



Programmable Controllers
MELSEC iQ-R
series



Ezi-ROBO® CC-Link IE TSN
Precise Actuator System **VZR**



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

Connection Guide

MELSEC iQ-R RD78G (H) and

Ezi-ROBO® CC-Link IE TSN - **Ezi-SERVO**® CC-Link IE TSN
Precise Actuator System **VZR** Closed Loop Stepping System **4X**

Mitsubishi Electric Products
RD78G4 / RD78G8 / RD78G16
RD78G32 / RD78G64
RD78G4HV / RD78GHW

FASTECH Products
Ezi-ROBO CC-Link IE TSN VZR
(Ezi-SERVO CC-Link IE TSN 4X)

Before you begin

- Thank you for using our company's products.
- The control unit of the Ezi-ROBO VZR is interfaced with the Ezi-SERVO CC-Link IE TSN 4X. The following connection guide is based on the Ezi-SERVO CC-Link IE TSN 4X.
- 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 iQ-R RD78G(H). It covers CSP+ file registration, system configuration, parameter settings, and programming methods.
- Before writing the PLC program, please 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/en/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 iQ-R RD78G(H)][Ezi-ROBO VZR Ezi-SERVO 4X]	

- The MELSEC iQ-R RD78G(H) manual can be downloaded from the Mitsubishi Electric website.
<https://www.mitsubishielectric.com/fa/index.html>

Manual Name	Manual Number
MELSEC iQ-R Motion Unit User's Manual (Startup Edition)	IB-0300405
MELSEC iQ-R Motion Unit User's Manual (Application Edition)	IB-0300410
MELSEC iQ-R Motion Unit User's Manual (Network Edition)	IB-0300425
MELSEC iQ-R Programming Manual (Motion Unit Instructions/General-Purpose FUN/General-Purpose FB Edition)	IB-0300430
MELSEC iQ-R Programming Manual (Motion Control FB Edition)	IB-0300532
MELSEC iQ-R Motion Unit User's Manual (Simple Motion Mode Applications Edition)	IB-0300571
MELSEC iQ-R Motion Unit User's Manual (Simple Motion Mode Advanced Synchronous Control Edition)	IB-0300574
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)	This station manages the entire network and can perform cyclic transmission and transient transmission with all stations. The MELSEC iQ-R RD78G(H) corresponds to this station.
Remote station	A station that performs cyclic transmission of bit-level I/O signals and word-level I/O data, also capable of 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 iQ-R RD78G(H) and Ezi-SERVO CC-Link IE TSN 4X Connection Guide**

- ◆ **Master station: RD78G4 (4-axis) / RD78G8 (8-axis) / RD78G16 (16-axis) / RD78G32 (32-axis) / RD78G64 (64-axis)**

RD78G4HV (128-axis) / RD78GHW (256-axis)

- 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 later
- Motion control setting function: Ver. 1.055H or later
- ※ For the latest files, please refer to the Mitsubishi Electric website.

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

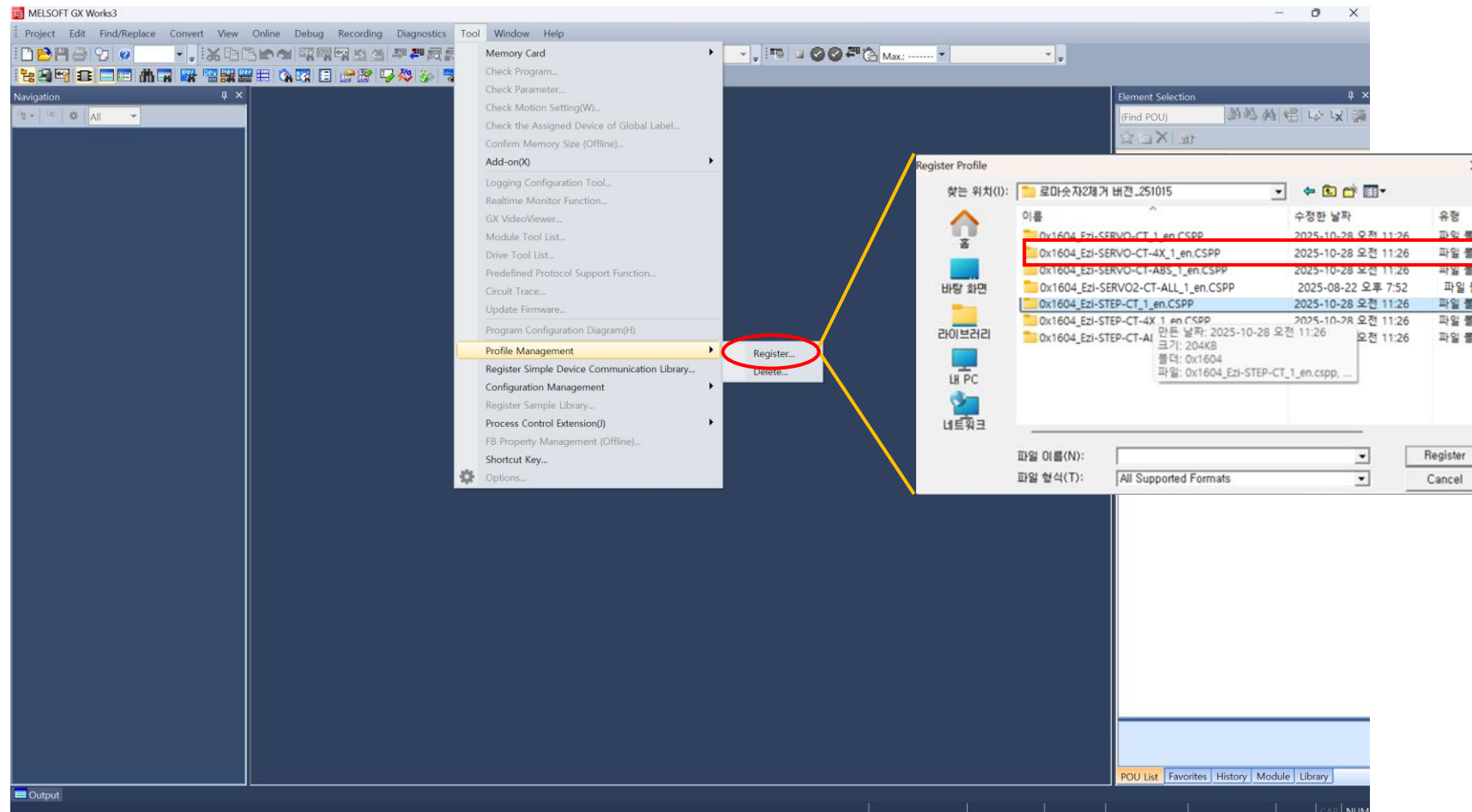
- ◆ **Remote station: Ezi-SERVO CC-Link IE TSN 4X**

- CSP+ File Download address: <https://cltsn.fastech-motions.com/en/download/quick>
- File Name: 0x1604_Ezi-SERVO-CT_4X_1_en_CSPP

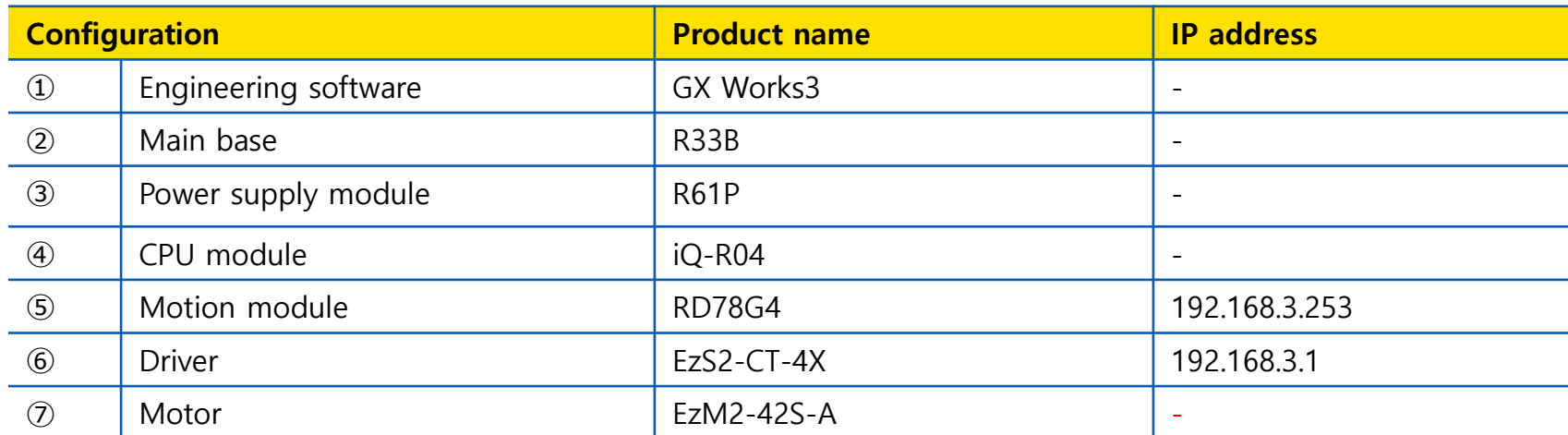
1-2. Ezi-SERVO CC-Link IE TSN 4X CSP+ File Registration

● CSP+ Registration

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



- **System Configuration**



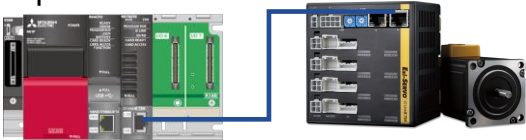
1-3. CC-Link IE TSN Configuration

- **Ezi-SERVO Specifications**

Item		Specification
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, RD78G(H) 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 FASTECH Co., Ltd. website. ※ Address: https://cltsn.fastech-motions.com/en/download/quick
2	RD78G(H) Configuration 	Create an RD78G(H) project using GX-Works3, then configure the unit parameters (communication method, connection target) and axis parameters (for motion control).
3	RD78G(H) + Ezi-SERVO Operation Verification 	Write a program to verify that the RD78G(H) 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. ※ 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. Restrictions

● Motion Control Function Restrictions (RD78G(H) 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

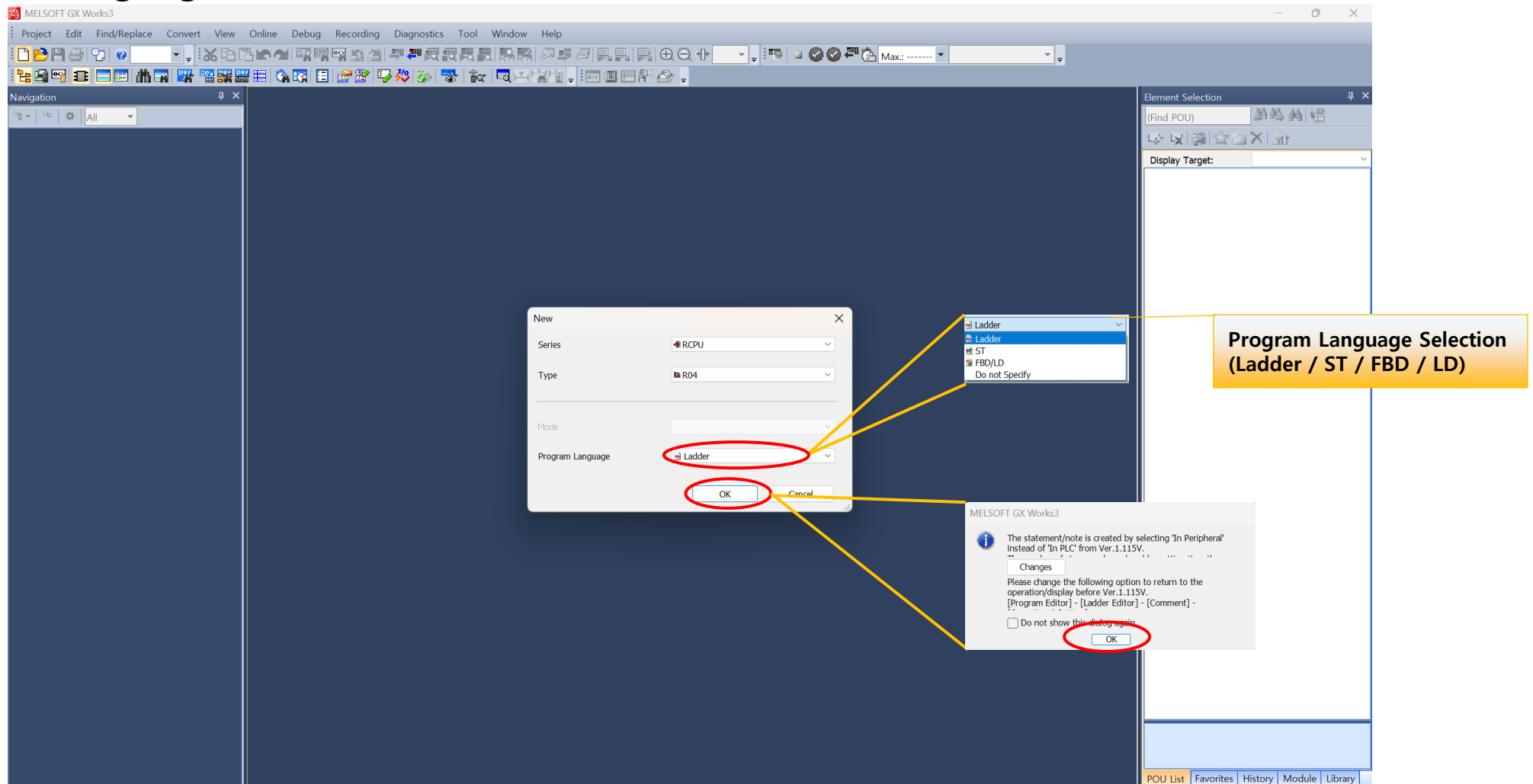
● Motion Control Function Restrictions (RD78G(H) and Ezi-SERVO)

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. RD78G(H) Settings

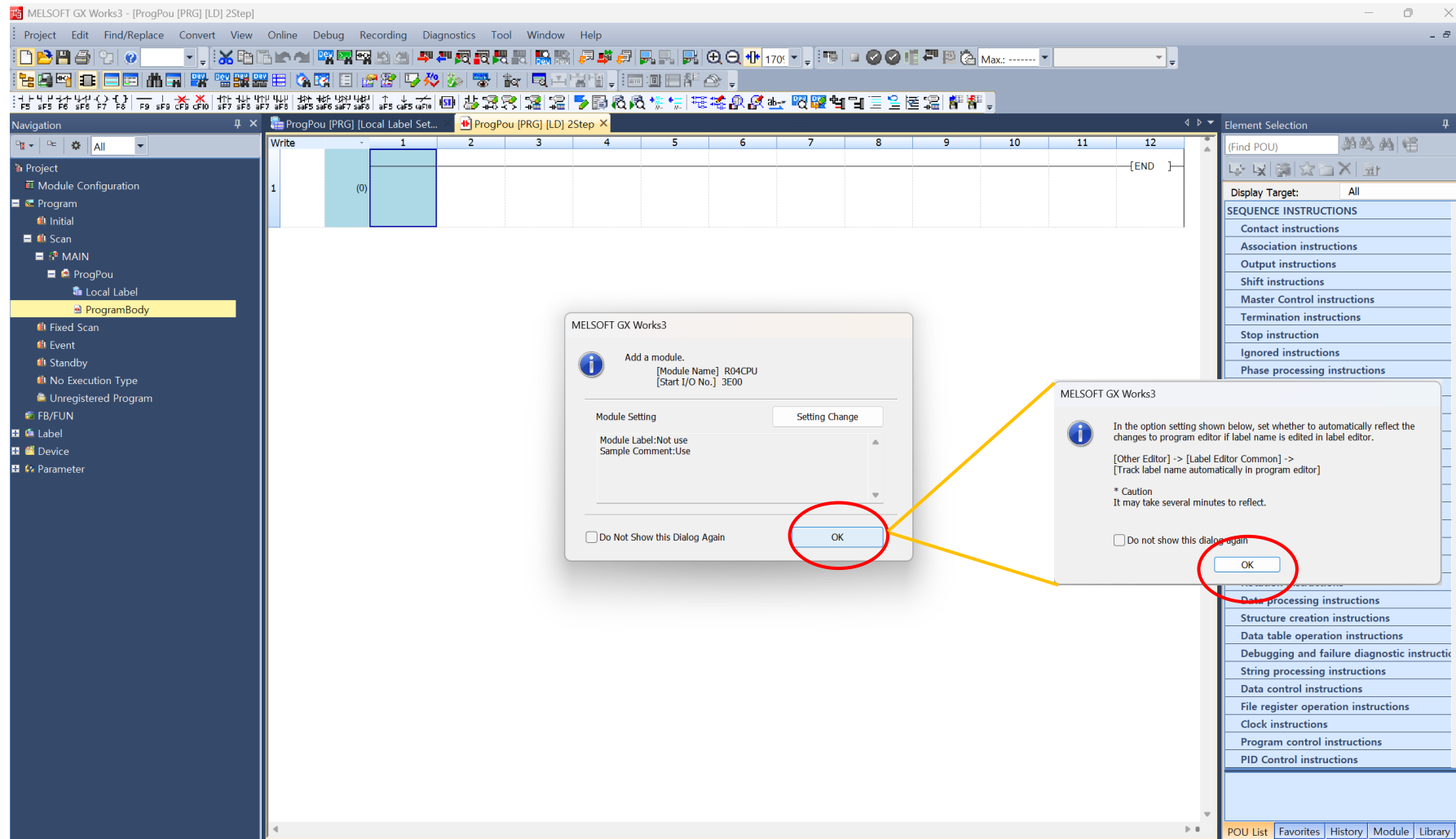
2-1. Project Creation

- When creating a new project, select iQ-R RD78G(H), model name, number of axes used, and program language



2-2. Module Registration

- iQ-R CPU Registration



2-3. Module Configuration – H/W

- Click and drag with the mouse to configure the Main Base, CPU Module, and Power Supply

The screenshot shows the MELSOFT GX Works3 interface in the 'Module Configuration' tab. The 'Element Selection' panel on the right lists various modules. Five red boxes highlight specific modules, numbered 1 through 5. A yellow box with a legend explains the steps: 1. Main Base, 2. Power Supply, 3. CPU iQ-R Mounted, 4. RD78(H) Mounted. A 'Mouse Click & Drag' label points to the main configuration area. A dialog box in the bottom left corner contains an information icon and text: '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]'. The 'Element Selection' panel lists the following modules:

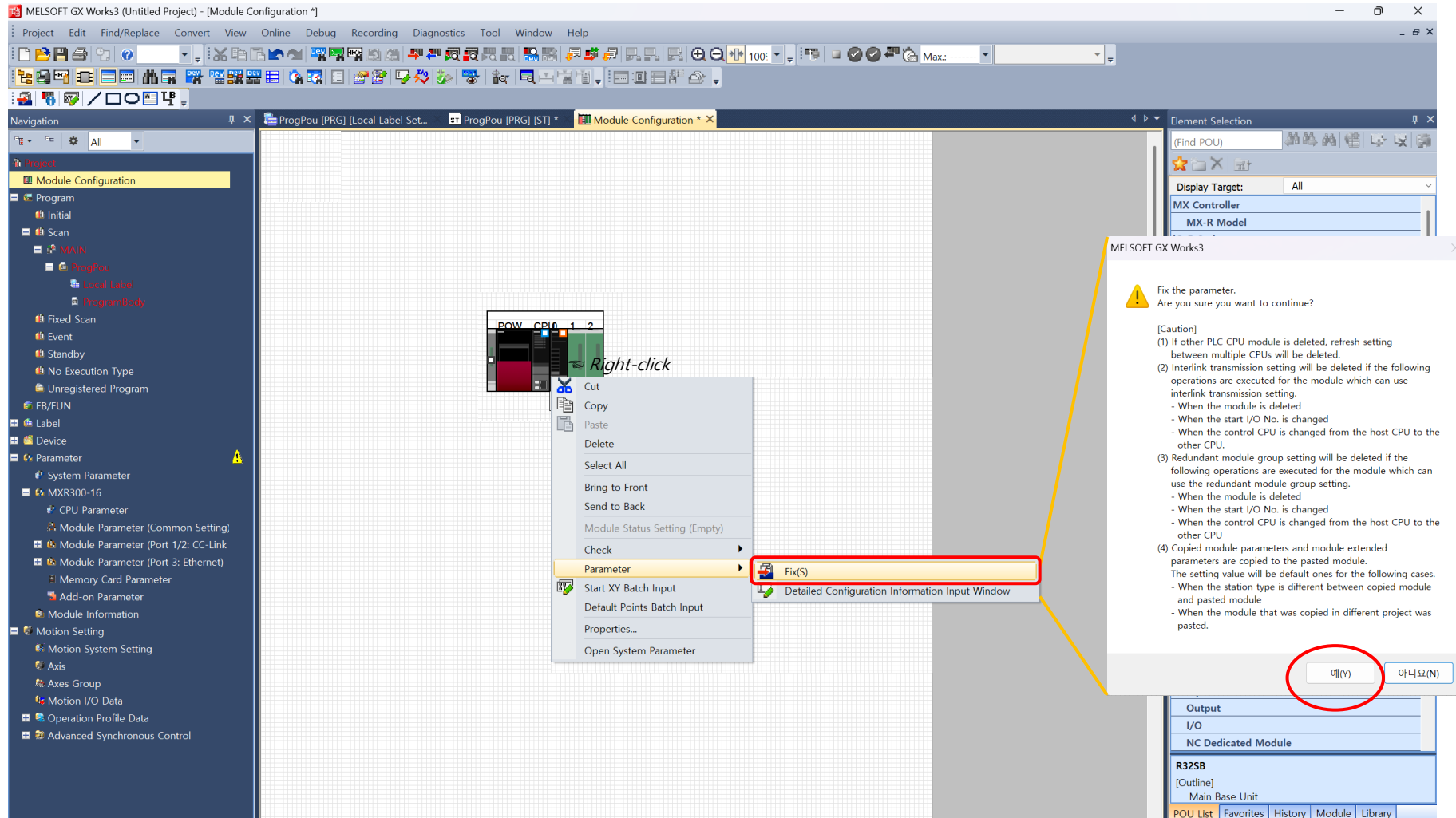
Module	Slots (Type requiring)
Main Base	
R32SB	2 Slots (Type requiring)
R33B	3 Slots (Type requiring)
R33SB	3 Slots (Type requiring)
R35B	5 Slots (Type requiring)
SIL2 Process CPU	
Safety CPU	
C Controller	
MELSECWinCPU	
Head Module	
Motion CPU	
NCCPU	
Robot CPU	
Power Supply	
R61SP	2.5A output (Slim type)
R62P	3.5A output
R61P	6.5A output
R63P	6.5A output
NC Dedicated Module	
Sensor Control	
Analog Input	
Analog Output	
Temperature Input	
Temperature Control Module	
Motion Module	
RD78G4	4 axes CC-Link IE TSN
RD78G4(S)	4 axes CC-Link IE TSN
RD78G8	8 axes CC-Link IE TSN
RD78G8(S)	8 axes CC-Link IE TSN
Network Module	
Blank Cover	

[Click & Drag]
1. Main Base
2. Power Supply
3. CPU iQ-R Mounted
4. RD78(H) Mounted

Mouse Click & Drag

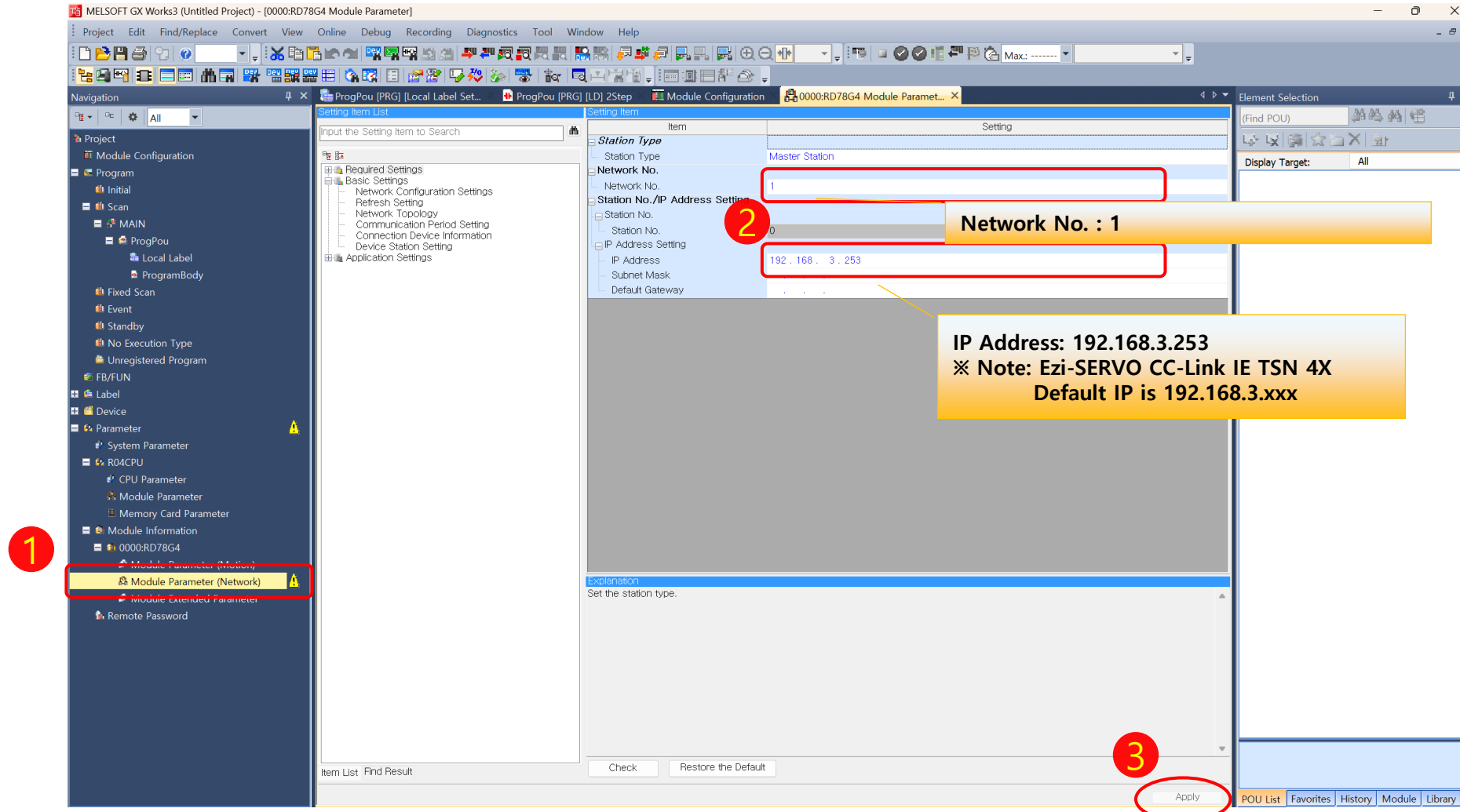
2-3. Module Configuration – H/W

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



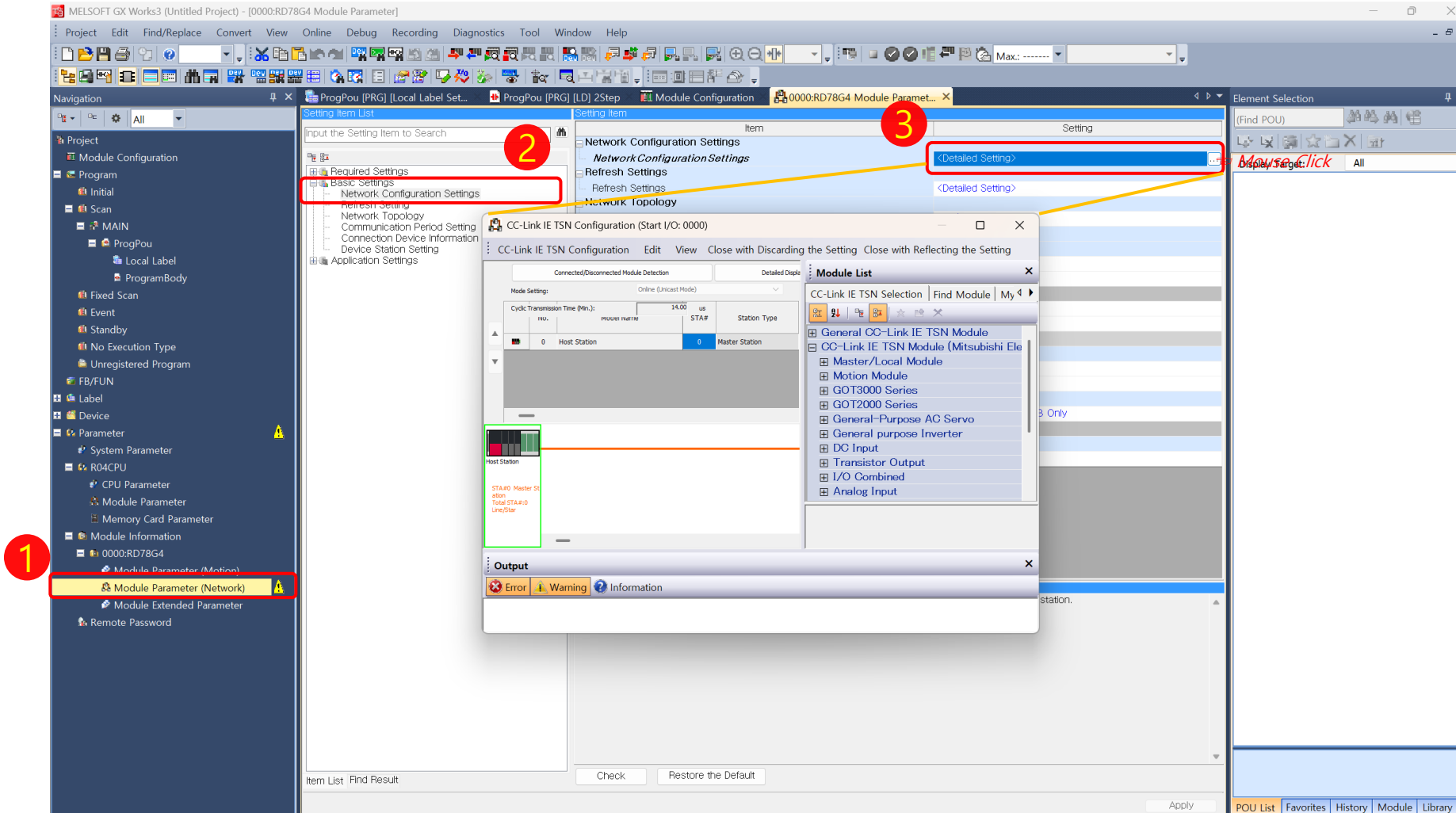
2-4. Parameter / Module Information / 0000:RD78G4

- **Module Parameter (Network): Station No., IP Address Setting**



2-4. Parameter / Module Information / 0000:RD78G4

- **Module Parameter (Network): Basic Settings / Network Configuration Settings**



2-4. Parameter / Module Information / 0000:RD78G4

- **Network Disconnected State: Configure the CC-Link IE TSN Module **Manually** (Click & Drag)**

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	RY Setting	RW Setting	RWw Setting	Parameter Automatic Setting	PDO Mapping Setting	IP Address	Subnet Mask	Default Gateway
				Points	Points	Points	Points					
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		

Generated upon registration

2

[Ezi-SERVO CC-Link IE TSN-4X IP Address can be 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 (Repeat)

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
- BLDC 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

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

P2 P1 X16 X1

[Station Type]
Remote Station

Network Label

Output

Error Warning Information

2-4. Parameter / Module Information / 0000:RD78G4

- CC-Link IE TSN Configuration: Select Module as Motion Control Station and Synchronous

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:

Station	Module Name	Motion Control Station	RX Setting	Communication Period Interval (Min.)	UDR Setting	POD Mapping Setting	IP Address	Subnet Mask	Default Gateway	Reserved/Error Invalid Station	Network Synchronous Communication	Communication Period Setting
0	Host Station						192.168.3.253					
1	Ezi-SERVO-CT-4X	☒		16	16	<Detail Setting>	192.168.3.17			No Setting	Asynchronous	Basic Period
2	Ezi-SERVO-CT-4X	☒		16	16	<Detail Setting>	192.168.3.18			No Setting	Asynchronous	Basic Period
3	Ezi-SERVO-CT-4X	☒		16	16	<Detail Setting>	192.168.3.19			No Setting	Asynchronous	Basic Period
4	Ezi-SERVO-CT-4X	☒		16	16	<Detail Setting>	192.168.3.20			No Setting	Asynchronous	Basic Period

1 Motion Control Station – Check (mouse click)

2 Synchronous Selection

Module List

CC-Link IE TSN Selection Find Module My 4

- 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
- EnergyMeasuringUnit
- Bridge module
- FPGA module
- CC-Link IE TSN Module (FASTECH Co. Ltd.)
- Closed-loop Step Drive
 - Ezi-SERVO-CT Closed-Loop
- Open-loop Step Drive
 - Ezi-STEP-CT Open-Loop

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

Host Station STA#1 STA#2 STA#3 STA#4

STA#0 Master Station Total STA#1:3 LineStar

Ezi-SERVO-CT-4X Ezi-SERVO-CT-4X Ezi-SERVO-CT-4X Ezi-SERVO-CT-4X

2-4. Parameter / Module Information / 0000:RD78G4

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

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	Ei-SERVO-CT-4X	1	Remote Station			16	16		<Detail Setting>	192.168.3.17		
2	Ei-SERVO-CT-4X	2	Remote Station			16	16		<Detail Setting>	192.168.3.18		
3	Ei-SERVO-CT-4X	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

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

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

2-4. Parameter / Module Information / 0000:RD78G4

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

The screenshot displays the 'CC-Link IE TSN Configuration' software interface. The main window shows a table of modules with columns for No., Model Name, STA#, Station Type, RX Setting, RY Setting, RW Setting, and Parameter Automatic Setting. A red box highlights the '<Detail Setting>' button in the 'Parameter Automatic Setting' column for STA#1.

A dialog box titled 'PDO Mapping Setting' is open, showing the 'PDO Mapping Parameter' table. The table has columns for Link Device, Index [Hexadecimal], Sub-Index [Hexadecimal], Entry Name, Comment, and Data Type. The 'Link Device' column is populated with values from RW0000 to RW000F. The 'Index' column contains values 1402, 6041, 6061, 603F, 6064, 6064, 6064, 6064, 6064, 6064, 6064, 6064, 6064, 6064, 6064, 6064. The 'Sub-Index' column contains values 01, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00. The 'Entry Name' column contains values: Watchdog counter UL 1, Statusword, Modes of operation display, Error code, Position actual value, Position actual value, Digital Inputs, Digital Inputs, Digital Inputs, Digital Inputs, Digital Inputs, Digital Inputs, Digital Inputs, Digital Inputs, Digital Inputs, Digital Inputs. The 'Data Type' column contains values: UNSIGNED16, UNSIGNED16, INTEGER8, UNSIGNED16, INTEGER32, INTEGER32, UNSIGNED32, UNSIGNED32, UNSIGNED32, UNSIGNED32, UNSIGNED32, UNSIGNED32, UNSIGNED32, UNSIGNED32, UNSIGNED32, UNSIGNED32.

A yellow callout box with an arrow pointing to the '<Detail Setting>' button contains the text: 'Turns black when PDO settings are complete <Detail Setting> → <Detail Setting> Repeat to configure all axis PDOs'.

The bottom of the interface shows a 'Network Label' section with a diagram of the network topology, including a Host Station and three Remote Stations (STA#1, STA#2, STA#3). The 'Output' section at the bottom right shows 'Error:0', 'Warning:0', and 'Information:0'.

2-4. Parameter / Module Information / 0000:RD78G4

- CC-Link IE TSN Configuration: Module Setting applied

The screenshot displays the 'CC-Link IE TSN Configuration' software window. The main table lists the configuration for three remote stations (No. 1, 2, and 3), all of which are 'Ezi-SERVO-CT-4X' models. The 'Station Type' for all is 'Remote Station'. The 'IP Address' for each is 192.168.3.17, 192.168.3.18, and 192.168.3.19 respectively. The 'Subnet Mask' is 192.168.3.253. The 'Default Gateway' is blank. The 'Parameter Automatic Setting' column shows '<Detail Setting>' for each station. The 'PDO Mapping Setting' column shows '<Detail Setting>' for each station. The 'IP Address' column shows 192.168.3.17, 192.168.3.18, and 192.168.3.19. The 'Subnet Mask' column shows 192.168.3.253. The 'Default Gateway' column is blank.

A warning dialog box from 'MELSOFT GX Works3' is displayed in the center, asking: '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.

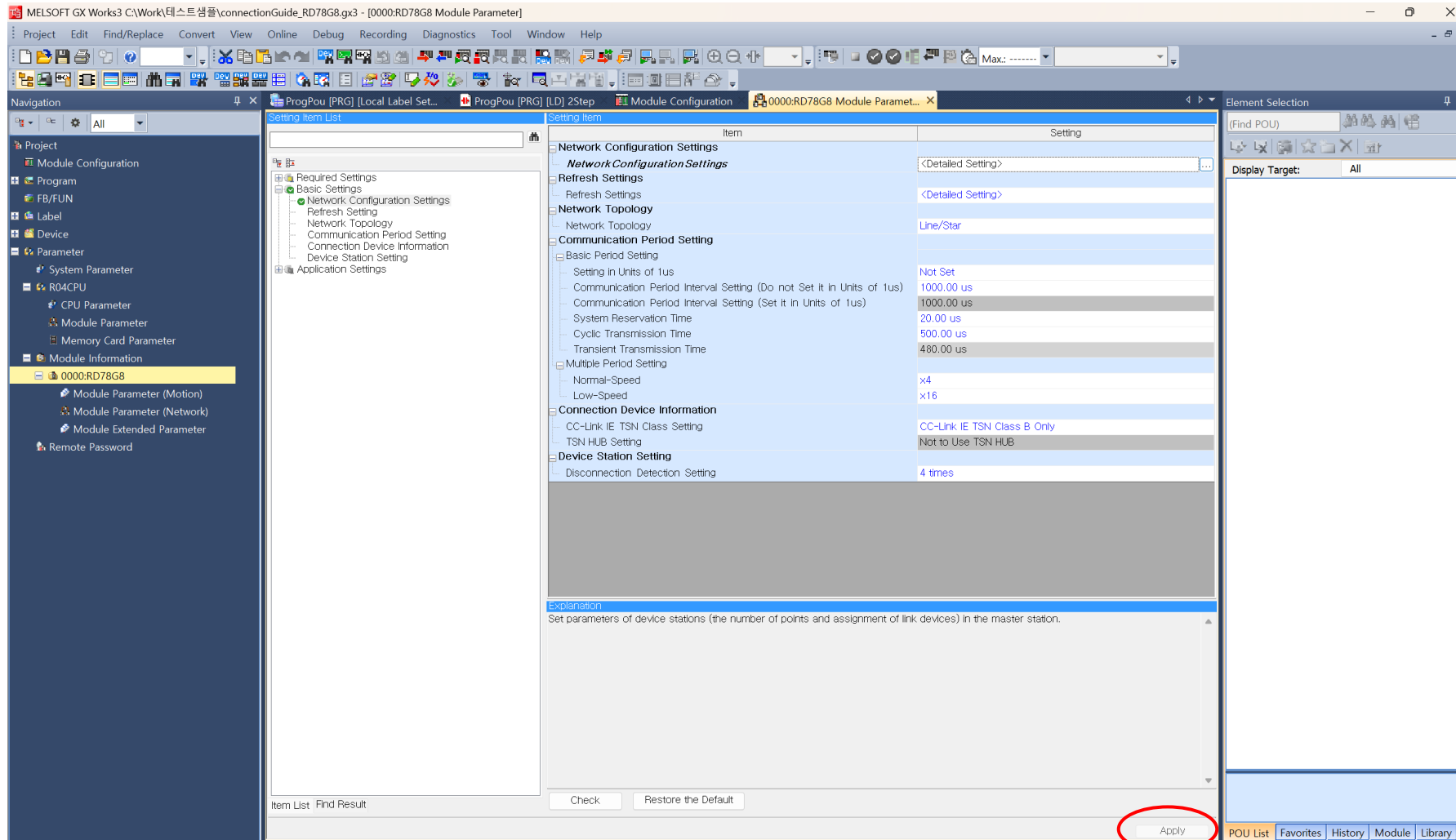
The 'Module List' panel on the right shows a tree view of modules. The 'CC-Link IE TSN Module (Mitsubishi Electric)' is selected, and its sub-modules are listed: 'General CC-Link IE TSN Module', 'CC-Link IE TSN Module (Mitsubishi Electric)', 'Master/Local Module', 'Motion Module', 'GOT3000 Series', 'GOT2000 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', and 'Speed Control'.

The 'Network Label' panel at the bottom shows a diagram of the network topology. It includes a 'Host Station' (STA#0) and four 'Remote Stations' (STA#1, STA#2, STA#3, STA#4). The 'Host Station' is labeled 'STA#0 Master Station' and 'Total STA#1:3 LineStar'. The 'Remote Stations' are labeled 'Ezi-SERVO-CT-4X'.

The 'Output' panel at the bottom right shows the status of the configuration: 'Error:0', 'Warning:0', and 'Information:0'.

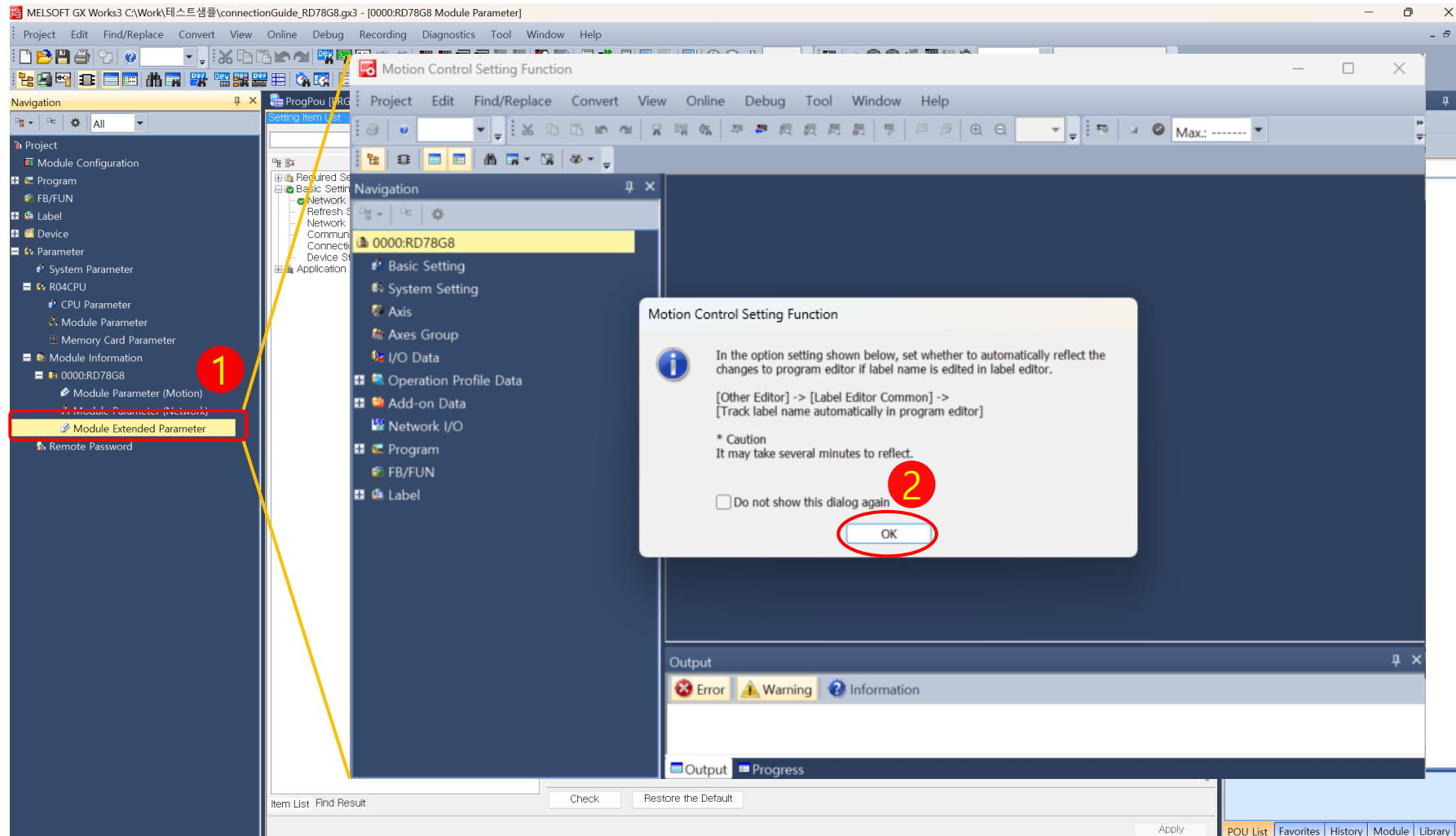
2-4. Parameter / Module Information / 0000:RD78G4

- Apply Network Configuration Settings



2-5. Module Extended Parameter – Motion Control Setting Function

- Module Extended Parameter



2-5. Module Extended Parameter – Motion Control Setting Function

- Axis - Axis0001 Creation

Right-click

1

2

3

New Data

Basic Setting

Data Type: Axis

(Data Name): Axis0001

Detailed Setting

Axis Information

Axis No.: 1

Axis Parameter Constant

Station Address Setting: ...

Axis Type Setting: 0:Real Drive Axis

Control Cycle Setting: 0:Operate in the First Operation C

OK Cancel

Station Address Setting

IP Address	Model Name	Alias
192.168.3.1	Ezi-SERVO-CT-4X	
192.168.3.1	Ezi-SERVO-CT-4X	
192.168.3.1	Ezi-SERVO-CT-4X	

OK Cancel

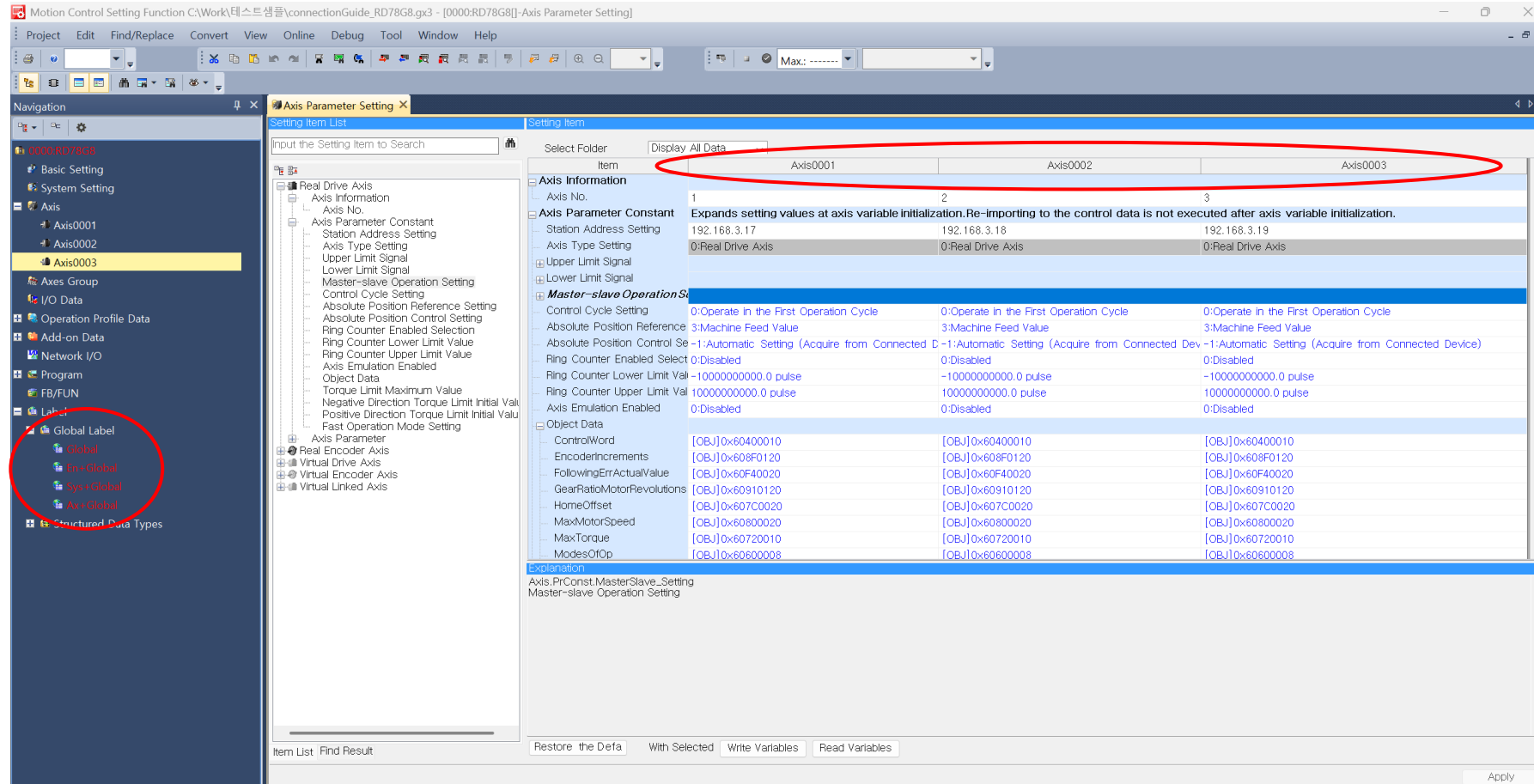
Output

Error Warning Information

Output Progress

2-5. Module Extended Parameter – Motion Control Setting Function

- Axis - Create Axis0001, Axis0002, Axis0003 (Repeat)



2-5. Module Extended Parameter – Motion Control Setting Function

- Axis - Axis0001... - Object Data Setting (Set as Ezi-SERVO CC-Link IE TSN 4X Object Data)

The screenshot shows the 'Axis Parameter Setting' window for Axis0001. The 'ControlWord' parameter is highlighted in red, and a red circle with the number 1 is placed over it. A red circle with the number 2 is placed over the 'Restore the Defa' button. A red circle with the number 3 is placed over the '예(Y)' button in a dialog box. A red circle with the number 4 is placed over the '예(Y)' button in another dialog box. A yellow callout box points to the 'ControlWord' parameter with the text 'Ezi-SERVO CC-Link IE TSN 4X Object Data'.

Item	Axis0001	Axis0002	Axis0003
Ring Counter Lower Limit Value	-10000000000.0 pulse	-10000000000.0 pulse	-10000000000.0 pulse
Ring Counter Upper Limit Value	10000000000.0 pulse	10000000000.0 pulse	10000000000.0 pulse
Axis Emulation Enabled	0:Disabled	0:Disabled	0:Disabled
Object Data			
ControlWord	[OBJ]0x60400010	[OBJ]0x60400010	[OBJ]0x60400010
EncoderIncrements	[OBJ]0x608F0120	[OBJ]0x608F0120	[OBJ]0x608F0120
FollowingErrorActualValue	[OBJ]0x60F40020	[OBJ]0x60F40020	[OBJ]0x60F40020

Object Data Setting (Axis0001)

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 Restore the Default Settings button when the non-MELSERVO device has been used.
It can be changed individually when the device inherent object data has been set.

ControlWord [OBJ]0x60400010 Controlword

EncoderIncrements [OBJ]0x608F0120 Encoder increments

FollowingErrorActualValue [OBJ]0x60F40020 Following error actual value

GearRatioMotorRevolutions [OBJ]0x60910120 Motor revolutions

HomeOffset [OBJ]0x607C0020 Home offset

MaxMotorSpeed [OBJ]0x60800020 Max motor speed

MaxTorque [OBJ]0x60720010 Max torque

ModesOfOp [OBJ]0x60600008 Modes of operation

ModesOfOpDisp [OBJ]0x60610008 Modes of operation display

NegativeTorqueLimitValue [OBJ]0x60E10010 Negative torque limit value

Polarity [OBJ]0x607E0008 Polarity

PositionActualValue [OBJ]0x60640020 Position actual value

StatusWord [OBJ]0x60410010 Status word

SupportedDriveModes [OBJ]0x65020020 Supported drive modes

Explanation

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

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: Do not set to generic default values for MELSERVO

예(Y) 아니요(N) 취소

2-5. Module Extended Parameter – Motion Control Setting Function

- Axis - Axis0001... - Object Data Setting (Set as Ezi-SERVO CC-Link IE TSN 4X Object Data)

The screenshot displays the 'Motion Control Setting Function' software interface. The 'Axis Parameter Setting' window is open, showing the 'Object Data' section for Axis0003. The 'ControlWord' row is highlighted, and three columns (Axis0001, Axis0002, Axis0003) are circled in red. A yellow callout box points to the 'ControlWord' row with the text '[OBJ] Verify Changes'.

Item	Axis0001	Axis0002	Axis0003
Ring Counter Lower Limit Value	-10000000000.0 pulse	-10000000000.0 pulse	-10000000000.0 pulse
Ring Counter Upper Limit Value	10000000000.0 pulse	10000000000.0 pulse	10000000000.0 pulse
Axis Emulation Enabled	0:Disabled	0:Disabled	0:Disabled
Object Data			
ControlWord	[OBJ] 0x60400010	[OBJ] 0x60400010	[OBJ] 0x60400010
EncoderIncrements	[OBJ] 0x608F0120	[OBJ] 0x608F0120	[OBJ] 0x608F0120
FollowingErrorActualValue	[OBJ] 0x60F40020	[OBJ] 0x60F40020	[OBJ] 0x60F40020
GearRatioMotorRevolutions			
HomeOffset	[OBJ] 0x607C0020	[OBJ] 0x607C0020	[OBJ] 0x607C0020
MaxMotorSpeed	[OBJ] 0x60800020	[OBJ] 0x60800020	[OBJ] 0x60800020
MaxTorque	[OBJ] 0x60720010	[OBJ] 0x60720010	[OBJ] 0x60720010
ModesOfOp	[OBJ] 0x60600008	[OBJ] 0x60600008	[OBJ] 0x60600008
ModesOfOpDisp	[OBJ] 0x60610008	[OBJ] 0x60610008	[OBJ] 0x60610008
NegativeTorqueLimitValue	[OBJ] 0x60E10010	[OBJ] 0x60E10010	[OBJ] 0x60E10010
Polarity	[OBJ] 0x607E0008	[OBJ] 0x607E0008	[OBJ] 0x607E0008
PosActualValue	[OBJ] 0x60640020	[OBJ] 0x60640020	[OBJ] 0x60640020
PosEncoderResolution	[OBJ] 0x608F0008	[OBJ] 0x608F0008	[OBJ] 0x608F0008
PosEncoderResolutionMot	[OBJ] 0x608F0220	[OBJ] 0x608F0220	[OBJ] 0x608F0220
PositiveTorqueLimitValue	[OBJ] 0x60E00010	[OBJ] 0x60E00010	[OBJ] 0x60E00010
ShaftRevolutions			
SiUnitPos	[OBJ] 0x60A80020	[OBJ] 0x60A80020	[OBJ] 0x60A80020
SiUnitVel	[OBJ] 0x60A90020	[OBJ] 0x60A90020	[OBJ] 0x60A90020
StatusWord	[OBJ] 0x60410010	[OBJ] 0x60410010	[OBJ] 0x60410010
SupportedDriveModes	[OBJ] 0x65020020	[OBJ] 0x65020020	[OBJ] 0x65020020

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

[OBJ] Verify Changes

2-5. Module Extended Parameter – Motion Control Setting Function

● Axis – Position Command Unit (Gear Ratio Setting) ※ Ezi-SERVO CC-Link IE TSN 4X Encoder

10,000 ppr

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

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

1. Encoder Resolution: 10000 [pulse/rev]

2. Calculate reduction ratio by teeth or diameters

3. Calculate Axis Para

4. Calculation Result: Position Command Unit: degree, Encoder Resolution: 10000 [pulse/rev]

5. Apply

Output: Parameter Check: Error: 0, Warning: 0, Information: 1, CheckWarning: 0

No.	Result	Data Name	Category	Content
1	OK	Position Command Unit	Unit	degree
2	OK	Encoder Resolution	Resolution	10000 [pulse/rev]
3	OK	Position Command Unit String	String	degree
4	OK	Velocity Command Unit	Unit	U/s
5	OK	Velocity Bias Value	Value	0.0 degree/s

2-5. Module Extended Parameter – Motion Control Setting Function

● Axis – Position Command Unit (Gear Ratio Setting) ※ Ezi-SERVO CC-Link IE TSN 4X Encoder

10,000 ppr

Axis Parameter Setting

Setting Item List

Input the Setting Item to Search

Select Folder Display All Data

Item	Axis0001	Axis0002	Axis0003
Acceleration Limit Value	2147483647.0 degree/s ²	2147483647.0 pulse/s ²	2147483647.0 pulse/s ²
Operation Selection at Start Acceleration	-1:Error (Not Started)	-1:Error (Not Started)	-1:Error (Not Started)
Command In-position Width	100.0 degree	100.0 pulse	100.0 pulse
Deceleration Limit Value	2147483647.0 degree/s ²	2147483647.0 pulse/s ²	2147483647.0 pulse/s ²
Driver Unit Conversion Numerator	10000		
Driver Unit Conversion Denominator	360 degree	1 pulse	1 pulse
Forced Stop Signal			
Homing Required or Not	1:Homing Required	1:Homing Required	1:Homing Required
Jerk Limit Value	2147483647.0 degree/s ³	2147483647.0 pulse/s ³	2147483647.0 pulse/s ³
Operation Setting at Overrun	1:Immediate Stop	1:Immediate Stop	1:Immediate Stop
Start Permission at Homing Uncomplete	0:Disabled	0:Disabled	0:Disabled
Deceleration at Stop	0.0 degree/s ²	0.0 pulse/s ²	0.0 pulse/s ²
Stop Selection at Deceleration to Stop	1:Recreate Deceleration Curve	1:Recreate Deceleration Curve	1:Recreate Deceleration Curve
Stop Selection at Stop Cause Occurrence	3:Alternative Acceleration/Deceleration	3:Alternative Acceleration/Deceleration	3:Alternative Acceleration/Deceleration
Stop Selection at H/W Stroke Limit Error	1:Immediate Stop	1:Immediate Stop	1:Immediate Stop
Process Selection at Servo OFF Correction	0:Ignore	0:Ignore	0:Ignore
Stop Selection at S/W Stroke Limit Error	1:Immediate Stop	1:Immediate Stop	1:Immediate Stop
Driver Command Discard Detection Signal	1:Detection Enabled	1:Detection Enabled	1:Detection Enabled
Stop Signal			
Signal			
Target			
Signal Detection Method	0:Detection at TRUE	0:Detection at TRUE	0:Detection at TRUE
Compensation Time	0.0 s	0.0 s	0.0 s
Filter Time	0.0 s	0.0 s	0.0 s
Software Stroke Limit Lower Value	-10000000000.0 degree	-10000000000.0 pulse	-10000000000.0 pulse
Software Stroke Limit Target	-1:Invalid	-1:Invalid	-1:Invalid
Software Stroke Limit Upper Value	10000000000.0 degree	10000000000.0 pulse	10000000000.0 pulse
Position Command Unit	degree	pulse	pulse
Position Command Unit String			
Velocity Command Unit	U/s	U/s	U/s
Velocity Bias Value	0.0 degree/s	0.0 pulse/s	0.0 pulse/s

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

Travel Distance/Angle Setting per Motor Revolution

Robot or Stage Movement Unit Selection

Explanation

Axis Pr. Unit Position

Restore the Defa With Selected Write Variables Read Variables

Apply

Output

Parameter Check Error: 0 Warning: 0 Information CheckWarning: 0

No. Result Data Name Category Content

Error Code

2-5. Module Extended Parameter – Motion Control Setting Function

- Axis – Absolute Position Control Setting: Set to Disable

**Ezi-SERVO CC-Link IE TSN 4X
Select Disable Absolute Position System**

Item	Axis0001	Axis0002	Axis0003
Axis Information			
Axis No.	1	2	3
Axis Parameter Constant	Expands setting values at axis variable initialization. Re-importing to the control data is not executed after axis variable initialization.		
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
Upper Limit Signal			
Lower Limit Signal			
Master-slave Operation Setting	0:Operate in the First Operation Cycle	0:Operate in the First Operation Cycle	0:Operate in the First Operation Cycle
Control Cycle Setting	3:Machine Feed Value	3:Machine Feed Value	3:Machine Feed Value
Absolute Position Control Setting	0:Disable Absolute Position System	-1:Automatic Setting (Acquire from Connected Dev)	-1:Automatic Setting (Acquire from Connected Device)
Ring Counter Enabled Selection	0:Disabled	0:Disabled	0:Disabled
Ring Counter Lower Limit Value	1:Enable Absolute Position System	100000.0 mm	-10000000000.0 mm
Ring Counter Upper Limit Value	-1:Automatic Setting (Acquire from Connected Device)	10000.0 mm	10000000000.0 mm
Axis Emulation Enabled	0:Disabled	0:Disabled	0:Disabled
Object Data			
Torque Limit Maximum Value	1000.0 %	1000.0 %	1000.0 %
Negative Direction Torque Limit Initial	300.0 %	300.0 %	300.0 %
Positive Direction Torque Limit Initial	300.0 %	300.0 %	300.0 %
Fast Operation Mode Setting	0000	0000	0000
Axis Parameter	Expands initial values at axis variable initialization. Re-importing to the control data is also executed after axis variable initialization.		
Acceleration Limit Value	2147483647.0 degree/s ²	2147483647.0 mm/s ²	2147483647.0 mm/s ²
Operation Selection at Start Acceleration	-1:Error (Not Started)	-1:Error (Not Started)	-1:Error (Not Started)
Position Command Unit	100.0 degree	100.0 mm	100.0 mm
Velocity Command Unit	2147483647.0 degree/s	2147483647.0 mm/s	2147483647.0 mm/s
Velocity Bias Value	10000	10000	10000
Negative Direction Velocity Limit Value	360 degree	5 mm	10 mm
Operation Setting at Overrun	1:Homming Required	1:Homming Required	1:Homming Required
Start Permission at Homming	2147483647.0 degree/s ³	2147483647.0 mm/s ³	2147483647.0 mm/s ³
Operation Setting at Velocity Limit	1:Immediate Stop	1:Immediate Stop	1:Immediate Stop
Positive Direction Velocity Limit Value	0:Flashlight	0:Flashlight	0:Flashlight

Item List Find Result

Restore the Defa With Selected Write Variables Read Variables

Apply

Output

Parameter Check Error: 0 Warning: 0 Information CheckWarning: 0

No.	Result	Data Name	Category	Content
-----	--------	-----------	----------	---------

Error Code

2-5. Module Extended Parameter – Motion Control Setting Function

● Network I/O Setting – Per-Axis Digital Input/Output Configuration

1 Digital Output Label Settings

2 Digital Input Label Settings - Limit +/-, ORG, Input

3 MELSOFT GX Works3

Start creating the label on the basis of the content.
Are you sure you want to continue?

예(Y) 아니요(N)

Create Label

Update Network Configuration Info

Output

Parameter Check Error: 0 Warning: 0 Information CheckWarning: 0

No. Result Data Name Category Content Error Code

Output Progress

2-5. Module Extended Parameter – Motion Control Setting Function

● Axis – Upper/Lower Limit Signal – Signal Detection Method setting

The screenshot displays the 'Motion Control Setting Function' software interface, specifically the 'Axis Parameter Setting' window for 'Axis0001'. The interface is divided into several sections:

- Navigation Tree (Left):** Lists various settings categories including Basic Setting, System Setting, Axis, Axes Group, I/O Data, Operation Profile Data, Add-on Data, Network I/O, Program, FB/FUN, Label, Global Label, and Structured Data Types. The 'Axis' category is currently selected.
- Setting Item List (Top):** A table showing the list of parameters for Axis0001, Axis0002, and Axis0003. The 'Upper Limit Signal' and 'Lower Limit Signal' parameters are highlighted with red boxes.
- Parameter Details (Main Table):** A detailed view of the selected parameters. The 'Upper Limit Signal' and 'Lower Limit Signal' parameters are shown with their respective settings, including the 'Signal Detection Method' and 'Target' values. The 'Signal Detection Method' is set to '0:Detection at TRUE' and the 'Target' is set to '[VAR](BOOL)Ezi_SERVO_CT_001_DigitalInputs.1' for the Upper Limit Signal and '[VAR](BOOL)Ezi_SERVO_CT_001_DigitalInputs.0' for the Lower Limit Signal.
- Callout Boxes:** Two yellow callout boxes provide additional information:
 - Upper Limit Signal:** Ezi-SERVO CC-Link IE TSN 4X + Limit Switch Settings Ezi_SERVO_CT_001_DigitalInputs.1
 - Lower Limit Signal:** Ezi-SERVO CC-Link IE TSN 4X -Limit Switch settings are Ezi_SERVO_CT_001_DigitalInputs.0
- Note Box:** A grey note box states: 'Note) If the label setting for Ezi_SERVO_CT_xxx_DigitalInputs.x fails, 1. Check Network Settings (page 27)'
- Bottom Status Bar:** Includes an 'Apply' button (circled in red), a 'Parameter Check' section showing 'Error: 0' and 'Warning: 0', and an 'Output' section with a table for results.

2-5. Module Extended Parameter – Motion Control Setting Function

- Label – Global Label – System + Global

1

2

To use Label in GX Works3, specify Enable

Label Name	Data Type	Class	Initial Value	Constant	English(Display Target)	Rem	Public Label	Motion Control Attribute
1	System	SYSTEM	VAR_GLOBAL	<Detailed Settings>			Enabled	-
2	MotionControl_AdvancedSync	MotionControl_AdvancedSync_SYS	VAR_GLOBAL	<Detailed Settings>			Disabled	-
3								

Label Name	Data Type	Comment	Initial Value	Public Label
MotionControl_AdvancedSync_System	MotionControl_AdvancedSync_SYS	System Parameter Constant	Disabled	Disabled
ADDON_PARAM	ADDON_PARAM	Add-on MotionControl_AdvancedSync	Disabled	Disabled
RamSizeMax	Double Word (Unsigned) Bit String [32]	Maximum RAM Size	2048	Disabled
BackupRamSizeMax	Double Word (Unsigned) Bit String [32]	Maximum Backup RAM Size	16	Disabled
Md	Md	System Monitor Data	Disabled	Disabled
ADDON_MONI	ADDON_MONI	System Memory Usage	Disabled	Disabled
RamUsage	Double Word (Unsigned) Bit String [32]	RAM Usage	Disabled	Disabled
RamMaxUsage	Double Word (Unsigned) Bit String [32]	RAM Usage Maximum	Disabled	Disabled
BackupRamUsage	Double Word (Unsigned) Bit String [32]	Backup RAM Usage	Disabled	Disabled
BackupRamMaxUsage	Double Word (Unsigned) Bit String [32]	Backup RAM Usage Maximum	Disabled	Disabled

Extd Dspl

Progress

Assigning global label...

Error: 0, Warning: 0

===== Rebuild All Ends Error: 0, Warning: 0, End Time: 2026/01/16 19:49:54, Processing Time (Seconds): 5.475 =====

----- Rebuild All/Parameter Check Starts Start Time: 2026/01/16 19:50:25 -----

--- Start checking: Target: Basic Setting ---

Checking Basic Setting...

--- Start checking: Target: System Setting ---

Checking System Setting...

--- Start checking: Target: Axis ---

Checking Axis...

--- Start checking: Target: Operation Profile Data ---

Checking Operation Profile Data...

--- Start checking: Target: I/O Data ---

Checking I/O Data...

--- Start checking: Target: Advanced Synchronous Control ---

===== Rebuild All/Parameter Check Ends Error: 0, Warning: 0, End Time: 2026/01/16 19:50:29, Processing Time: 4 Seconds =====

2-5. Module Extended Parameter – Motion Control Setting Function

- Label – Global Label – Ax+Global

Global Label Setting Table (Main):

Label Name	Data Type	Class	Initial Value	Constant	English(Display Target)	Rem
1 Axis0001	AXIS_REAL	VAR_GLOBAL	<Detailed Settings>			
2 Axis0002	AXIS_REAL	VAR_GLOBAL	<Detailed Settings>			
3 Axis0003	AXIS_REAL	VAR_GLOBAL	<Detailed Settings>			
4						

Axis0003 Detail Table:

Label Name	Data Type	Comment	Initial Value	Public Label
Axis0003	AXIS_REAL			Enabled
AxisRef	AXIS_REF	Axis Information		Enabled
AxisNo	Word (Unsigned) (Bit String [16-bit])	Axis No.	3	Enabled
StartIO	Word (Unsigned) (Bit String [16-bit])	IO Number	0	Enabled
PrConst	AXIS_REAL_PRM_CONST	Axis Parameter Constant		Disabled
AddressOfStation	String (Unicode) (S3)	Station Address Setting	192.168	Disabled
AxisType	Word (Signed)	Axis Type Setting	0	Disabled
MaxStrokeLimit_FixSignal	SIGNAL_SELECT	Upper Limit Signal		Disabled
Source	TARGET_REF	Signal		Disabled
StartIO	Word (Unsigned) (Bit String [16-bit])	IO Number	0	Disabled
Target	String (Unicode) (S3)	Target		Disabled

Progress Log:

```
Assigning global label...
Error: 0, Warning: 0
===== Rebuild All/Parameter Check Starts Start Time: 2026/01/16 19:50:25 =====
--- Start checking: Target: Basic Setting ---
Checking Basic Setting...
--- Start checking: Target: System Setting ---
Checking System Setting...
--- Start checking: Target: Axis ---
Checking Axis...
--- Start checking: Target: Operation Profile Data ---
Checking Operation Profile Data...
--- Start checking: Target: I/O Data ---
Checking I/O Data...
--- Start checking: Target: Advanced Synchronous Control ---
===== Rebuild All/Parameter Check Ends Error: 0, Warning: 0, End Time: 2026/01/16 19:50:29, Processing Time: 4 Seconds =====
```

2-5. Module Extended Parameter – Motion Control Setting Function

- Label – Global Label – System + Global

1

2

To use Label in GX Works3, specify Enable

Label Name	Data Type	Class	Initial Value	Constant	ReadWrite	English(Display Target)	Rem	Public Label	Motion Control Attribute
ExL_SERVO_CT_001_Phys	Double Word (Unsigned) Bit String B3	VAR_GLOBAL			R/W/S			Enabled	WRITE (← Motion) R/W
ExL_SERVO_CT_001_Digi	Double Word (Unsigned) Bit String B3	VAR_GLOBAL			R/W/S			Enabled	READ (Motion →) R/W
ExL_SERVO_CT_002_Phys	Double Word (Unsigned) Bit String B3	VAR_GLOBAL			R/W/S			Enabled	WRITE (← Motion) R/W
ExL_SERVO_CT_002_Digi	Double Word (Unsigned) Bit String B3	VAR_GLOBAL			R/W/S			Enabled	READ (Motion →) R/W
ExL_STEP_CT_001_Phys	Double Word (Unsigned) Bit String B3	VAR_GLOBAL			R/W/S			Enabled	WRITE (← Motion) R/W
ExL_STEP_CT_001_Digi	Double Word (Unsigned) Bit String B3	VAR_GLOBAL			R/W/S			Enabled	READ (Motion →) R/W
								Enabled	

Progress

Assigning global label...

Error: 0, Warning: 0

===== Rebuild All Ends Error: 0, Warning: 0, End Time: 2026/01/16 19:49:54, Processing Time (Seconds): 5.475 =====

----- Rebuild All/Parameter Check Starts Start Time: 2026/01/16 19:50:25 -----

--- Start checking: Target: Basic Setting ---

Checking Basic Setting...

--- Start checking: Target: System Setting ---

Checking System Setting...

--- Start checking: Target: Axis ---

Checking Axis...

--- Start checking: Target: Operation Profile Data ---

Checking Operation Profile Data...

--- Start checking: Target: I/O Data ---

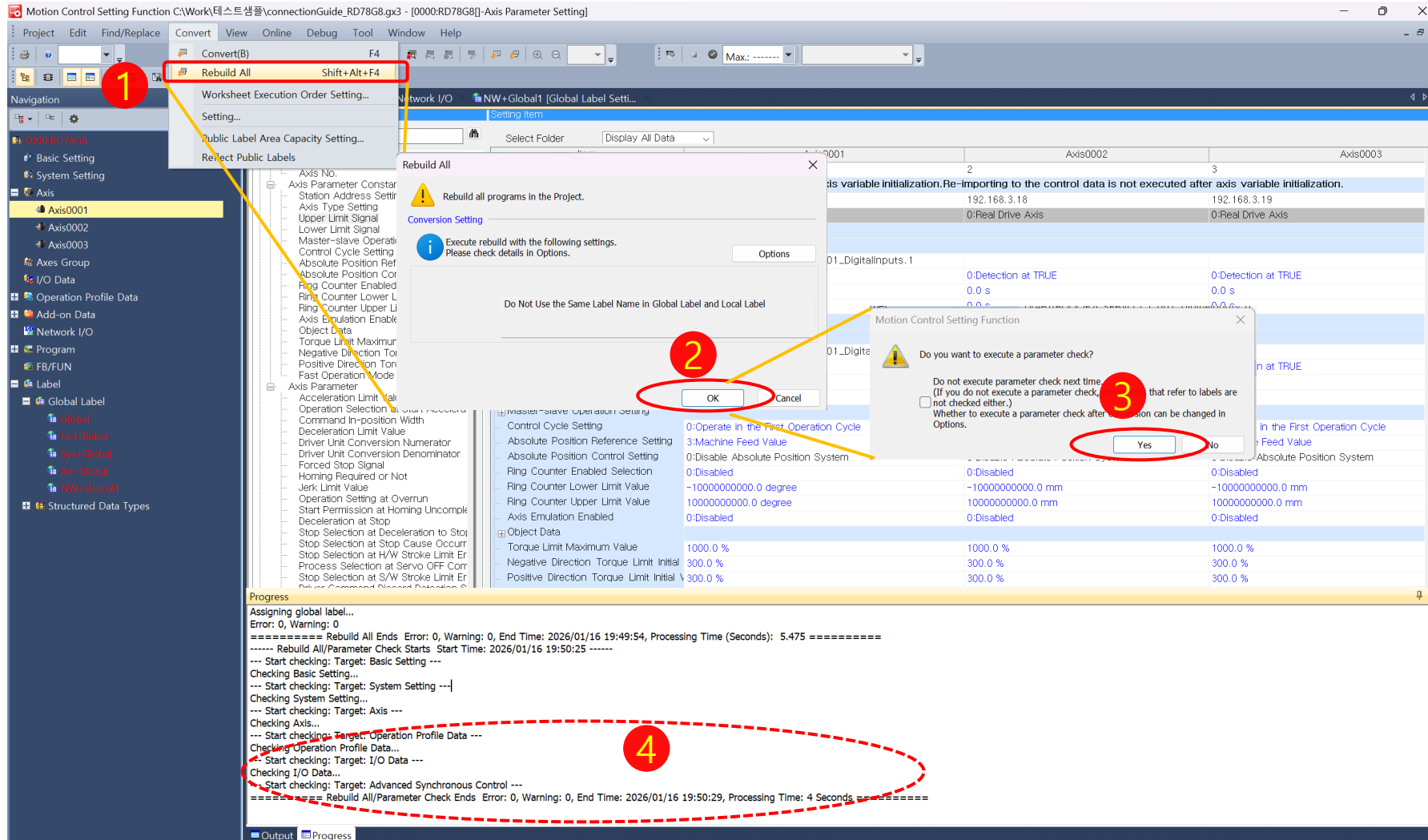
Checking I/O Data...

--- Start checking: Target: Advanced Synchronous Control ---

===== Rebuild All/Parameter Check Ends Error: 0, Warning: 0, End Time: 2026/01/16 19:50:29, Processing Time: 4 Seconds =====

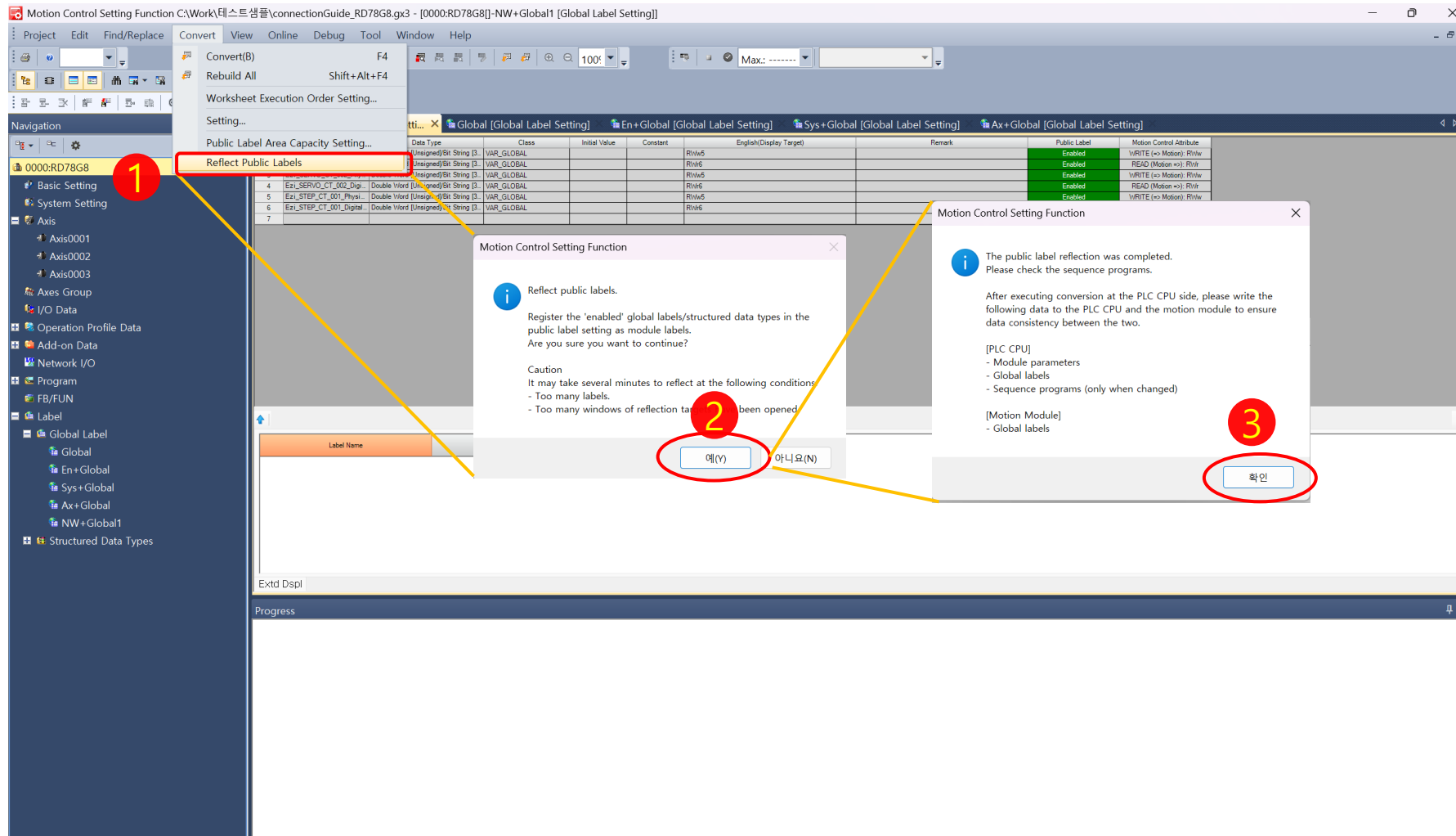
2-5. Module Extended Parameter – Motion Control Setting Function

- Convert – Rebuild All → Parameter Check



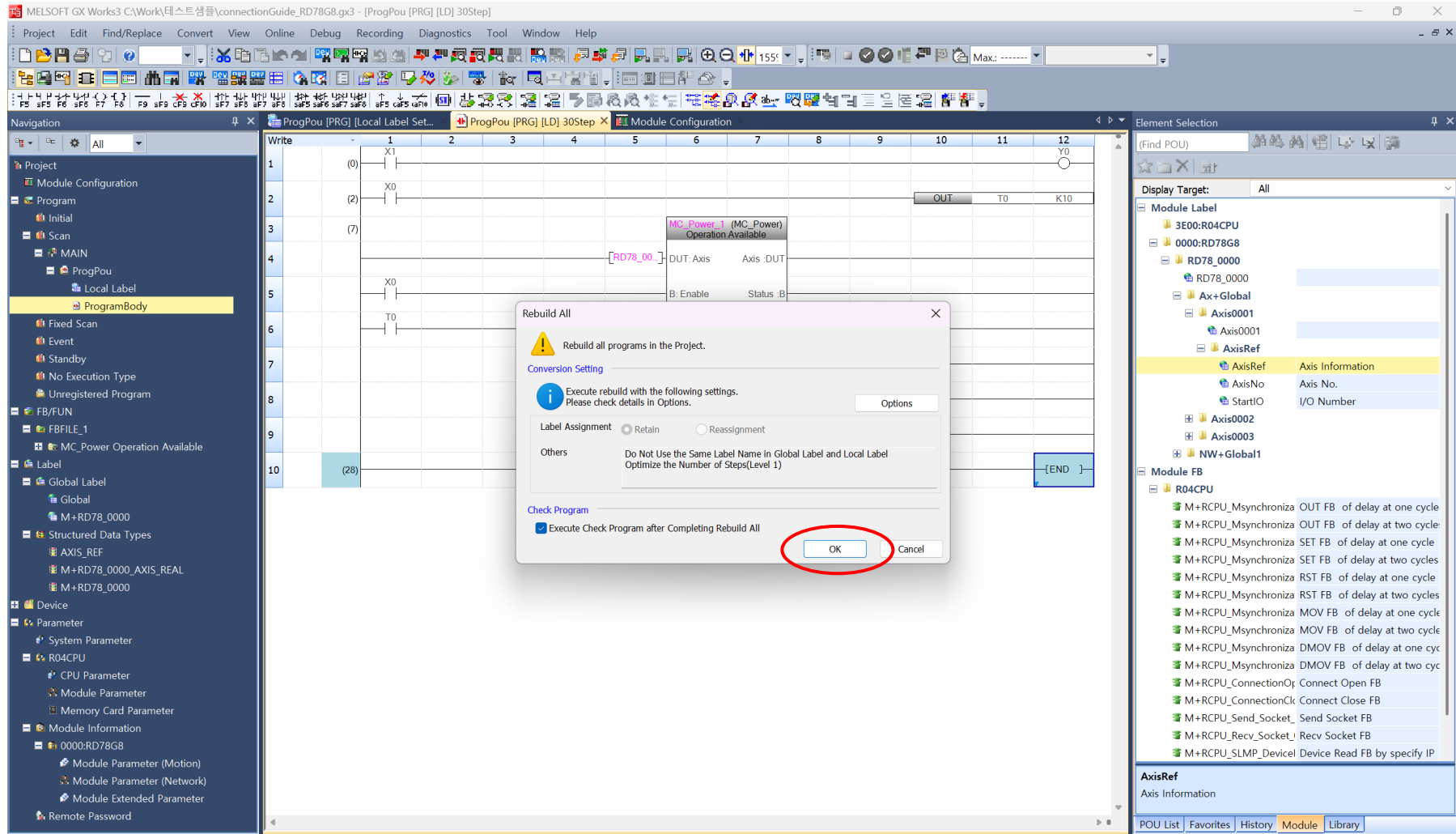
2-5. Module Extended Parameter – Motion Control Setting Function

● Reflect Public Labels



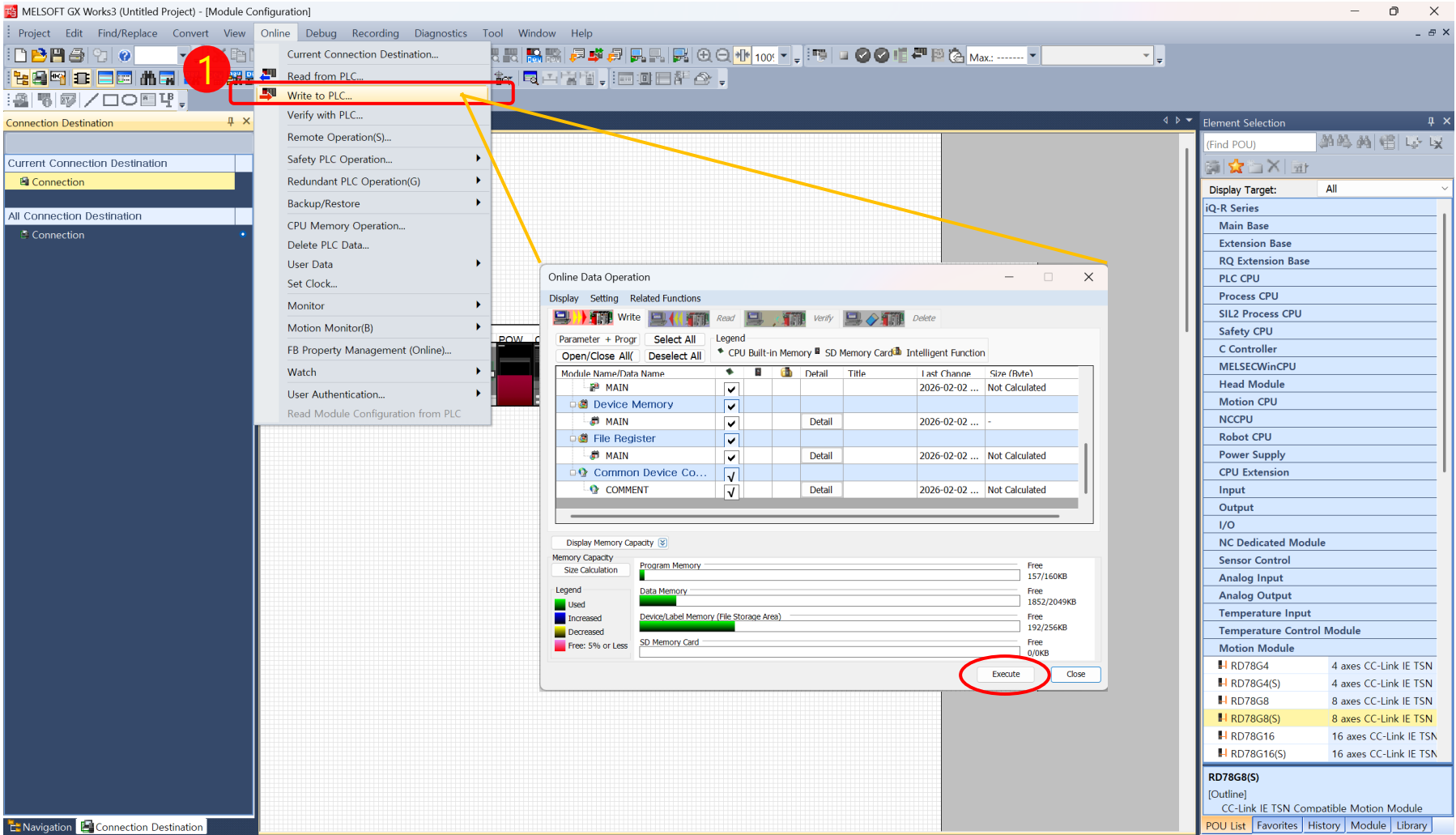
2-6. Convert

- Convert – Rebuild All



2-7. Write to PLC

- Online Data Operation



3. Follow the Program

3-1. Exploring Motion Control Commands

● Motion Control Function/Function Block Command – Element Selection - Library

The screenshot displays the MELSOFT GX Works3 interface. The main workspace shows a ladder logic diagram with a function block labeled 'MC_Power (MC_Power) Operation Available'. A yellow dotted arrow labeled 'Mouse Click & Drag' points from the 'MC_Power' block in the library to the diagram. The library is open on the right, showing a list of Motion Control commands. The 'MC_Power' command is highlighted with a red box and a red circle labeled '2'. The 'Library' tab is selected at the bottom of the library window, indicated by a red circle labeled '1'.

Library List:

Library	Command
Management	MC_AbortTrigger Touch Probe Disabled
	MC_CamTableSele Cam Table Selection
	MC_GroupDisable Axis Group Disabled
	MC_GroupEnable Axis Group Enabled
	MC_GroupReset Axis Group Error Reset
	MC_GroupSetOve Axis Group Override Change
	MC_Power Operation Available
	MC_ReadParamet Read Axis Parameters
	MC_Reset Axis Error Reset
	MC_SetOverride Axis Override Change
	MC_SetPosition Current Position Change
	MC_TouchProbe Touch Probe Enabled
	MC_WriteParamet Write Axis Parameter
MCv_AdvCamSetP	CamSetPosition Calculation
MCv_AdvPositionF	Position Per Cycle Calculation
MCv_AllPower	All Axes Operation Available
MCv_ChangeCycle	Current Value Change per Cycle
MCv_MotionErrorf	System Error Reset
MCv_SetTorqueLir	Torque Limit Value

MC_Power Details:

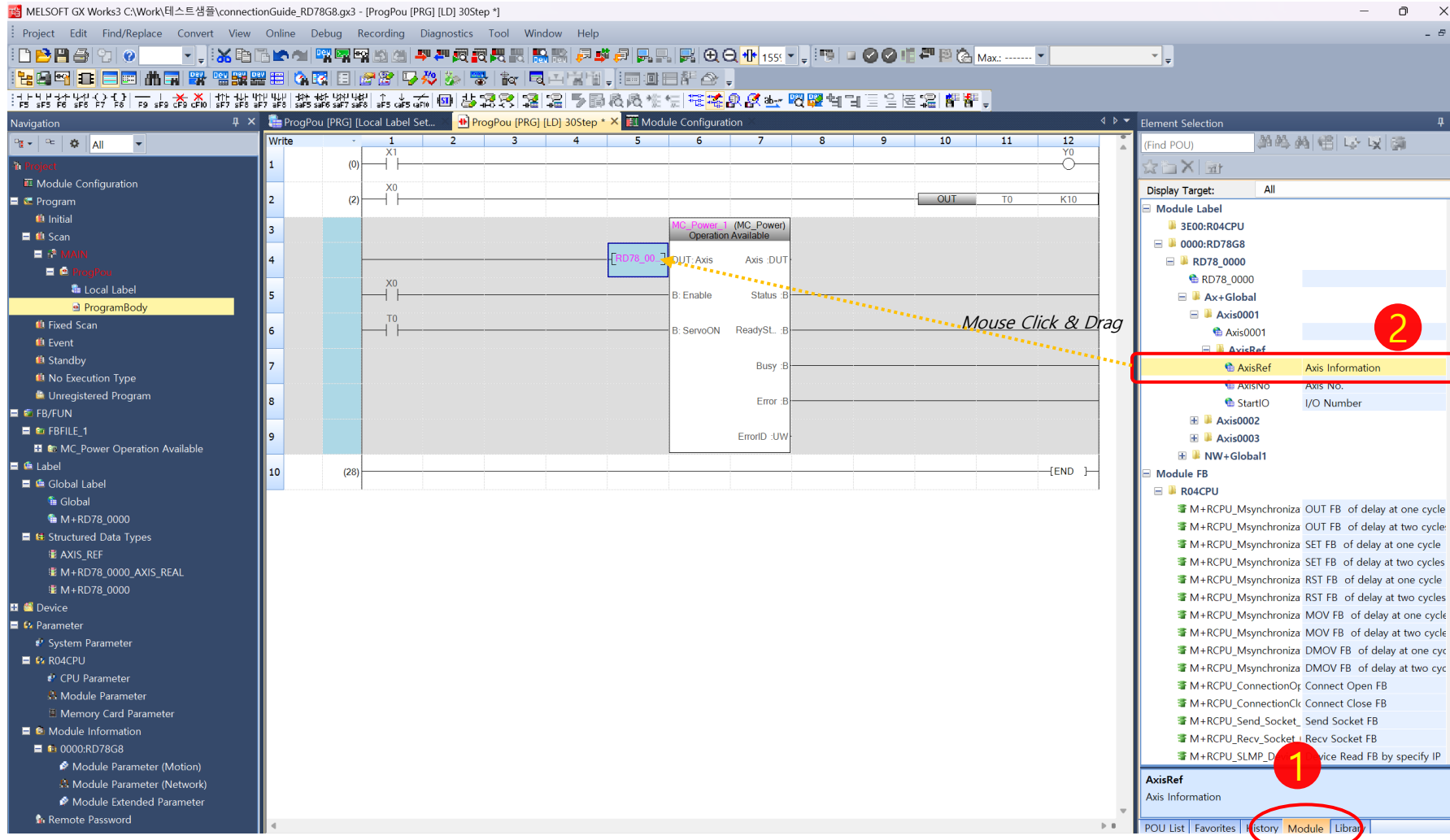
MC_Power
[Version]
06G

Navigation Panel:

- Project
 - Module Configuration
 - Program
 - Initial
 - Scan
 - MAIN
 - ProgPou
 - Local Label
 - ProgramBody
 - Fixed Scan
 - Event
 - Standby
 - No Execution Type
 - Unregistered Program
 - FB/FUN
 - FBFILE_1
 - MC_Power Operation Available
 - Label
 - Global
 - M+RD78_0000
 - Structured Data Types
 - AXIS_REF
 - M+RD78_0000_AXIS_REAL
 - M+RD78_0000
 - Device
 - Parameter
 - System Parameter
 - R04CPU
 - CPU Parameter
 - Module Parameter
 - Memory Card Parameter
 - Module Information
 - 0000:RD78G8
 - Module Parameter (Motion)
 - Module Parameter (Network)
 - Module Extended Parameter
 - Remote Password

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

- Ezi-SERVO CC-Link IE TSN Enable/SERVO ON Program



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 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

The screenshot displays the MELSOFT GX Works3 interface. The main ladder logic editor shows a function block call for **MC_WriteParameter** (labeled **MC_WriteParameter_1**). The configuration for this block is as follows:

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

The ladder logic includes the following steps:

- Step 3: **Read Mnt** (Read Memory) instruction.
- Step 6: **SM400** (Set Memory) instruction.
- Step 12: **bAx1SrvEnb** (Bit Set) instruction.
- Step 16: **bAx1SrvOn** (Bit Set) instruction.
- Step 17: **bAx1WParam** (Bit Set) instruction.
- Step 18: **bAx1WParam** (Bit Set) instruction.
- Step 19: **bAx1WParam** (Bit Set) instruction.
- Step 20: **MC_WriteParameter_1** (Function Block) instruction.
- Step 21: **END** (End) instruction.

The **MC_WriteParameter** block is configured with the following parameters:

- Axis:** Axis001.A
- UD:** Param...
- L:** Value
- W:** Execution...
- UD:** Options

The **MC_WriteParameter** block is also configured with the following parameters:

- Version:** 00A
- POU List:** Favorites, History, Module, Library

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

- Homing Execution (MC_Home)

The screenshot displays the MELSOFT GX Works3 interface with a ladder logic program for Ezi-SERVO homing execution. The main routine (MAIN) is shown on the left, and the sub-routine (MC_Home) is highlighted with a yellow dashed box on the right. The sub-routine is titled "MC_Home_1 (MC_Home)" and contains the following logic:

- Input: bAx1Home (Bit)
- Output: bAx1HomeDo (Bit)
- Logic: The sub-routine is triggered by the bAx1Home input. It contains a network with a normally open contact labeled "bAx1Home" and a coil labeled "bAx1HomeDo".

The right-hand pane shows the "Element Selection" dialog, which lists various function blocks and modules. The "MC_Home" block is selected under the "Motion Control Function/Function Block" category.

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		

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

- Digital Input, Output Operation Execution

The screenshot displays the MELSOFT GX Works3 interface with a ladder logic program for Ezi-SERVO DIO operation. The program is organized into a project tree on the left, showing the hierarchy from Project to Program, then to MAIN, and finally to ProgramBody. The main workspace shows a ladder logic diagram with a network of 12. The network contains a DMOV instruction (Digital Move) that moves data from D0 to D2. The D0 register is connected to a series of digital input/output modules, including bAx1In[0] through bAx1In[5] and D3.1 through D3.5. The D2 register is connected to a series of digital input/output modules, including bAx1Out[0] through bAx1Out[4] and D3.1 through D3.5. The program is titled 'MoveProgram [PRG] [LD] 57Byte'.

Ezi_SERVO_CT_001_DigitalInputs

Ezi_SERVO_CT_001_PhysicalOutputs

MC_MoveAbsolute

POU List Favorites History Module Library

3-6. [Ladder] Execute Ezi-SERVO DIO Operation: Refer to Map

- Digital Inputs

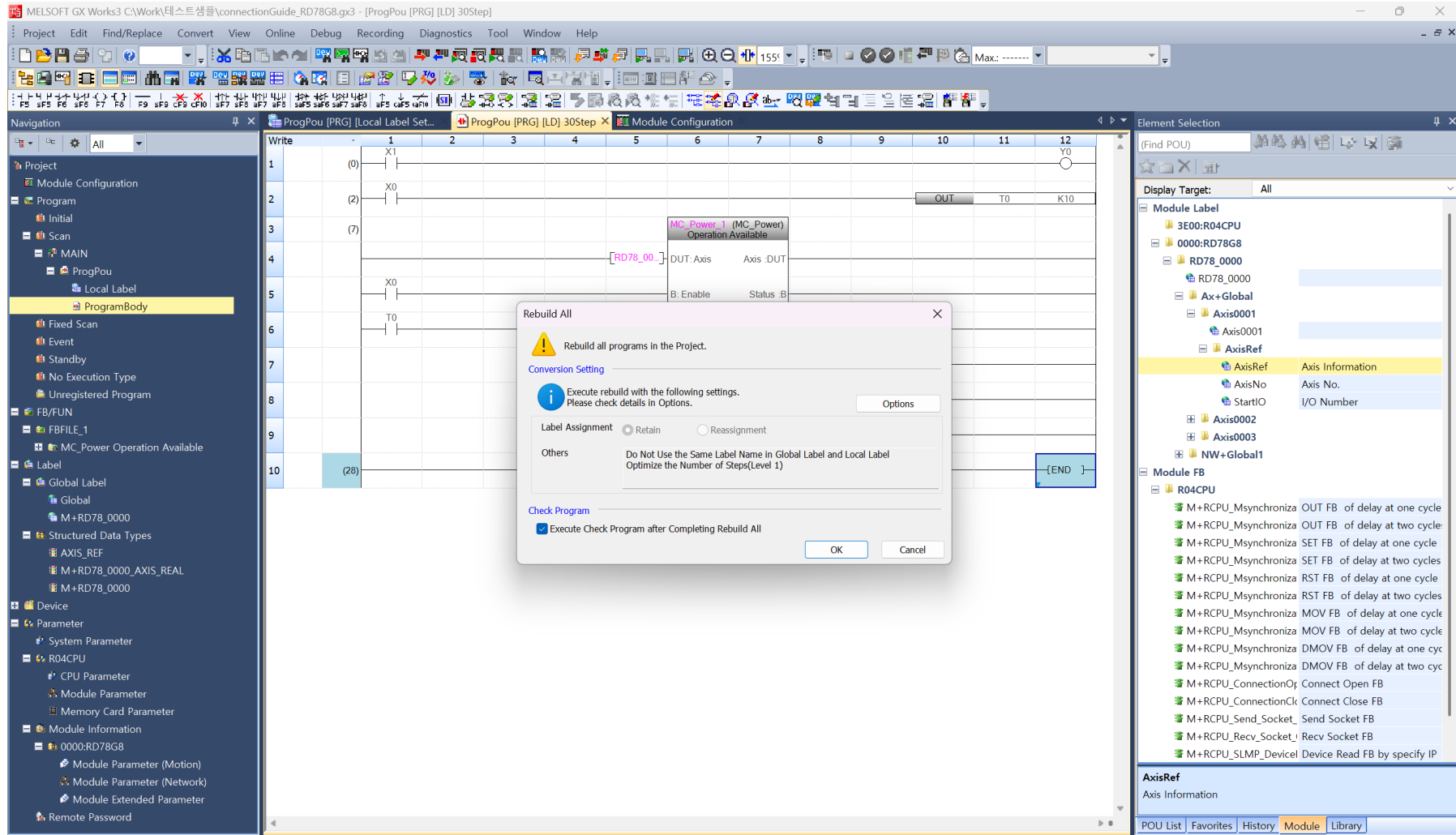
Bit 31	Bit 30	Bit 29	Bit 28	Bit 27	Bit 26	Bit 25	Bit 24
-	Motor Power	TQOFF2	TQOFF1	-	-	User input 6	User input 5
Bit 23	Bit 22	Bit 21	Bit 20	Bit 19	Bit 18	Bit 17	Bit 16
User input 4	User input 3	User input 2	User input 1	Reserved	Reserved	Reserved	
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit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

3-7. [Ladder] Convert

- Convert – Rebuild All



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 operations. The 'Motion Area System Error Detection' section shows the latest error code as H0000.

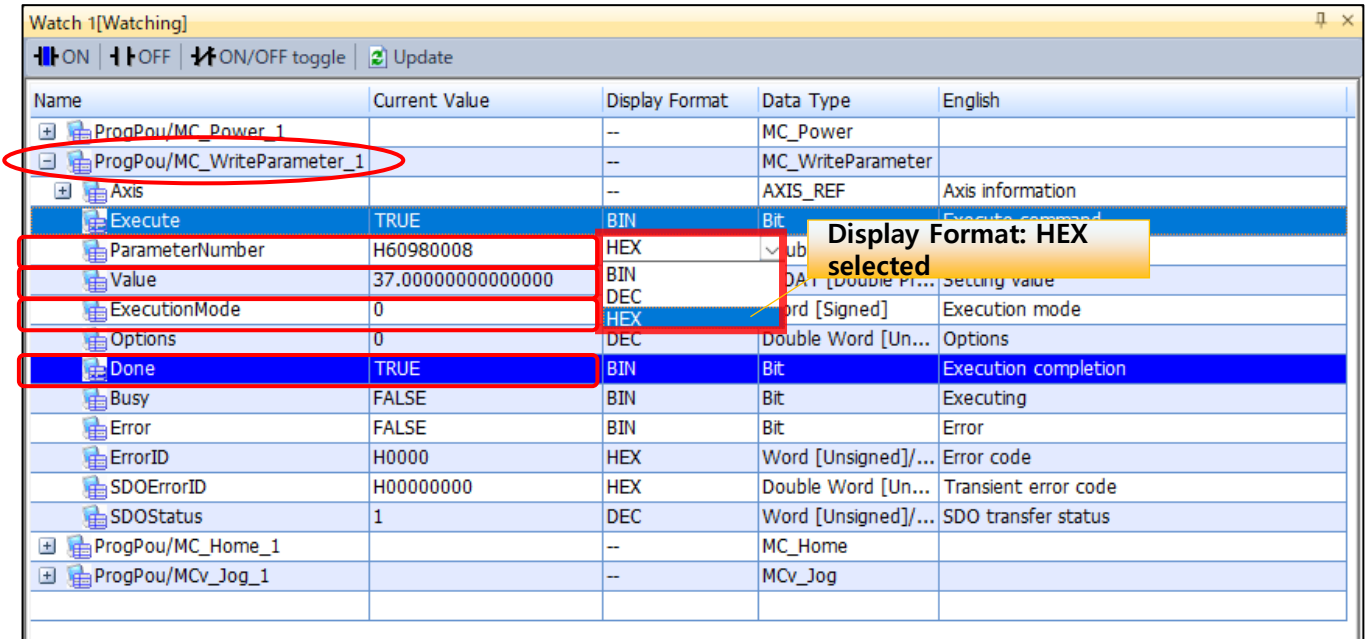
[Operation Verification] Changing the Homing Method

- 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

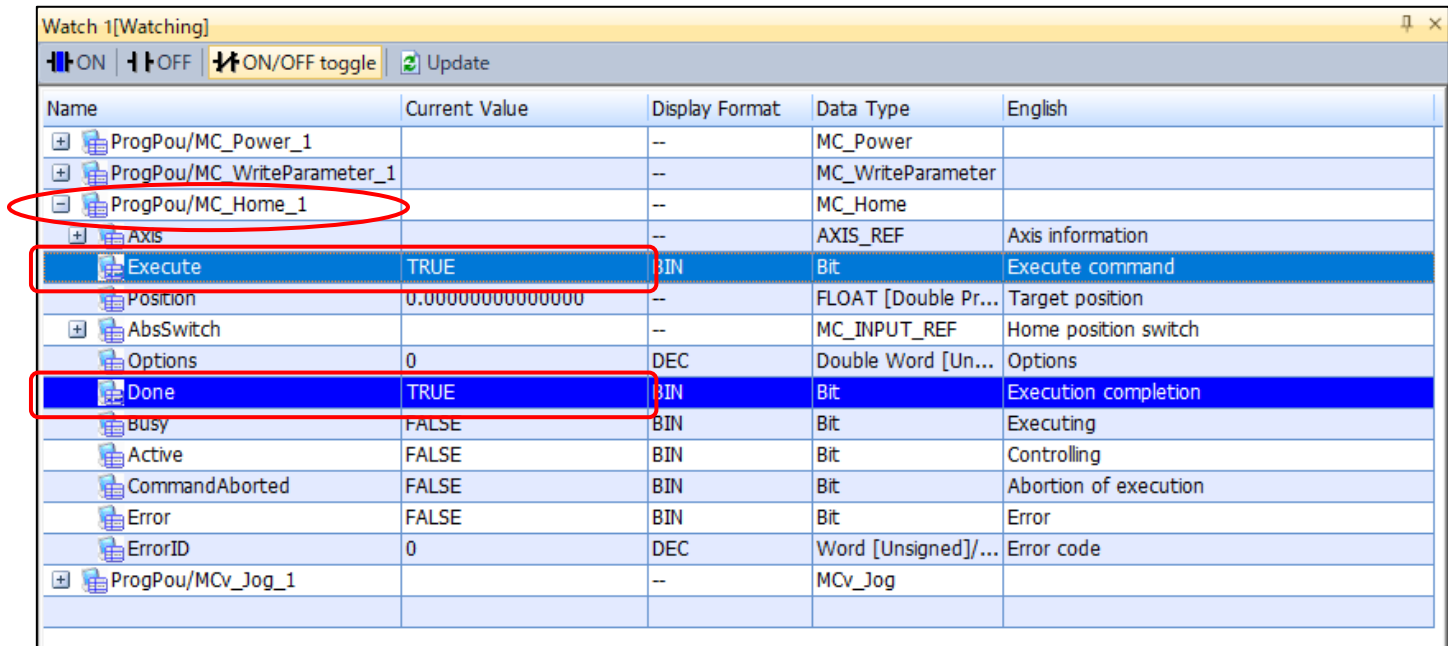


Name	Current Value	Display Format	Data Type	English
ProgPou/MC_Power_1		--	MC_Power	
ProgPou/MC_WriteParameter_1		--	MC_WriteParameter	
Axis		--	AXIS_REF	Axis information
Execute	TRUE	BIN	Bit	Execute command
ParameterNumber	H60980008	HEX	Word [Unsigned]/...	Setting value
Value	37.00000000000000	BIN	Double 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	

[Operation Verification] Homing

- Execute homing using motion control FB

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



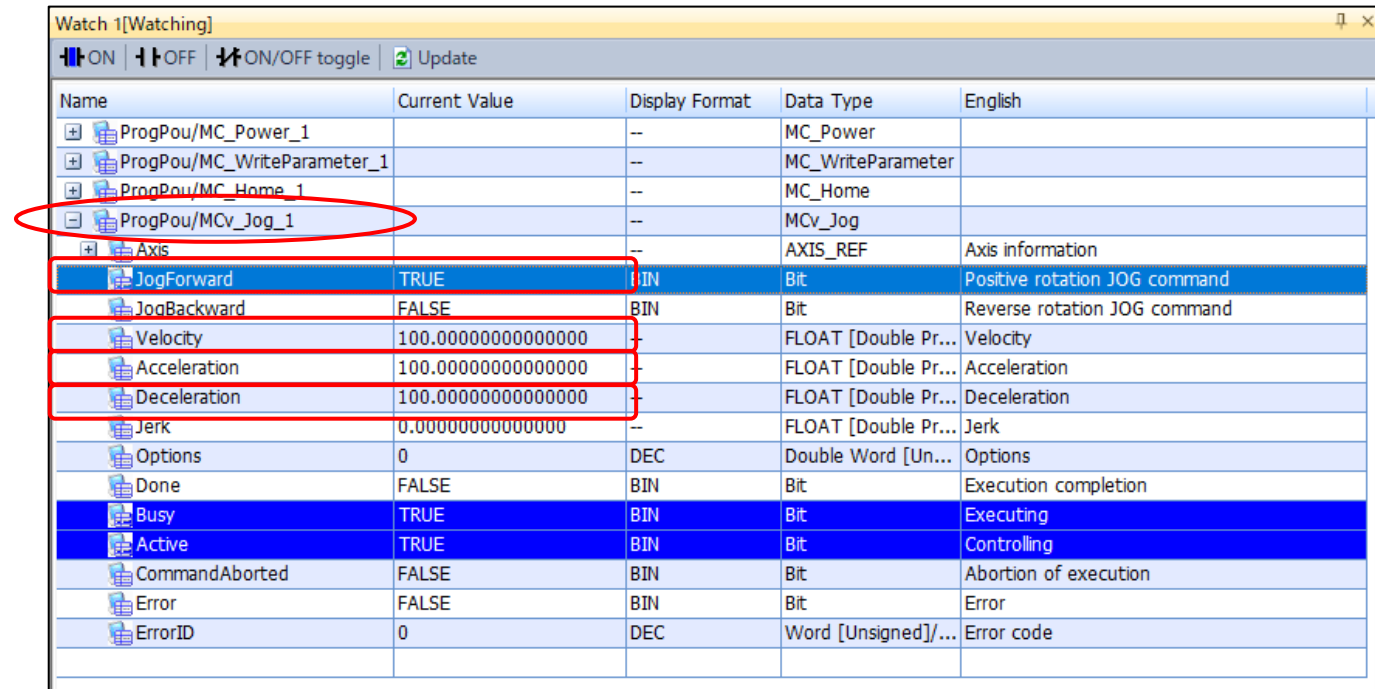
Name	Current Value	Display Format	Data Type	English
ProgPou/MC_Power_1		--	MC_Power	
ProgPou/MC_WriteParameter_1		--	MC_WriteParameter	
ProgPou/MC_Home_1		--	MC_Home	
Axis		--	AXIS_REF	Axis information
Execute	TRUE	BIN	Bit	Execute command
Position	0.0000000000000000	--	FLOAT [Double Pr...	Target position
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 the Ezi-SERVO CC-Link IE TSN 4X 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 table of events. The 'Details' tab is active, showing detailed information for event 00001.

No.	Occurrence Date	Event Type	Status	Event Code	Description
00001	2024/10/15 15:15:07.512	System	OK	00001	Homing Request (H- to OK)
00002	2024/10/15 15:15:07.517	System	OK	00002	Current Position Extension Completion
00003	2024/10/15 15:15:07.527	System	OK	00003	servo System Extension Start
00004	2024/10/15 15:15:08.000	Operation	OK	00004	Follow-up Motion Execution

Details Information

Axis Type: Real Drive Axis
Event Occurrence: 00001/00002/00003/00004
Event Code: 00001

00001

Homing request was OK.
- Absolute position error in driver data was detected. (Data code: 00001)
- An absolute position error in the driver data was detected. (Data code: 00001)
- The axis type was changed. (Data code: 00001)
- Drive object: 'Polarity (00001)' b7 position polarity was changed. (Data code: 00001)
- Change of the drive of motion encoder was detected. (Data code: 00001)
- Machine homing was detected. (Data code: 00001)
- Driver unit connection (frictionless connection) of the axis was detected. (Data code: 00001)
- Machine homing has been detected after the system started. (Data code: 00001)

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 settings 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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