVO-CT-ABS
- Ezi-SERVO-CT-ALL
- Open-loop Step Drive
- Speed Control

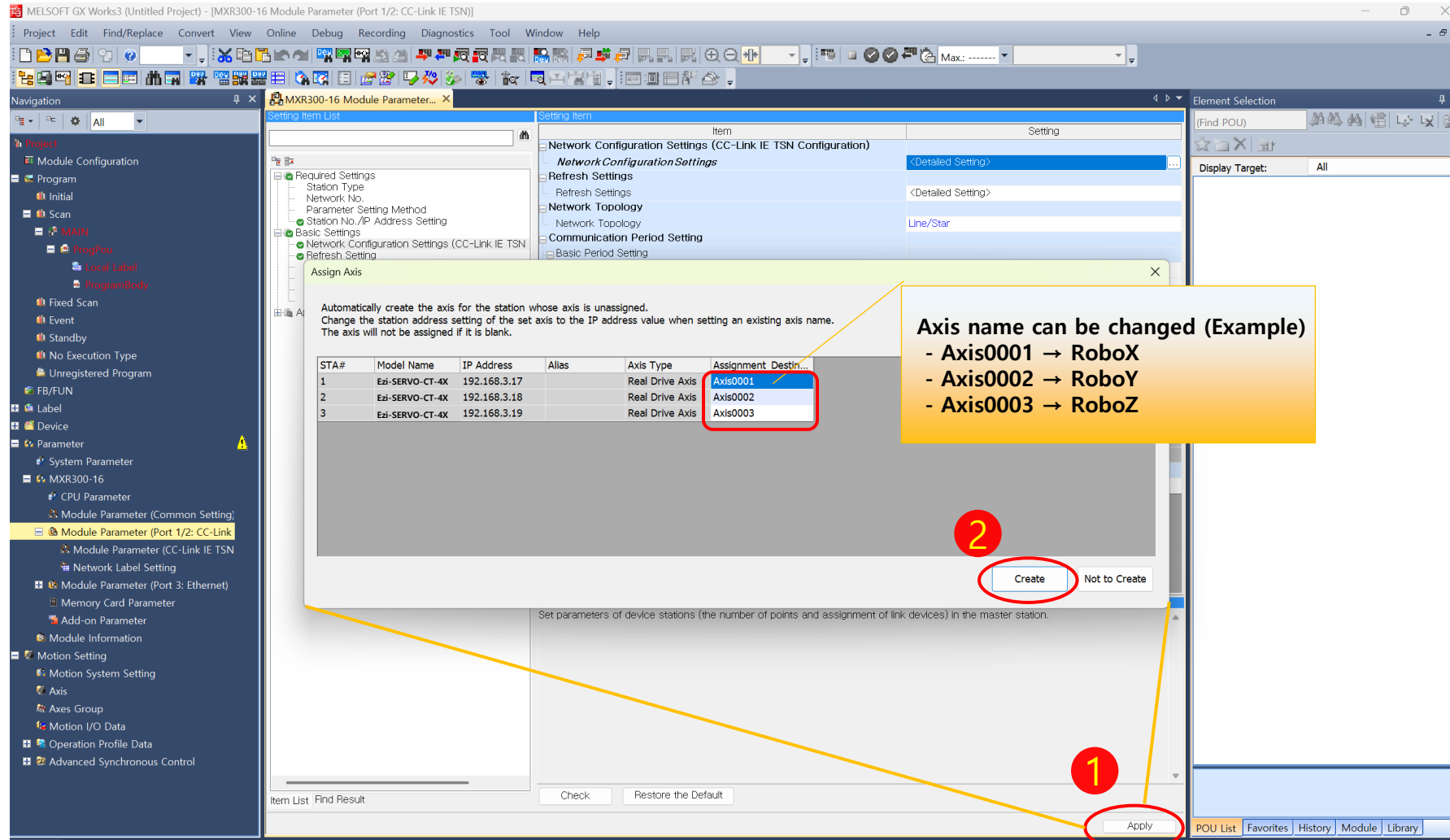
Network Label

Output

Error:0 Warning:0 Information:0

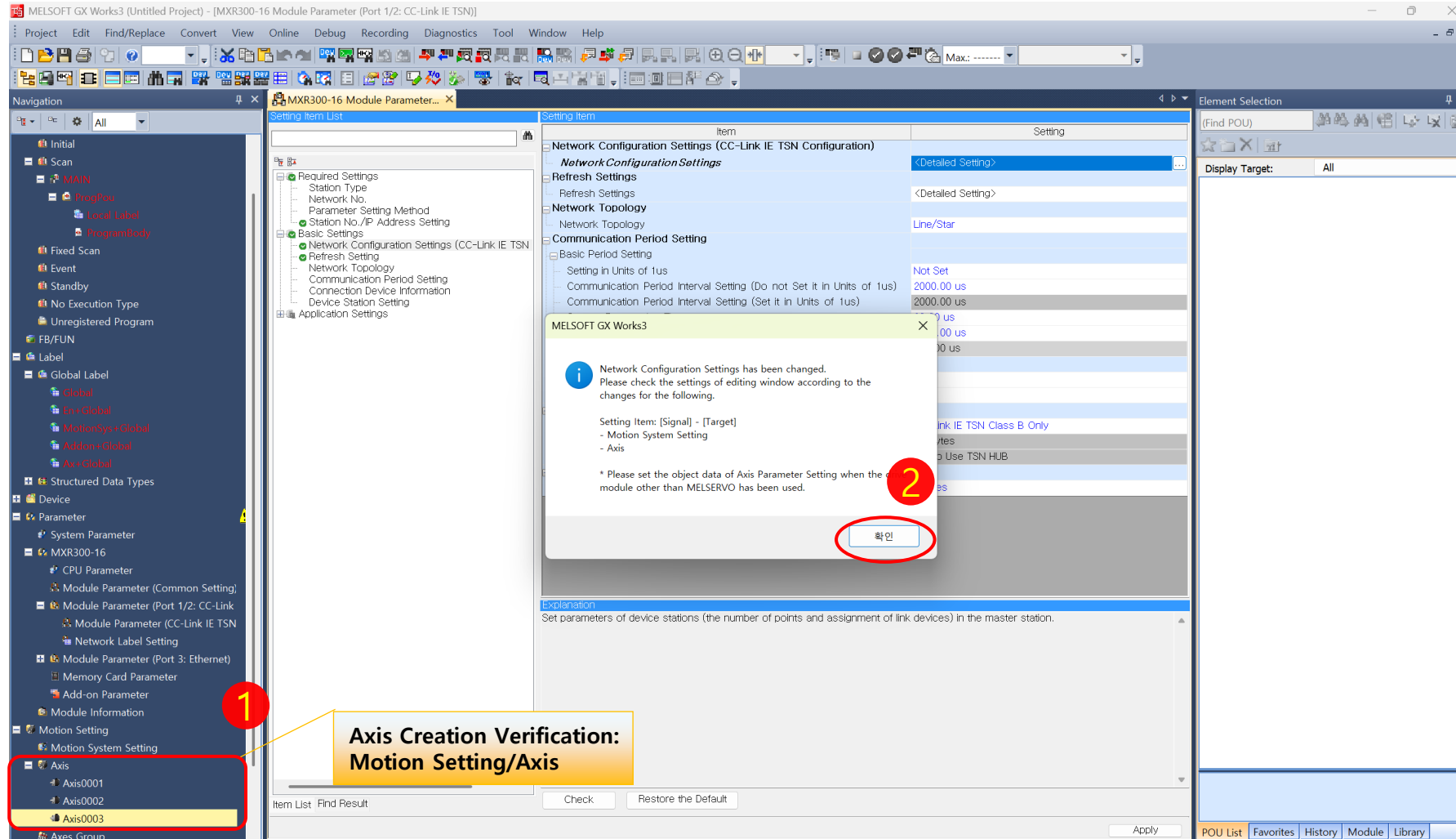
2-5. Module Parameter – CC-Link IE TSN Configuration

● Axis Creation



2-5. Module Parameter – CC-Link IE TSN Configuration

- Confirming axis creation



2-5. Module Parameter – CC-Link IE TSN Configuration

● Network Label Setting – Channel-Specific Digital Input/Output Settings

The screenshot shows the MELSOFT GX Works3 interface with the 'Network Label Setting' window open for the MXR300-16 module. The window displays a table of digital input/output settings for three channels (1, 2, and 3). The table has columns for IP Address, Model Name, Device Label/Structure, Data Type, Labeling Target, Arranged Target, Label Data Type, Label Name, and English Display. Red circles and arrows highlight specific settings and actions:

- 1**: Points to the 'Labeling Target' column, where 'Yes' is selected for digital output labels (RWw0, RWw1, RWw2, RWw3, RWw5, RWr0, RWr1, RWr2, RWr3, RWr4, RWr6) and 'No' is selected for digital input labels (RWw4, RWw6, RWr5, RWr6).
- 2**: Points to the 'Create Label' button at the bottom right of the window.
- 3**: Points to a confirmation dialog box that appears after clicking 'Create Label'. The dialog box contains the text: 'Start creating the label on the basis of the following content. Are you sure you want to continue?' with '예(Y)' (Yes) and '아니요(N)' (No) buttons.

Annotations on the right side of the screenshot provide additional context:

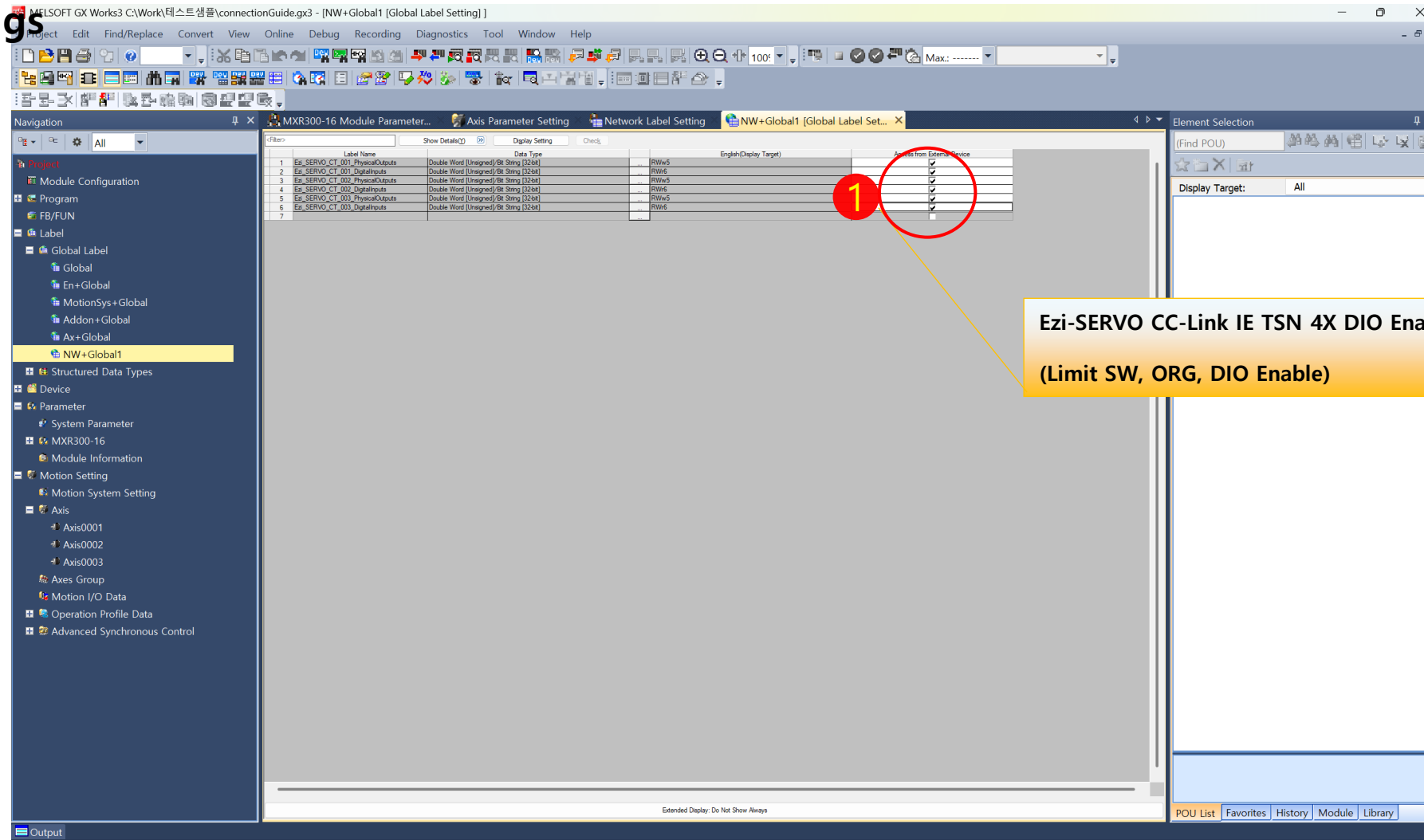
- Digital Output Label Settings**: Points to the 'Labeling Target' column for digital output labels.
- Digital Input Label Setting - Limit +/-, ORG, Input**: Points to the 'Labeling Target' column for digital input labels.

The bottom of the screenshot shows the 'Structure Array Setting...' and 'Update Network Configuration Info' buttons, along with the 'Create Label' button.

2-5. Module Parameter – CC-Link IE TSN Configuration

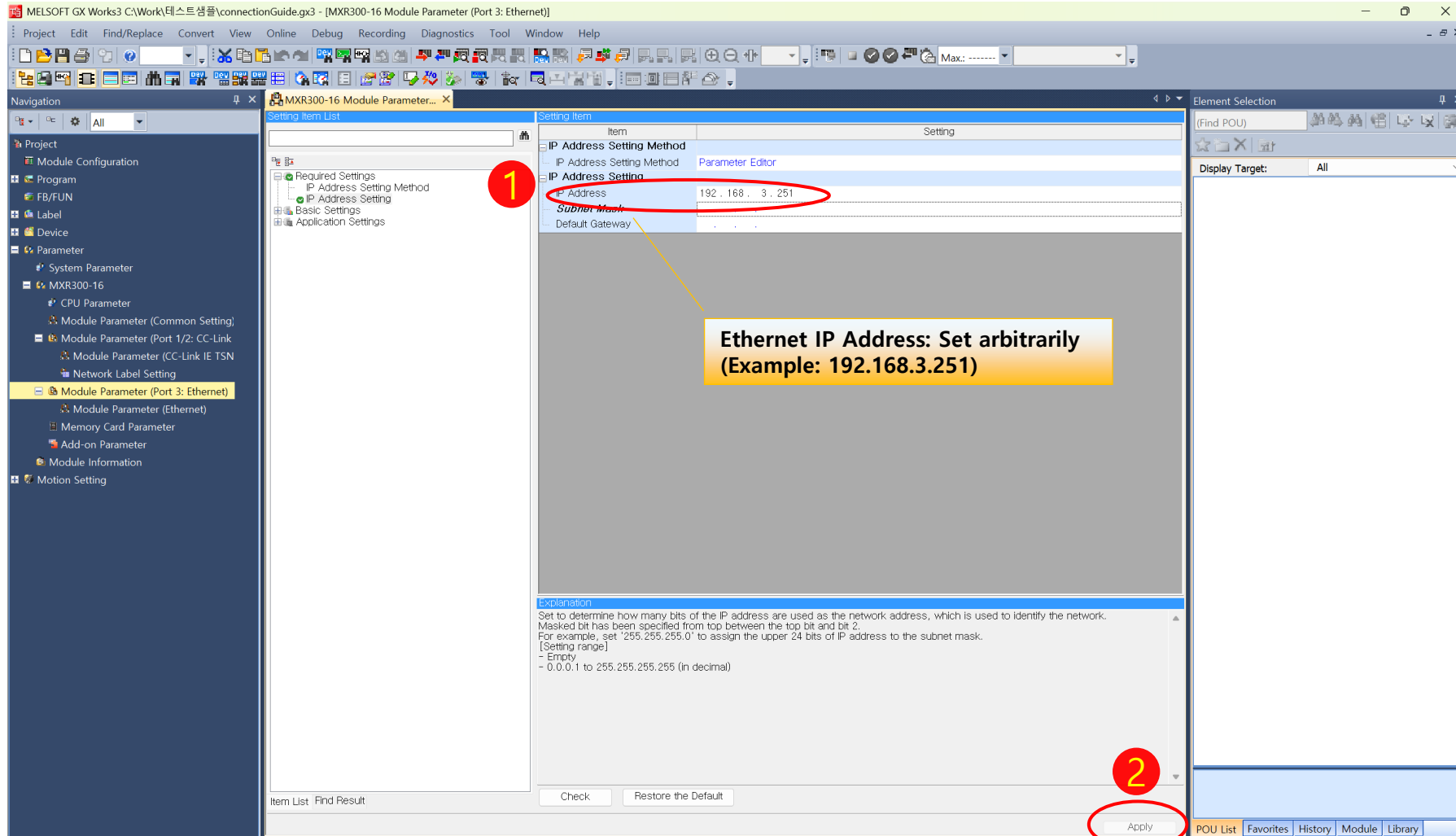
- Network Label Setting – Digital Input/Output Enable per Axis *Limit SW, ORG SW, DIO Enable

Settings



2-5. Module Parameter – Port 3: Ethernet

- Ethernet IP Address Setting



2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Object Data Settings (1/3) *Ezi-SERVO CC-Link IE TSN 4X Object Data Registration

The screenshot displays the MELSOFT GX Works3 software interface for configuring motion parameters. The navigation tree on the left (1) shows the 'Axis' folder selected. The main window shows the 'Axis Parameter Setting' for 'Axis0001'. The 'Basic Parameter' tab is active, and the 'Object Data' section is expanded (2). The 'ControlWord' parameter is selected (3), and the 'Object Data Setting (Axis0001)' dialog box is open. This dialog box shows the 'ControlWord' parameter set to 'Ezi-SERVO-CT' and lists various object data items (4). The 'Restore the Data' button is highlighted (5). A warning dialog box (6) appears, asking if the user wants to set generic default values for a non-MELSERVO device. The '예(Y)' (Yes) button is highlighted (6).

Ezi-SERVO CC-Link IE TSN 4X Object Data

Set default data.
Are you sure you want to continue?

예(Y) 아니요(N)

MELSOFT GX Works3

The specified station address refers to a non-MELSERVO device.
Do you want to set to generic default values?

Yes: Set to generic default values
No: Set to default values for MELSERVO

예(Y) 아니요(N) 취소

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Object Data Settings (2/3) *Ezi-SERVO CC-Link IE TSN 4X Object Data Registration

The screenshot displays the MELSOFT GX Works3 interface for configuring motion parameters. The 'Axis Parameter Setting' dialog is open for 'Axis0001'. The 'Object Data' tab is active, showing a table of object data settings. A red circle highlights the 'ControlWord' section, and another red circle highlights the 'OK' button. A yellow callout box labeled '[OBJ] Review Changes' points to the 'ControlWord' section. A red circle with the number 7 is also visible near the 'ControlWord' section.

Item	Axis0001	Axis0002	Axis0003
Set Axis Information			
Axis No.	1	2	3
Set Basic Parameter			
Station Address Setting	192.168.3.17	192.168.3.18	192.168.3.19
Axis Type Setting	0:Real Drive Axis	0:Real Drive Axis	0:Real Drive Axis
Axis Emulation Enabled	0:Disabled	0:Disabled	0:Disabled
Control Cycle Setting	0:Automatic settir	0:Automatic settir	0:Automatic settir
Object Data			
ControlWord	[OBJ]0x60400010	[OBJ]0x60400010	[OBJ]0x60400010
EncoderIncrements	[OBJ]0x608F0120	[OBJ]0x608F0120	[OBJ]0x608F0120
FollowErrActualValue	[OBJ]0x607C0020	[OBJ]0x607C0020	[OBJ]0x607C0020
MaxMotorSpeed	[OBJ]0x60720010	[OBJ]0x60720010	[OBJ]0x60720010
MaxTorque	[OBJ]0x60600008	[OBJ]0x60600008	[OBJ]0x60600008
ModesOfOper	[OBJ]0x60610008	[OBJ]0x60610008	[OBJ]0x60610008
ModesOfOperDispl	[OBJ]0x60E10010	[OBJ]0x60E10010	[OBJ]0x60E10010
NegativeTorqueLimitValue	[OBJ]0x607E0008	[OBJ]0x607E0008	[OBJ]0x607E0008
Polarity	[OBJ]0x60640000	[OBJ]0x60640000	[OBJ]0x60640000
PosActualValue	[OBJ]0x60A90020	[OBJ]0x60A90020	[OBJ]0x60A90020
StatusWord	[OBJ]0x60410010	[OBJ]0x60410010	[OBJ]0x60410010
SupportedDriveModes	[OBJ]0x65020020	[OBJ]0x65020020	[OBJ]0x65020020

[OBJ] Review Changes

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Object Data Settings (3/3) *Ezi-SERVO CC-Link IE TSN 4X Object Data Registration

MELSOFT GX Works3 C:\Work\테스트샘플\connectionGuide.gx3 - [Axis Parameter Setting]

Navigation: Project, Module Configuration, Program, FB/FUN, Label, Device, Parameter, System Parameter, MXR300-16, CPU Parameter, Module Parameter (Common Setting), Module Parameter (Port 1/2: CC-Link), Module Parameter (CC-Link IE TSN), Network Label Setting, Module Parameter (Port 3: Ethernet), Memory Card Parameter, Add-on Parameter, Module Information, Motion Setting, Motion System Setting, Axis, Axis0001, Axis0002, Axis0003, Axis Group, Motion I/O Data, Operation Profile Data, Advanced Synchronous Control.

Setting Item List: Real Drive Axis, Axis Information, Basic Parameter, Station Address Setting, Axis Type Setting, Axis Emulation Enabled, Control Cycle Setting, Object Data, Absolute Position Control Setting, Current Position Restore Reference Position, Ring Counter Enabled Selection, Ring Counter Upper Limit Value, Ring Counter Lower Limit Value, Position Command Unit, Position Command Unit String, Velocity Command Unit, Velocity Bias Value, Driver Unit Conversion Numerator, Driver Unit Conversion Denominator, Limit Parameter, Velocity Limit, Homing, Stop, Stroke Limit, Driver, Other, Real Encoder Axis, Virtual Drive Axis, Virtual Encoder Axis, Virtual Linked Axis.

Setting Item: Select Folder, Display All Data

Item	Axis0001	Axis0002	Axis0003
Set Axis Information			
Axis No.	1	2	3
Set Basic Parameter			
Station Address Setting	192.168.3.17	192.168.3.18	192.168.3.19
Axis Type Setting	0:Real Drive Axis	0:Real Drive Axis	0:Real Drive Axis
Axis Emulation Enabled	0:Disabled	0:Disabled	0:Disabled
Control Cycle Setting	0:Automatic setting	0:Automatic setting	0:Automatic setting
Object Data			
ControlWord	[OBJ]0x6040001	[OBJ]0x6040001	[OBJ]0x6040001
EncoderIncrements	[OBJ]0x608F012	[OBJ]0x608F012	[OBJ]0x608F012
FollowingErrActualValue	[OBJ]0x60F4002	[OBJ]0x60F4002	[OBJ]0x60F4002
GearRatioMotorRevolutions	[OBJ]0x607C002	[OBJ]0x607C002	[OBJ]0x607C002
HomeOffset	[OBJ]0x6080002	[OBJ]0x6080002	[OBJ]0x6080002
MaxMotorSpeed	[OBJ]0x6072001	[OBJ]0x6072001	[OBJ]0x6072001
MaxTorque	[OBJ]0x6060000	[OBJ]0x6060000	[OBJ]0x6060000
ModesOfOpDisp	[OBJ]0x6061000	[OBJ]0x6061000	[OBJ]0x6061000
NegativeTorqueLimitValue	[OBJ]0x60E1001	[OBJ]0x60E1001	[OBJ]0x60E1001
Polarity	[OBJ]0x607E000	[OBJ]0x607E000	[OBJ]0x607E000
PosActualValue	[OBJ]0x6064002	[OBJ]0x6064002	[OBJ]0x6064002
PosEncoderResolution	[OBJ]0x608F000	[OBJ]0x608F000	[OBJ]0x608F000
PosEncoderResolutionMotorRevolutions	[OBJ]0x608F022	[OBJ]0x608F022	[OBJ]0x608F022
Request the drive unit to switch status.	[OBJ]0x60E0001	[OBJ]0x60E0001	[OBJ]0x60E0001
Request the drive unit to switch status.	[OBJ]0x60A8002	[OBJ]0x60A8002	[OBJ]0x60A8002
Request the drive unit to switch status.	[OBJ]0x60A9002	[OBJ]0x60A9002	[OBJ]0x60A9002
Request the drive unit to switch status.	[OBJ]0x6041001	[OBJ]0x6041001	[OBJ]0x6041001
Request the drive unit to switch status.	[OBJ]0x6502002	[OBJ]0x6502002	[OBJ]0x6502002

Ezi-SERVO CC-Link IE TSN 4X All Axes [OBJ] Verify Modified Content

Apply

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Absolute Position Control Setting - Disable selected

MELSOFT GX Works3 C:\Work\테스트샘플\connectionGuide.gx3 - [Axis Parameter Setting]

Navigation: Project, Module Configuration, Program, FB/FUN, Label, Device, Parameter, System Parameter, MXR300-16, CPU Parameter, Module Parameter (Common Setting), Module Parameter (Port 1/2: CC-Link), Module Parameter (CC-Link IE TSN), Network Label Setting, Module Parameter (Port 3: Ethernet), Memory Card Parameter, Add-on Parameter, Module Information, Motion Setting, Motion System Setting, Axis.

Setting Item List: Input the Setting Item to Search, Select Folder, Display All Data.

Axis0001, Axis0002, Axis0003

Axis Information: Set Axis Information

Basic Parameter: Set Basic Parameter

Absolute Position Control Setting: 0:Disable Absc, -1:Automatic, Set -1:Automatic, Set

Limit Parameter: Set Limit Parameter

Explanation: <Axis Parameter Constant> Axis.PrConst.PosRestoration_AbsPosEnable Set the absolute position control setting. [Setting Range] 0:Disable Absolute Position System 1:Enable Absolute Position System -1:Automatic Setting (Acquire from Connected Device)

Apply

Ezi-SERVO CC-Link IE TSN 4X is selected as Disable Absolute Position System

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Position Command Unit Settings (Ezi-SERVO CC-Link IE TSN 4X Encoder 10,000 ppr)

Ezi-SERVO CC-Link IE TSN 4X Encoder Resolution Setting Range is 10,000 pulses/revolution

The gear ratio setting method is the same as the existing method

Click OK to reflect to the axis parameters.

Reflects the calculation result to the axis parameters. Values currently set will be deleted and updated to the values of calculation result. Are you sure?

Click OK to reflect to the axis parameters.

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Position Command Unit Settings (Ezi-SERVO CC-Link IE TSN 4X Encoder 10,000 ppr)

MELSOFT GX Works3 C:\Work\테스트샘플\connectionGuide.gx3 - [Axis Parameter Setting]

Navigation: Project, Module Configuration, Program, FB/FUN, Label, Device, Parameter, System Parameter, MXR300-16, CPU Parameter, Module Parameter (Common Setting), Module Parameter (Port 1/2: CC-Link), Module Parameter (CC-Link IE TSN), Network Label Setting, Module Parameter (Port 3: Ethernet), Memory Card Parameter, Add-on Parameter, Module Information, Motion Setting, Motion System Setting, Operation Profile Data, Advanced Synchronous Control.

Setting Item List: Input the Setting Item to Search, Select Folder, Display All Data.

Setting Item: Axis Information, Basic Parameter, Position Command Unit, Limit Parameter, Signal.

Item	Axis0001	Axis0002	Axis0003
Axis Information	Set Axis Information		
Axis No.	1	2	3
Station Address Setting	192.168.3.17	192.168.3.18	192.168.3.19
Axis Type Setting	0:Real Drive Axis	0:Real Drive Axis	0:Real Drive Axis
Axis Emulation Enabled	0:Disabled	0:Disabled	0:Disabled
Control Cycle Setting	0:Automatic settin	0:Automatic settin	0:Automatic settin
Object Data			
Absolute Position Control Setting	0:Disable Absolut	0:Disable Absolut	0:Disable Absolut
Current Position Restore Reference	-1:Automatic judg	-1:Automatic judg	-1:Automatic judg
Ring Counter Enabled Selection	0:Disabled	0:Disabled	0:Disabled
Ring Counter Upper Limit Value	10000000000.0	10000000000.0	10000000000.0
Ring Counter Lower Limit Value	10000000000.0	10000000000.0	10000000000.0
Position Command Unit	degree	mm	mm
Position Command Unit String			
Velocity Command Unit	U/s	U/s	U/s
Velocity Bias Value	0.0 degree/s	0.0 mm/s	0.0 mm/s
Driver Unit Conversion Numerator	10000 pulse	10000 pulse	10000 pulse
Driver Unit Conversion Denominator	360 degree	5 mm	10 mm
Limit Parameter	Set Limit Parameter		
Torque Limit Maximum Value	1000.0 %	1000.0 %	1000.0 %
Negative Direction Torque Limit Initial Value	300.0 %	300.0 %	300.0 %
Positive Direction Torque Limit Initial Value	300.0 %	300.0 %	300.0 %
Upper Limit Signal			
Signal			
Target			
Signal Detection Method	0:Detection at TRL	0:Detection at TRL	0:Detection at TRL
Compensation Time	0.0 s	0.0 s	0.0 s

Explanation: <Axis Parameter> Axis.Pr.Unit.Position Set the position command unit to use in motion control.

Apply

POU List Favorites History Module Library

Callouts:

- Select Robot or Stage Movement Unit
- Ezi-SERVO CC-Link IE TSN 4X Encoder 10,000 pulses/rev
- Set Movement Distance/Angle per Motor Revolution

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Limit Parameter

Setting Item List

- Real Drive Axis
 - Axis Information
 - Axis No.
 - Basic Parameter
 - Station Address Setting
 - Axis Type Setting
 - Axis Emulation Enabled
 - Control Cycle Setting
 - Object Data
 - Absolute Position Control Setting
 - Current Position Restore Reference Position
 - Ring Counter Enabled Selection
 - Ring Counter Upper Limit Value
 - Ring Counter Lower Limit Value
 - Position Command Unit
 - Position Command Unit String
 - Velocity Command Unit
 - Velocity Bias Value
 - Driver Unit Conversion Numerator
 - Driver Unit Conversion Denominator
 - Limit Parameter
 - Torque Limit Maximum Value
 - Negative Direction Torque Limit Initial Value
 - Positive Direction Torque Limit Initial Value
 - Upper Limit Signal
 - Signal
 - Target
 - Lower Limit Signal
 - Signal
 - Target
 - Signal Detection Method
 - Compensation Time
 - Filter Time
 - Velocity Limit
 - Positive Direction Velocity Limit Value

Setting Item

Item	Axis0001	Axis0002	Axis0003
Ring Counter Enabled Selection	0:Disabled	0:Disabled	0:Dis...
Ring Counter Upper Limit Value	10000000000.0 degree	10000000000.0 m	1000...
Ring Counter Lower Limit Value	-10000000000.0 degree	-10000000000.0	-100...
Position Command Unit	degree	mm	mm
Position Command Unit String			
Velocity Command Unit	U/s	U/s	U/s
Velocity Bias Value	0.0 degree/s	0.0 mm/s	0.0 m...
Driver Unit Conversion Numerator	10000 pulse	10000 pulse	1000...
Driver Unit Conversion Denominator	360 degree	5 mm	10 m...
Limit Parameter	Set Limit Parameter		
Torque Limit Maximum Value	1000.0 %	1000.0 %	1000...
Negative Direction Torque Limit Initial Value	300.0 %	300.0 %	300.C
Positive Direction Torque Limit Initial Value	300.0 %	300.0 %	300.C
Upper Limit Signal			
Signal	[VAR](BOOL)Ezi_SERVO_CT_001_DigitalInputs.1		
Target	0:Detection at TRUE	0:Detect...	0:De...
Signal Detection Method	0:Detection at TRUE	0:Detect...	0:De...
Compensation Time	0.0 s	0.0 s	0.0 s
Filter Time	0.0 s	0.0 s	0.0 s
Lower Limit Signal			
Signal	[VAR](BOOL)Ezi_SERVO_CT_001_DigitalInputs.0		
Target	0:Detection at TRUE	0:Detect...	0:De...
Signal Detection Method	0:Detection at TRUE	0:Detect...	0:De...
Compensation Time	0.0 s	0.0 s	0.0 s
Filter Time	0.0 s	0.0 s	0.0 s
Velocity Limit	Set Velocity Limit		
Positive Direction Velocity Limit Value	2500000000.0 degree/s	2500000000.0 mm	2500...

Explanation

Specify the logic of the signal.
The selectable setting values are different depending on the function. Check the Manual of each function.

[Setting Range]
0:Detection at TRUE
1:Detection at FALSE
2:Detection at FALSE -> TRUE (Rising Edge)
3:Detection at TRUE -> FALSE (Falling Edge)
4:Detection at Rising Edge/Falling Edge

Ezi-SERVO CC-Link IE TSN 4X + Limit Switch settings are Ezi_SERVO_CT_001_DigitalInputs.1

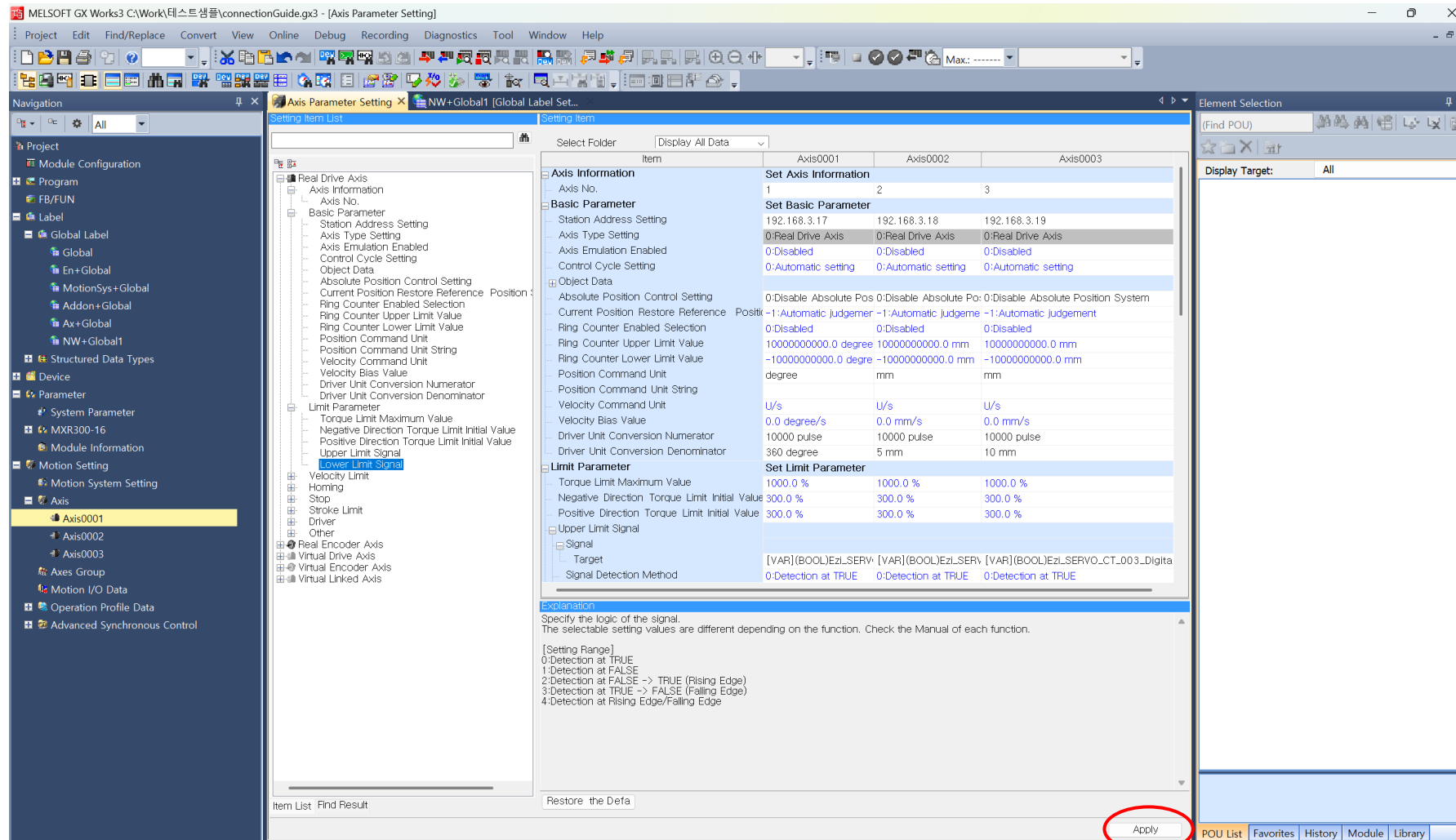
Ezi-SERVO CC-Link IE TSN 4X - Limit Switch settings are Ezi_SERVO_CT_001_DigitalInputs.0

Note) If the label setting for Ezi_SERVO_CT_xxx_DigitalInputs.x fails,
1. Check PDO Mapping Setting (pages 16-17)
2. Verify Network Label Setting (pages 21-22)

Apply

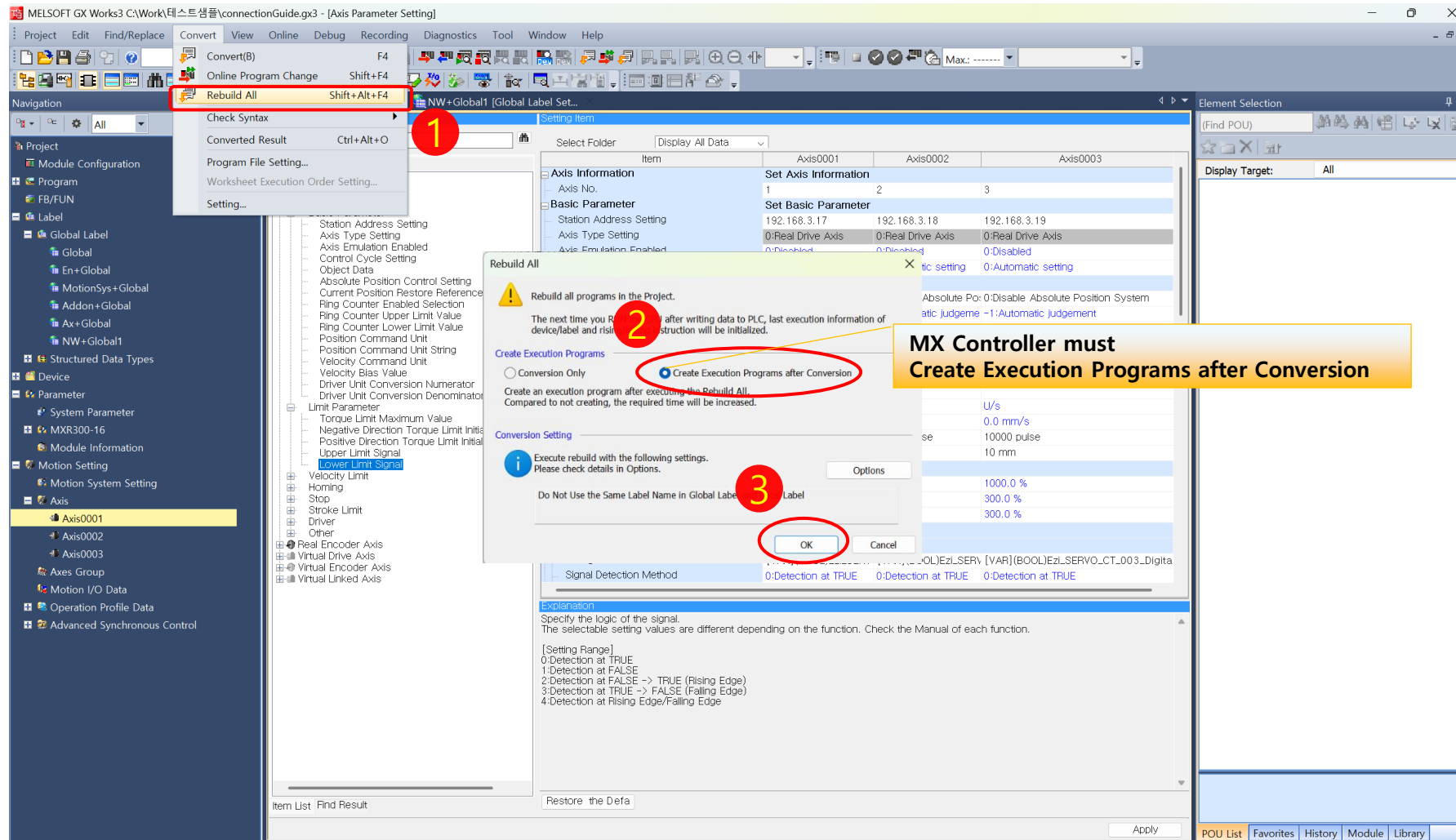
2-6. Motion Setting – Parameter Registration

- Complete Motion Setting by registering parameters



2-7. Convert

- Regarding parameter settings, etc., "Create Execution Programs after Conversion"



2-8. Write to PLC

- Online Data Operation

The screenshot displays the MELSOFT GX Works3 interface. A red circle with the number '1' highlights the 'Write to PLC...' option in the 'Online' menu. A yellow arrow points from this menu item to the 'Online Data Operation' dialog box. The dialog box has tabs for 'Display', 'Setting', and 'Related Functions'. The 'Display' tab is active, showing a table of memory areas and their status. Below the table, there is a 'Memory Capacity' section with a bar chart and a legend. The 'Execute' button at the bottom right of the dialog is circled in red.

Module Name/Data Name	Detail	Title	Last Change	Size (Byte)
MAIN			2026-02-02 ...	Not Calculated
Device Memory				
MAIN		Detail	2026-02-02 ...	-
File Register				
MAIN		Detail	2026-02-02 ...	Not Calculated
Common Device Co...				
COMMENT		Detail	2026-02-02 ...	Not Calculated

Memory Capacity Size Calculation

Legend: Used (Green), Increased (Blue), Decreased (Red), Free: 5% or Less (Pink)

Program Memory: Free 157/160KB
Data Memory: Free 1852/2049KB
Device/Label Memory (File Storage Area): Free 192/256KB
SD Memory Card: Free 0/0KB

Execute Close

3. Follow the Program

3-1. Exploring Motion Control Commands

- Motion Control Function/Function Block Commands – Element Selection (Left Menu)

The screenshot displays the MELSOFT GX Works3 interface. On the left, the 'Project' tree shows the 'ProgramBody' folder selected. The main workspace shows a ladder logic diagram with a 'MC_Power 1 (MC_Power)' block. A yellow dotted arrow points from the 'MC_Power 1 (MC_Power)' block to the 'Motion Control Function/Function Block' selection menu on the right. The menu is titled 'Motion Control Function/Function Block' and lists various functions under the 'Administrative' category. A red box highlights the 'MC_Power' function, which is currently selected. The 'MC_Power' function is described as 'Operation Available'. Below the 'MC_Power' function, the 'MC_ReadParameter' function is also visible, described as 'Parameter Read'. The 'MC_WriteParameter' function is described as 'Parameter Write'. The 'MCv_AdvCamSetPos' function is described as 'Advanced Synchroni'. The 'MCv_AdvPositionPe' function is described as 'Advanced Synchroni'. The 'MCv_AllPower' function is described as 'All Axes Operation Av'. The 'MCv_ChangeCycle' function is described as 'Current Value Change'. The 'MCv_MotionErrorRe' function is described as 'Motion Error Reset'. The 'MCv_SetTorqueLimi' function is described as 'Torque Limit Value'. The 'MCv_SyncOperation' function is described as 'Control Operation Cyc'. The 'Motion - Individual' section is also visible. The 'General FB' section is also visible. The 'MC_AbortTrigger' function is also visible. The 'MC_AbortTrigger' function is described as 'Touch Probe Disabled'. The 'MC_CamTableSelect' function is described as 'Cam Table Selection'. The 'MC_DigitalCamSwitc' function is described as 'Outputs the digital ca'. The 'MC_GroupDisable' function is described as 'Axes Group Disabled'. The 'MC_GroupEnable' function is described as 'Axes Group Enabled'. The 'MC_GroupReset' function is described as 'Axes Group Error Resi'. The 'MC_GroupSetOverri' function is described as 'Axes Group Override'.

Mouse Click & Drag

3-2. [Ladder] SERVO Enable, SERVO ON

- Ezi-SERVO Enable/SERVO ON Program

The screenshot displays the MELSOFT GX Works3 interface for a ladder logic program. The main workspace shows a ladder logic diagram with the following components:

- Read Mtrr** (Block 1): A read master register block.
- DUT: Axis** (Block 6): A block for DUT: Axis, with a parameter **Axis0001.A**.
- B: ServoON** (Block 7): A block for B: ServoON, with a parameter **ReadyStat**.
- MC_Power** (Block 8): A block for MC_Power, with a parameter **MC_Power**.
- END** (Block 9): The end of the program.

A callout box highlights the following information:

SERVO ON/OFF FB: 2 types

- Individual On/Off: MC_Power
- Batch On/Off: MCv_AllPower

The right sidebar shows the **Element Selection** panel, which lists various motion control function blocks and parameters. The **MC_Power** block is highlighted in the list.

3-3. [Ladder] Specifying the homing method

- Specifying the Homing Method (MC_WriteParameter, 33: Homing i

FB: MC_WriteParameter

- Homing Parameter Address: H60980008
- Homing Method: 33 (Homing index pulse (negative direction))

설정값	내용
1	Homing on negative limit switch and index pulse
2	Homing on positive limit switch and index pulse
7	Homing on home switch (positive direction, negative edge) and index pulse
10	Homing on home switch (positive direction, positive edge) and index pulse
11	Homing on home switch (negative direction, positive edge) and index pulse
14	Homing on home switch (negative direction, negative edge) and index pulse
17	Homing on negative limit switch
18	Homing on positive limit switch
24	Homing on home switch (positive direction, negative edge)
25	Homing on home switch (positive direction, positive edge)
28	Homing on home switch (negative direction, positive edge)
29	Homing on home switch (negative direction, negative edge)
33	Homing index pulse (negative direction)
34	Homing index pulse (positive direction)
35	Set the current position origin
37	Set the current position origin and reset current position
-3	Homing on negative mechanical limit
-4	Homing on positive mechanical limit
-5	Homing on negative mechanical limit and index pulse
-6	Homing on positive mechanical limit and index pulse

Comparison	
Time Data Type	Single Numeric Variable
Selection	String
Bit Shift	Edge Detection
Counter	Timer
Bistable	
Motion Control Function/Function Block	
Administrative	
MC_AbortTrigger	Touch Probe Disabled
MC_CamTableSelect	Cam Table Selection
MC_DigitalCamSwitch	Outputs the digital ca
MC_GroupDisable	Axes Group Disabled
MC_GroupEnable	Axes Group Enabled
MC_GroupReset	Axes Group Error Rese
MC_GroupSetOverri	Axes Group Override
MC_Power	Operation Available
MC_ReadParameter	Parameter Read
MC_Reset	Axis Error Reset
MC_SetOverride	Override Value Setting
MC_SetPosition	Current Position Chan
MC_TouchProbe	Touch Probe Enabled
MC_WriteParameter	Parameter Write

MC_WriteParameter	
[Version]	00A
POU List	Favorites History Module Library

The homing method is classified as follows based on the setting value for Homing method (6098h).

설정값	내용
1	Homing on negative limit switch and index pulse
2	Homing on positive limit switch and index pulse
7	Homing on home switch (positive direction, negative edge) and index pulse
10	Homing on home switch (positive direction, positive edge) and index pulse
11	Homing on home switch (negative direction, positive edge) and index pulse
14	Homing on home switch (negative direction, negative edge) and index pulse
17	Homing on negative limit switch
18	Homing on positive limit switch
24	Homing on home switch (positive direction, negative edge)
25	Homing on home switch (positive direction, positive edge)
28	Homing on home switch (negative direction, positive edge)
29	Homing on home switch (negative direction, negative edge)
33	Homing index pulse (negative direction)
34	Homing index pulse (positive direction)
35	Set the current position origin
37	Set the current position origin and reset current position
-3	Homing on negative mechanical limit
-4	Homing on positive mechanical limit
-5	Homing on negative mechanical limit and index pulse
-6	Homing on positive mechanical limit and index pulse

3-4. [Ladder] Execute Ezi-SERVO homing

- Homing Execution (MC_Home)

MELSOFT GX Works3 C:\Work\테스트샘플\connectionGuide.gx3 - [ProgPou [PRG] [LD] 51Byte]

Project Edit Find/Replace Convert View Online Debug Recording Diagnostics Tool Window Help

Navigation

Project

- Module Configuration
- Program
 - Initial
 - Scan
 - MAIN
 - ProgPou
 - Local Label
 - ProgramBody
 - Fixed Scan
 - Event
 - Standby
 - No Execution Type
 - Unregistered Program
- FB/FUN
- Label
- Device
- Parameter
 - System Parameter
 - CPU Parameter
 - Module Parameter (Common Setting)
 - Module Parameter (Port 1/2: CC-Link)
 - Module Parameter (CC-Link IE TSN)
 - Network Label Setting
 - Module Parameter (Port 3: Ethernet)
 - Memory Card Parameter
 - Add-on Parameter
 - Module Information
- Motion Setting
 - Motion System Setting
 - Axis
 - Axis0001
 - Axis0002
 - Axis0003
 - Axis Group
 - Motion I/O Data
- Operation Profile Data

Write

1 2 3 4 5 6 7 8 9 10 11 12

12 (16)

13 bAx1WParam

14 [Axis0001.A] DUT: Axis Axis DUT

15 [bAx1WParam] UD: Param... Busy B

16 [bAx1WParam] L: Value Error B

17 [0] W: Execution... ErrorID UW

18 [H0] UD: Options SDOErr... UD

19 SDOStat... UW

20 bAx1HomeSL (33) bAx1HomeDo

21 bAx1Home

22 (37)

23 [Axis0001.A] DUT: Axis Axis DUT

24 bAx1Home B: Execute Done B

25 [0.0] L: Position Busy B

26 DUT: AbsSwit... Active B

27 [H0] UD: Options Command... B

28 Error B

29 ErrorID UW

30 (30)

MC_WriteParameter_1 (MC_...)

MC_Home_1 (MC_Home)

Element Selection

(Find POU)

Display Target: All

- CC-Link IE TSN Network module
- Add-on instructions
- Standard Function/Function Block
 - Bit Type Boolean
 - Type Conversion
 - Arithmetic Operation
 - Comparison
 - Time Data Type
 - Single Numeric Variable
 - Selection
 - String
 - Bit Shift
 - Edge Detection
 - Counter
 - Timer
 - Bistable
- Motion Control Function/Function Block
 - Administrative
 - Motion - Individual
 - MC_CamIn Cam Operation Start
 - MC_CombineAxes Addition/Subtraction I
 - MC_GearIn Gear Operation Start
 - MC_GroupStop Group Forced Stop
 - MC_Home OPR
 - MC_MoveAbsolute Absolute Value Positio
 - MC_MoveRelative Relative Value Positio
 - MC_MoveVelocity Speed Control
 - MC_Stop Forced Stop
 - MC_TorqueControl Torque Control
 - MCv_AdvancedSync Advanced Synchronou
 - MCv_BacklashComp Backlash Compensatic
 - MCv_CyclicPosition Motion Cyclic Positio

MC_Home

[Version]

00A

POU List Favorites History Module Library

3-5. [Ladder] Execute Ezi-SERVO Operation

- Execute Movement Operation (MC_MoveAbsolute)

Arbitrary Position Setting

- bAx1PosPos1 ON → 3600.0
- bAx1PosPos1 ON → 0.0
- ※ 3,600 – 10 rotations

MC_MoveAbsolute

Parameter	Value	Unit
DUT: Axis	Axis 0001 A	Axis
B: Execute	Done	B
B: Continuous	Busy	B
L: Position	edAx1Pos1	Active
L: Velocity	3000.0	Command
L: Acceleration	180000.0	Error
L: Deceleration	180000.0	ErrorID
L: Jerk	0.0	
W: Direction	K3	
W: Buffer Mode		
UD: Options		

- Digital Input, Output Operation Execution



3-6. [Ladder] Ezi-SERVO DIO Map - Reference

- Digital Inputs

Bit 31	Bit 30	Bit 29	Bit 28	Bit 27	Bit 26	Bit 25	Bit 24
-	Motor Power	TQOFF2	TQOFF1	-	-	User input 6	User input 5
Bit 23	Bit 22	Bit 21	Bit 20	Bit 19	Bit 18	Bit 17	Bit 16
User input 4	User input 3	User input 2	User input 1	Reserved	Reserved	Reserved	
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
-	-	-	-	-	-	-	-
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
-	-	-	-	-	Origin switch	Positive limit switch	Negative limit switch

- Physical Outputs

Bit 31	Bit 30	Bit 29	Bit 28	Bit 27	Bit 26	Bit 25	Bit 24
-	-	-	-	-	-	-	-
Bit 23	Bit 22	Bit 21	Bit 20	Bit 19	Bit 18	Bit 17	Bit 16
-	-	-	User output 5	User output 4	User output 3	User output 2	User output 1
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
-	-	-	-	-	-	-	-
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
-	-	-	-	-	-	-	Set brake

Appendix

[Operation Verification] Axis Monitor

- Monitor the status, position, homing, and error of each axis.

The screenshot displays the MELSOFT GX Works3 interface. On the left, the Project tree shows the 'ProgramBody' folder selected. The main window shows a ladder logic program with a red box highlighting the 'Motion Monitor(B)' menu item, which has a sub-menu 'Axis Monitor...'. The 'Axis Monitor' window is open, showing a table of axis data for five axes (Axis #1 to Axis #5). The table includes columns for Axis Name, Axis Status, Control Cycle, Position Command Unit Display, Velocity Command Unit Display, Set Position, Actual Position, Commanded Position, Set Velocity, Actual Velocity, Commanded Velocity, Negative Direction Velocity Limit Value, Positive Direction Velocity Limit Value, Automatically Decelerating Command In-position, Negative Direction Torque Limit Value, Positive Direction Torque Limit Value, Execution Profile ID No., Homing Request, Start Permission at Homing Uncompleted, Upper Limit Signal Status, Lower Limit Signal Status, Forced Stop Cancelling, Axis Error Detection, Axis Error Code, Axis Warning Detection, Axis Warning Code, Driver Ready On Status, Driver Servo On Status, Driver Status, Drive Unit Error Detection, Drive Unit Error Code, and Drive Unit Error Detail Code. The 'Homing Request' row is highlighted in green, indicating that homing is in progress for all axes. The 'Motion Common Monitor' window is also open, showing a table of motion common data, including Operation Cycle Monitor[1], Operation Cycle Monitor[2], and Operation Cycle Monitor[3]. The 'Motion Common Monitor' window is also highlighted with a red box.

	Axis #1	Axis #2	Axis #3	Axis #4	Axis #5
Axis Name	Axis0001	Axis0002	Axis0003	Axis0004	Axis0005
Axis Status	4:Standstill	4:Standstill	4:Standstill	4:Standstill	4:Standstill
Control Cycle	1	1	1	1	1
Position Command Unit Display	degree	degree	degree	degree	degree
Velocity Command Unit Display	degree/s	degree/s	degree/s	degree/s	degree/s
Set Position	0.10058283805847 d...	0.0 degree	0.0 degree	0.0 degree	0.0 degree
Actual Position	0.1003303527832 de...	0.0 degree	0.0 degree	0.0 degree	0.0 degree
Commanded Position	0.0 degree	0.0 degree	0.0 degree	0.0 degree	0.0 degree
Set Velocity	0.0 degree/s	0.0 degree/s	0.0 degree/s	0.0 degree/s	0.0 degree/s
Actual Velocity	-0.31650066375732 d...	0.0 degree/s	0.0 degree/s	0.0 degree/s	0.0 degree/s
Commanded Velocity	0.0 degree/s	0.0 degree/s	0.0 degree/s	0.0 degree/s	0.0 degree/s
Negative Direction Velocity Limit Value	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s
Positive Direction Velocity Limit Value	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s
Automatically Decelerating Command In-position	FALSE	FALSE	FALSE	FALSE	FALSE
Negative Direction Torque Limit Value	300.0 %	300.0 %	300.0 %	300.0 %	300.0 %
Positive Direction Torque Limit Value	300.0 %	300.0 %	300.0 %	300.0 %	300.0 %
Execution Profile ID No.	0	0	0	0	0
Homing Completed	FALSE	FALSE	FALSE	FALSE	FALSE
Homing Request	TRUE	TRUE	TRUE	TRUE	TRUE
Start Permission at Homing Uncompleted	FALSE	FALSE	FALSE	FALSE	FALSE
Upper Limit Signal Status	FALSE	FALSE	FALSE	FALSE	FALSE
Lower Limit Signal Status	FALSE	FALSE	FALSE	FALSE	FALSE
Forced Stop Cancelling	TRUE	TRUE	TRUE	TRUE	TRUE
Axis Error Detection	FALSE	FALSE	FALSE	FALSE	FALSE
Axis Error Code	H0000	H0000	H0000	H0000	H0000
Axis Warning Detection	FALSE	FALSE	FALSE	FALSE	FALSE
Axis Warning Code	H0000	H0000	H0000	H0000	H0000
Driver Ready On Status	TRUE	TRUE	TRUE	TRUE	TRUE
Driver Servo On Status	TRUE	TRUE	TRUE	TRUE	TRUE
Driver Status	6:Operation Enable	6:Operation Enable	6:Operation Enable	6:Operation Enable	6:Operation Enable
Drive Unit Error Detection	FALSE	FALSE	FALSE	FALSE	FALSE
Drive Unit Error Code	H0000	H0000	H0000	H0000	H0000
Drive Unit Error Detail Code	H0000	H0000	H0000	H0000	H0000

	Axis #1	Axis #2	Axis #3	Axis #4	Axis #5
Axis Name	Axis0001	Axis0002	Axis0003	Axis0004	Axis0005
Axis Status	4:Standstill	4:Standstill	4:Standstill	4:Standstill	4:Standstill
Control Cycle	1	1	1	1	1
Position Command Unit Display	degree	degree	degree	degree	degree
Velocity Command Unit Display	degree/s	degree/s	degree/s	degree/s	degree/s
Set Position	0.10058283805847 d...	0.0 degree	0.0 degree	0.0 degree	0.0 degree
Actual Position	0.1003303527832 de...	0.0 degree	0.0 degree	0.0 degree	0.0 degree
Commanded Position	0.0 degree	0.0 degree	0.0 degree	0.0 degree	0.0 degree
Set Velocity	0.0 degree/s	0.0 degree/s	0.0 degree/s	0.0 degree/s	0.0 degree/s
Actual Velocity	-0.31650066375732 d...	0.0 degree/s	0.0 degree/s	0.0 degree/s	0.0 degree/s
Commanded Velocity	0.0 degree/s	0.0 degree/s	0.0 degree/s	0.0 degree/s	0.0 degree/s
Negative Direction Velocity Limit Value	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s
Positive Direction Velocity Limit Value	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s	2500000000.0 degree/s
Automatically Decelerating Command In-position	FALSE	FALSE	FALSE	FALSE	FALSE
Negative Direction Torque Limit Value	300.0 %	300.0 %	300.0 %	300.0 %	300.0 %
Positive Direction Torque Limit Value	300.0 %	300.0 %	300.0 %	300.0 %	300.0 %
Execution Profile ID No.	0	0	0	0	0
Homing Completed	FALSE	FALSE	FALSE	FALSE	FALSE
Homing Request	TRUE	TRUE	TRUE	TRUE	TRUE
Start Permission at Homing Uncompleted	FALSE	FALSE	FALSE	FALSE	FALSE
Upper Limit Signal Status	FALSE	FALSE	FALSE	FALSE	FALSE
Lower Limit Signal Status	FALSE	FALSE	FALSE	FALSE	FALSE
Forced Stop Cancelling	TRUE	TRUE	TRUE	TRUE	TRUE
Axis Error Detection	FALSE	FALSE	FALSE	FALSE	FALSE
Axis Error Code	H0000	H0000	H0000	H0000	H0000
Axis Warning Detection	FALSE	FALSE	FALSE	FALSE	FALSE
Axis Warning Code	H0000	H0000	H0000	H0000	H0000
Driver Ready On Status	TRUE	TRUE	TRUE	TRUE	TRUE
Driver Servo On Status	TRUE	TRUE	TRUE	TRUE	TRUE
Driver Status	6:Operation Enable	6:Operation Enable	6:Operation Enable	6:Operation Enable	6:Operation Enable
Drive Unit Error Detection	FALSE	FALSE	FALSE	FALSE	FALSE
Drive Unit Error Code	H0000	H0000	H0000	H0000	H0000
Drive Unit Error Detail Code	H0000	H0000	H0000	H0000	H0000

[Operation Verification] Changing the Homing Method

- Change the homing method using Motion Control FB

- ① Specify Parameter Number: H60980008
- ② Specify Value (Homing Method): 33.0
- ③ Execution Mode: TRUE (Write)
- ④ Done: Becomes TRUE

The homing method is classified as follows based on the setting value for Homing method (6098h).

설정값	내용
1	Homing on negative limit switch and index pulse
2	Homing on positive limit switch and index pulse
7	Homing on home switch (positive direction, negative edge) and index pulse
10	Homing on home switch (positive direction, positive edge) and index pulse
11	Homing on home switch (negative direction, positive edge) and index pulse
14	Homing on home switch (negative direction, negative edge) and index pulse
17	Homing on negative limit switch
18	Homing on positive limit switch
24	Homing on home switch (positive direction, negative edge)
25	Homing on home switch (positive direction, positive edge)
28	Homing on home switch (negative direction, positive edge)
29	Homing on home switch (negative direction, negative edge)
33	Homing index pulse (negative direction)
34	Homing index pulse (positive direction)
35	Set the current position origin
37	Set the current position origin and reset current position
-3	Homing on negative mechanical limit
-4	Homing on positive mechanical limit
-5	Homing on negative mechanical limit and index pulse
-6	Homing on positive mechanical limit and index pulse

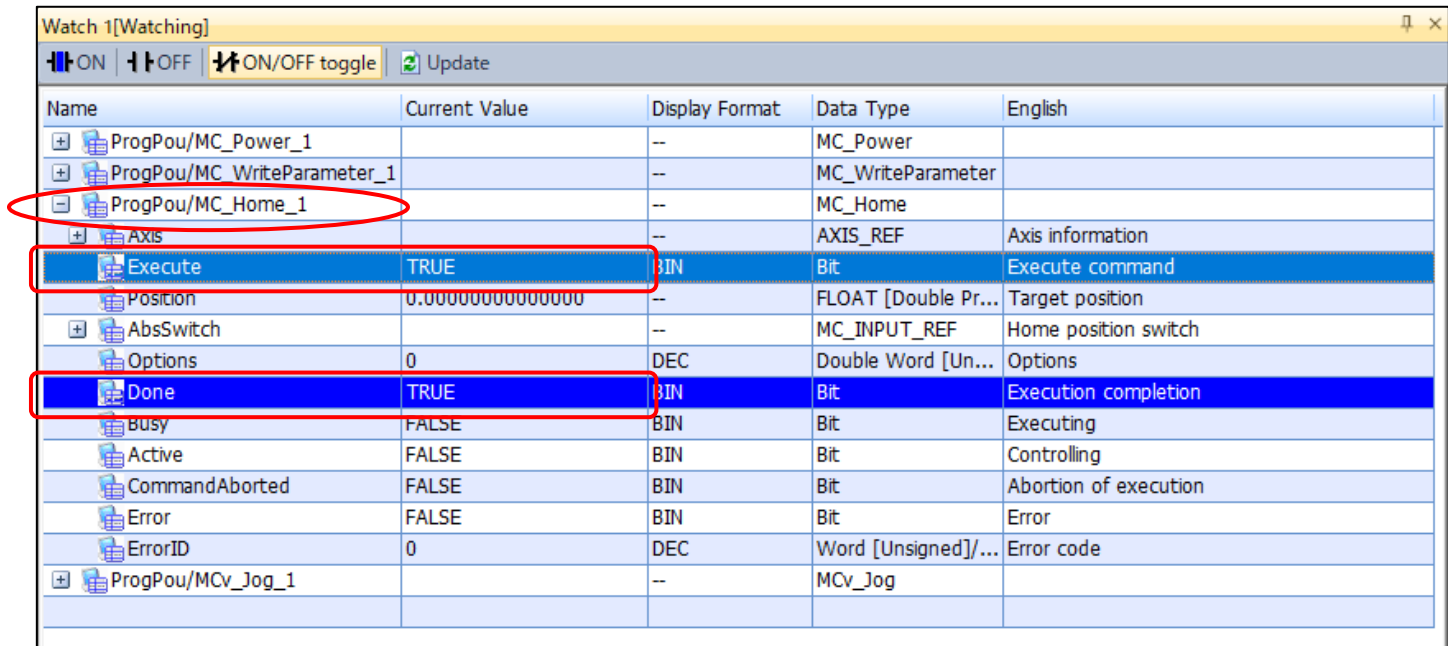
Watch 1[Watching]				
Name	Current Value	Display Format	Data Type	English
ProgPou/MC_Power_1		--	MC_Power	
ProgPou/MC_WriteParameter_1		--	MC_WriteParameter	
Axis		--	AXIS_REF	Axis information
Execute	TRUE	BIN	Bit	Execute command
ParameterNumber	H60980008	HEX	Word [Unsigned]/...	Setting value
Value	37.00000000000000	BIN	Double Word [Un...	Setting value
ExecutionMode	0	DEC	Word [Signed]	Execution mode
Options	0	DEC	Double Word [Un...	Options
Done	TRUE	BIN	Bit	Execution completion
Busy	FALSE	BIN	Bit	Executing
Error	FALSE	BIN	Bit	Error
ErrorID	H0000	HEX	Word [Unsigned]/...	Error code
SDOErrorID	H00000000	HEX	Double Word [Un...	Transient error code
SDOStatus	1	DEC	Word [Unsigned]/...	SDO transfer status
ProgPou/MC_Home_1		--	MC_Home	
ProgPou/MCv_Jog_1		--	MCv_Jog	

Display Format: HEX
selected

[Operation Verification] Homing

- Execute homing using motion control FB

- ① Execute → TRUE (Write)
- ② Done → Becomes TRUE



Name	Current Value	Display Format	Data Type	English
ProgPou/MC_Power_1		--	MC_Power	
ProgPou/MC_WriteParameter_1		--	MC_WriteParameter	
ProgPou/MC_Home_1		--	MC_Home	
Axis		--	AXIS_REF	Axis information
Execute	TRUE	BIN	Bit	Execute command
Position	0.0000000000000000	--	FLOAT [Double Pr...	Target position
AbsSwitch		--	MC_INPUT_REF	Home position switch
Options	0	DEC	Double Word [Un...	Options
Done	TRUE	BIN	Bit	Execution completion
Busy	FALSE	BIN	Bit	Executing
Active	FALSE	BIN	Bit	Controlling
CommandAborted	FALSE	BIN	Bit	Abortion of execution
Error	FALSE	BIN	Bit	Error
ErrorID	0	DEC	Word [Unsigned]/...	Error code
ProgPou/MCv_Jog_1		--	MCv_Jog	

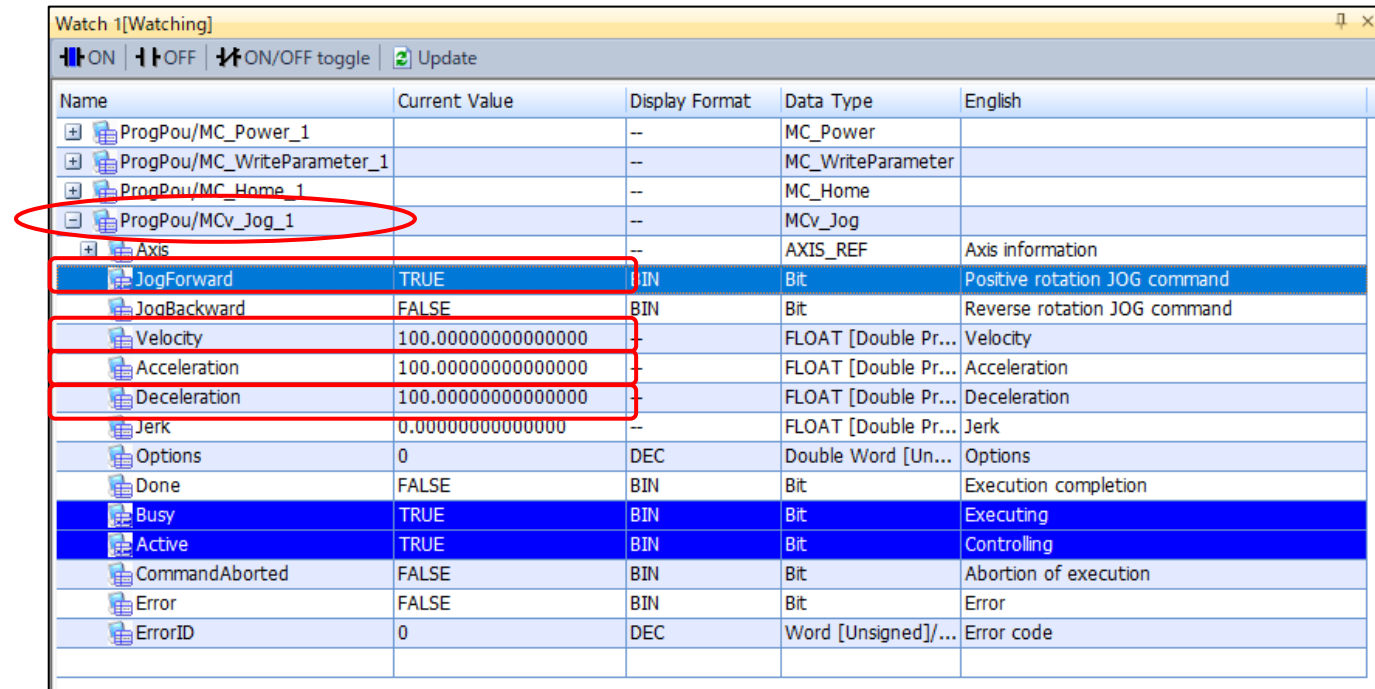
- When using Ezi-SERVO's LIMIT+ / LIMIT- signals as hardware stroke limits, set the following axis control data before starting operation.

[AxisName.Cd.HwStrokeLimit_Override] → 'DISABLE'

[Operation Verification] Jog Operation

- Execute Jog operation using Motion Control FB

- ① Velocity → 100.0
- ② Acceleration → 100.0
- ③ Deceleration → 100.0
- ④ JogForward → TRUE (Write)



Name	Current Value	Display Format	Data Type	English
ProgPou/MC_Power_1		--	MC_Power	
ProgPou/MC_WriteParameter_1		--	MC_WriteParameter	
ProgPou/MC_Home_1		--	MC_Home	
ProgPou/MCv_Jog_1		--	MCv_Jog	
Axis		--	AXIS_REF	Axis information
JogForward	TRUE	BIN	Bit	Positive rotation JOG command
JogBackward	FALSE	BIN	Bit	Reverse rotation JOG command
Velocity	100.00000000000000		FLOAT [Double Pr...	Velocity
Acceleration	100.00000000000000		FLOAT [Double Pr...	Acceleration
Deceleration	100.00000000000000		FLOAT [Double Pr...	Deceleration
Jerk	0.0000000000000000	--	FLOAT [Double Pr...	Jerk
Options	0	DEC	Double Word [Un...	Options
Done	FALSE	BIN	Bit	Execution completion
Busy	TRUE	BIN	Bit	Executing
Active	TRUE	BIN	Bit	Controlling
CommandAborted	FALSE	BIN	Bit	Abortion of execution
Error	FALSE	BIN	Bit	Error
ErrorID	0	DEC	Word [Unsigned]/...	Error code

[Operation Verification] Troubleshooting

- When an error occurs, check the cause in the Event History (log)

① [Online] -> [Motion Monitor] -> [Event History]

The screenshot shows the 'Motion Control Setting Function (Untitled Project)' software. The 'Motion Monitor' menu is open, and 'Event History' is selected. The 'Event History: [0000RD78G64]' window is displayed, showing a table of events. The 'Detailed Information' tab is active, showing details for event 000001.

No.	Occurrence Date	Error Type	Status	Error Code	Description
000001	2024/10/15 15:15:57.512	System	OK	000000	Homing Request (H- to OK)
000002	2024/10/15 15:15:57.512	System	OK	000000	Current Position Extension Completion
000003	2024/10/15 15:15:57.512	System	OK	000000	servo System Extension Start
000004	2024/10/15 15:15:57.512	Operation	OK	000000	Follow-up Motion Execution

Detailed Information

Axis No. Information

Axis Type: Dual Drive Axis

Error Occurrence Mode/Axis Group: 1

Error Code: 000001

000001

Homing request was OK.

- Absolute position error in driver data was detected. (Error code: 000001)
- An absolute position error in the driver data was detected. (Error code: 000001)
- The axis type was changed. (Error code: 000001)
- Slave object: 'Polarity (000001)' b7 position polarity was changed. (Error code: 000001)
- Change of the drive of motion encoder was detected. (Error code: 000001)
- Machine homing was detected. (Error code: 000001)
- Driver unit connection (communication) of the axis was detected. (Error code: 000001)
- Machine homing has been detected after the system started. (Error code: 000001)

Review the event in detail

[Operation Verification] Troubleshooting

- If "**SLMP Communication Error**" (1C43h) occurs
→ Please set the object data by referring to the axis parameters.
- If the "**Warning: Connection setting error for drive unit other than MELSERVO**" (0D4Ch) occurs
→ Refer to the axis parameters and disable the Absolute position system.
- If "**Control Mode Switching Error**" (1A1Dh) occurs when **starting MC_Home**
→ In the network configuration settings (add driver),
Set Network Synchronous Communication to ****"Synchronous"****.
- When starting MC_Home using the driver's **LIMIT+ / –** signals, it detects upper/lower limit signals and stops
→ Set [AxisName.Cd.HwStrokeLimit_Override] to 'DISABLE' and configure the axis control data in the program, etc.

[Parameter] Homing Parameter Settings

- Various settings related to homing are performed on the following object
 - Use MC_WriteParameter to write the setting values.
 - For detailed information on each object, refer to the Ezi-SERVO CC-Link IE TSN 4X Manual.

Object Name	Index: Subindex	Setting Details
Home Offset	Obj.607C: 00h	Difference between the zero position of the machine coordinate system and the homing position
Homing method	Obj.6098: 00h	Homing method
Homing speeds	Obj.6099: 01h	Homing speeds
Homing speeds	Obj.6099: 02h	Cliff speed during homing
Homing acceleration	Obj.609A: 00h	Acceleration during homing



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