



Programmable Automation Controllers
MELSEC MX Controller



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

Connection Guide

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

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 ALL

Before you begin

- Thank you for using our company's products.
- The Ezi-SERVO CC-Link IE TSN ALL 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 in a CC-Link IE TSN network.
- Ezi-SERVO CC-Link IE TSN ALL is an industrial product. Do not use it for any other purpose. Our company assumes no responsibility 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 ALL 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

- Ezi-SERVO CC-Link IE TSN ALL manuals can be downloaded from the FASTECH website.

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

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

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

<https://www.mitsubishielectric.com/fa/index.html>

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 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. Ezi-SERVO CC-Link IE TSN ALL 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 ALL 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>)

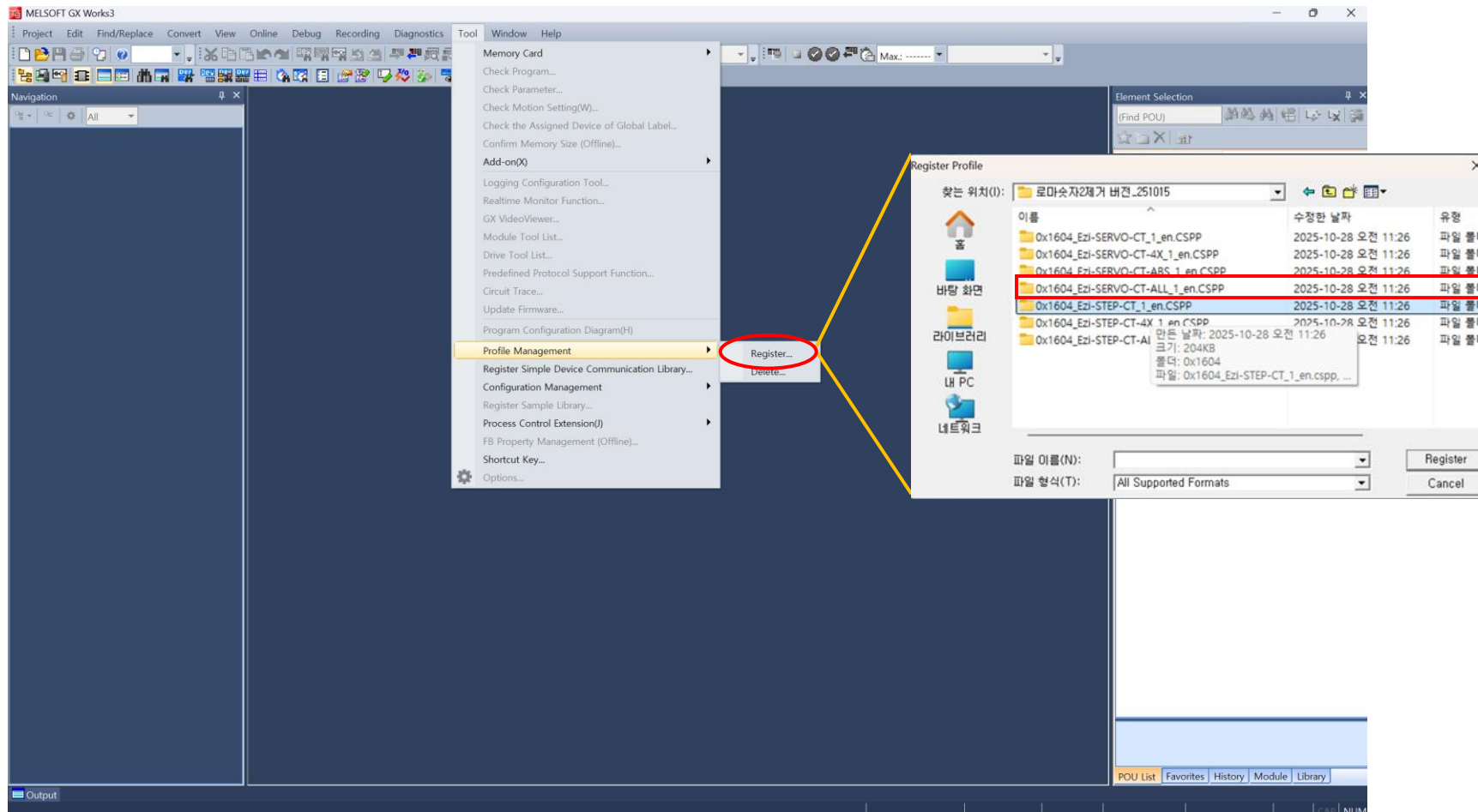
- ◆ **Remote station: Ezi-SERVO CC-Link IE TSN ALL**

- CSP+ File Download address: <https://cltsn.fastech-motions.com/en/download/quick>
 - File Name: 0x1604_Ezi-SERVO-CT_ALL_1_en_CSPP

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

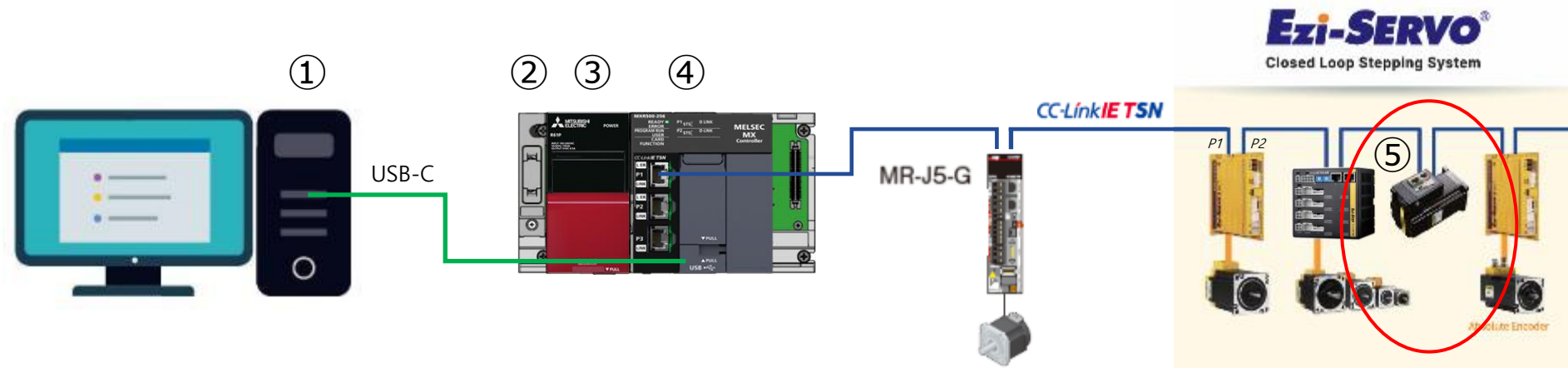
● CSP+ Registration

- [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 + Motor	Ezi-SERVO-CT-ALL-42S-A-R	192.168.3.1

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 Flow

- 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/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 Flow

● 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 Set the homing method (Index: 6098h, Subindex: 00h) - Set homing method: '0' (default) → '33', etc. ※ Refer to [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. Limitations

● Motion Control Function Constraints (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. Limitations

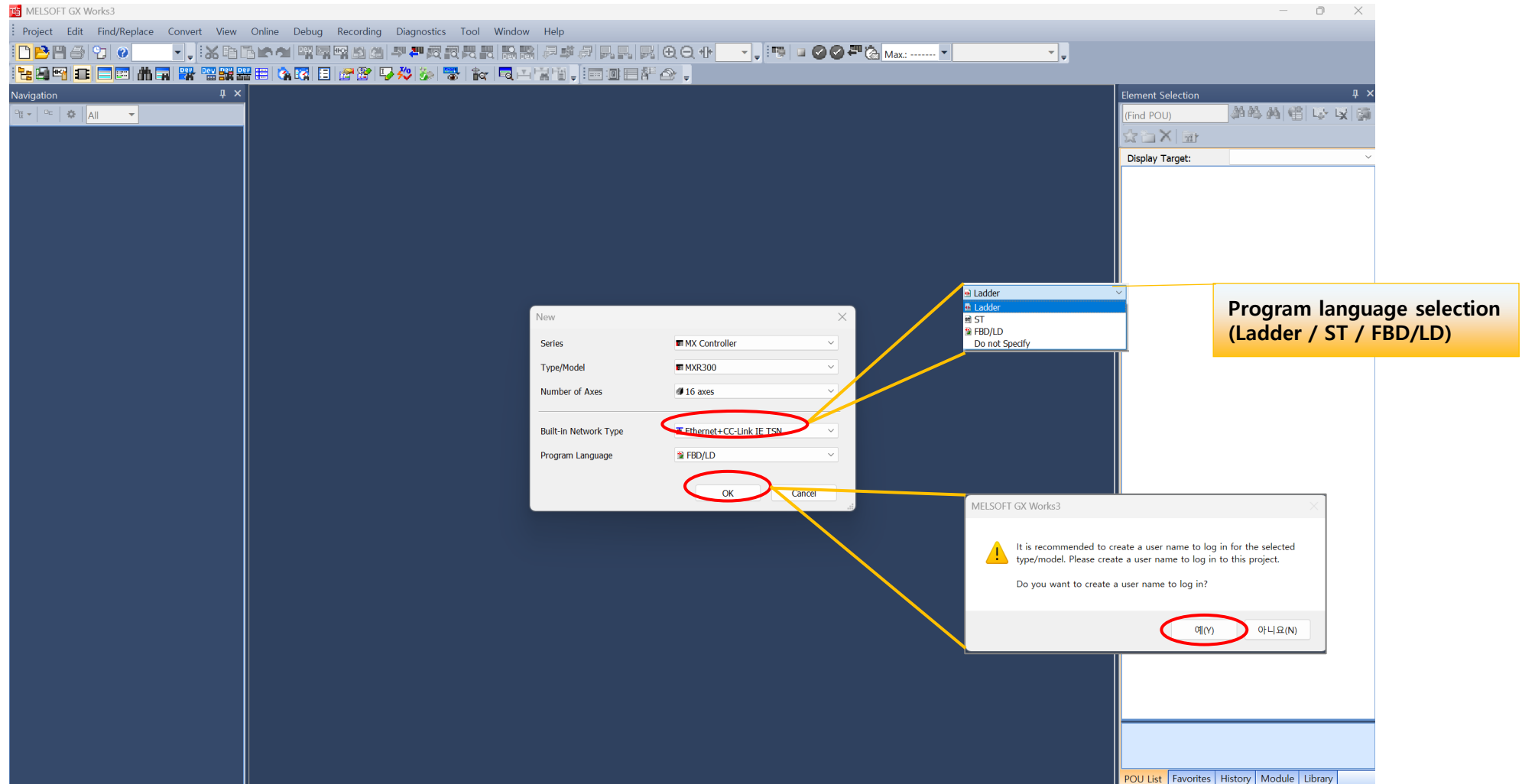
● Motion Control Function Constraints (MX Controller and Ezi-SERVO)

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 responds to this data.
Cd.136: PI-PID switching request	Not supported. Only MELSERVO supports this data.

2. MX Controller Settings

2-1. Project Creation

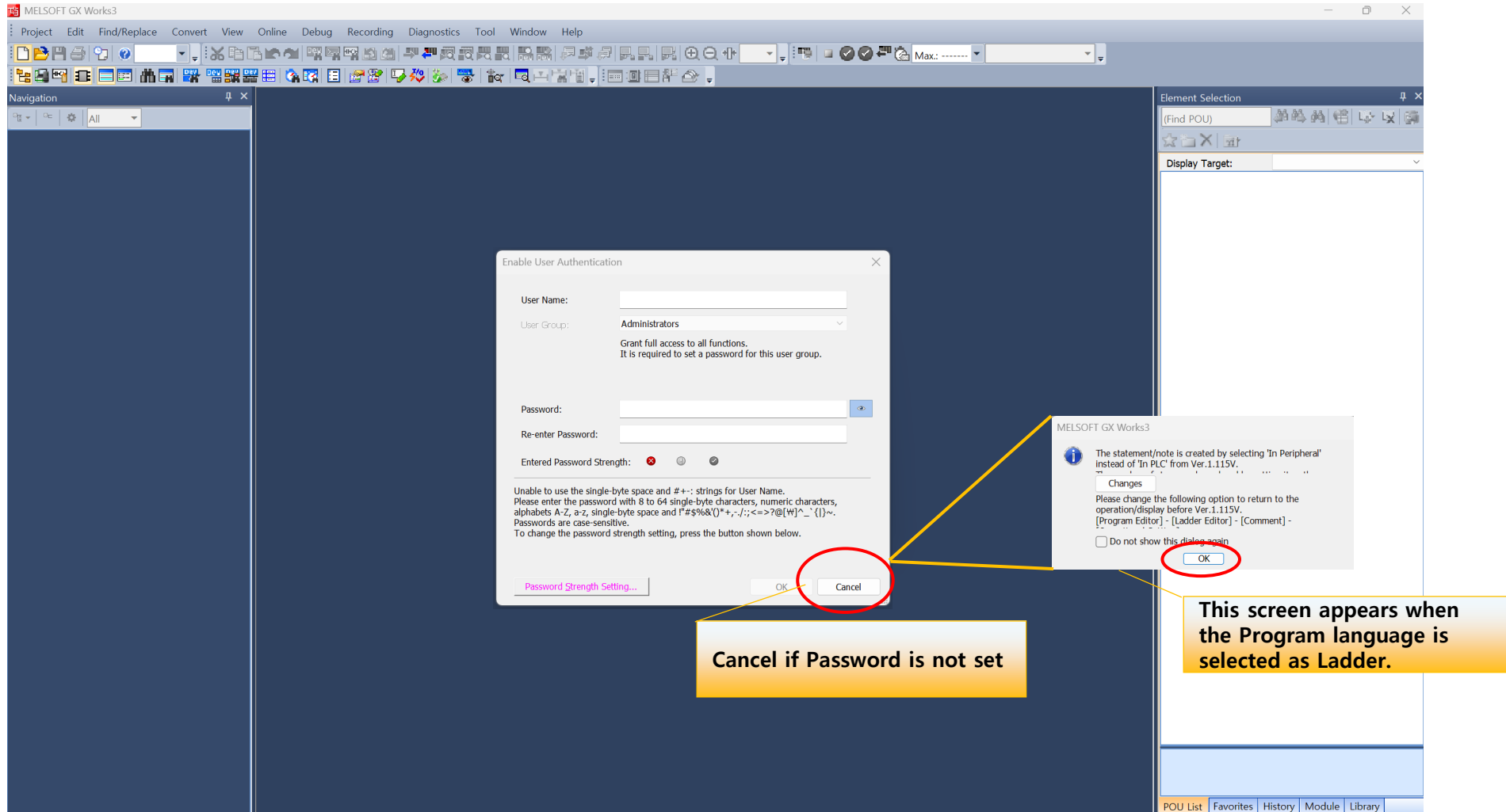
- When creating a new project, select the MX Controller, model name, number of axes used, and programming language.



2-2. User Authentication Settings

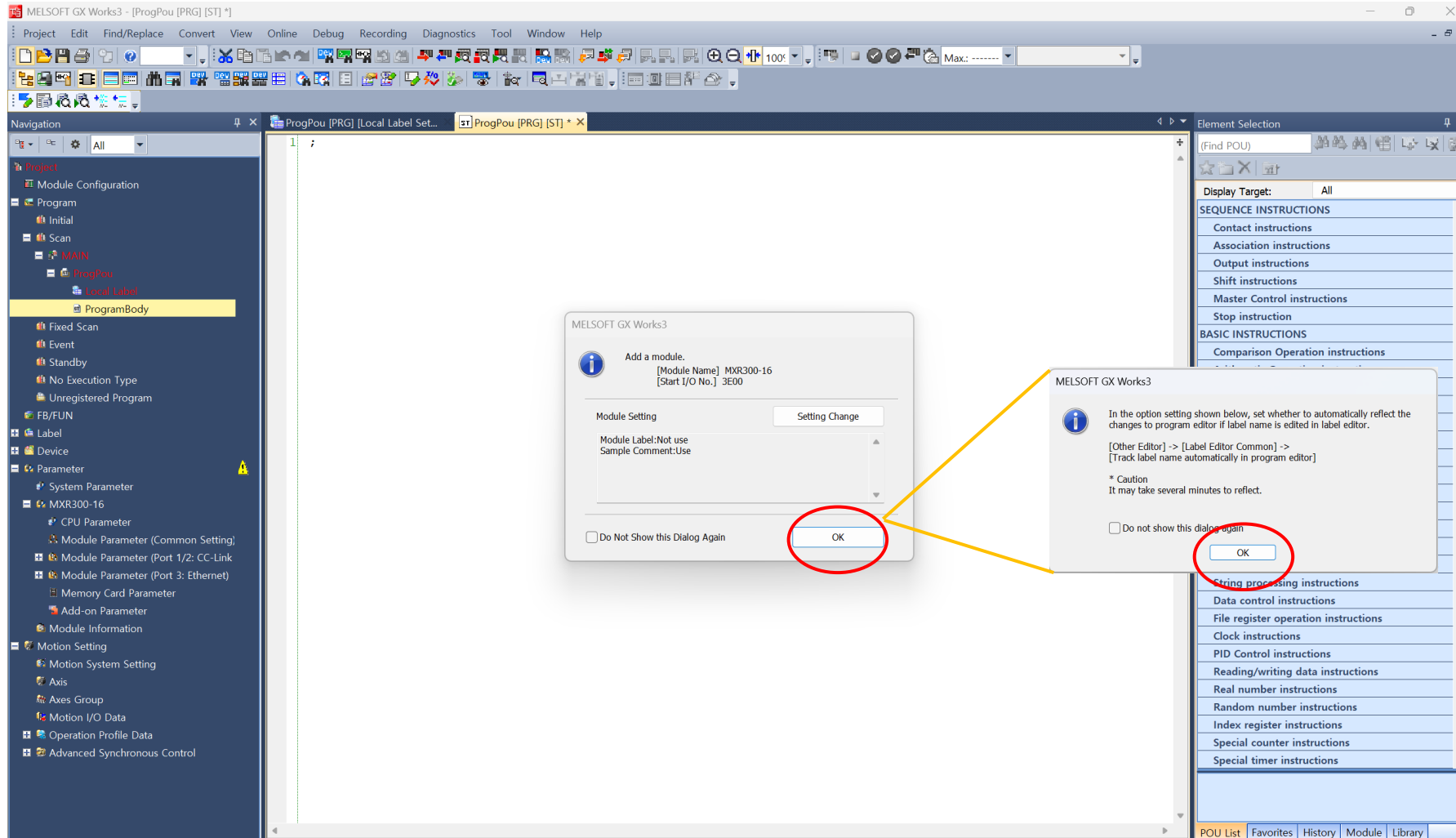
● Password Setting

※ 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 for Module Configuration. The 'Module Configuration' tab is active in the left sidebar (callout 1). The main workspace shows a rack configuration with a 'Main Base' (callout 4) and a 'CPU' module. A 'Click & Drag' instruction box (callout 3) lists the steps: 1. Main Base, 2. Power Supply, 3. Install MX Controller. The right sidebar shows the 'Element Selection' list with 'Main Base' and 'Power Supply' sections. The 'Main Base' section lists various modules, with 'R32SB' (2 Slots) and 'R33B' (3 Slots) highlighted (callout 2). The 'Power Supply' section lists various power supply modules, with 'R61P' (6.5A output) highlighted (callout 2). A 'Mouse Click & Drag' label (callout 2) points to the CPU module in the rack. A dialog box in the bottom left corner provides instructions on how to fix parameters after editing.

Click & Drag

1. Main Base
2. Power Supply
3. Install MX Controller

Element Selection

Display Target: All

MX Controller

MX-R Model

iQ-R Series

Main Base

- R32SB 2 Slots (Type requiring s)
- R33B 3 Slots (Type requiring p)
- R33SB 3 Slots (Type requiring s)
- R35B 5 Slots (Type requiring p)
- R35SB 5 Slots (Type requiring s)
- R38B 8 Slots (Type requiring p)
- R38RB-HT 8 Slots (Extended temper)
- R310B-HT 10 Slots (Extended temp)
- R310RB 10 Slots (Type requiring)
- R312B 12 Slots (Type requiring)

Extension Base

RQ Extension Base

PLC CPU

Process CPU

SIL2 Process CPU

Safety CPU

C Controller

MELSECWinCPU

Head Module

Motion CPU

NCCPU

Robot CPU

Power Supply

- R61SP 2.5A output (Slim type p)
- R62P 3.5A output
- R61P 6.5A output
- R63P 6.5A output
- R63RP 6.5A output (Redundant)
- R64P 9.0A output
- R64RP 9.0A output (Redundant)
- R69P 9.0A output
- R69RP 9.0A output (Redundant)

MELSOFT GX Works3

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

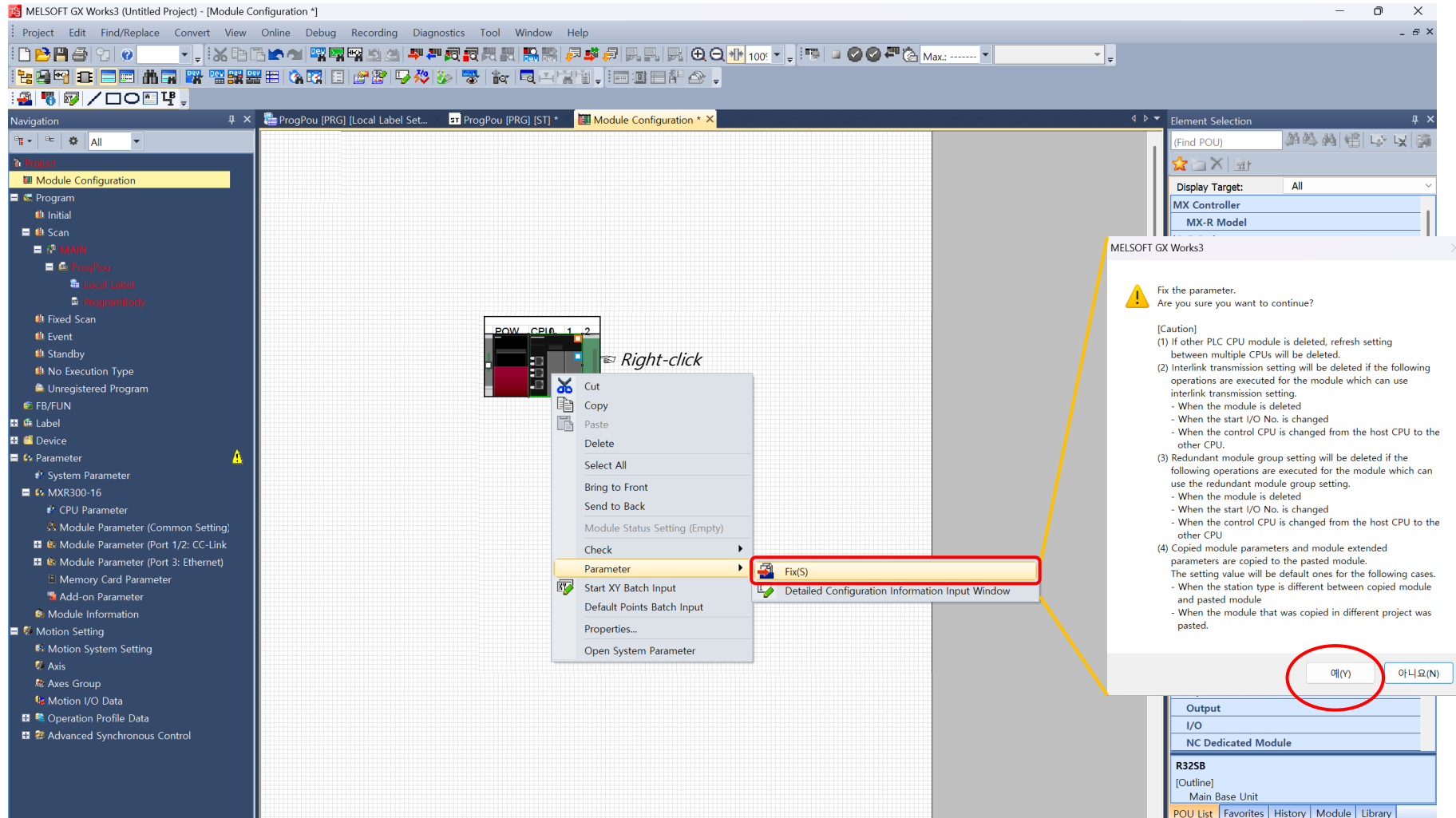
☐ Do not show this dialog again.

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: All

Project Tree:

- Module Configuration
- Program
- Initial
- Scan
- MAIN
- Program
- Local Label
- Programbody
- Fixed Scan
- Event
- Standby
- No Execution Type
- Unregistered 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
- Axis Group
- Motion I/O Data
- Operation Profile Data
- Advanced Synchronous Control

Setting Item List:

- Required Settings
 - Station Type
 - Network No.
 - Parameter Setting Method
- Basic Settings
 - Station No./IP Address Setting
- Application Settings

Setting Item Table:

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

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

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

Bottom Panel: POU List, Favorites, History, Module, Library

IP Address: 192.168.3.253
※ Note: Ezi-SERVO CC-Link IE TSN ALL
Default IP: 192.168.3.xxx

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)]'. The left navigation pane shows the project structure, with 'Module Parameter (Port 1/2: CC-Link)' selected. The main area shows the 'Setting Item List' with 'Basic Settings' selected. The 'Network Configuration Settings (CC-Link IE TSN Configuration)' window is open, showing various settings like Station Type, Network No., and Communication Period Setting. A 'Module List' window is also visible, showing the selected module.

1 Select 'Module Parameter (Port 1/2: CC-Link)' in the navigation pane.

2 Select 'Basic Settings' in the 'Setting Item List'.

3 Click '<Detailed Setting>' for 'Network Configuration Settings (CC-Link IE TSN Configuration)'.

The detailed configuration window shows the following settings:

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

The 'Module List' window shows the following modules:

- 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

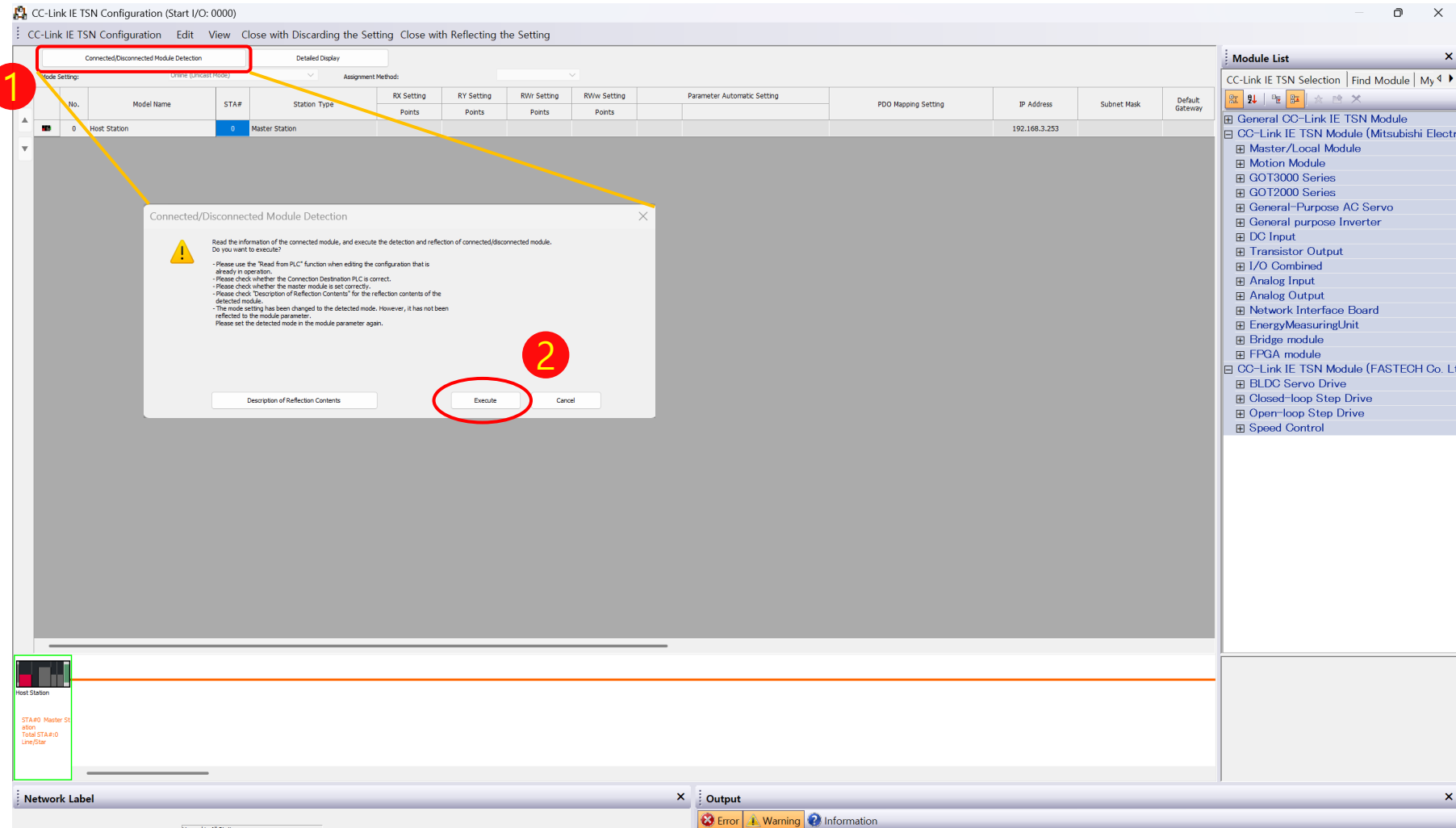
The 'Network Label' window shows the following status:

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 Status:** 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 Ezi-SERVO CC-Link IE TSN ALL

The screenshot displays the 'CC-Link IE TSN Configuration' window. The main table lists detected modules:

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-ALL-CT	1	Remote Station			16	16		<Detail Setting>	192.168.3.1		
2	Ezi-SERVO-ALL-CT	3	Remote Station			16	16		<Detail Setting>	192.168.3.18		
3	Ezi-SERVO-ALL-CT	6	Remote Station			16	16		<Detail Setting>	192.168.3.19		

A yellow starburst callout points to the first three rows of the table, stating: "Automatically Found Module".

A 'Module List' panel on the right shows a tree view of available modules, with 'General Purpose AC Servo' selected.

A 'Network Label' panel at the bottom left shows a diagram of the network topology with three 'Ezi-SERVO-CT-ALL' modules connected to the 'Host Station'.

A 'MELSOFT GX Works3' dialog box is displayed in the center, indicating that 'Connected/Disconnected Module Detection is completed' and suggesting to 'Please execute Write to PLC if necessary.' and 'Please execute system configuration check because the system configuration is changed.' The '확인' (Confirm) button is circled in red.

An orange callout box on the right provides an example of IP address configuration:

[Example of Ezi-SERVO CC-Link IE TSN ALL 3-axis configuration]
[IP Address Set in Ezi-SERVO CC-Link IE TSN ALL Driver]

1. 192.168.3.17
2. 192.168.3.18
3. 192.168.3.19

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

- **N/W Not Connected:** **Manually** configure the CC-Link IE TSN Module (**click & drag**)

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

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

Mode Setting: Online (Unicast Mode) Assignment Method:

No.	Model Name	STA#	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	0	Master Station							192.168.3.253		
1	Ezi-SERVO-ALL-CT	1	Remote Station			16	16		<Detail Setting>	192.168.3.1		
2	Ezi-SERVO-ALL-CT	2	Remote Station			16	16		<Detail Setting>	192.168.3.2		
3	Ezi-SERVO-ALL-CT	3	Remote Station			16	16		<Detail Setting>	192.168.3.3		

Created upon registration

2

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

1. 192.168.3.1
2. 192.168.3.2
3. 192.168.3.3

※ 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 ALL IP Address Settings Hexadecimal Rotary Switch

(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	Esi-SERVO-ALL-CT	1	Remote Station			16	16		<Detail Setting>	192.168.3.17		
2	Esi-SERVO-ALL-CT	2	Remote Station			16	16		<Detail Setting>	192.168.3.18		
3	Esi-SERVO-ALL-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 (RW).

Link Device (RW) 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 (RW).

Link Device (RW) 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

Output

Error:0 Warning:0 Information:0

[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 PDO Mapping Setting (Per-Axis Setting)

Generated upon registration

PDO Mapping Setting

Link Device Points: 16

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	Status word		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					

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

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

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

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

Mode Setting: Online (Unicast Mode) Assignment Method:

No.	Model Name	STA#	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	0	Master Station							192.168.3.253		
1	Ezi-SERVO-ALL-CT	1	Remote Station			16	16		<Detail Setting>	192.168.3.17		
2	Ezi-SERVO-ALL-CT	2	Remote Station			16	16		<Detail Setting>	192.168.3.18		
3	Ezi-SERVO-ALL-CT	3	Remote Station			16	16		<Detail Setting>	192.168.3.19		

Network Label

Output

Error:0 Warning:0 Information:0

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 parameters and a network diagram at the bottom.

No.	Model Name	Station Type	RX Setting	RY Setting	RWr Setting	RWv 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-ALL-CT	Remote Station				16		<Detail Setting>	192.168.3.17		
2	Ezi-SERVO-ALL-CT	Remote Station				16		<Detail Setting>	192.168.3.18		
3	Ezi-SERVO-ALL-CT	Remote Station				16		<Detail Setting>	192.168.3.19		

Generated upon registration

Network Diagram:

- Host Station
- STA#0 Master Station
- STA#1 Ezi-SERVO-CT-ALL
- STA#2 Ezi-SERVO-CT-ALL
- STA#3 Ezi-SERVO-CT-ALL

Module List:

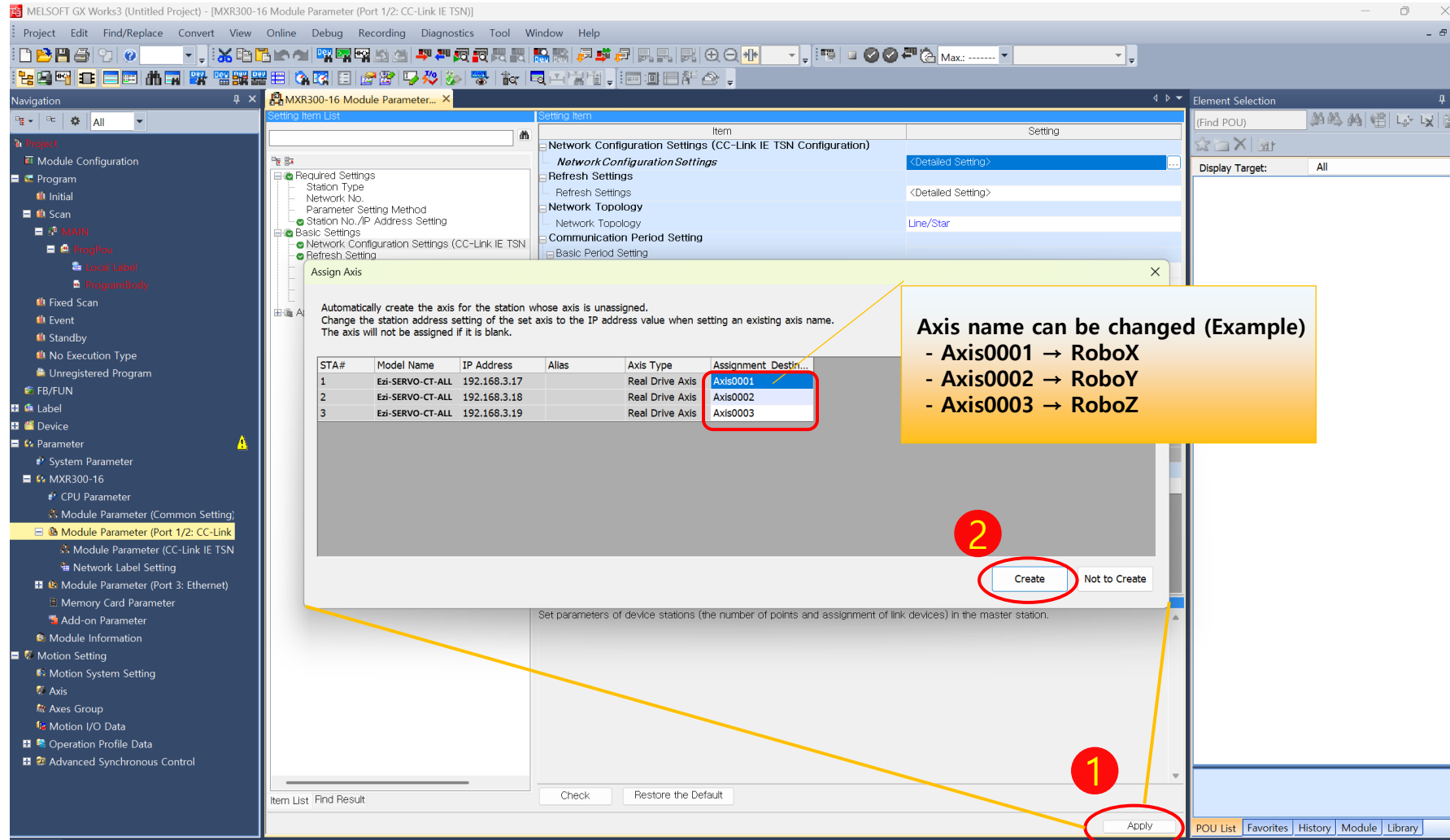
- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi Electric)
- Master/Local Module
- Motion Module
- GOT3000 Series
- GOT2000 Series
- General-Purpose AC Servo
- General purpose Inverter
- DC Input
- Transistor Output
- I/O Combined
- Analog Input
- Analog Output
- Network Interface Board
- EnergyMeasuringUnit
- Bridge module
- FPGA module
- CC-Link IE TSN Module (FASTECH Co. Ltd.)
- 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

Output:

- Error:0
- Warning:0
- Information:0

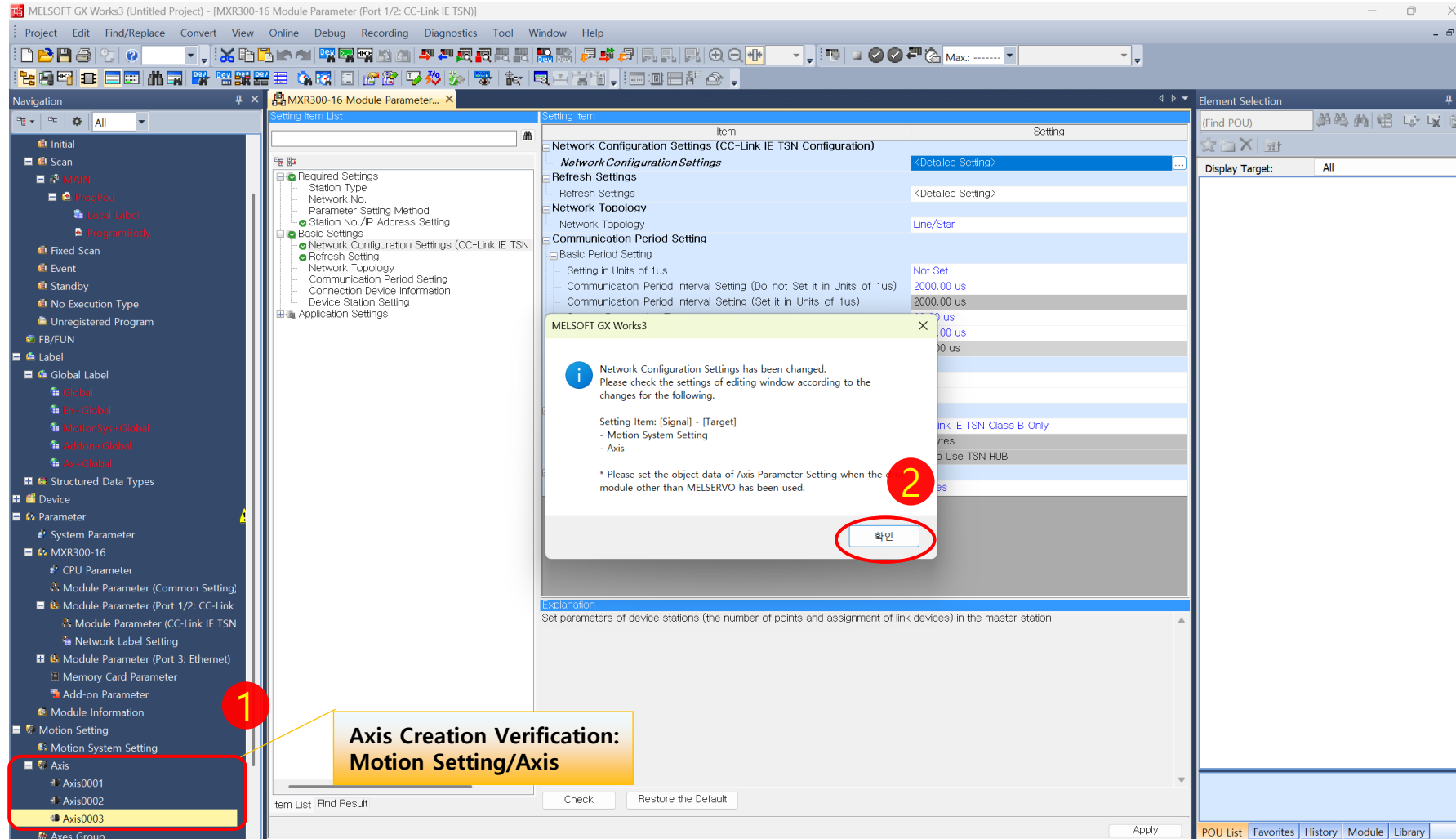
2-5. Module Parameter – CC-Link IE TSN Configuration

● 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 displays the MELSOFT GX Works3 interface for Network Label Setting. The main table lists parameters for three channels (1, 2, and 3) with 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 numbers 1, 2, and 3 highlight specific areas:

- 1**: Points to the 'Labeling Target' column, which contains checkboxes for each parameter.
- 2**: Points to the 'Create Label' button at the bottom right of the window.
- 3**: Points to a confirmation dialog box titled 'Start creating the label on the basis of the editing content. Are you sure you want to continue?' with '예(Y)' and '아니요(N)' buttons.

Annotations on the right side of the image:

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

Explanation text at the bottom of the window:

The I/O data exchanged between the device stations of built-in CC-Link IE TSN and the CPU module by cyclic communication can be registered. If 'Create Label' is executed, the label selected in 'Labeling Target' will be registered to the global label list (NW+Global).

[Caution]

- If 'Create Label' is executed, the all labels/structured data types created from this window last time will be deleted and new labels/structured data types will be created.
- The background of 'No.' in the window will be displayed in yellow for the device for which addition/change exists in the network configuration.
- 'Create Label' again if necessary.
- If 'Create Label' is not executed, the edited content in this window will not be saved in the project.

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

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

MELSOFT GX Works3 C:\Work\테스트샘플\connectionGuide.gx3 - [NW+Global1 [Global Label Setting]]

Navigation: Project, Module Configuration, Program, FB/FUN, Label, Global Label, En+Global, MotionSys+Global, Addon+Global, Ax+Global, NW+Global1, Structured Data Types, Device, Parameter, System Parameter, MXR300-16, Module Information, Motion Setting, Motion System Setting, Axis, Axis0001, Axis0002, Axis0003, Axes Group, Motion I/O Data, Operation Profile Data, Advanced Synchronous Control.

Label Name	Data Type	English(Display Target)	Axis from External Device
1. Ezi-SERVO_CT_001_PhysicalOutputs	Double Word (Unsigned) Bit String (32bit)	RWw5	☒
2. Ezi-SERVO_CT_001_DigitalInputs	Double Word (Unsigned) Bit String (32bit)	RWw5	☒
3. Ezi-SERVO_CT_002_PhysicalOutputs	Double Word (Unsigned) Bit String (32bit)	RWw5	☒
4. Ezi-SERVO_CT_002_DigitalInputs	Double Word (Unsigned) Bit String (32bit)	RWw5	☒
5. Ezi-SERVO_CT_003_PhysicalOutputs	Double Word (Unsigned) Bit String (32bit)	RWw5	☒
6. Ezi-SERVO_CT_003_DigitalInputs	Double Word (Unsigned) Bit String (32bit)	RWw5	☒
7.			

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

Output

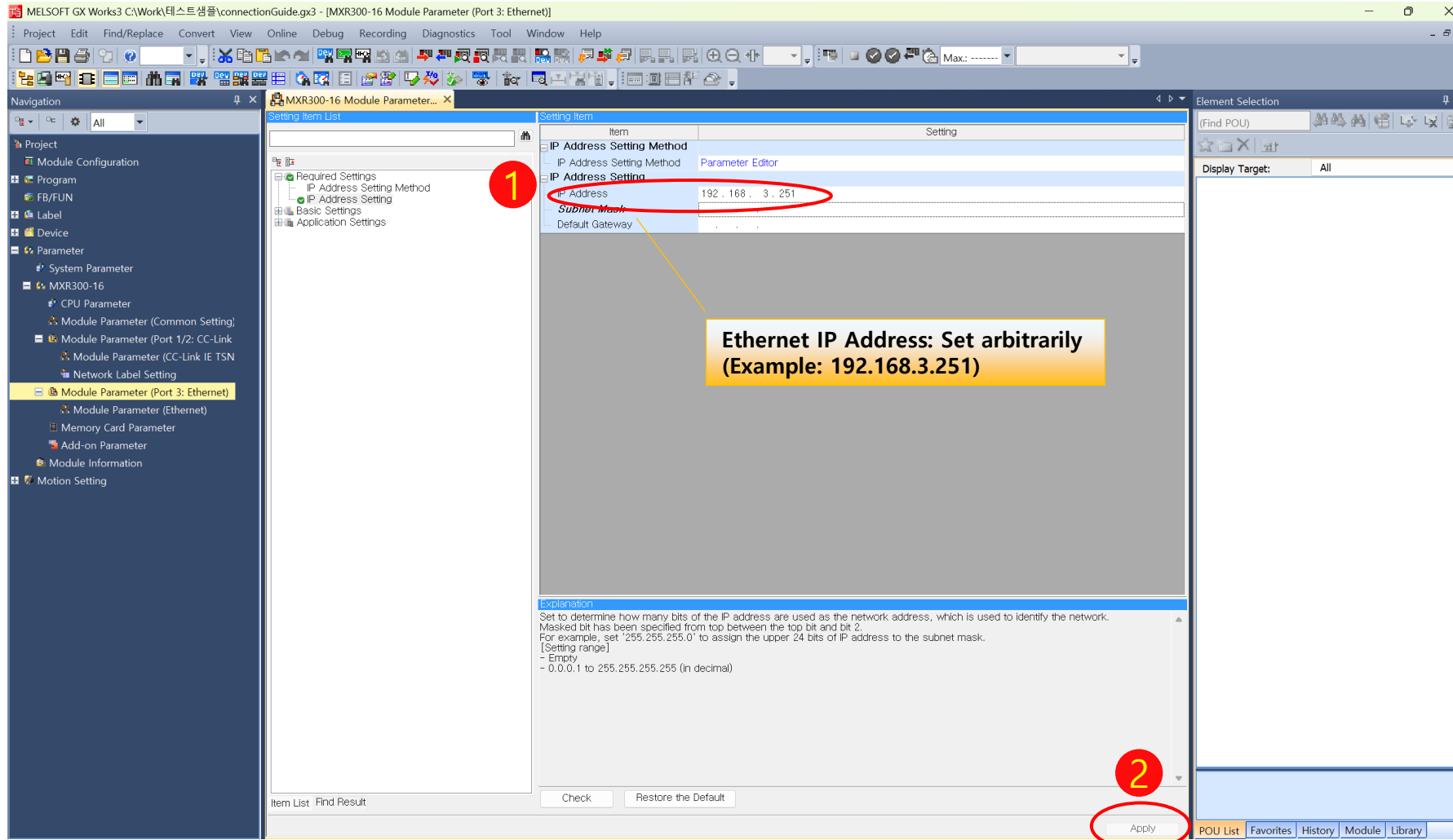
Extended Display: Do Not Show Always

POU List | Favorites | History | Module | Library

MXR300-16 | Host | Row 6 Column 5 | CAD | NUM

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 (2/3)
*Ezi-SERVO CC-Link IE TSN ALL 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, Axes Group, Motion I/O Data, Operation Profile Data, Advanced Synchronous Control.

Setting Item List: Input the Setting Item to Search

Setting Item: Select Folder, Display All Data

Item	Axis0001	Axis0002	Axis0003
Axis Information	Set Axis Information		
Axis No.	1	2	3
Basic Parameter	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

Object Data Setting (Axis0002)

Target Device: Ezi-SERVO-CT

Changing the object data is not required when MELSERVO has been used. Please set it to the generic default value by pressing the Default Settings button when the non-MELSERVO device has been used. It can be changed individually when the device's inherent object data has been set.

Parameter	Value
ControlWord	[OBJ]0x60400010
EncoderIncrements	[OBJ]0x608F0120
FollowingErrActualValue	[OBJ]0x60F40020
GearRatioMotorRevolutions	[OBJ]0x607C0020
HomeOffset	[OBJ]0x60800020
MaxMotorSpeed	[OBJ]0x60720010
MaxTorque	[OBJ]0x60600008
ModesOfOp	[OBJ]0x60610008
ModesOfOpDiso	[OBJ]0x60E10010
NegativeTorqueLimitValue	[OBJ]0x607E0008
Polarity	[OBJ]0x60640000
PosActualValue	[OBJ]0x60640000

Buttons: Import..., Export..., Restore the Defa..., OK, Cancel

[OBJ] Review Changes

Item List Find Result

Restore the Defa

Apply

POU List Favorites History Module Library

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Object Data Settings (3/3)
*Ezi-SERVO CC-Link IE TSN ALL 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
ControlWord			
EncoderIncrements	[OBJ]0x6040001	[OBJ]0x6040001	[OBJ]0x6040001
FollowingErrActualValue	[OBJ]0x608F012	[OBJ]0x608F012	[OBJ]0x608F012
GearRatioMotorRevolutions	[OBJ]0x60F4002	[OBJ]0x60F4002	[OBJ]0x60F4002
HomeOffset	[OBJ]0x607C002	[OBJ]0x607C002	[OBJ]0x607C002
MaxMotorSpeed	[OBJ]0x6080002	[OBJ]0x6080002	[OBJ]0x6080002
MaxTorque	[OBJ]0x6072001	[OBJ]0x6072001	[OBJ]0x6072001
ModesOfOp	[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
PosEncoderResolutionMotorRevolutions	[OBJ]0x60E0001	[OBJ]0x60E0001	[OBJ]0x60E0001
PosEncoderResolutionMotorRevolutions	[OBJ]0x60A8002	[OBJ]0x60A8002	[OBJ]0x60A8002
PosEncoderResolutionMotorRevolutions	[OBJ]0x60A9002	[OBJ]0x60A9002	[OBJ]0x60A9002
PosEncoderResolutionMotorRevolutions	[OBJ]0x6041001	[OBJ]0x6041001	[OBJ]0x6041001
PosEncoderResolutionMotorRevolutions	[OBJ]0x6502002	[OBJ]0x6502002	[OBJ]0x6502002

Request the drive unit to switch status.
The setting values depending on the drive unit connected. Check the manual of object data settings.

Apply

2-6. Motion Setting – Basic Parameter

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

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

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 Set	0:Automatic Set	0:Automatic Set
Absolute Position Control Setting			
Current Position Restore Reference Position	0:Disable Absc	-1:Automatic Set	-1:Automatic Set
Ring Counter Enabled Selection	0:Disable Absolute Position System	-1:Automatic Setting (Acquire from Connected Device)	-1:Automatic Setting (Acquire from Connected Device)
Ring Counter Upper Limit Value	-1000000000.0	-1000000000.0	-1000000000.0
Ring Counter Lower Limit Value	1 pulse	1 pulse	1 pulse
Position Command Unit	U/s	U/s	U/s
Position Command Unit String	0.0 pulse/s	0.0 pulse/s	0.0 pulse/s
Velocity Command Unit	1 pulse	1 pulse	1 pulse
Velocity Bias Value	1 pulse	1 pulse	1 pulse
Driver Unit Conversion Numerator	1000.0 %	1000.0 %	1000.0 %
Driver Unit Conversion Denominator	300.0 %	300.0 %	300.0 %
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 %
Value	300.0 %	300.0 %	300.0 %
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

2-6. Motion Setting – Basic Parameter

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

Ezi-SERVO CC-Link IE TSN ALL Encoder Resolution Setting Range is 10,000pulse/rev

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

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.

Calculation Result

Item	Axis0001	Axis0002	Axis0003
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	0:Disable Absolut	0:Disable Absolut	0:Disable Absolut
Absolute Position Control Setting	0:Disable Absolut	0:Disable Absolut	0:Disable Absolut
Current Position Restore Reference	Position -1:Automatic judg	Position -1:Automatic judg	Position -1:Automatic judg
Ring Counter Enabled Selection	0:Disabled	0:Disabled	0:Disabled
Ring Counter Upper Limit Value	10000000000.0 p	10000000000.0 p	10000000000.0 p
Ring Counter Lower Limit Value	-10000000000.0 p	-10000000000.0 p	-10000000000.0 p

Electronic Gear Setting Axis0001

Entry

Select the machine components, and enter the machine data to automatically set the axis parameters (position command unit, driver unit conversion numerator and driver unit conversion denominator).

Position Command Unit: degree [degree]

One Revolution: 360.0000 [degree]

Reduction Ratio (NL/NM) = 1 / 1

☒ Calculate reduction ratio by teeth or diameters to S

Encoder Resolution: 10000 [pulse/rev]

Calculation Result

Axis Parameters: Position Command Unit: degree, Driver Unit Conversion Numerator: 1, Driver Unit Conversion Denominator: 3

Movement Amount: 0.0 [degree], Error: 0.0 [degree]

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 ALL 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, Axis.

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

Item	Axis0001	Axis0002	Axis0003
Axis Information	Set Axis Information		
Axis No.	1	2	3
Basic Parameter	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 settin	0:Automatic settin	0:Automatic settin
Object Data	0:Disable Absolut 0:Disable Absolut 0:Disable Absolut		
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 ALL Encoder 10,000pulse/rev
- Set Movement Distance/Angle per Motor Revolution

2-6. Motion Setting – Basic Parameter

● Real Drive Axis / Basic Parameter / Limit Parameter

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

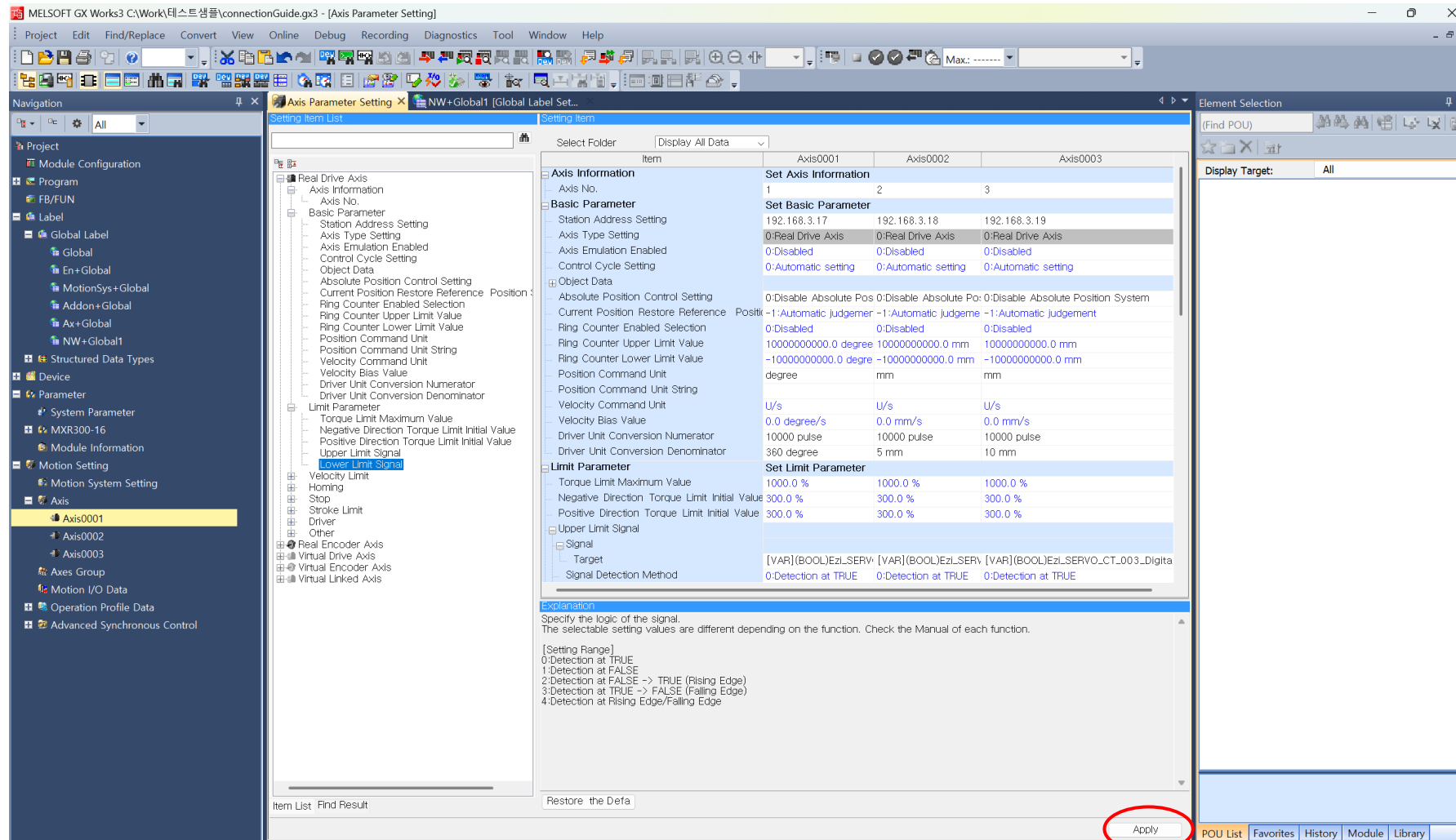
Ezi-SERVO CC-Link IE TSN ALL -Limit Switch settings are Ezi_SERVO_CT_001_DigitalInputs.0

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

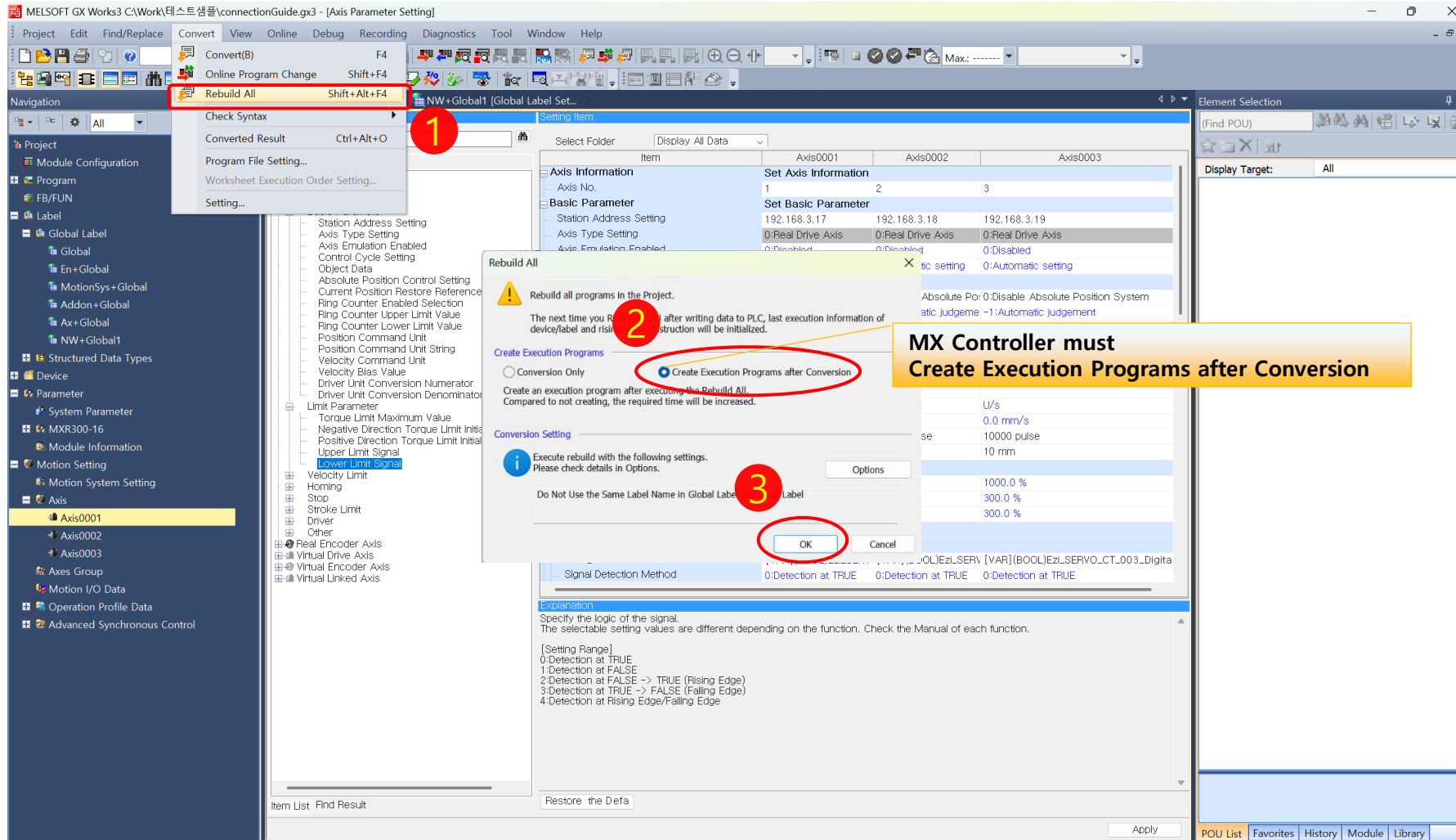
2-6. Motion Setting – Parameter Registration

- Complete Motion Setting by registering parameters



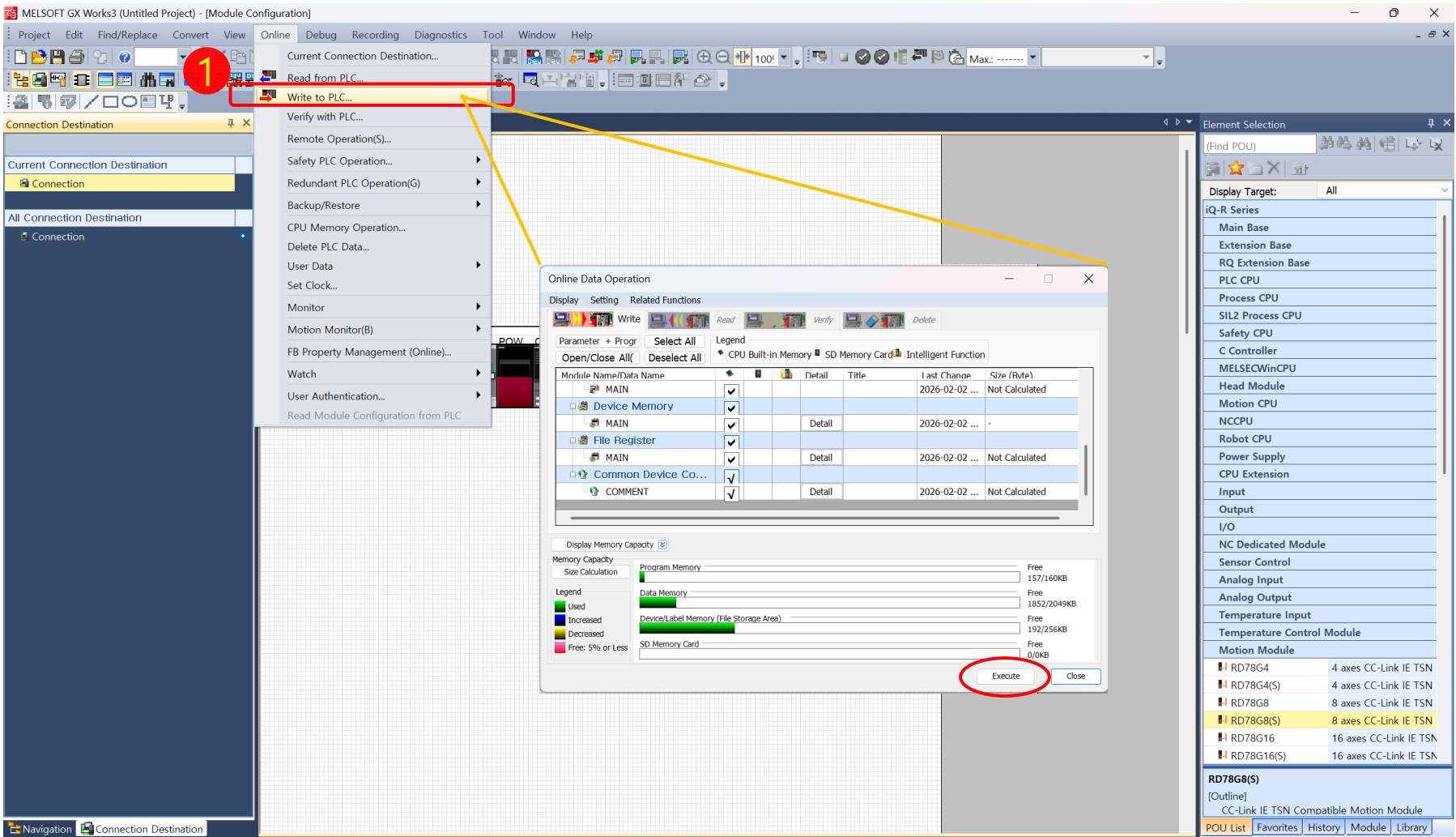
2-7. Convert

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



2-8. Write to PLC

- Online Data Operation



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 commands under 'Administrative' and 'General FB' categories. A red box highlights the 'Motion Control Function/Function Block' section, and a yellow box highlights the 'MC_Power 1 (MC_Power)' block. The text 'Mouse Click & Drag' is written in the center of the workspace.

Motion Control Function/Function Block

Command	Description
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 Resi
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
MCv_AdvCamSetPos	Advanced Synchron
MCv_AdvPositionPe	Advanced Synchron
MCv_AllPower	All Axes Operation Av
MCv_ChangeCycle	Current Value Change
MCv_MotionErrorRe	Motion Error Reset
MCv_SetTorqueLimi	Torque Limit Value
MCv_SyncOperation	Control Operation Cyc

General FB

MC_AbortTrigger

[Version]
00A

POU List Favorites History Module Library

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

- Ezi-SERVO CC-Link IE TSN ALL 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 steps:

- Step 1: Read Mtr (0)
- Step 2: DUT: Axis (Axis001.A)
- Step 3: B: Enable (bAx1SrvEnbl)
- Step 4: B: ServoON (bAx1SrvOn)
- Step 5: MC_Power 1 (MC_Power)
- Step 6: MC_Power 1 (MC_Power)
- Step 7: MC_Power 1 (MC_Power)
- Step 8: MC_Power 1 (MC_Power)
- Step 9: MC_Power 1 (MC_Power)
- Step 10: MC_Power 1 (MC_Power)
- Step 11: MC_Power 1 (MC_Power)
- Step 12: MC_Power 1 (MC_Power)
- Step 13: END

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-hand pane shows the Element Selection window, 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 in

The homing method is classified as follows based on the setting value for the 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

Homing Parameter Address: H60980008

Homing Method: 33 (Homing index pulse (negative direction))

FB: MC_WriteParameter

MC_WriteParameter_1 (MC_001)

Parameter	Value
Homing Parameter Address	H60980008
Homing Method	33.0

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_DigitalCamSwitc	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 Libra

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

- Execute Homing (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

14 bAx1WParam

15

16

17

18

19

20 bAx1HomeSL (33)

21 bAx1HomeDo (37)

22

23

24 bAx1Home

25

26

27

28

29

30

MC_WriteParameter_1 (MC_...

DUT: Axis Axis DUT

B: Execute Done B

UD: Param... Busy B

L: Value Error B

W: Execution... ErrorID UW

UD: Options SDOErr... UD

SDOStat... UW

MC_Home_1 (MC_Home)

DUT: Axis Axis DUT

B: Execute Done B

L: Position Busy B

DUT: AbsSwit... Active B

UD: Options Command... B

Error B

ErrorID UW

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 Positic
 - MC_MoveRelative Relative Value Positor
 - MC_MoveVelocity Speed Control
 - MC_Stop Forced Stop
 - MC_TorqueControl Torque Control
 - MCv_AdvancedSync Advanced Synchronou
 - MCv_BacklashComp Backlash Compensatic
 - MCv_CyclicPosition Motion Cyclic Positor

MC_Home

[Version]

00A

POU List Favorites History Module Library

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

- Execute Move Operation (MC_MoveAbsolute)

Move to Arbitrary Position

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

The screenshot shows the MELSOFT GX Works3 interface with a ladder logic program for MC_MoveAbsolute. The program is organized into steps (1-12) and includes various logic elements such as bAx1Pos1, bAx1Pos2, bAx1Run, and bAx1MoveDone. A red circle highlights the EDMOV instruction in step 10, which is set to 3600.0 and edAx1Pos1. A yellow callout box provides details about the move operation.

MC_MoveAbsolute

Parameter	Value	Unit	Comment
DUT: Axis	Axis : DUT		
B: Execute	Done	B	
B: Continuou...	Busy	B	
L: Position	Active	B	
L: Velocity	Command...	B	
L: Accelerati...	Error	B	
L: Decelerati...	ErrorID : UW		
L: Jerk	0.0		
W: Direction	K3		
W: BufferMo...			
UD: Options			

MC_MoveAbsolute

Version	00A			
POU List	Favorites	History	Module	Library

3-6. [Ladder] Ezi-SERVO DIO Operation

- Digital Input, Output Operation Execution

The screenshot displays the MELSOFT GX Works3 interface for a ladder logic program. The main workspace shows a ladder logic diagram with various digital inputs and outputs. The left sidebar contains a project tree with the following structure:

- Project
 - Module Configuration
 - Program
 - Initial
 - Scan
 - MAIN
 - ProgPou
 - Local Label
 - ProgramBody
 - MoveProgram
 - Local Label

The main workspace shows a ladder logic diagram with the following components:

- Write: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
- 13: L: Decelerati... ErrorID :UW
- 14: L: Jerk
- 15: W: Direction
- 16: W: BufferMode
- 17: UD: Options
- 18: (30) SM400
- 19: (32) D1.4
- 20: (34) D1.5
- 21: (36) D1.6
- 22: (38) D1.7
- 23: (40) D1.8
- 24: (42) D1.9
- 25: (44) bAx1Out[0]
- 26: (46) bAx1Out[1]
- 27: (48) bAx1Out[2]
- 28: (50) bAx1Out[3]
- 29: (52) bAx1Out[4]
- 30: (54) SM400
- DMOV Ezi_SERVO... D0
- DMOV D2 Ezi_SERVO...

The right sidebar shows the 'Element Selection' panel with the following sections:

- Display Target: All
- Serial Communication Module
- MODBUS/TCP Interface Module
- MODBUS Interface Module
- File operation instructions
- 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_MoveAbsolute Absolute Value Positic
- MC_MoveAbsolute
- [Version] 00A
- POU List Favorites History Module Library

Two yellow callout boxes highlight specific sections:

- Ezi_SERVO_CT_001_DigitalInputs** (points to the digital input section)
- Ezi_SERVO_CT_001_PhysicalOutputs** (points to the physical output section)

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 shows the MELSOFT GX Works3 interface with the Axis Monitor window open. The window displays a table of axis parameters for five axes (Axis #1 to Axis #5). The 'Homing Request' row is highlighted in green, indicating it is active. The 'Motion Common Monitor' panel on the right shows various motion parameters and error codes.

Axis Name	Axis #1	Axis #2	Axis #3	Axis #4	Axis #5
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

The 'Motion Common Monitor' panel on the right shows various motion parameters and error codes. The 'Ready' status is indicated by a green checkmark. The 'Synchronization flag' is also shown. The 'Operation Cycle Monitor' section displays processing times and setting cycles for various motion operations.

[Operation Verification] Changing the Homing Method

- Change the homing method using Motion Control FB

- ① Specify Parameter Number: H60980008
- ② Value (Homing Method) Specified: 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

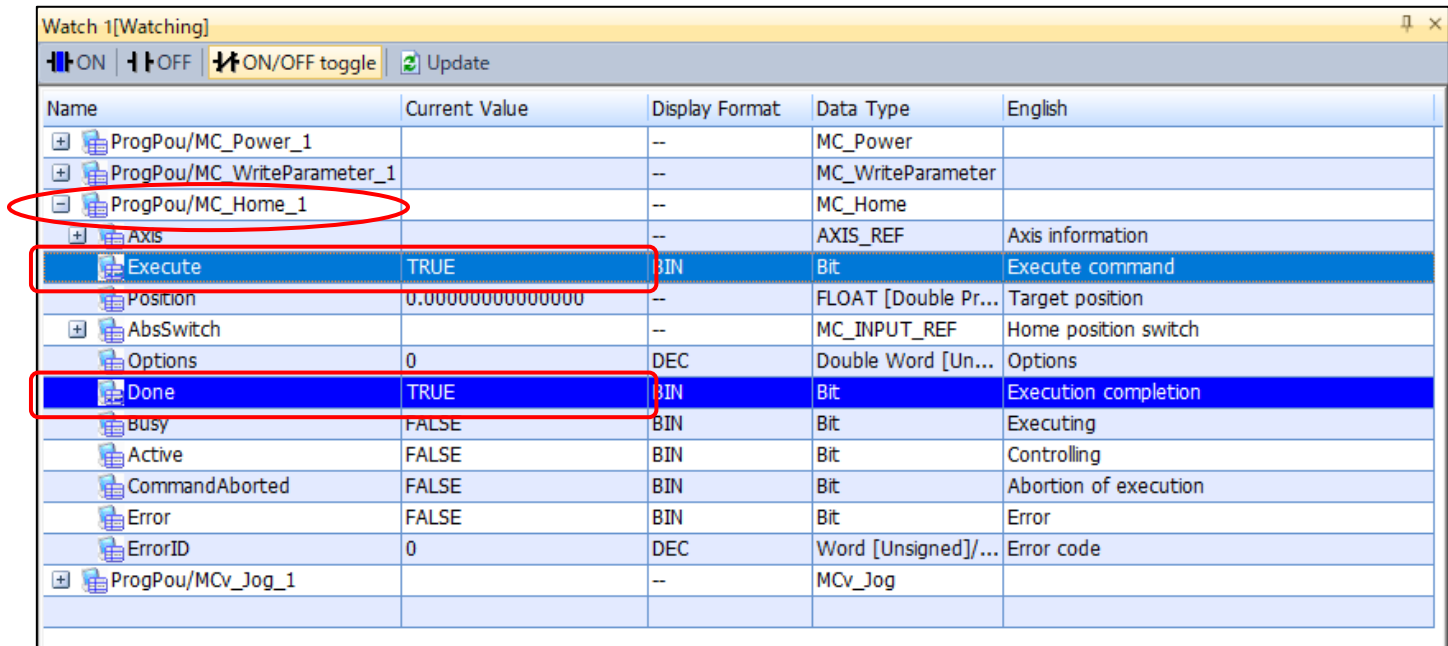
Watch 1[Watching]				
ON OFF ON/OFF toggle Update				
Name	Current Value	Display Format	Data Type	English
ProgPou/MC_Power_1		--	MC_Power	
ProgPou/MC_WriteParameter_1		--	MC_WriteParameter	
Axis		--	AXIS_REF	Axis information
Execute	TRUE	BIN	Bit	Execute command
ParameterNumber	H60980008	HEX	Word [Unsigned]/...	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	

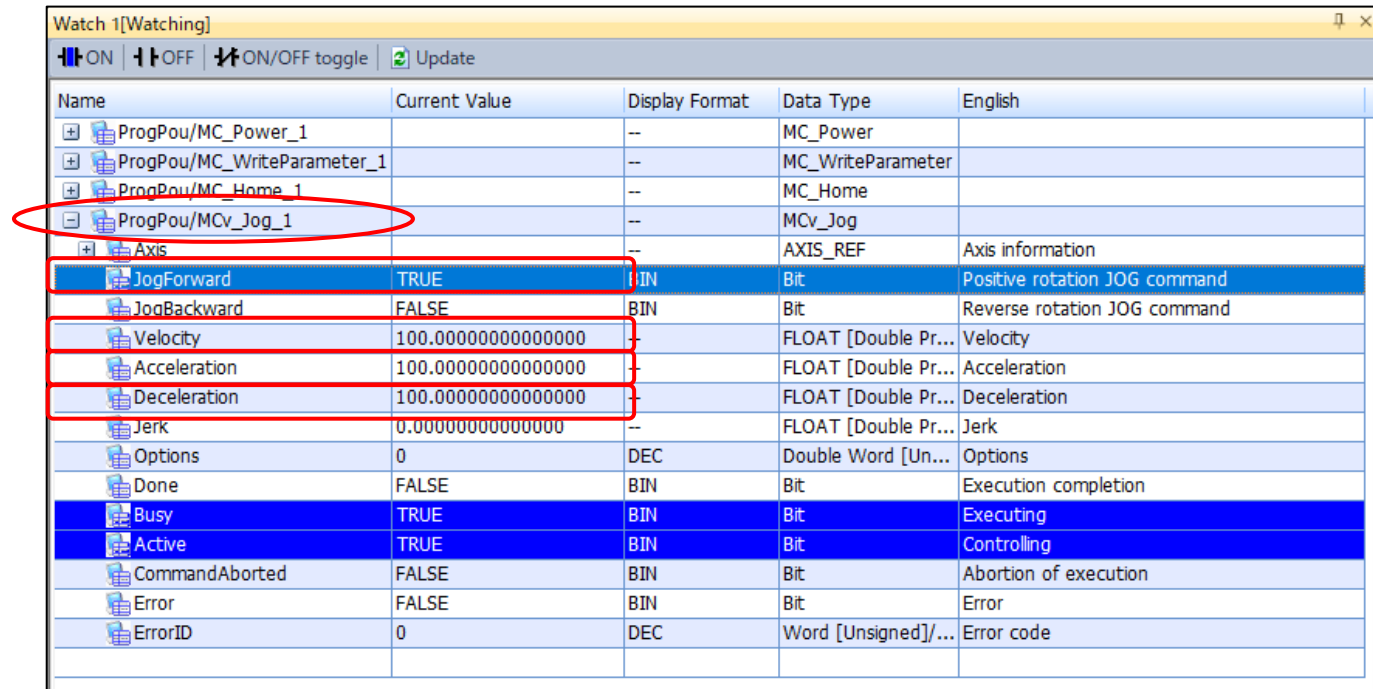
- When using the LIMIT+ / LIMIT- signals of Ezi-SERVO CC-Link IE TSN ALL as hardware stroke limits, set the following axis control data before startup (start).

[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 list of events. The 'Detailed Information' tab is active, showing details for event 000001.

Event History: [0000RD78G64]

Events to Exclude: All First (F) All Last (L)

Filter: ☒ Match all the conditions ☐ Match any one of the conditions

1. Event Type: Including Mask:

2.

3.

☐ Exclude program starts (Allow jumping)

Start Filter: Clear Filter Conditions

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

Legend: Warning Error Information

Detailed Information

Axis No. Information

Axis Type: Dual Drive Axis

Event Occurrence: 000001/000002/000003/000004

Event Code: 000001

000001

Homing request was OK.

- Absolute position error in driver data was detected. (Data code: 000001)
- An absolute position error in the driver data was detected. (Data code: 000002)
- The axis type was changed. (Data code: 000003)
- Slave object: "Polarity (000001)" b7 position polarity was changed. (Data code: 000004)
- Change of the drive of motion encoder was detected. (Data code: 000005)
- Machine homing was detected. (Data code: 000006)
- Driver unit connection (communication) of the axis was detected. (Data code: 000007)
- Machine homing has been detected after the system started. (Data code: 000008)

Create File...

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 ALL 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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