



Programmable Controllers  
**MELSEC iQ-F**  
series



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

# Connection Guide

**MELSEC iQ-F** series and **Ezi-SERVO**® CC-Link IE TSN  
Closed Loop Stepping System **4X**

Mitsubishi Electric Products  
FX5-40SSC-G(S), FX5-80SSC-G(S)

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

# Before you begin

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- Thank you for using our company's products.
- The Ezi-SERVO CC-Link IE TSN 4X is a stepping motor unit consisting of a driver equipped with a 32-bit high-performance ARM processor and various motors. It is used as a remote station on a CC-Link IE TSN network.
- The Ezi-SERVO CC-Link IE TSN 4X is an industrial product. Please do not use it for any other purpose. Our company shall not be liable for any damages incurred due to non-compliance with this instruction.
- This connection guide provided by our company explains how to connect the Ezi-SERVO CC-Link IE TSN 4X to Mitsubishi Electric's MELSEC iQ-F FX5-SSC-G. 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 FX5-SSC-G][Ezi-SERVO 4X] |               |

- The MELSEC iQ-F FX5-SSC-G manual can be downloaded from the Mitsubishi Electric website.

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

| Manual Name                                                                                         | Manual Number |
|-----------------------------------------------------------------------------------------------------|---------------|
| MELSEC iQ-F FX5 Motion Unit / Simple Motion Unit User's Manual (Startup Edition)                    | IB-0300250    |
| MELSEC iQ-F FX5 Motion Unit/Simple Motion Unit User's Manual (Application Edition)                  | IB-0300252    |
| MELSEC iQ-F FX5 Motion Unit/Simple Motion Unit User's Manual (Advanced Synchronous Control Edition) | IB-0300254    |
| MELSEC iQ-F FX5 Motion Unit User's Manual (CC-Link IE TSN Edition)                                  | IB-0300567    |
| 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 and transient transmission with all stations. The MELSEC iQ-F FX5 Motion Module 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.                                                                                                                                                      |

# Table of Contents

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## 1. Overview

- 1-1. Overview
- 1-2. Ezi-SERVO CC-Link IE TSN 4X CSP+ File Registration
- 1-3. CC-Link IE TSN Configuration
- 1-4. Setup Sequence
- 1-5. Restrictions

## 2. FX5-40SSC-G(S) Settings

- 2-1. Project Creation
- 2-2. Module Registration
- 2-3. Module Configuration – H/W
- 2-4. Parameter/Module Information/1[U1]:FX5-40SSC-G(S)
- 2-5. Simple Motion Module Setting
- 2-6. Convert
- 2-7. Write to PLC

## 3. Verify Operation

- 3-1. Program Development
- 3-2. Axis Monitoring
- 3-3. Axis Operation Verification

### [ Appendix ]

[Appendix 1] Homing Method

# 1. Overview

# 1-1. Overview

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- **MELSEC iQ-F FX5-SSC-G and Ezi-SERVO CC-Link IE TSN 4X Connection Guide**

- ◆ **Master station: FX5-40SSC-G(S) / FX5-80SSC-G(S)**

- ◆ **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>)

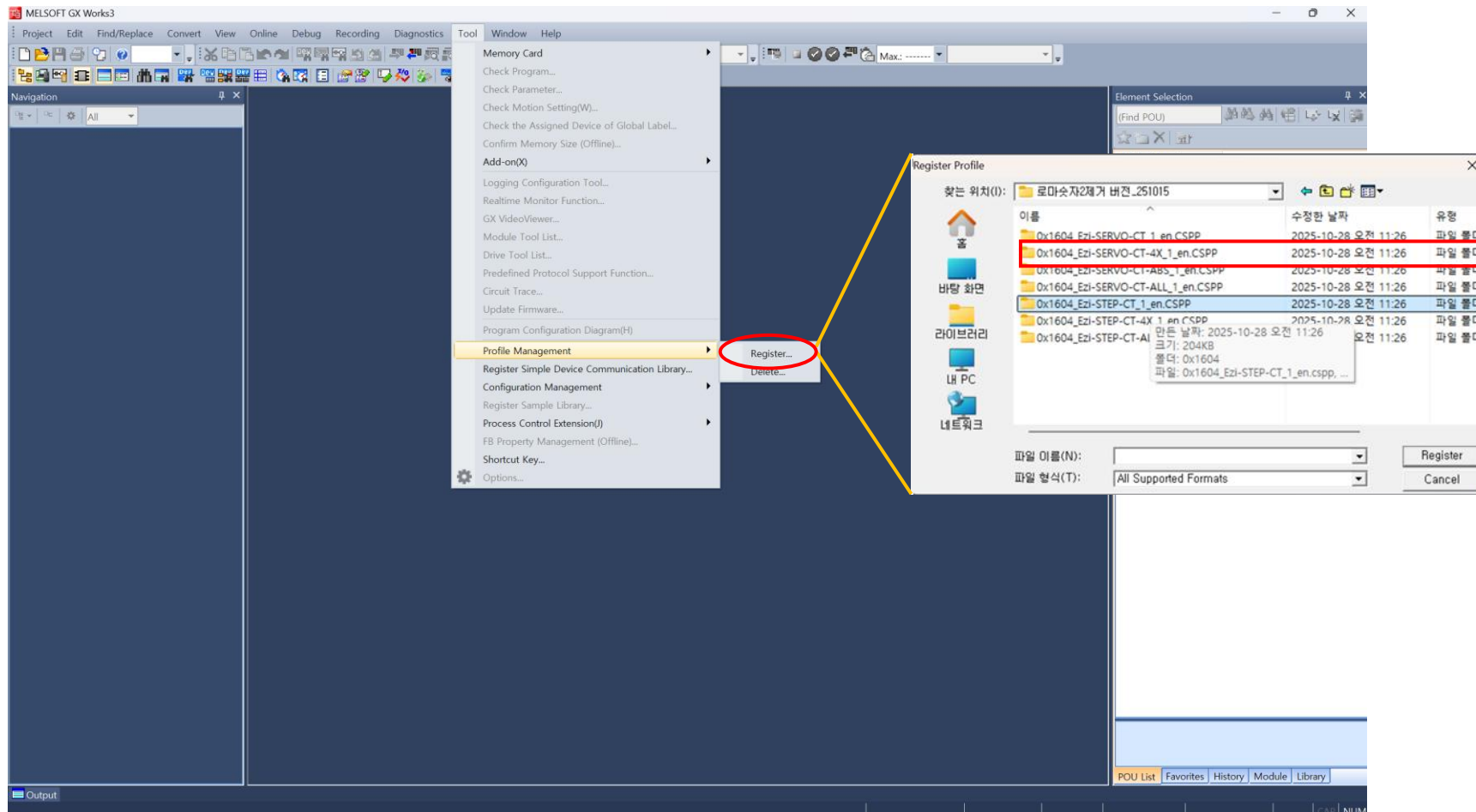
- ◆ **Remote station: Ezi-SERVO CC-Link IE TSN 4X**

- CSP+ File Download address: <https://cltsn.fastech-motions.com/en/download/quick>
  - File name: 0x1604\_Ezi-SERVO-CT-4X\_1\_en\_CSPP

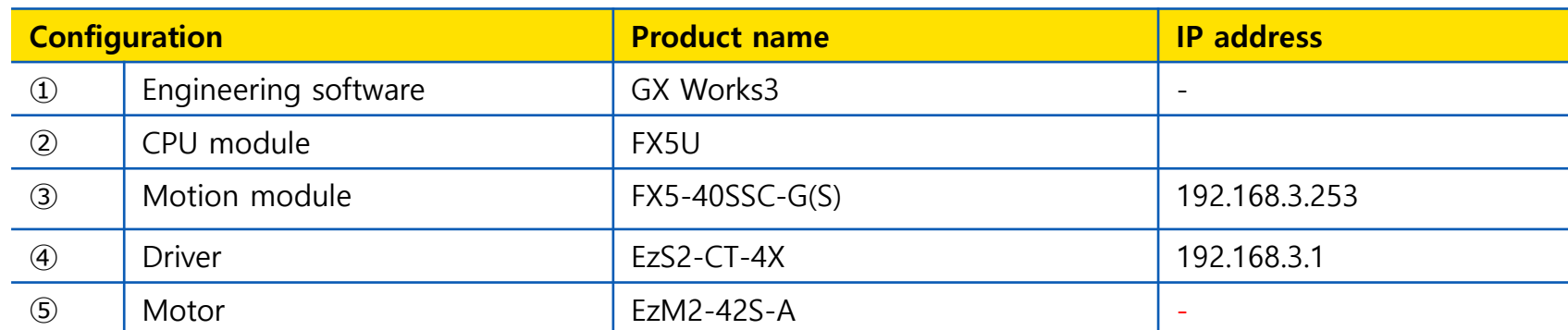
# 1-2. Ezi-SERVO CC-Link IE TSN 4X CSP+ File Registration

## ● CSP+ Registration

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



- **Network Connection**



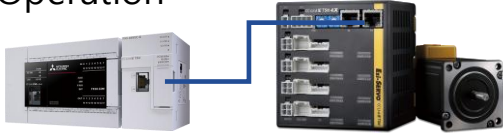
# 1-3. CC-Link IE TSN Configuration

- **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<br>ion method | Time synchronization method           | IEEE1588 / IEEE802.1AS                                                                                       |
|                            | Communication cycle                   | Minimum 250 $\mu$ s                                                                                          |
|                            | Network synchronization communication | Synchronous communication (CSP, PP, HM) / Asynchronous communication (PP, HM)                                |
| Encoder type               |                                       | Incremental type                                                                                             |

# 1-4. Setup Sequence

- Ezi-SERVO, FX5 Parameter Settings

| No. | Item                                                                                                                    | Description                                                                                                                                                                                                                                                                                                                |
|-----|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Ezi-SERVO Settings<br>                 | 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.<br>※ Address: <a href="https://cltsn.fastech-motions.com/en/download/quick">https://cltsn.fastech-motions.com/en/download/quick</a> |
| 2   | PLC FX5 CPU Configuration<br>          | Create a project for the FX5 CPU module using GX-Works3, then configure the unit parameters (communication method, connection target) and axis parameters (for motion control).                                                                                                                                            |
| 3   | Verify FX5 + Ezi-SERVO Operation<br> | Write a program to verify that the FX5 CPU module and Ezi-SERVO are configured correctly.<br>Manipulate labels to verify the motor operates normally.                                                                                                                                                                      |

# 1-4. Setup Sequence

## ● Ezi-SERVO Settings

| Item                         | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IP address setting           | <ul style="list-style-type: none"><li>① Set using the driver's rotary switch</li><li>② Rotary Switch → Setting value: '00', IP address (Index: 2101h, Subindex: 01~04h)</li></ul>                                                                                                                                                                                                                                                                                                                                                                                  |
| Driver homing method setting | <ul style="list-style-type: none"><li>① Homing method (Index: 6098h, Subindex:00h) setting<ul style="list-style-type: none"><li>- Set homing method: '0' (default) → '33', etc. ※ See [Appendix 1] Homing Method</li></ul></li><li>② Home offset (Index: 607Ch, Subindex:00h) → Set to '0'<br/>Caution) Setting a value other than 0 may cause rapid acceleration or deceleration upon homing completion.</li></ul>                                                                                                                                                |
| Limit stop method setting    | <ul style="list-style-type: none"><li>① Limit stop method (Index:2003h, Subindex:00h) setting<ul style="list-style-type: none"><li>- 0: PP, HM → Quick stop / CSP → No stop</li><li>- 1: PP, HM → Deceleration stop / CSP → Does not stop</li></ul></li><li>② Setting a value other than '0' or '1' may cause '1ED0H: Drive error' when detecting the hardware stroke limit.</li></ul>                                                                                                                                                                             |
| In-position range            | <ul style="list-style-type: none"><li>① In-position range (Index:2B21h, Subindex:00h, Data type:Unsigned32) setting<ul style="list-style-type: none"><li>- Register a value within the In-position range (5 to 20000 pulses) considering the operating environment</li></ul></li><li>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.</li></ul> |

# 1-5. Restrictions

## ● Motion Control Function Restrictions (FX5 and Ezi-SERVO)

| Item                                   | Restriction                                                                                                                                                                                                                                                                                                               |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Speed control                          | Speed control is unavailable because the driver does not support cyclic synchronous speed mode (CSV).                                                                                                                                                                                                                     |
| Torque control                         | Torque control is not available because the driver does not support cyclic synchronous torque mode (CST).                                                                                                                                                                                                                 |
| Continuous operation to torque control | Continuous operation to torque control is only supported by MELSERVO, so continuous operation to torque control is unavailable.                                                                                                                                                                                           |
| Advanced synchronous control           | You cannot set 'Synchronous encoder via servo amplifier' in [Pr.320: Synchronous encoder axis type].                                                                                                                                                                                                                      |
| Torque limit function                  | The driver does not support the following objects, so the Torque limit function cannot be used. <ul style="list-style-type: none"><li>• Positive torque limit value (Index:60E0h, Subindex:00h)</li><li>• Negative torque limit value (Index:60E1h, Subindex:00h)</li></ul>                                               |
| 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                | [Pr.800: Mark detection signal setting] Driver's TPR1 (Touch Probe 1) cannot be used.                                                                                                                                                                                                                                     |
| 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

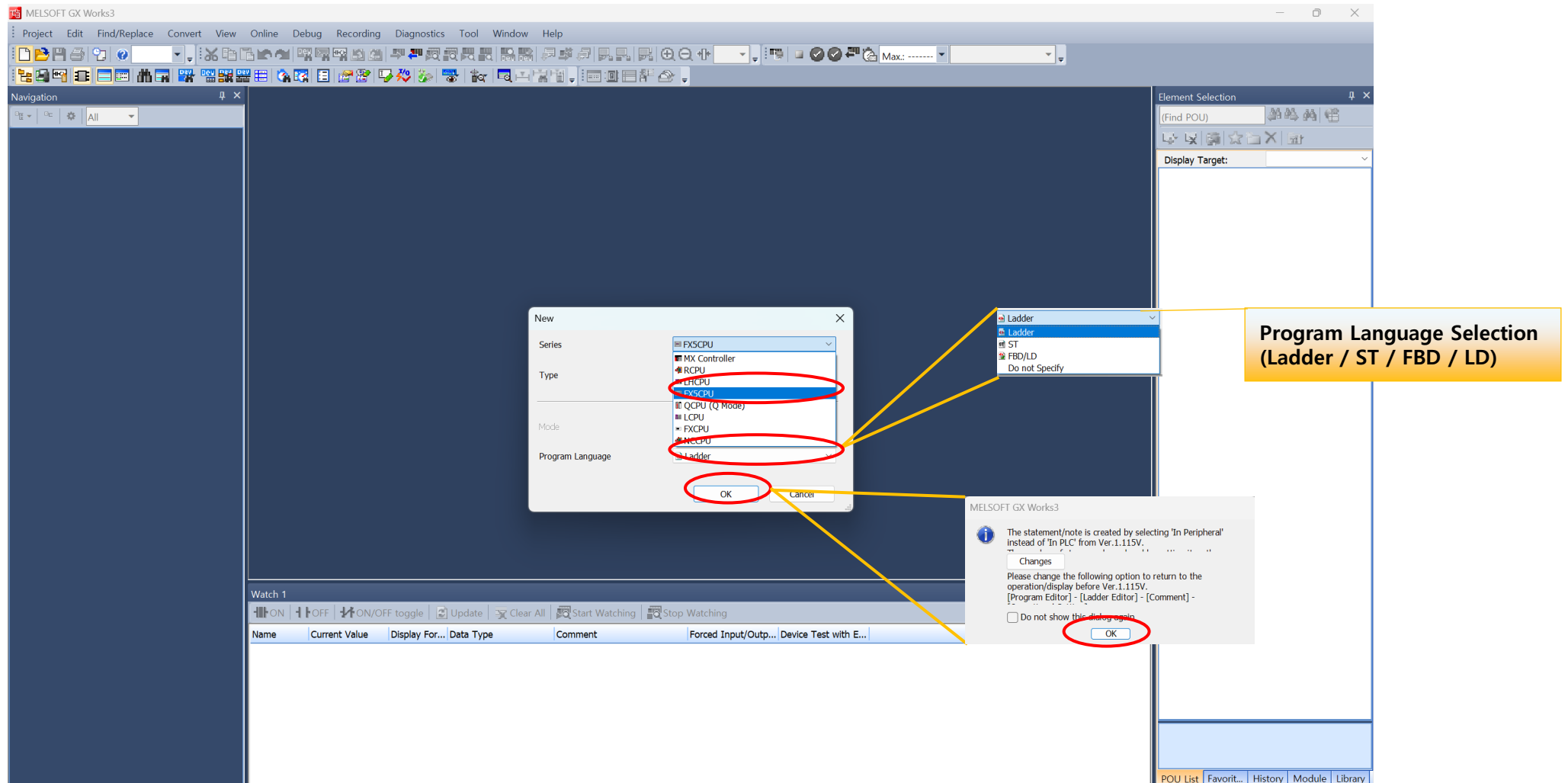
## ● Motion Control Function Restrictions (FX5 and Ezi-SERVO)

| 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 is always displayed as "0".                                                                                                                                                                                |
| Md.108: Servo status 1                           | The following bits in the monitor data are always in the 'OFF' state. <ul style="list-style-type: none"><li>· Gain switching (b4)</li><li>· Fully closed control switching (b5)</li><li>· Torque limit active (b13)</li><li>· Absolute position lost (b14)</li><li>· Servo warning (b15)</li></ul> |
| Md.119: Servo status 2                           | The following bits in the monitor data are always in the 'OFF' state. <ul style="list-style-type: none"><li>· Zero point pass (b0)</li><li>· Zero speed (b3)</li><li>· Speed limit active (b4)</li><li>· PID control active (b8)</li></ul>                                                         |
| 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. FX5-40SSC-G(S) Settings**

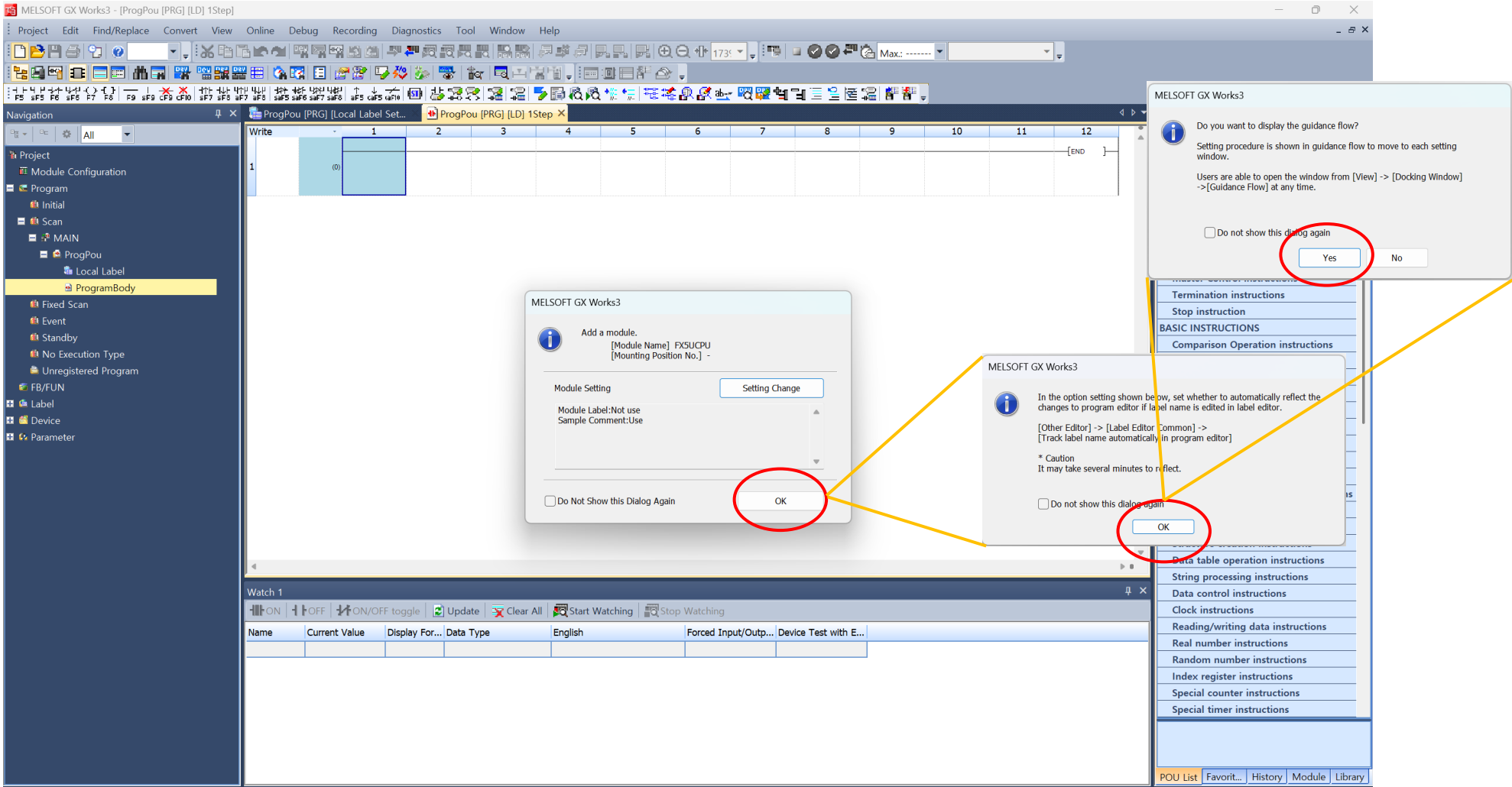
## 2-1. Project Creation

- When creating a new project, select iQ-F FX5, model name, number of axes used, and programming language



# 2-2. Module Registration

- FX5U CPU Registration



## 2-3. Module Configuration – H/W

- Click and drag with the mouse to install FX5-40SSC-G(S)

The screenshot displays the MELSOFT GX Works3 interface for Module Configuration. The main workspace shows a rack configuration with a CPU module (FX5U) and a slot for a new module. A yellow callout box with the number 1 points to the 'Module Configuration' tab in the left-hand Project tree. A yellow callout box with the number 2 points to the 'FX5-40SSC-G(S) 4 axes CC-Link IE TSN' module in the 'Element Selection' list on the right. A yellow arrow points from the selected module to the empty slot in the rack. A yellow callout box with the text '[Click & Drag] 1. FX5U CPU created. 2. FX5-40SSC-G(S)' is positioned near the rack. A dialog box in the bottom-left corner contains the 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.' with an 'OK' button circled in red.

**1**

**2**

[Click & Drag]  
1. FX5U CPU created.  
2. FX5-40SSC-G(S)

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

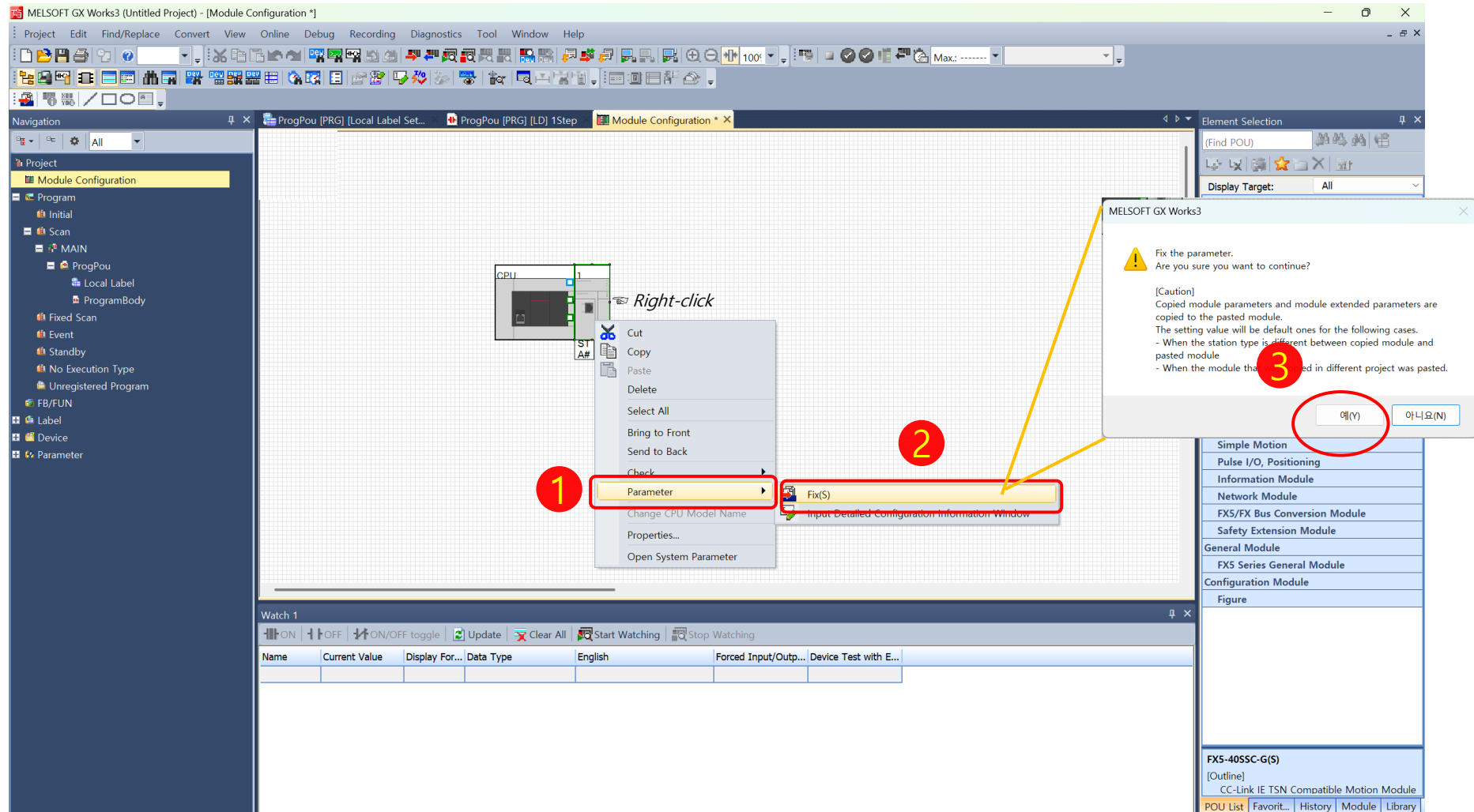
Watch 1

| Name | Current Value | Display For... | Data Type | English | Forced Input/Outp... | Device Test with E... |
|------|---------------|----------------|-----------|---------|----------------------|-----------------------|
|      |               |                |           |         |                      |                       |

FX5-40SSC-G(S)  
[Outline]  
CC-Link IE TSN Compatible Motion Module  
POU List | Favorit... | History | Module | Library

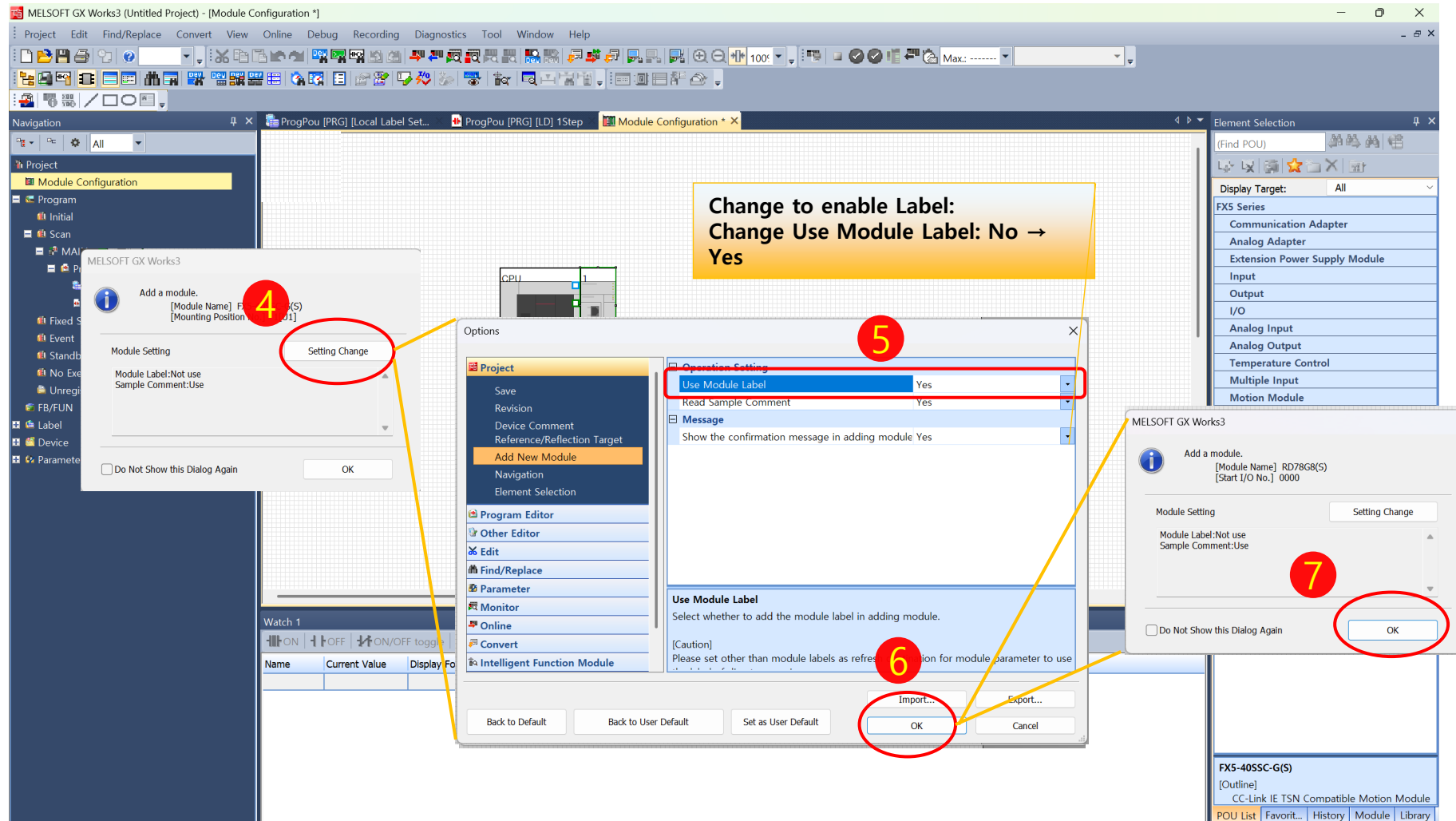
## 2-3. Module Configuration – H/W

- Right-click the mouse and select Fix(S) to complete Module configuration (1/2)



## 2-3. Module Configuration – H/W

- Right-click the mouse and select Fix(S) to complete module configuration (2/2)



## 2-4. Parameter / Module Information / 1[U1]:FX5-40SSC-G(S)

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

**1** Module Information / 1[U1]:FX5-40SSC-G(S)

**2** Network Station No.: 1

**3** IP Address: 192.168.3.253  
Subnet Mask: 255.255.255.0  
※ Note: Ezi-SERVO Default IP is 192.168.3.xxx

**Apply**

**Explanation**  
Set to determine how many bits of the IP address are used as the network address, which is used to identify the network.  
Masked bit has been specified from top between the top bit and bit 2.  
For example, set '255.255.255.0 (FF.FF.FF.0)' to assign the upper 24 bits of IP address to the subnet mask.

**[Setting range]**  
- Empty  
- 0.0.0.1 to 255.255.255.255 (00.00.00.01 to FF.FF.FF.FF)

| Name | Current Value | Display For... | Data Type | English | Forced Input/Outp... | Device Test with E... |
|------|---------------|----------------|-----------|---------|----------------------|-----------------------|
|      |               |                |           |         |                      |                       |

POU List | Favorit... | History | Module | Library

## 2-4. Parameter / Module Information / 1[U1]:FX5-40SSC-G(S)

### ● Network Configuration Settings

The screenshot displays the MELSOFT GX Works3 interface for configuring a 1[U1]:FX5-40SSC-G(S) module. The interface is divided into several panes:

- Project Tree (Left):** Shows the project structure. The 'Module Information' section is expanded, and the '1[U1]:FX5-40SSC-G(S)' module is selected (indicated by a red circle 1).
- Setting Item List (Center):** Lists the available settings for the selected module. 'Network Configuration Settings' is highlighted (indicated by a red circle 2).
- Configuration Window (Right):** The 'CC-Link IE TSN Configuration' window is open. The '<Detailed Setting>' button is highlighted (indicated by a red circle 3 and an arrow). The window shows the 'CC-Link IE TSN Configuration' for 'Mounting Position No.: 1[U1]'. It includes a table for station settings and a 'Module List' on the right.

The 'Module List' on the right side of the configuration window includes the following items:

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

The bottom of the window shows a 'Watch' section with a table for monitoring the module's status.

| Name | Current Value | Display For... | Data Type | English | Forced Input/Outp... | Device Test with E... |
|------|---------------|----------------|-----------|---------|----------------------|-----------------------|
|      |               |                |           |         |                      |                       |

## 2-4. Parameter / Module Information / 1[U1]:FX5-40SSC-G(S)

- Configure the CC-Link IE TSN Module **manually (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-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  |             |                 |

**[Modify Ezi-SERVO CC-Link IE TSN 4X IP Address]**

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)

**2**

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

Host Station

STA#0 Master Station

STA#1 STA#2 STA#3 STA#4

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

Network Label

Output

Error Warning Information

- **CC-Link IE TSN Module selected for Motion Control Station and Synchronous**



## 2-4. Parameter / Module Information / 1[U1]:FX5-40SSC-G(S)

- PDO Mapping Settings are automatically assigned and configured as follows.

### ■ TPDO

| Index | Sub index | Data Type | Content                      |
|-------|-----------|-----------|------------------------------|
| 1D02  | 01        | U16       | Watchdog counter UL 1        |
| 6061  | 00        | I8        | Modes of operation display   |
| 0000  | 00        | U8        | GAP                          |
| 6064  | 00        | I32       | Position Actual Value        |
| 60F4  | 00        | I32       | Following error actual value |
| 6041  | 00        | U16       | Status word                  |
| 2B12  | 00        | U16       | Status DO 1                  |
| 603F  | 00        | U16       | Error code                   |
| 60FD  | 00        | U32       | Digital inputs               |
| 0000  | 00        | U32       | GAP                          |
| 0000  | 00        | U32       | GAP                          |

### ■ RPDO

| Index | Sub index | Data Type | Content               |
|-------|-----------|-----------|-----------------------|
| 1D01  | 01        | U16       | Watchdog counter DL 1 |
| 6060  | 00        | I8        | Modes of operation    |
| 0000  | 00        | U8        | GAP                   |
| 607A  | 00        | I32       | Target position       |
| 6040  | 00        | U16       | Controlword           |
| 2B02  | 00        | U16       | Control DI 5          |
| 0000  | 00        | U32       | GAP                   |
| 0000  | 00        | U32       | GAP                   |
| 0000  | 00        | U32       | GAP                   |
| 0000  | 00        | U32       | GAP                   |

# 2-4. Parameter / Module Information / 1[U1]:FX5-40SSC-G(S)

- Select CC-Link IE TSN 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

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method:

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

Changes take effect immediately upon clicking

Module List

- CC-Link IE TSN Selection Find Module My
- 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.)
- 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

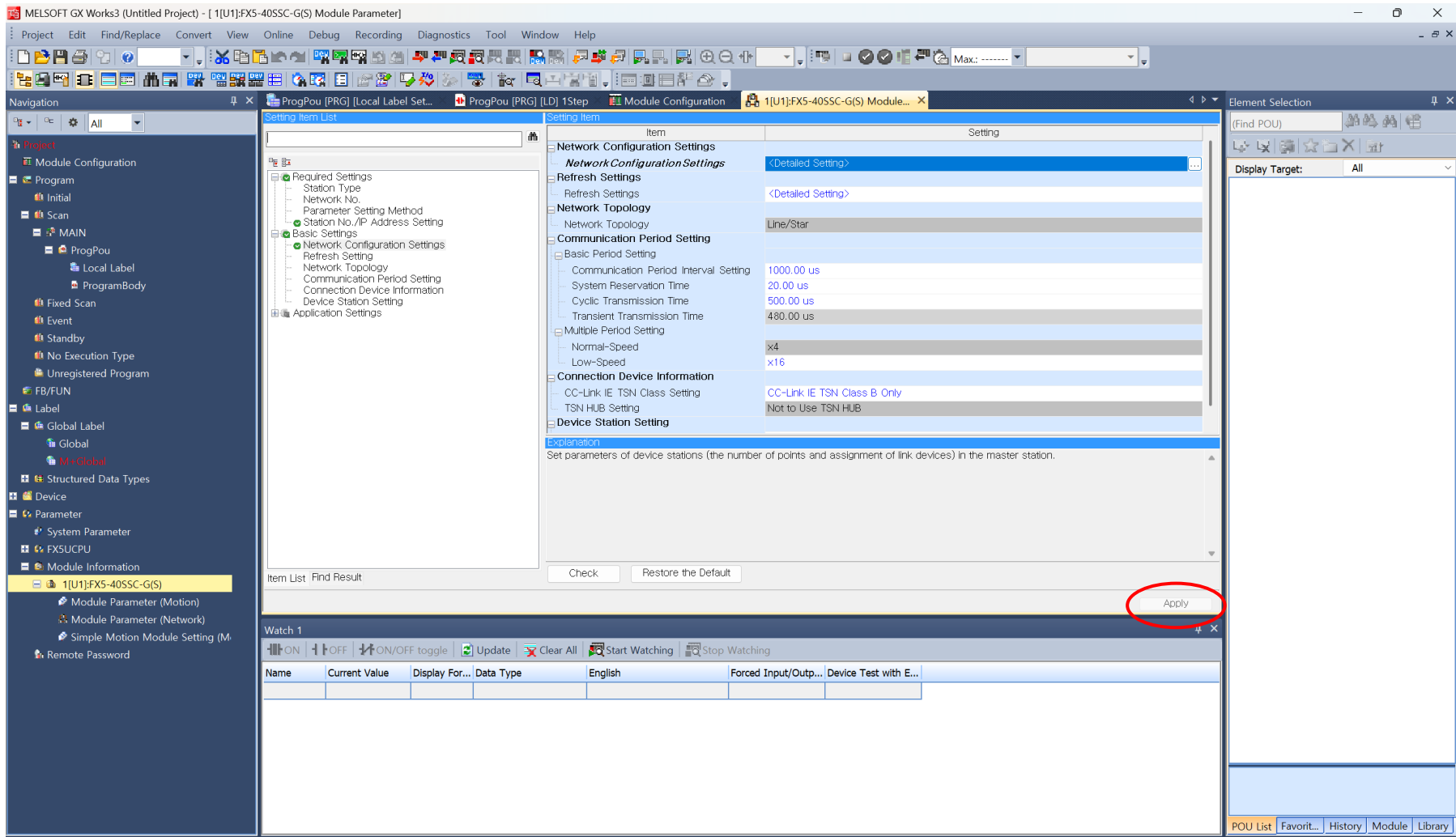
[Outline]  
Step Drive  
[Specification]  
Closed-Loop Step Drive  
Motor: Max. NEMA 24  
Mode: Homing, CSP, FP  
CC-Link IE TSN Class B  
[Manufacturer Name]  
FASTECH Co. Ltd.  
[Station Type]  
Remote Station

Network Label

Output  
Error Warning Information

# 2-4. Parameter / Module Information / 1[U1]:FX5-40SSC-G(S)

- Applying Network Configuration Settings



## 2-4. Parameter / Module Information / 1[U1]:FX5-40SSC-G(S)

- Running the Simple Motion Module Setting Program

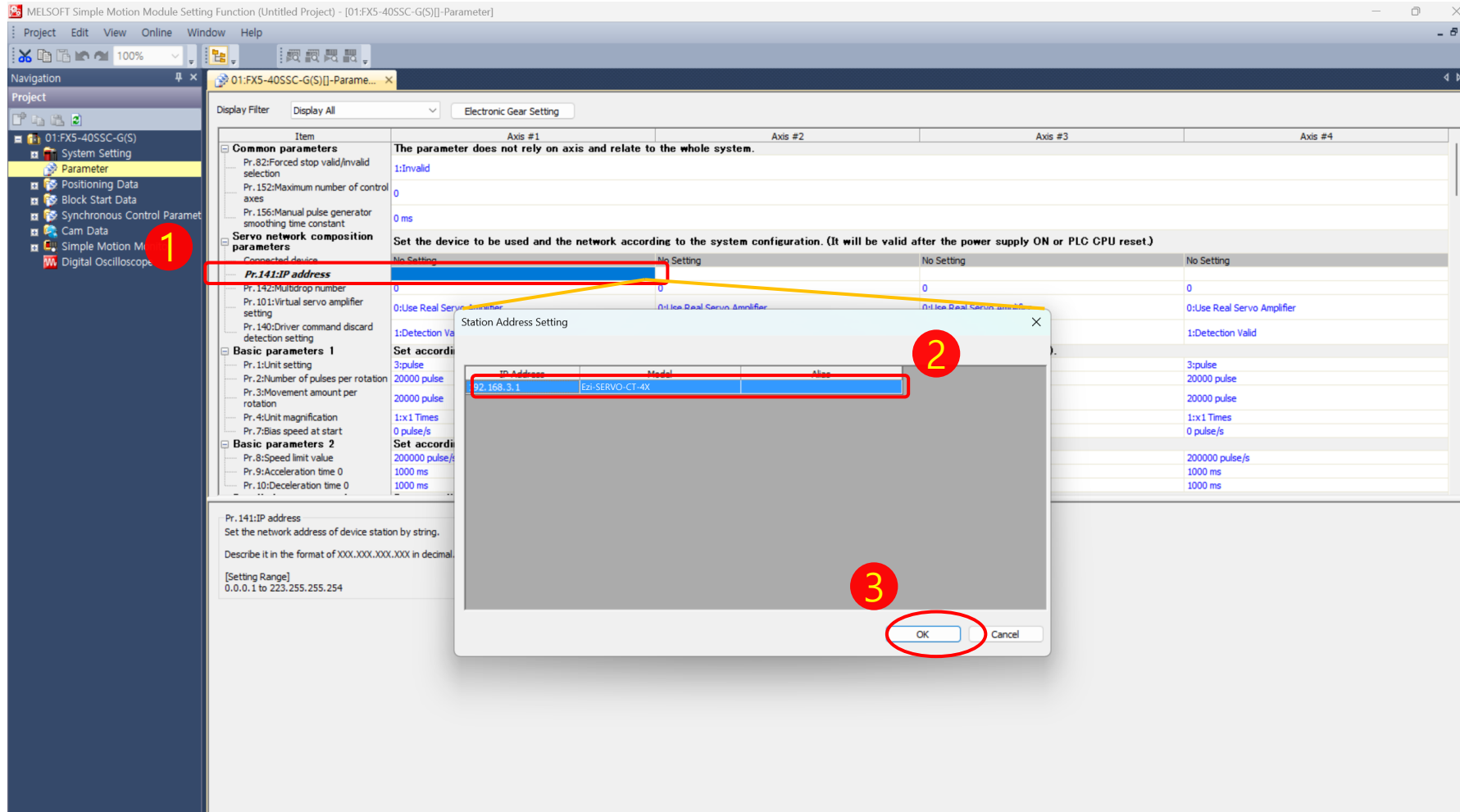
1

The screenshot displays the MELSOFT GX Works3 software interface. The left sidebar shows the project tree with the 'Simple Motion Module Setting (M)' option highlighted under the 'Parameter' folder. The main window shows the 'Simple Motion Module Setting Function' dialog box. The 'Display Filter' is set to 'Electronic Gear Setting'. The 'Common parameters' section includes 'Pr. 82: Forced stop valid/invalid selection' (set to 1: Invalid) and 'Pr. 152: Maximum number of control axes' (set to 0). The 'Servo network composition parameters' section includes 'Connected device' (No Setting), 'Pr. 141: IP address' (0), 'Pr. 142: Multidrop number' (0), and 'Pr. 101: Virtual servo amplifier' (0: Use Real Servo Amplifier). The 'Basic parameters 1' section includes 'Set according to the machine and applicable motor when system is started up (It will be valid according to PLC ready signal)'.

| Item                                                    | Axis #1                                                                                                                                         | Axis #2                     | Axis #3                     | Axis #4                     |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|
| <b>Common parameters</b>                                | The parameter does not rely on axis and relate to the whole system.                                                                             |                             |                             |                             |
| Pr. 82: Forced stop valid/invalid selection             | 1: Invalid                                                                                                                                      |                             |                             |                             |
| Pr. 152: Maximum number of control axes                 | 0                                                                                                                                               |                             |                             |                             |
| Pr. 156: Manual pulse generator smoothing time constant | 0 ms                                                                                                                                            |                             |                             |                             |
| <b>Servo network composition parameters</b>             | Set the device to be used and the network according to the system configuration. (It will be valid after the power supply ON or PLC CPU reset.) |                             |                             |                             |
| Connected device                                        | No Setting                                                                                                                                      | No Setting                  | No Setting                  | No Setting                  |
| Pr. 141: IP address                                     | 0                                                                                                                                               | 0                           | 0                           | 0                           |
| Pr. 142: Multidrop number                               | 0: Use Real Servo Amplifier                                                                                                                     | 0: Use Real Servo Amplifier | 0: Use Real Servo Amplifier | 0: Use Real Servo Amplifier |
| Pr. 101: Virtual servo amplifier                        | 0: Use Real Servo Amplifier                                                                                                                     | 0: Use Real Servo Amplifier | 0: Use Real Servo Amplifier | 0: Use Real Servo Amplifier |
| <b>Basic parameters 1</b>                               | Set according to the machine and applicable motor when system is started up (It will be valid according to PLC ready signal).                   |                             |                             |                             |

## 2-5. Simple Motion Module Setting

- Parameter / Servo network composition parameters / Pr.141: IP address setting



## 2-5. Simple Motion Module Setting

- Parameter / Basic parameters 1 / Pr.7: Bias speed at start(500pulse/s) Setting

MELSOFT Simple Motion Module Setting Function (Untitled Project) - [01:FX5-40SSC-G(S)]-Parameter

Navigation: Project, Edit, View, Online, Window, Help

Project: 01:FX5-40SSC-G(S) > System Setting > Parameter

Display Filter: Display All | Electronic Gear Setting

| Item                                  | Axis #1                                                                                                                       | Axis #2                                                 | Axis #3                                                 | Axis #4                                                 |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|
| Pr. 141:IP address                    | 192.168.3.1                                                                                                                   |                                                         |                                                         |                                                         |
| Pr. 142:Multidrop number              | 0                                                                                                                             | 0                                                       | 0                                                       | 0                                                       |
| Pr. 101:Virtual servo amplifier se... | 0:Use Real Servo Amplifier                                                                                                    | 0:Use Real Servo Amplifier                              | 0:Use Real Servo Amplifier                              | 0:Use Real Servo Amplifier                              |
| Pr. 140:Driver command discard ...    | 1:Detection Valid                                                                                                             | 1:Detection Valid                                       | 1:Detection Valid                                       | 1:Detection Valid                                       |
| Pr. 143:Driver communication set...   | 0:Driver Communication Invalid                                                                                                | 0:Driver Communication Invalid                          | 0:Driver Communication Invalid                          | 0:Driver Communication Invalid                          |
| <b>Basic parameters 1</b>             | Set according to the machine and applicable motor when system is started up (It will be valid according to PLC ready signal). |                                                         |                                                         |                                                         |
| Pr. 1:Unit setting                    | 3:pulse                                                                                                                       | 3:pulse                                                 | 3:pulse                                                 | 3:pulse                                                 |
| Pr. 2:Number of pulses                | 20000 pulse                                                                                                                   | 20000 pulse                                             | 20000 pulse                                             | 20000 pulse                                             |
| Pr. 3:Movement amount                 | 20000 pulse                                                                                                                   | 20000 pulse                                             | 20000 pulse                                             | 20000 pulse                                             |
| Pr. 4:Unit magnification              | 1:x1 Times                                                                                                                    | 1:x1 Times                                              | 1:x1 Times                                              | 1:x1 Times                                              |
| <b>Pr. 7: Bias speed at start</b>     | 500 pulse/s                                                                                                                   | 0 pulse/s                                               | 0 pulse/s                                               | 0 pulse/s                                               |
| <b>Basic parameters 2</b>             | Set according to the machine and applicable motor when system is started up.                                                  |                                                         |                                                         |                                                         |
| Pr. 8:Speed limit value               | 200000 pulse/s                                                                                                                | 200000 pulse/s                                          | 200000 pulse/s                                          | 200000 pulse/s                                          |
| Pr. 9:Acceleration time 0             | 1000 ms                                                                                                                       | 1000 ms                                                 | 1000 ms                                                 | 1000 ms                                                 |
| Pr. 10:Deceleration time 0            | 1000 ms                                                                                                                       | 1000 ms                                                 | 1000 ms                                                 | 1000 ms                                                 |
| <b>Detailed parameters 1</b>          | Set according to the system configuration when the system is started up.(It will be valid according to PLC ready signal).     |                                                         |                                                         |                                                         |
| Pr. 11:Backlash compensation a...     | 0 pulse                                                                                                                       | 0 pulse                                                 | 0 pulse                                                 | 0 pulse                                                 |
| Pr. 12:Software stroke limituppe...   | 2147483647 pulse                                                                                                              | 2147483647 pulse                                        | 2147483647 pulse                                        | 2147483647 pulse                                        |
| Pr. 13:Software stroke limit lowe...  | -2147483648 pulse                                                                                                             | -2147483648 pulse                                       | -2147483648 pulse                                       | -2147483648 pulse                                       |
| Pr. 14:Software stroke limit selec... | 0:Apply Software Stroke Limit on Command Position Value                                                                       | 0:Apply Software Stroke Limit on Command Position Value | 0:Apply Software Stroke Limit on Command Position Value | 0:Apply Software Stroke Limit on Command Position Value |
| Pr. 15:Software stroke limit valid... | 0:Valid                                                                                                                       | 0:Valid                                                 | 0:Valid                                                 | 0:Valid                                                 |
| Pr. 16:Command in-position width      | 100 pulse                                                                                                                     | 100 pulse                                               | 100 pulse                                               | 100 pulse                                               |
| Pr. 17:Torque limit setting value     | 300.0 %                                                                                                                       | 300.0 %                                                 | 300.0 %                                                 | 300.0 %                                                 |
| Pr. 18:M-code ON signal output t...   | 0:WITH Mode                                                                                                                   | 0:WITH Mode                                             | 0:WITH Mode                                             | 0:WITH Mode                                             |

**Pr. 7: Bias speed at start**  
In "Bias speed at start", "Minimum speed at start" will be set.  
Set the speed to start the motor smoothly in using stepping motor or like. (A stepping motor will not start smoothly if a low rotation speed is instructed at the beginning.)  
Setting bias speed at start will be valid in the operation below.  
- At positioning operation  
- At HPR  
- At JOG operation  
Please set value less than speed limit value.

Setting Range  
0 to 200000 pulse/s

**Bias speed at start: 500pulse/s**  
※ Settings may be adjusted based on the encoder specifications installed on the motor.

## 2-5. Simple Motion Module Setting

- Parameter / HPR parameters / Pr.46:HPR speed (500 pulses/s) setting

MELSOFT Simple Motion Module Setting Function (Untitled Project) - [01:FX5-40SSC-G(S)]-Parameter

Navigation: Project, Edit, View, Online, Window, Help

Project: 01:FX5-40SSC-G(S), System Setting, Parameter, Positioning Data, Block Start Data, Synchronous Control Parameter, Cam Data, Simple Motion Monitor, Digital Oscilloscope

Display Filter: Display All, Electronic Gear Setting

| Item                                   | Axis #1                                                                                                                              | Axis #2                                                      | Axis #3                                                      | Axis #4                                                      |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|
| Pr.41:Allowable circular interpol...   | 100 pulse                                                                                                                            | 100 pulse                                                    | 100 pulse                                                    | 100 pulse                                                    |
| Pr.42:External command functio...      | 0:External Positioning Start                                                                                                         | 0:External Positioning Start                                 | 0:External Positioning Start                                 | 0:External Positioning Start                                 |
| Pr.83:Speed control 10x multipl...     | 0:Invalid                                                                                                                            | 0:Invalid                                                    | 0:Invalid                                                    | 0:Invalid                                                    |
| Pr.84:Restart allowable range w...     | 0 pulse                                                                                                                              | 0 pulse                                                      | 0 pulse                                                      | 0 pulse                                                      |
| Pr.90:Operation setting for SPD...     | 0:Command Torque                                                                                                                     | 0:Command Torque                                             | 0:Command Torque                                             | 0:Command Torque                                             |
| Pr.90:Operation setting for SPD...     | 0:Command Speed                                                                                                                      | 0:Command Speed                                              | 0:Command Speed                                              | 0:Command Speed                                              |
| Pr.90:Operation setting for SPD...     | 0:Check the Switching Conditions on the Simple Motion Module                                                                         | 0:Check the Switching Conditions on the Simple Motion Module | 0:Check the Switching Conditions on the Simple Motion Module | 0:Check the Switching Conditions on the Simple Motion Module |
| Pr.127:Speed limit value input s...    | 0:Input Enable                                                                                                                       | 0:Input Enable                                               | 0:Input Enable                                               | 0:Input Enable                                               |
| Pr.95:External command signal s...     | 0:Not Used                                                                                                                           | 0:Not Used                                                   | 0:Not Used                                                   | 0:Not Used                                                   |
| Pr.112:Servo OFF command val...        | 0:Servo OFF Command Invalid                                                                                                          | 0:Servo OFF Command Invalid                                  | 0:Servo OFF Command Invalid                                  | 0:Servo OFF Command Invalid                                  |
| Pr.122:Manual pulse generator ...      | 0:Do Not Execute Speed Limit                                                                                                         | 0:Do Not Execute Speed Limit                                 | 0:Do Not Execute Speed Limit                                 | 0:Do Not Execute Speed Limit                                 |
| Pr.123:Manual pulse generator ...      | 20000 pulse/s                                                                                                                        | 20000 pulse/s                                                | 20000 pulse/s                                                | 20000 pulse/s                                                |
| <b>HPR parameters</b>                  | Set the parameters required for HPR, which are not set on the driver (servo amplifier) side (Valid when the PLC ready signal is ON). |                                                              |                                                              |                                                              |
| Pr.44:HPR direction                    | 0:Forward Direction (Address Increase Direction)                                                                                     | 0:Forward Direction (Address Increase Direction)             | 0:Forward Direction (Address Increase Direction)             | 0:Forward Direction (Address Increase Direction)             |
| Pr.45:HP address                       | 0 pulse                                                                                                                              | 0 pulse                                                      | 0 pulse                                                      | 0 pulse                                                      |
| <b>Pr.46:HPR speed</b>                 | 500 pulse/s                                                                                                                          | 1 pulse/s                                                    | 1 pulse/s                                                    | 1 pulse/s                                                    |
| Pr.51:HPR acceleration time sele...    | 0:1000                                                                                                                               | 0:1000                                                       | 0:1000                                                       | 0:1000                                                       |
| Pr.52:HPR deceleration time sel...     | 0:1000                                                                                                                               | 0:1000                                                       | 0:1000                                                       | 0:1000                                                       |
| Pr.55:Operation setting for inco...    | 0:Positioning Control is Not Executed                                                                                                | 0:Positioning Control is Not Executed                        | 0:Positioning Control is Not Executed                        | 0:Positioning Control is Not Executed                        |
| <b>External input signal assign...</b> | Set the link device to assign external input signal.                                                                                 |                                                              |                                                              |                                                              |
| <b>Forced stop signal</b>              | Set the link device to assign forced stop signal.                                                                                    |                                                              |                                                              |                                                              |
| Pr.900:Type                            | 00h:Invalid                                                                                                                          |                                                              |                                                              |                                                              |
| Pr.901:Start No.                       | H0000                                                                                                                                |                                                              |                                                              |                                                              |
| Pr.902:Bit specification               | H0                                                                                                                                   |                                                              |                                                              |                                                              |

Pr.46:HPR speed  
Set the speed at high-speed home position return.  
The speed at machine home position return depends on the servo amplifier setting.

Setting Range  
1 to 200000 pulse/s

HPR speed: 500pulse/s

※ If the HPR speed (Pr.46) value is greater than the Bias speed (Pr.7) value, (1C15H: Homing Speed Error) will occur.

## 2-5. Simple Motion Module Setting

- Parameter / Basic parameters 1 / Number of pulses per rotation

The screenshot displays the MELSOFT Simple Motion Module Setting Function (Untitled Project) - [01:FX5-40SSC-G(S)]-Parameter window. The left sidebar shows the project structure, with 'Parameter' selected under 'System Setting'. The main window shows the 'Electronic Gear Setting' for Axis #1. The 'Basic parameters 1' section is expanded, and 'Pr.2: Number of pulses per rotation' is highlighted with a red circle and the number 1. The 'Electronic Gear Setting - Axis #1' dialog box is open, showing the 'Entry' tab. The 'Machine Components' dropdown is set to 'Others'. The 'Unit Setting' is '3:pulse'. The 'Movement Amount per Load Rotation (dSL)' is set to '10000 [pulse]' with a red circle and the number 2. The 'Encoder Resolution' is set to '10000 [pulse]' with a red circle and the number 3. The 'Calculate Electronic Gear' button is circled in red with a red circle and the number 4. The 'Calculation Result' dialog box is shown at the bottom, with the 'OK' button circled in red with a red circle and the number 5. A yellow callout box on the right contains the following text:

- ✓ Movement Amount per Load Rotation (dSL): 10,000pulse
- ✓ Encoder Resolution: 10,000 pulses

## 2-5. Simple Motion Module Setting

- Parameter / HPR parameters / Pr.46:HPR speed (500 pulses/s) setting

Pr.2: Number of pulses per rotation

Set the number of pulses required for a complete rotation of the motor shaft.

Set it taking the electronic gear of the servo amplifier into consideration.

Number of pulses per rotation (AP) = Encoder resolution x Electronic gear denominator / Electronic gear numerator

When the encoder resolution is 67108864 pulses, the electronic gear (numerator / denominator) of the servo amplifier is rewritten with 16/1 inside RD78G(S).

Therefore, set the number of pulses per rotation (AP) as 4194304 pulses in such a case.

"Electronic gear function" coordinates the output pulses calculated from the values set as the pulses per rotation and the movement amount per rotation with the actual movement amount of a machine.

Using the electronic gear setting allows users to configure the electronic gear easily.

Setting Range

1 to 2000000000 pulse

Electronic Gear Setting - Axis #1

Entry

Select the machine components, and enter the machine data to automatically set the basic parameters 1 (unit setting, number of pulses per rotation, movement amount per rotation and unit magnification).

Machine Components: Others

Unit Setting: 3:pulse

Movement Amount per Load Rotation (dSL): 10000 [pulse]

Reduction Ratio (NL/NM): 1 / 1

Encoder Resolution: 10000 [pulse/rev]

Setting Range: 1 to 2000000000 pulse

Calculate Electronic Gear

Calculation Result

\* Basic Parameters 1

| Unit Setting                  | 3:pulse     |
|-------------------------------|-------------|
| Number of Pulses per Rotation | 10000 pulse |
| Movement Amount per Rotation  | 10000 pulse |
| Unit Magnification            | 1x1 Times   |

Movement Amount per Pulse: 0 [pulse]

As a result of calculation, no error occurs in the movement amount.

Applying the calculation result above,

you want to perform is about 0 [pulse] the error for the movement amount 0 [pulse] Error Calculation

Click OK to reflect to the basic parameters 1.

OK Cancel

※ If the HPR speed (Pr.46) value is greater than the Bias speed (Pr.7) value, (1C15H: Homing Speed Error) will occur.

## 2-5. Simple Motion Module Setting

- Parameter / Basic parameters 2 / Speed limit value, Acceleration time 0, Deceleration time 0

MELSOFT Simple Motion Module Setting Function (Untitled Project) - [01:FX5-40SSC-G(S)]-Parameter

Navigation: Project, Edit, View, Online, Window, Help

Project: 01:FX5-40SSC-G(S) > System Setting > Parameter

Display Filter: Display All | Electronic Gear Setting

| Item                                                                                                                                                                                           | Axis #1                                                  | Axis #2                                                  | Axis #3                                                  | Axis #4                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| <b>Common parameters</b><br>The parameter does not rely on axis and relate to the whole system.                                                                                                |                                                          |                                                          |                                                          |                                                          |
| Pr. 82: Forced stop valid/invalid selection                                                                                                                                                    | 1: Invalid                                               |                                                          |                                                          |                                                          |
| Pr. 152: Maximum number of control axes                                                                                                                                                        | 0                                                        |                                                          |                                                          |                                                          |
| Pr. 156: Manual pulse generator smoothing time constant                                                                                                                                        | 0 ms                                                     |                                                          |                                                          |                                                          |
| <b>Servo network composition parameters</b><br>Set the device to be used and the network according to the system configuration. (It will be valid after the power supply ON or PLC CPU reset.) |                                                          |                                                          |                                                          |                                                          |
| Connected device                                                                                                                                                                               | Ezi-SERVO-CT                                             | Ezi-SERVO-CT                                             |                                                          |                                                          |
| Pr. 141: IP address                                                                                                                                                                            | 192.168.3.1                                              | 192.168.3.50                                             |                                                          |                                                          |
| Pr. 142: Multidrop number                                                                                                                                                                      | 0                                                        | 0                                                        |                                                          |                                                          |
| Pr. 101: Virtual servo amplifier setting                                                                                                                                                       | 0: Use Real Servo Amplifier                              | 0: Use Real Servo Amplifier                              |                                                          |                                                          |
| Pr. 140: Driver command discard detection setting                                                                                                                                              | 1: Detection Valid                                       | 1: Detection Valid                                       |                                                          |                                                          |
| Pr. 143: Driver communication setting                                                                                                                                                          | 0: Driver Communication Invalid                          | 0: Driver Communication Invalid                          |                                                          |                                                          |
| <b>Basic parameters 1</b><br>Set according to the machine and applicable motor when system is started up.                                                                                      |                                                          |                                                          |                                                          |                                                          |
| Pr. 1: Unit setting                                                                                                                                                                            | 3: pulse                                                 | 3: pulse                                                 |                                                          |                                                          |
| Pr. 2: Number of pulses per rotation                                                                                                                                                           | 10000 pulse                                              | 20000 pulse                                              |                                                          |                                                          |
| Pr. 3: Movement amount per rotation                                                                                                                                                            | 10000 pulse                                              | 20000 pulse                                              |                                                          |                                                          |
| Pr. 4: Unit magnification                                                                                                                                                                      | 1: 1 Times                                               | 1: 1 Times                                               |                                                          |                                                          |
| Pr. 7: Bias speed at start                                                                                                                                                                     | 500 pulse/s                                              | 500 pulse/s                                              |                                                          |                                                          |
| <b>Basic parameters 2</b><br>Set according to the machine and applicable motor when system is started up.                                                                                      |                                                          |                                                          |                                                          |                                                          |
| Pr. 8: Speed limit value                                                                                                                                                                       | 500000 pulse/s                                           | 20000 pulse/s                                            | 200000 pulse/s                                           | 200000 pulse/s                                           |
| Pr. 9: Acceleration time 0                                                                                                                                                                     | 200 ms                                                   | 1000 ms                                                  | 1000 ms                                                  | 1000 ms                                                  |
| Pr. 10: Deceleration time 0                                                                                                                                                                    | 200 ms                                                   | 1000 ms                                                  | 1000 ms                                                  | 1000 ms                                                  |
| <b>Detained parameters 1</b><br>Set according to the system configuration when the system is started up. (It will be valid according to PLC ready signal)                                      |                                                          |                                                          |                                                          |                                                          |
| Pr. 11: Backlash compensation amount                                                                                                                                                           | 0 pulse                                                  | 0 pulse                                                  | 0 pulse                                                  | 0 pulse                                                  |
| Pr. 12: Software stroke limit upper limit value                                                                                                                                                | 2147483647 pulse                                         | 2147483647 pulse                                         | 2147483647 pulse                                         | 2147483647 pulse                                         |
| Pr. 13: Software stroke limit lower limit value                                                                                                                                                | -2147483648 pulse                                        | -2147483648 pulse                                        | -2147483648 pulse                                        | -2147483648 pulse                                        |
| Pr. 14: Software stroke limit selection                                                                                                                                                        | 0: Apply Software Stroke Limit on Command Position Value | 0: Apply Software Stroke Limit on Command Position Value | 0: Apply Software Stroke Limit on Command Position Value | 0: Apply Software Stroke Limit on Command Position Value |
| Pr. 15: Software stroke limit valid/invalid setting                                                                                                                                            | 0: Valid                                                 | 0: Valid                                                 | 0: Valid                                                 | 0: Valid                                                 |
| Pr. 16: Command in-position width                                                                                                                                                              | 100 pulse                                                | 100 pulse                                                | 100 pulse                                                | 100 pulse                                                |
| Pr. 17: Torque limit setting value                                                                                                                                                             | 300.0 %                                                  | 300.0 %                                                  | 300.0 %                                                  | 300.0 %                                                  |
| Pr. 18: M-code ON signal output timing                                                                                                                                                         | 0: WITH Mode                                             | 0: WITH Mode                                             | 0: WITH Mode                                             | 0: WITH Mode                                             |
| Pr. 19: Speed switching mode                                                                                                                                                                   | 0: Standard Speed Switching Mode                         | 0: Standard Speed Switching Mode                         | 0: Standard Speed Switching Mode                         | 0: Standard Speed Switching Mode                         |
| Pr. 20: Interpolation speed designation method                                                                                                                                                 | 0: Vector Speed                                          | 0: Vector Speed                                          | 0: Vector Speed                                          | 0: Vector Speed                                          |
| Pr. 21: Command position value during speed control                                                                                                                                            | 0: Not Update of Command Position Value                  | 0: Not Update of Command Position Value                  | 0: Not Update of Command Position Value                  | 0: Not Update of Command Position Value                  |
| Pr. 22: Inout signal logic selection : Lower limit                                                                                                                                             | 0: Neactive Logic                                        | 0: Neactive Logic                                        | 0: Neactive Logic                                        | 0: Neactive Logic                                        |

Pr. 8: Speed limit value  
Set the maximum speed during positioning, HPR, and speed/torque operations.

Setting Range  
1 to 1000000000 pulse/s

Speed limit value graph showing Speed vs Time. The graph shows a trapezoidal profile with acceleration time 0 and deceleration time 0. The speed limit value is indicated by a horizontal line.

- ✓ Pr8 : Speed limit value → 500,000 (For encoders with 10,000 pulses)
- ✓ Pr9 : Acceleration time 0 → 200ms (Ezi-SERVO also supports 100ms)
- ✓ Pr10: Deceleration time 0 → 200ms (Ezi-SERVO also supports 100ms)

# 2-5. Simple Motion Module Setting

- Parameter/Detailed parameters 1/FLS, RLS, DOG Signal selection: Input type : Invalid (Temporary)

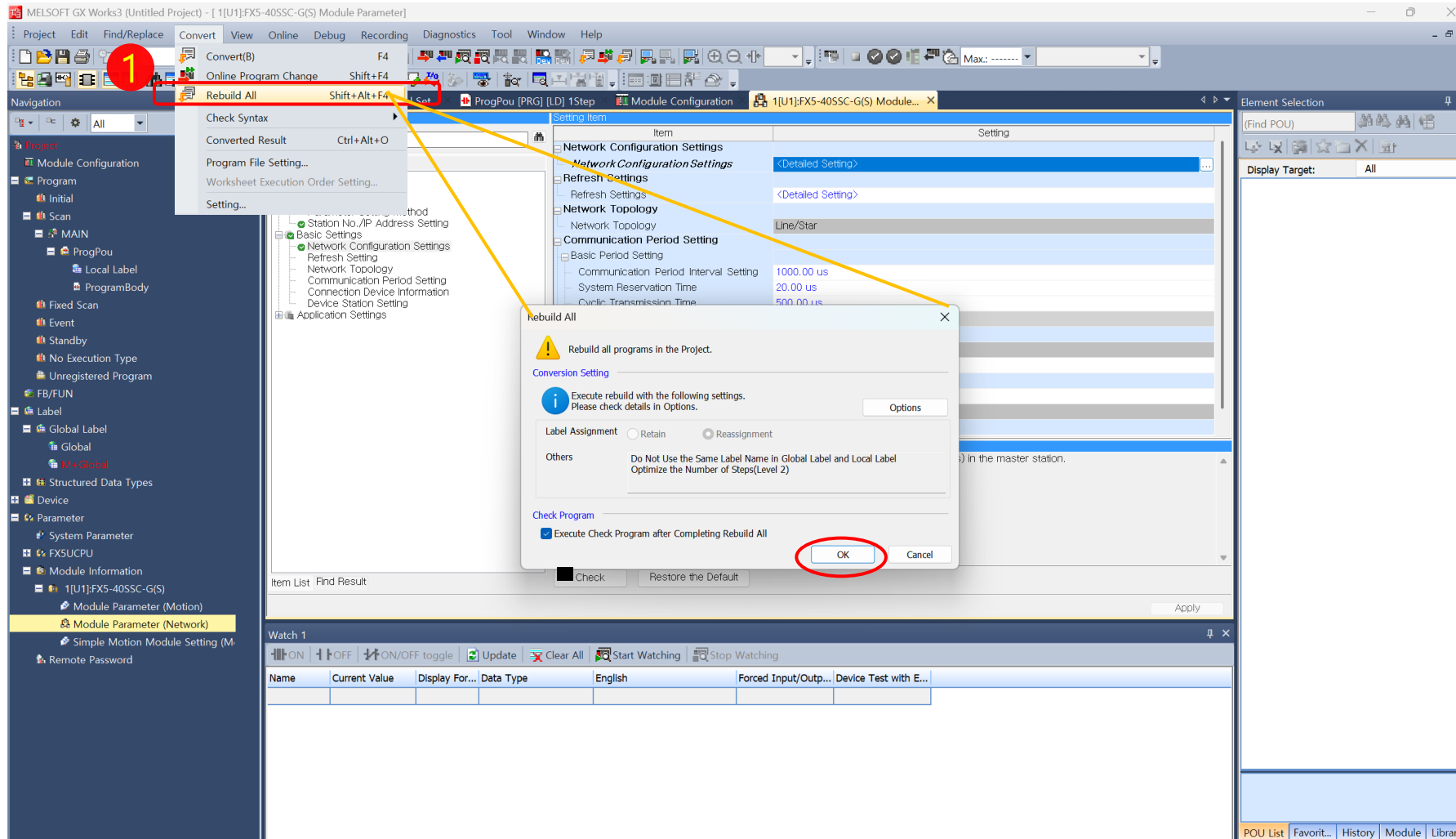
After setting is complete, close the window to apply the setting values

| Item                                                                    | Axis #1                                                                                   | Axis #2                                                                                   | Axis #3                                                                                   | Axis #4                                                                                   |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Pr. 13:Software stroke limit lower limit value                          | -2147483648 pulse                                                                         | -2147483648 pulse                                                                         | -2147483648 pulse                                                                         | -2147483648 pulse                                                                         |
| Pr. 14:Software stroke limit selection                                  | 0:Apply Software Stroke Limit on Command Position Value                                   | 0:Apply Software Stroke Limit on Command Position Value                                   | 0:Apply Software Stroke Limit on Command Position Value                                   | 0:Apply Software Stroke Limit on Command Position Value                                   |
| Pr. 15:Software stroke limit valid/invalid setting                      | 0:Valid                                                                                   | 0:Valid                                                                                   | 0:Valid                                                                                   | 0:Valid                                                                                   |
| Pr. 16:Command in-position width                                        | 100 pulse                                                                                 | 100 pulse                                                                                 | 100 pulse                                                                                 | 100 pulse                                                                                 |
| Pr. 17:Torque limit setting value                                       | 300.0 %                                                                                   | 300.0 %                                                                                   | 300.0 %                                                                                   | 300.0 %                                                                                   |
| Pr. 18:M-code ON signal output timing                                   | 0:WITH Mode                                                                               | 0:WITH Mode                                                                               | 0:WITH Mode                                                                               | 0:WITH Mode                                                                               |
| Pr. 19:Speed switching mode                                             | 0:Standard Speed Switching Mode                                                           | 0:Standard Speed Switching Mode                                                           | 0:Standard Speed Switching Mode                                                           | 0:Standard Speed Switching Mode                                                           |
| Pr. 20:Interpolation speed designation method                           | 0:Vector Speed                                                                            | 0:Vector Speed                                                                            | 0:Vector Speed                                                                            | 0:Vector Speed                                                                            |
| Pr. 21:Command position value during speed control                      | 0:Not Update of Command Position Value                                                    | 0:Not Update of Command Position Value                                                    | 0:Not Update of Command Position Value                                                    | 0:Not Update of Command Position Value                                                    |
| Pr. 22:Input signal logic selection : Lower limit                       | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          |
| Pr. 22:Input signal logic selection : Upper limit                       | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          |
| Pr. 22:Input signal logic selection : Stop signal                       | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          |
| Pr. 22:Input signal logic selection : External command/switching signal | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          |
| Pr. 22:Input signal logic selection : Proximity dog signal              | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          | 0:Negative Logic                                                                          |
| Pr. 81:Speed-position function selection                                | 0:Speed-position Switching Control (PMC Mode)                                             | 0:Speed-position Switching Control (PMC Mode)                                             | 0:Speed-position Switching Control (PMC Mode)                                             | 0:Speed-position Switching Control (PMC Mode)                                             |
| Pr. 116:FLS signal selection : Input type                               | 15:Invalid                                                                                | 15:Invalid                                                                                | 1:Servo Amplifier                                                                         | 1:Servo Amplifier                                                                         |
| Pr. 117:RLS signal selection : Input type                               | 15:Invalid                                                                                | 15:Invalid                                                                                | 1:Servo Amplifier                                                                         | 1:Servo Amplifier                                                                         |
| Pr. 118:DOG signal selection : Input type                               | 15:Invalid                                                                                | 15:Invalid                                                                                | 1:Servo Amplifier                                                                         | 1:Servo Amplifier                                                                         |
| Pr. 119:STOP signal selection : Input type                              | 2:Buffer Memory                                                                           | 2:Buffer Memory                                                                           | 2:Buffer Memory                                                                           | 2:Buffer Memory                                                                           |
| Detailed parameters 2                                                   | Set according to the system configuration when the system is started up(Set as required). | Set according to the system configuration when the system is started up(Set as required). | Set according to the system configuration when the system is started up(Set as required). | Set according to the system configuration when the system is started up(Set as required). |
| Pr. 25:Acceleration time 1                                              | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   |
| Pr. 26:Acceleration time 2                                              | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   |
| Pr. 27:Acceleration time 3                                              | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   |
| Pr. 28:Deceleration time 1                                              | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   |
| Pr. 29:Deceleration time 2                                              | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   |
| Pr. 30:Deceleration time 3                                              | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   |
| Pr. 31:JOG speed limit value                                            | 20000 pulse/s                                                                             | 20000 pulse/s                                                                             | 20000 pulse/s                                                                             | 20000 pulse/s                                                                             |
| Pr. 32:JOG operation acceleration time selection                        | 0:200                                                                                     | 0:200                                                                                     | 0:1000                                                                                    | 0:1000                                                                                    |
| Pr. 33:JOG operation deceleration time selection                        | 0:200                                                                                     | 0:200                                                                                     | 0:1000                                                                                    | 0:1000                                                                                    |
| Pr. 34:Acceleration/deceleration process selection                      | 0:Trapezoidal Acceleration/Deceleration Process                                           | 0:Trapezoidal Acceleration/Deceleration Process                                           | 0:Trapezoidal Acceleration/Deceleration Process                                           | 0:Trapezoidal Acceleration/Deceleration Process                                           |
| Pr. 35:S-curve ratio                                                    | 100 %                                                                                     | 100 %                                                                                     | 100 %                                                                                     | 100 %                                                                                     |
| Pr. 36:Rapid stop deceleration time                                     | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   | 1000 ms                                                                                   |
| Pr. 37:Stop group 1 rapid stop selection                                | 0:Normal Deceleration Stop                                                                | 0:Normal Deceleration Stop                                                                | 0:Normal Deceleration Stop                                                                | 0:Normal Deceleration Stop                                                                |
| Pr. 38:Stop group 2 rapid stop selection                                | 0:Normal Deceleration Stop                                                                | 0:Normal Deceleration Stop                                                                | 0:Normal Deceleration Stop                                                                | 0:Normal Deceleration Stop                                                                |
| Pr. 39:Stop group 3 rapid stop selection                                | 0:Normal Deceleration Stop                                                                | 0:Normal Deceleration Stop                                                                | 0:Normal Deceleration Stop                                                                | 0:Normal Deceleration Stop                                                                |

Basic parameters 1  
Set according to the machine and applicable motor when system is started up (It will be valid according to PLC ready signal).

## 2-6. Convert

- Convert / Rebuild All



## 2-7. Write to PLC

- Online Data Operation

The screenshot shows the MELSOFT GX Works3 interface. The 'Online' menu is open, and the 'Write to PLC...' option is highlighted. The 'Online Data Operation' dialog box is displayed, showing the 'Module Name/Data Name' list. The 'Common Device Co...' option is circled in red. A yellow callout box points to this option with the text: 'Common Device Co... Checking this may cause a transmission error, so send without checking.'

**Online Data Operation**

Display Setting Related Functions

Parameter + Progr Select All Legend  
Open/Close All/ Deselect All CPU Built-in Memory SD Memory Card Intelligent Function

| Module Name/Data Name | Detail | Title |
|-----------------------|--------|-------|
| MAIN                  |        | 20    |
| Device Memory         |        |       |
| MAIN                  |        | 20    |
| File Register         |        |       |
| MAIN                  |        | 20    |
| Common Device Co...   |        | 20    |
| COMMENT               |        | 20    |

Display Memory Capacity

Memory Capacity Size Calculation

Legend

- Used
- Increased
- Decreased
- Free: 5% or Less

Program Memory Free 157/160KB

Data Memory Free 1852/2049KB

Device/Label Memory (File Storage Area) Free 192/256KB

SD Memory Card Free 0/0KB

Execute Close

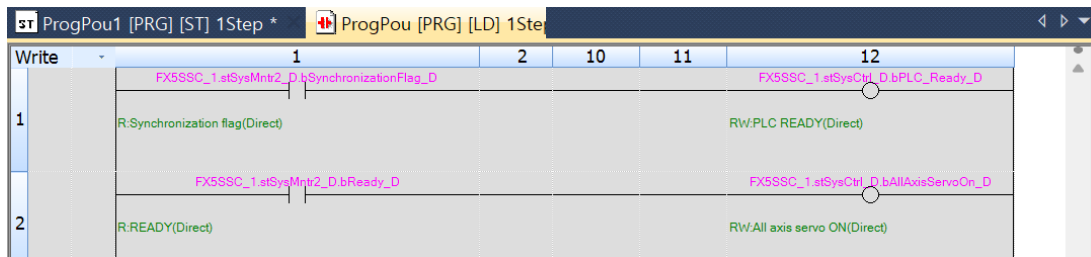
## **3. Verify Operation**

# 3.1 Program Development

## ● PLC Motion Module: Ready / Servo On

Label (Variable) Method

[ Ladder Program ]



- ① Sequence Ready Signal (FX5SSC\_1.stSysCtrl\_D.bPLC\_Ready\_D): When ON
- ② Synchronization Flag (FX5SSC\_1.stSysMntr2\_D.bSynchronizationFlag\_D): Requires ON
- ③ Ready Signal (FX5SSC\_1.stSysMntr2\_D.bReady\_D): When ON
- ④ All-Axis Servo (FX5SSC\_1.stSysCtrl\_D.bAllAxisServoOn\_D): ON required

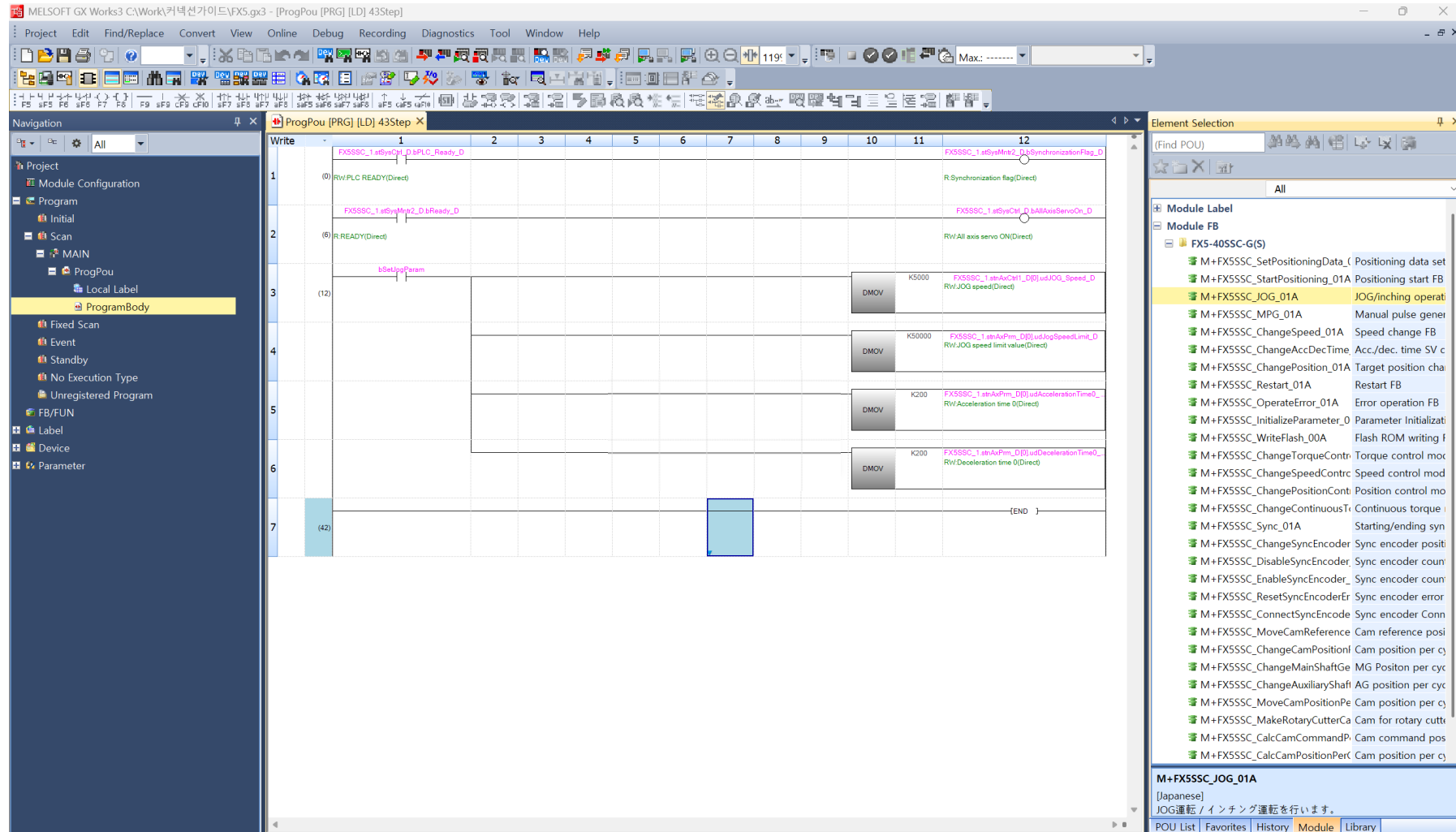
Label (Variable) Method

[ ST Program ]

```
1 IF SM400 & FX5SSC_1.stSysMntr2_D.bSynchronizationFlag_D THEN
2   FX5SSC_1.stSysCtrl_D.bPLC_Ready_D := TRUE;
3 END_IF;
4
5 IF FX5SSC_1.stSysMntr2_D.bReady_D THEN
6   FX5SSC_1.stSysCtrl_D.bAllAxisServoOn_D := TRUE;
7 END_IF;
8
```

# 3.1 Program Development

- Jog Settings: Speed, Limit Speed, Acceleration Time, Deceleration Time



MELSOFT GX Works3 C:\Work\카백선가이드\FX5.gx3 - [ProgPou [PRG] [LD] 43Step]

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

Navigation: ProgPou [PRG] [LD] 43Step

Write:

| Line | Step | Instruction           | Value  | Target                                        |
|------|------|-----------------------|--------|-----------------------------------------------|
| 1    | (0)  | R/W PLC READY(Direct) |        | FX5SSC_1 a8SyncIn_D bPLC_Ready_D              |
| 2    | (6)  | R READY(Direct)       |        | FX5SSC_1 a8SyncIn2_D bReady_D                 |
| 3    | (12) | bSettingParam         |        | FX5SSC_1 a8AxisCtrl_D bJOG_Speed_D            |
| 4    |      | DMOV                  | K5000  | FX5SSC_1 a8AxisCtrl_D bJOG_Speed_D            |
| 5    |      | DMOV                  | K50000 | FX5SSC_1 a8AxisCtrl_D bJOG_SpeedLimit_D       |
| 6    |      | DMOV                  | K200   | FX5SSC_1 a8AxisCtrl_D bJOG_AccelerationTime_D |
| 7    | (42) | DMOV                  | K200   | FX5SSC_1 a8AxisCtrl_D bJOG_DecelerationTime_D |
|      |      |                       |        | [END]                                         |

Element Selection

(Find POU)

Module Label

Module FB

FX5-40SSC-G(S)

- M+FX5SSC\_SetPositioningData\_ Positioning data set
- M+FX5SSC\_StartPositioning\_01A Positioning start FB
- M+FX5SSC\_JOG\_01A JOG/inching operation
- M+FX5SSC\_MPG\_01A Manual pulse generator
- M+FX5SSC\_ChangeSpeed\_01A Speed change FB
- M+FX5SSC\_ChangeAccDecTime\_ Acc./dec. time SV c
- M+FX5SSC\_ChangePosition\_01A Target position change
- M+FX5SSC\_Restart\_01A Restart FB
- M+FX5SSC\_OperateError\_01A Error operation FB
- M+FX5SSC\_InitializeParameter\_0 Parameter initialization
- M+FX5SSC\_WriteFlash\_00A Flash ROM writing
- M+FX5SSC\_ChangeTorqueControl\_ Torque control mode
- M+FX5SSC\_ChangeSpeedControl\_ Speed control mode
- M+FX5SSC\_ChangePositionControl\_ Position control mode
- M+FX5SSC\_ChangeContinuousTorque\_ Continuous torque
- M+FX5SSC\_Sync\_01A Starting/ending sync
- M+FX5SSC\_ChangeSyncEncoder\_ Sync encoder position
- M+FX5SSC\_DisableSyncEncoder\_ Sync encoder count
- M+FX5SSC\_EnableSyncEncoder\_ Sync encoder count
- M+FX5SSC\_ResetSyncEncoderError\_ Sync encoder error
- M+FX5SSC\_ConnectSyncEncoder\_ Sync encoder connection
- M+FX5SSC\_MoveCamReference\_ Cam reference position
- M+FX5SSC\_ChangeCamPosition\_ Cam position per cycle
- M+FX5SSC\_ChangeMainShaftGear\_ MG Position per cycle
- M+FX5SSC\_ChangeAuxiliaryShaftGear\_ AG position per cycle
- M+FX5SSC\_MoveCamPositionPerCycle\_ Cam position per cycle
- M+FX5SSC\_MakeRotaryCutterCam\_ Cam for rotary cutter
- M+FX5SSC\_CalcCamCommandPerCycle\_ Cam command per cycle
- M+FX5SSC\_CalcCamPositionPerCycle\_ Cam position per cycle

M+FX5SSC\_JOG\_01A

[Japanese]

JOG運転 / インチング運転を行います。

POU List Favorites History Module Library

# 3.1 Program Development

- Jog Operation Program: Module FB (MFX5SSC\_JOG\_01A1 Click & Drag)

The screenshot displays the MELSOFT GX Works3 interface for program development. The main window shows a ladder logic program with a network of contacts and coils. A red box highlights the 'FB Instance Name' dialog box, which is used to create a new instance of the 'MFX5SSC\_JOG\_01A1' module. The dialog box has a dropdown menu set to 'Local Label (ProgPou)' and the text 'MFX5SSC\_JOG\_01A1' entered. A red circle with the number '1' is placed next to the 'MFX5SSC\_JOG\_01A1' entry in the 'Element Selection' pane on the right. A yellow callout box at the bottom center contains the text '✓ JOG Operation FB Creation: OK'.

FB Instance Name

Local Label (ProgPou)

MFX5SSC\_JOG\_01A1

Register a FB instance at the last row.

1

✓ JOG Operation FB Creation: OK

Element Selection

(Find POU)

All

Module Label

Module FB

FX5-40SSC-G(S)

M+FX5SSC\_SetPositioningData\_ Positioning data set

M+FX5SSC\_StartPositioning\_01A Positioning start FB

M+FX5SSC\_JOG\_01A JOG/inching operat

M+FX5SSC\_MPG\_01A Manual pulse gener

M+FX5SSC\_ChangeSpeed\_01A Speed change FB

M+FX5SSC\_ChangeAccDecTime Acc./dec. time SV c

M+FX5SSC\_ChangePosition\_01A Target position cha

M+FX5SSC\_Restart\_01A Restart FB

M+FX5SSC\_OperateError\_01A Error operation FB

M+FX5SSC\_InitializeParameter\_0 Parameter Initializati

M+FX5SSC\_WriteFlash\_00A Flash ROM writing f

M+FX5SSC\_ChangeTorqueContr Torque control moc

M+FX5SSC\_ChangeSpeedContrc Speed control mod

M+FX5SSC\_ChangePositionConti Position control mo

M+FX5SSC\_ChangeContinuousTr Continuous torque

M+FX5SSC\_Sync\_01A Starting/ending syn

M+FX5SSC\_ChangeSyncEncoder Sync encoder positi

M+FX5SSC\_DisableSyncEncoder Sync encoder coun

M+FX5SSC\_EnableSyncEncoder\_ Sync encoder coun

M+FX5SSC\_ResetSyncEncoderEr Sync encoder error

M+FX5SSC\_ConnectSyncEncode Sync encoder Conn

M+FX5SSC\_MoveCamReference Cam reference posi

M+FX5SSC\_ChangeCamPositionl Cam position per c

M+FX5SSC\_ChangeMainShaftGe MG Positon per cyc

M+FX5SSC\_ChangeAuxiliaryShafl AG position per cyc

M+FX5SSC\_MoveCamPositionPe Cam position per c

M+FX5SSC\_MakeRotaryCutterCa Cam for rotary cutte

M+FX5SSC\_CalcCamCommandP Cam command pos

M+FX5SSC\_CalcCamPositionPerl Cam position per c

M+FX5SSC\_JOG\_01A

[Japanese]

JOG運転 / インチング運転を行います。

POU List Favorites History Module Library

# 3.1 Program Development

## ● Jog Operation Program: Module FB Configuration / Operation / Results

**✓ JOG Operation Execution Command**

**✓ Jog Forward Command**

**✓ Jog Reverse Command**

**✓ Jog Speed Command**

**✓ Jog Result Output**

The screenshot displays the MELSOFT GX Works3 software interface for developing a Jog Operation Program. The main window shows a ladder logic diagram with steps 1 through 12. Step 1 is labeled 'JOG Operation Execution Command'. Step 2 is labeled 'Jog Forward Command'. Step 3 is labeled 'Jog Reverse Command'. Step 4 is labeled 'Jog Speed Command'. Step 5 is labeled 'Jog Result Output'. The right-hand pane shows the 'Module FB' configuration for 'FX5-40SSC-G(S)', listing various functions such as 'M+FX5SSC\_SetPositioningData', 'M+FX5SSC\_StartPositioning\_01A', 'M+FX5SSC\_JOG\_01A', 'M+FX5SSC\_MPG\_01A', 'M+FX5SSC\_ChangeSpeed\_01A', 'M+FX5SSC\_ChangeAccDecTime', 'M+FX5SSC\_ChangePosition\_01A', 'M+FX5SSC\_Restart\_01A', 'M+FX5SSC\_OperateError\_01A', 'M+FX5SSC\_InitializeParameter\_0', 'M+FX5SSC\_WriteFlash\_00A', 'M+FX5SSC\_ChangeTorqueContr', 'M+FX5SSC\_ChangeSpeedContr', 'M+FX5SSC\_ChangePositionContr', 'M+FX5SSC\_ChangeContinuousTr', 'M+FX5SSC\_Sync\_01A', 'M+FX5SSC\_ChangeSyncEncoder', 'M+FX5SSC\_DisableSyncEncoder', 'M+FX5SSC\_EnableSyncEncoder', 'M+FX5SSC\_ResetSyncEncoder', 'M+FX5SSC\_ConnectSyncEncoder', 'M+FX5SSC\_MoveCamReference', 'M+FX5SSC\_ChangeCamPosition', 'M+FX5SSC\_ChangeMainShaftGe', 'M+FX5SSC\_ChangeAuxiliaryShaft', 'M+FX5SSC\_MoveCamPositionPe', 'M+FX5SSC\_MakeRotaryCutterCa', 'M+FX5SSC\_CalcCamCommandPe', and 'M+FX5SSC\_CalcCamPositionPer'. The bottom right corner shows the 'M+FX5SSC\_JOG\_01A' function block with its description in Japanese: 'JOG運転 / インチング運転を行います。' (Perform JOG operation / inching operation).

## 3.2 Axis Monitoring

- FX5-40SSC-G(S) PROGRAM RUN: D LINK Green LED lit
- Axis Monitor

FX5-40SSC-G

READY ●

D LINK ●

SD/RD ●

**1** Simple Motion Module Setting

**2** Axis Monitor

**3** Module Information List

**Axis Monitor**

Monitor Type: Axis (Output Axis) Font Size: 9pt

(\*) Please check the Event History function of GX Works3 for the Error History/Warning History.

|                                                                 | Axis #1              |
|-----------------------------------------------------------------|----------------------|
| Md.20:Command position value                                    | 0 pulse              |
| Md.21:Machine feed value                                        | 0 pulse              |
| Md.23:Axis error No.                                            | -                    |
| Md.24:Axis warning No.                                          | -                    |
| Md.26:Axis operation status                                     | Waiting              |
| Md.28:Axis speed command                                        | 0 pulse/s            |
| Md.44:Positioning data No. being executed                       | -                    |
| Md.47:Positioning data being executed : Operation pattern       | Positioning Complete |
| Md.47:Positioning data being executed : Control method          | -                    |
| Md.47:Positioning data being executed : Acceleration time No.   | 0:200                |
| Md.47:Positioning data being executed : Deceleration time No.   | 0:200                |
| Md.47:Positioning data being executed : Axis to be interpolated | -                    |
| Md.47:Positioning data being executed : M-code                  | -                    |
| Md.102:Deviation counter                                        | 0 pulse              |
| Md.103:Motor rotation speed                                     | 0 pulse/s            |
| Md.104:Motor current value                                      | 0.0 %                |
| Md.108:Servo status 1 : Servo alarm                             | OFF                  |
| Md.108:Servo status 1 : Servo warning                           | OFF                  |
| Md.114:Servo alarm                                              | -                    |

**Module Information List**

- PLC ready(Y0)
- READY(X0)
- Synchronization flag(X1)
- All axes servo ON(Y1)
- Md.108:Servo status 1 : READY ON
- Md.108:Servo status 1 : Servo ON
- Md.50:Forced stop input(U0WG4231)
- BUSY
- Md.31:Status : Error detection
- Md.31:Status : Axis warning detection
- Md.1:In test mode flag(U0WG4000)
- Md.133:Operation cycle over flag(U0WG4239)
- Md.64:Network error No.(U0WG31504)
- Md.132:Operation cycle setting(U0WG4238)
- Md.134:Operation time(U0WG4008)
- Md.135:Maximum operation time(U0WG4009)
- Md.19:Number of write accesses to flash ROM(U0WG...
- Md.52:Communication between amplifiers axes search...
- Md.131:Digital OSC. running flag(U0WG4011)

[Operation Check: Green when ON]

- ✓ Synchronization flag (X1): Connection status between CPU and Motion Module
- ✓ PLC Ready (Y0): Motion Module activation instruction
- ✓ READY(X0): Motion Module control enabled
- ✓ All axes servo ON(Y1): All axes servo ON instruction

# 3.3 Axis Operation Verification

- **Jog Operation – Setup and Movement** (Verify Jog Operation Capability:  
FX5SSC\_1.stnAxMntr\_D[0].uServoStatus1\_D.1 → TRUE)

## Program Mode (Ladder, Label)

✓ **bSetJogSpeed, bSetJogSpeedLimit, bSetJogAccel, bSetJogDesel**  
Set value via ON/OFF

✓ **Jog Operation Verification**  
bJogMoveCW: ON → CW rotation, OFF → Stop  
bJogMoveCCW: ON → CCW rotation, OFF → Stop

| Instruction | Value  | Comment                                                                         |
|-------------|--------|---------------------------------------------------------------------------------|
| DMOV        | K5000  | FX5SSC_1.stnAxCtrl1_D[0].udJOG_Speed_D<br>RW:JOG speed(Direct)                  |
| DMOV        | K50000 | FX5SSC_1.stnAxPrm_D[0].udJogSpeedLimit_D<br>RW:JOG speed limit value(Direct)    |
| DMOV        | K200   | FX5SSC_1.stnAxPrm_D[0].udAccelerationTime0_D<br>RW:Acceleration time 0(Direct)  |
| DMOV        | K200   | FX5SSC_1.stnAxPrm_D[0].udDecelerationTime0_D<br>RW:Deceleration time 0(Direct)  |
| MOV         | K1     | FX5SSC_1.stnAxCtrl2_D[0].uStartForwardJOG_D<br>RW:Forward run JOG start(Direct) |
| MOV         | K0     | FX5SSC_1.stnAxCtrl2_D[0].uStartForwardJOG_D<br>RW:Forward run JOG start(Direct) |
| MOV         | K1     | FX5SSC_1.stnAxCtrl2_D[0].uStartReverseJOG_D<br>RW:Reverse run JOG start(Direct) |
| MOV         | K0     | FX5SSC_1.stnAxCtrl2_D[0].uStartReverseJOG_D<br>RW:Reverse run JOG start(Direct) |

## Watch Mode

Watch 1[Watching]

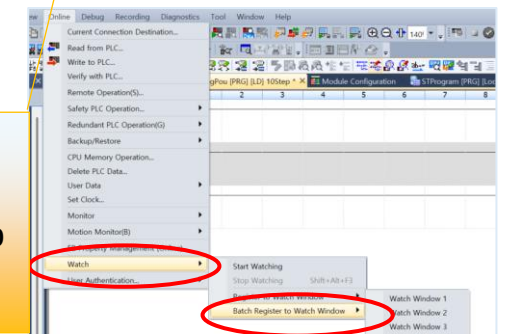
ON OFF ON/OFF toggle Update Clear All

| Name                                         | Current Value | English                        |
|----------------------------------------------|---------------|--------------------------------|
| FX5SSC_1.stSysCtrl_D.bPLC_Ready_D            | TRUE          | RW:PLC READY(Direct)           |
| FX5SSC_1.stSysCtrl_D.bAllAxisServoOn_D       | TRUE          | RW:All axis servo ON(Direct)   |
| FX5SSC_1.stnAxCtrl1_D[0].udJOG_Speed_D       | 5,000         | RW:JOG speed(Direct)           |
| FX5SSC_1.stnAxPrm_D[0].udJogSpeedLimit_D     | 50,000        | RW:JOG speed limit value(Di... |
| FX5SSC_1.stnAxPrm_D[0].udAccelerationTime0_D | 200           | RW:Acceleration time 0(Direct) |
| FX5SSC_1.stnAxPrm_D[0].udDecelerationTime0_D | 200           | RW:Deceleration time 0(Direct) |
| FX5SSC_1.stnAxCtrl2_D[0].uStartForwardJOG_D  | 0             | RW:Forward run JOG start(D...  |
| FX5SSC_1.stnAxCtrl2_D[0].uStartReverseJOG_D  | 0             | RW:Reverse run JOG start(Di... |

- ✓ **Registering labels for jog operation**

### [Operation Check]

- ✓ Key in the values as shown above for Jog Speed/SpeedLimit/Accel/Decel.
- ✓ Jog Operation Verification  
...uStartForwardJOG\_D : 1 → Clockwise rotation, 0 → Stop  
...uStartReverseJOG\_D : 1 → Counterclockwise rotation, 0 → Stop



# 3.3 Axis Operation Verification

## ● Jog Operation: Stop → Move

1[U1]:FX5-40SSC-G(S) – Axis Monitor

Axis Moni Monitor Type: Axis (Output Axis) Font Size: 9pt Select Monitor Item Select Monitor Axis

(\*) Please check the Event History function of GX Works3 for the Error History/Warning History.

|                                                                 | Axis #1              |
|-----------------------------------------------------------------|----------------------|
| Md.20:Command position value                                    | 256494 pulse         |
| Md.21:Machine feed value                                        | 256494 pulse         |
| Md.23:Axis error No.                                            | -                    |
| Md.24:Axis warning No.                                          | -                    |
| Md.26:Axis operation status                                     | Waiting              |
| Md.28:Axis speed command                                        | 0 pulse/s            |
| Md.44:Positioning data No. being executed                       | -                    |
| Md.47:Positioning data being executed : Operation pattern       | Positioning Complete |
| Md.47:Positioning data being executed : Control method          | -                    |
| Md.47:Positioning data being executed : Acceleration time No.   | 0:200                |
| Md.47:Positioning data being executed : Deceleration time No.   | 0:200                |
| Md.47:Positioning data being executed : Axis to be interpolated | -                    |
| Md.47:Positioning data being executed : M-code                  | -                    |
| Md.102:Deviation counter                                        | 0 pulse              |
| Md.103:Motor rotation speed                                     | 0 pulse/s            |
| Md.104:Motor current value                                      | 0.0 %                |
| Md.108:Servo status 1 : Servo alarm                             | OFF                  |
| Md.108:Servo status 1 : Servo warning                           | OFF                  |
| Md.114:Servo alarm                                              | -                    |

Module Information List

- PLC ready(Y0)
- READY(X0)
- Synchronization flag(X1)
- All axes servo ON(Y1)
- Md.108:Servo status 1 : READY ON
- Axis No. 1 2 3 4 5 6 7 8
- Md.108:Servo status 1 : Servo ON
- Axis No. 1 2 3 4 5 6 7 8
- Md.50:Forced stop input(U0#G4231)
- Axis No. 1 2 3 4 5 6 7 8
- Md.31:Status : Error detection
- Axis No. 1 2 3 4 5 6 7 8
- Md.31:Status : Axis warning detection
- Axis No. 1 2 3 4 5 6 7 8
- Md.1:In test mode flag(U0#G4000)
- Md.133:Operation cycle over flag(U0#G4239)
- Md.64:Network error No.(U0#G31504)
- Md.132:Operation cycle setting(U0#G4238)
- 1006h:1.000ms
- Md.134:Operation time(U0#G4008)
- 149 μs
- Md.135:Maximum operation time(U0#G4009)
- 171 μs
- Md.19:Number of write accesses to flash ROM(U0#G4010)
- 0 times
- Md.52:Communication between amplifiers axes se...
- Communication between set amplif...
- Md.131:Digital OSC. running flag(U0#G4011)
- Stopped

1[U1]:FX5-40SSC-G(S) – Axis Monitor

Axis Moni Monitor Type: Axis (Output Axis) Font Size: 9pt Select Monitor Item Select Monitor Axis

(\*) Please check the Event History function of GX Works3 for the Error History/Warning History.

|                                                                 | Axis #1              |
|-----------------------------------------------------------------|----------------------|
| Md.20:Command position value                                    | 277881 pulse         |
| Md.21:Machine feed value                                        | 277881 pulse         |
| Md.23:Axis error No.                                            | -                    |
| Md.24:Axis warning No.                                          | -                    |
| Md.26:Axis operation status                                     | JOG Operation        |
| Md.28:Axis speed command                                        | 5000 pulse/s         |
| Md.44:Positioning data No. being executed                       | -                    |
| Md.47:Positioning data being executed : Operation pattern       | Positioning Complete |
| Md.47:Positioning data being executed : Control method          | -                    |
| Md.47:Positioning data being executed : Acceleration time No.   | 0:200                |
| Md.47:Positioning data being executed : Deceleration time No.   | 0:200                |
| Md.47:Positioning data being executed : Axis to be interpolated | -                    |
| Md.47:Positioning data being executed : M-code                  | -                    |
| Md.102:Deviation counter                                        | 17 pulse             |
| Md.103:Motor rotation speed                                     | 4600 pulse/s         |
| Md.104:Motor current value                                      | 0.0 %                |
| Md.108:Servo status 1 : Servo alarm                             | OFF                  |
| Md.108:Servo status 1 : Servo warning                           | OFF                  |
| Md.114:Servo alarm                                              | -                    |

Module Information List

- PLC ready(Y0)
- READY(X0)
- Synchronization flag(X1)
- All axes servo ON(Y1)
- Md.108:Servo status 1 : READY ON
- Axis No. 1 2 3 4 5 6 7 8
- Md.108:Servo status 1 : Servo ON
- Axis No. 1 2 3 4 5 6 7 8
- Md.50:Forced stop input(U0#G4231)
- Axis No. 1 2 3 4 5 6 7 8
- Md.31:Status : Error detection
- Axis No. 1 2 3 4 5 6 7 8
- Md.31:Status : Axis warning detection
- Axis No. 1 2 3 4 5 6 7 8
- Md.1:In test mode flag(U0#G4000)
- Md.133:Operation cycle over flag(U0#G4239)
- Md.64:Network error No.(U0#G31504)
- Md.132:Operation cycle setting(U0#G4238)
- 1006h:1.000ms
- Md.134:Operation time(U0#G4008)
- 150 μs
- Md.135:Maximum operation time(U0#G4009)
- 171 μs
- Md.19:Number of write accesses to flash ROM(U0#G4010)
- 0 times
- Md.52:Communication between amplifiers axes se...
- Communication between set amplif...
- Md.131:Digital OSC. running flag(U0#G4011)
- Stopped

JOG  
Operation

# Appendix

# [Appendix 1] Homing Method

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                       |



Fast Accurate Smooth Motion

Accelerating the construction of Smart Factories with

**CC-Link***IE***TSN**

**Ezi-SERVO**<sup>®</sup> **25<sup>th</sup>** ANNIVERSARY  
2001-2026  
Closed Loop Stepping System

**Ezi-STEP**<sup>®</sup>  
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**Ezi-POS**<sup>®</sup>  
Servo Control System

**Ezi-SPEED**<sup>®</sup>  
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Network Input/Output