



Programmable Controllers
MELSEC iQ-R
series



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

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

Connection Guide

MELSEC iQ-R RD78G (S) and

Ezi-ROBO® CC-Link IE TSN - **Ezi-SERVO**® CC-Link IE TSN
Precise Actuator System **IGS** Closed Loop Stepping System **ALL**

Mitsubishi Electric Products
RD78G4(S) / RD78G8(S) / RD78G16(S)

FASTECH Products
Ezi-ROBO CC-Link IE TSN IGS
(Ezi-SERVO CC-Link IE TSN ALL)

Before you begin

- Thank you for using our company's products.
- The control unit of the Ezi-ROBO IGS is interfaced with the Ezi-SERVO CC-Link IE TSN ALL. The following connection guide is based on the Ezi-SERVO CC-Link IE TSN ALL.
- The Ezi-SERVO CC-Link IE TSN ALL is a stepping motor unit consisting of a driver equipped with a 32-bit high-performance ARM processor and various motors. It is used as a remote station in a CC-Link IE TSN network.
- Ezi-SERVO CC-Link IE TSN ALL is an industrial product. Do not use it for any other purpose. Our company 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 ALL to Mitsubishi Electric's MELSEC iQ-R RD78G(S). 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/download/quick>).

Manual Information

- The Ezi-SERVO CC-Link IE TSN ALL 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 ALL][Ezi-SERVO] Closed Loop Stepping System	
[Connection Guide][MELSEC RD78G(S)] Ezi-ROBO CC-Link IE TSN IGS - Ezi-SERVO ALL	

- The iQ-R RD78G(S) manual can be downloaded from the Mitsubishi Electric website.

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

Manual Name	Manual Number
MELSEC iQ-R Motion Unit User's Manual (Startup Edition)	IB-0300405
MELSEC iQ-R Motion Unit User's Manual (Network Edition)	IB-0300425
MELSEC iQ-R Motion Unit User's Manual (Simple Motion Mode Application Edition)	IB-0300571
MELSEC iQ-R Motion Unit User's Manual (Simple Motion Mode Advanced Synchronous Control Edition)	IB-0300574
GX Works3 Operating Manual	SH-081214

Terminology

- This section covers terms used in the connection guide.

Terminology	Description
CC-Link IE TSN	An open network that adopts 'TSN (Time-Sensitive Networking)', an extension of the standard Ethernet specification, enabling simultaneous processing of real-time control and information from other open networks.
Master station (Manager station)	This station manages the entire network and can perform cyclic transmission and transient transmission with all stations. The MELSEC iQ-R RD78G(S) 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 ALL corresponds to this.
PDO	Abbreviation for Process Data Object. A collection of application objects periodically transmitted between multiple CANopen nodes.
Object	Various data held by device stations corresponding to CANopen.

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[Appendix 1] Homing Method

1. Overview

1-1. Overview

- **MELSEC iQ-R RD78G(S) and Ezi-SERVO CC-Link IE TSN ALL Connection Guide**

- ◆ **Master station: RD78G(S)4 (4-axis) / RD78G(S)8 (8-axis) / RD78G(S)16 (16-axis)**

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

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

- ◆ **Engineering software**

- GX Works3: Ver. 1.105K or later
 - Motion control setting function: Ver. 1.055H or later
- ※ For the latest files, please refer to the Mitsubishi Electric website.

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

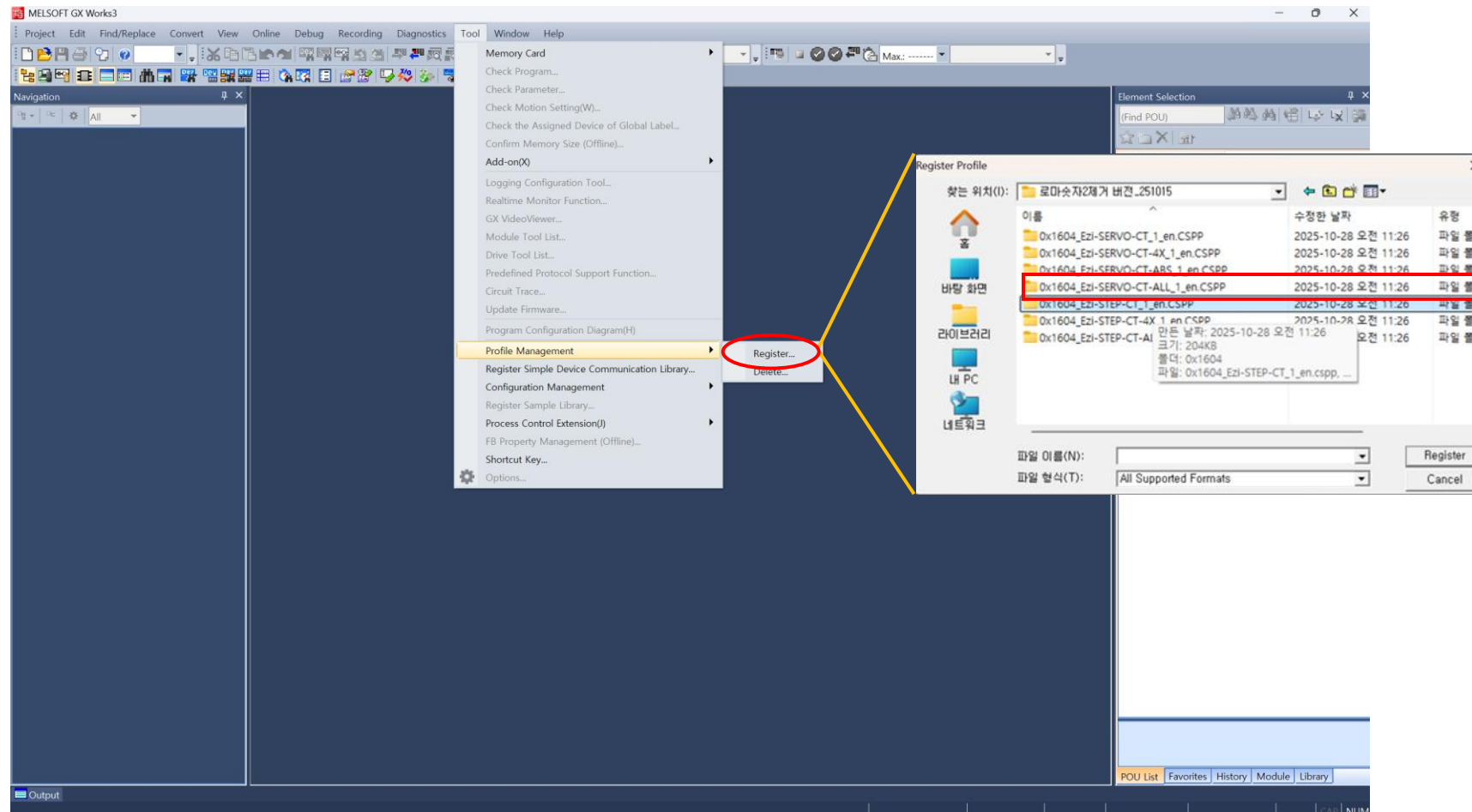
- ◆ **Remote station: Ezi-SERVO CC-Link IE TSN ALL**

- CSP+ File Download address: <https://cltsn.fastech-motions.com/en/download/quick>
 - File Name: 0x1604_Ezi-SERVO-CT-ALL_1_en_CSPP

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

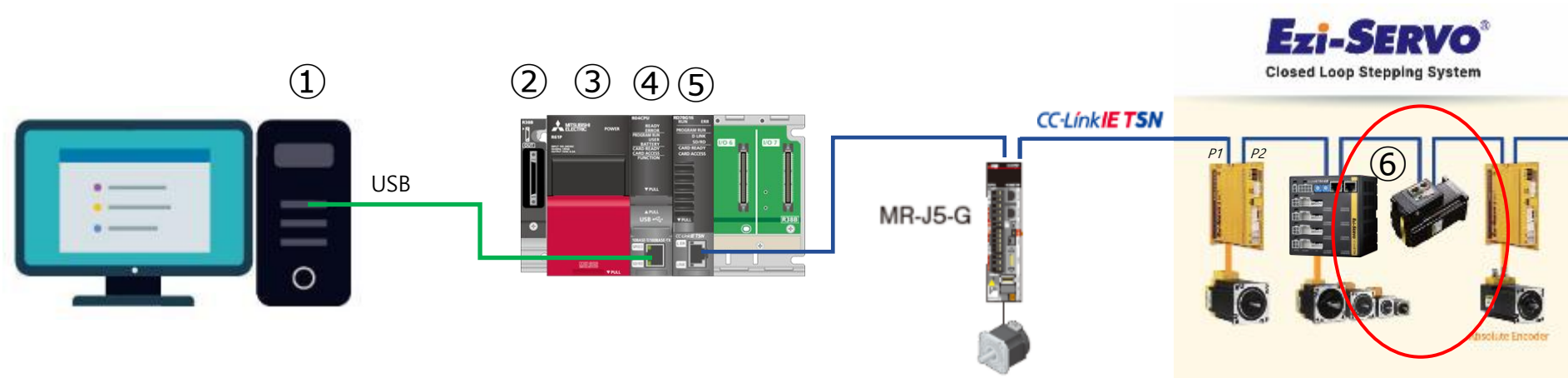
● CSP+ Registration

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



1-3. CC-Link IE TSN Configuration

- Network Connection



Configuration	Product name	IP address
①	Engineering software	GX Works3
②	Main base	R33B
③	Power supply module	R61P
④	CPU module	iQ-R
⑤	Motion module	RD78G4(S)
⑥	Driver + Motor	Ezi-SERVO-CT-ALL-42S-A-R
		192.168.3.253
		192.168.3.1

1-3. CC-Link IE TSN Configuration

- **Ezi-SERVO Specifications**

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

1-4. Setup Sequence

- Ezi-SERVO, RD78G(S) parameter settings

No.	Item	Description
1	Ezi-SERVO Settings 	Configure parameters using the driver configuration program (Ezi-CT Manager). Please download the configuration program and its usage guide from the <u>FASTECH Co., Ltd.</u> website. ※ Address: https://cltsn.fastech-motions.com/en/download/quick
2	RD78G(S) Configuration 	Create an RD78G(S) project using GX-Works3, then configure the unit parameters (communication method, connection target) and axis parameters (for motion control).
3	RD78G(S) + Ezi-SERVO Operation Verification 	Write a program to verify that the RD78G(S) and Ezi-SERVO are configured correctly. Manipulate labels to verify the motor operates normally.

1-4. Setup Sequence

● Ezi-SERVO Setup Notes

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

1-5. Restrictions

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

Item	Restrictions
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 not available.
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. • Positive torque limit value (Index:60E0h, Subindex:00h) • Negative torque limit value (Index:60E1h, Subindex:00h)
Absolute position system	The encoder is of the incremental type, so the absolute position system cannot be used.
Virtual servo amplifier function	Emulated by MR-J5-G.
Mark detection function	[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

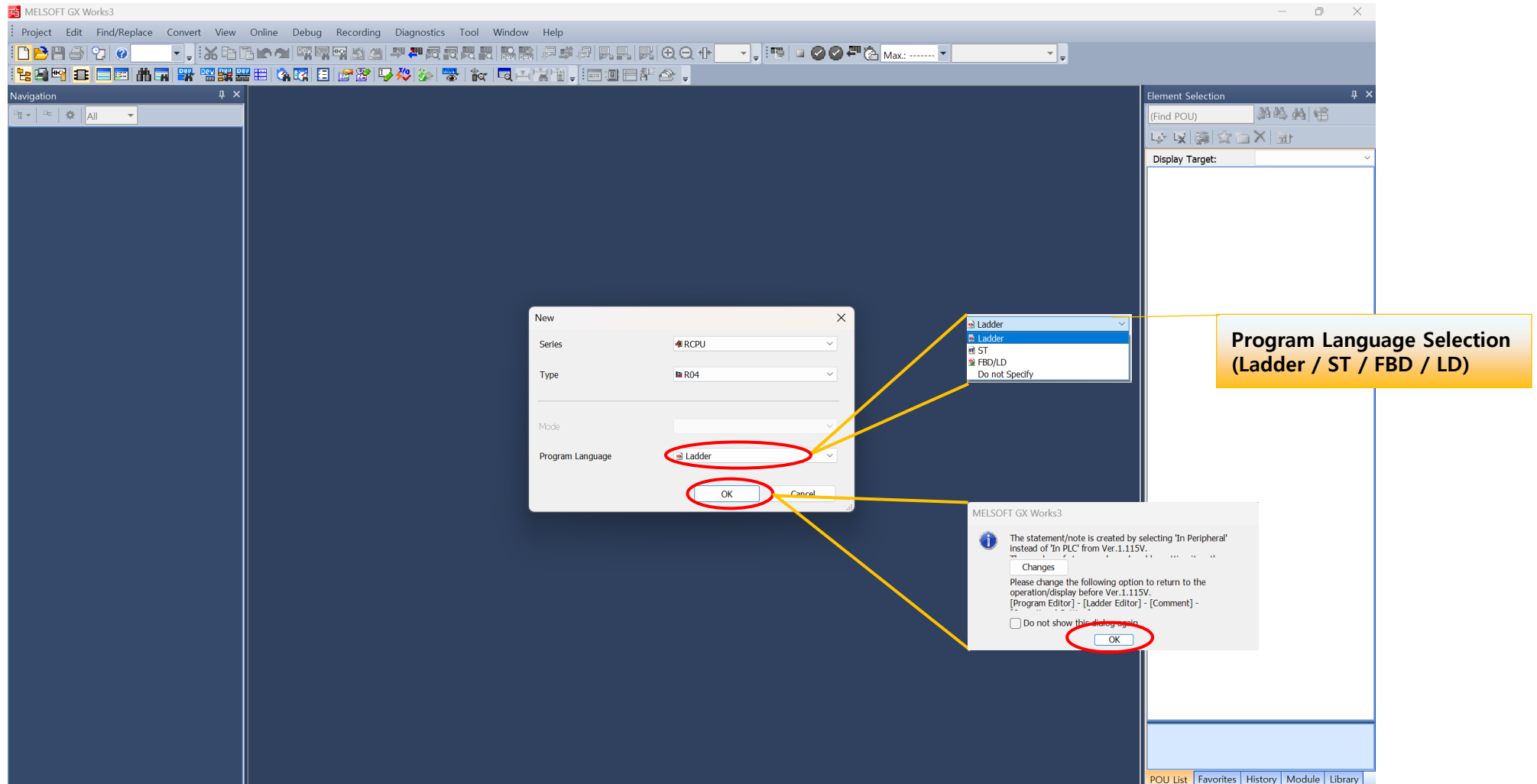
● Motion Control Function Restrictions (RD78G(S) and Ezi-SERVO)

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

2. RD78G(S) Settings

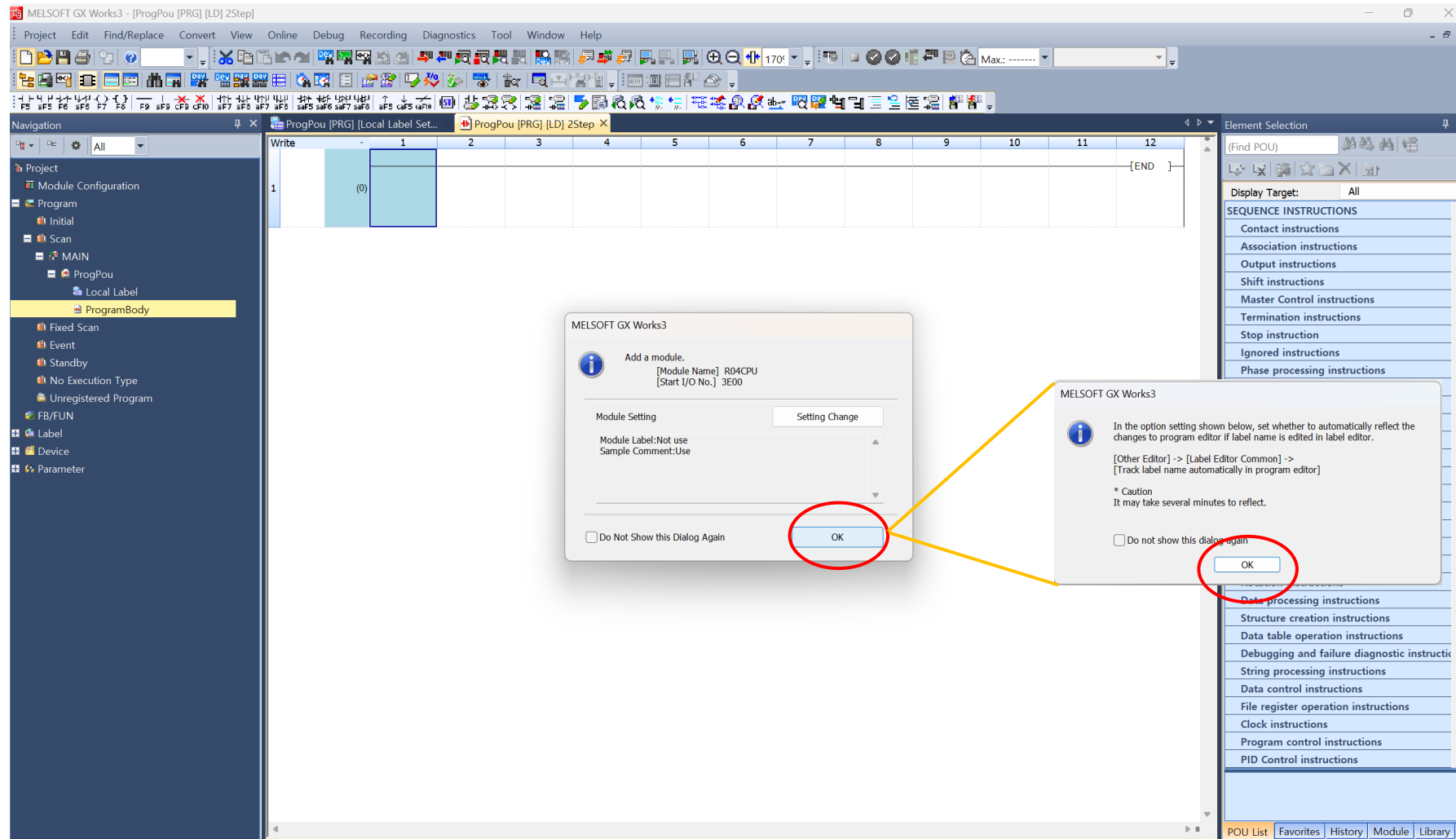
2-1. Project Creation

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



2-2. Module Registration

- iQ-R CPU Registration



2-3. Module Configuration – H/W

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

The screenshot shows the MELSOFT GX Works3 interface for Module Configuration. The left sidebar contains a tree view with 'Module Configuration' selected. The main workspace is a grid where modules are placed. The right sidebar shows the 'Element Selection' list. Five numbered callouts (1-5) indicate the steps for configuration:

- 1. Main Base
- 2. Power Supply
- 3. CPU iQ-R Mounted
- 4. RD78G(S) Installed
- 5. (Unlabeled, pointing to the bottom of the grid)

A legend box in the bottom center explains the steps:

[Click & Drag]
1. Main Base
2. Power Supply
3. CPU iQ-R Mounted
4. RD78G(S) Installed

The 'Element Selection' list on the right includes the following modules:

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

A dialog box in the bottom left corner contains the following text:

MELSOFT GX Works3

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

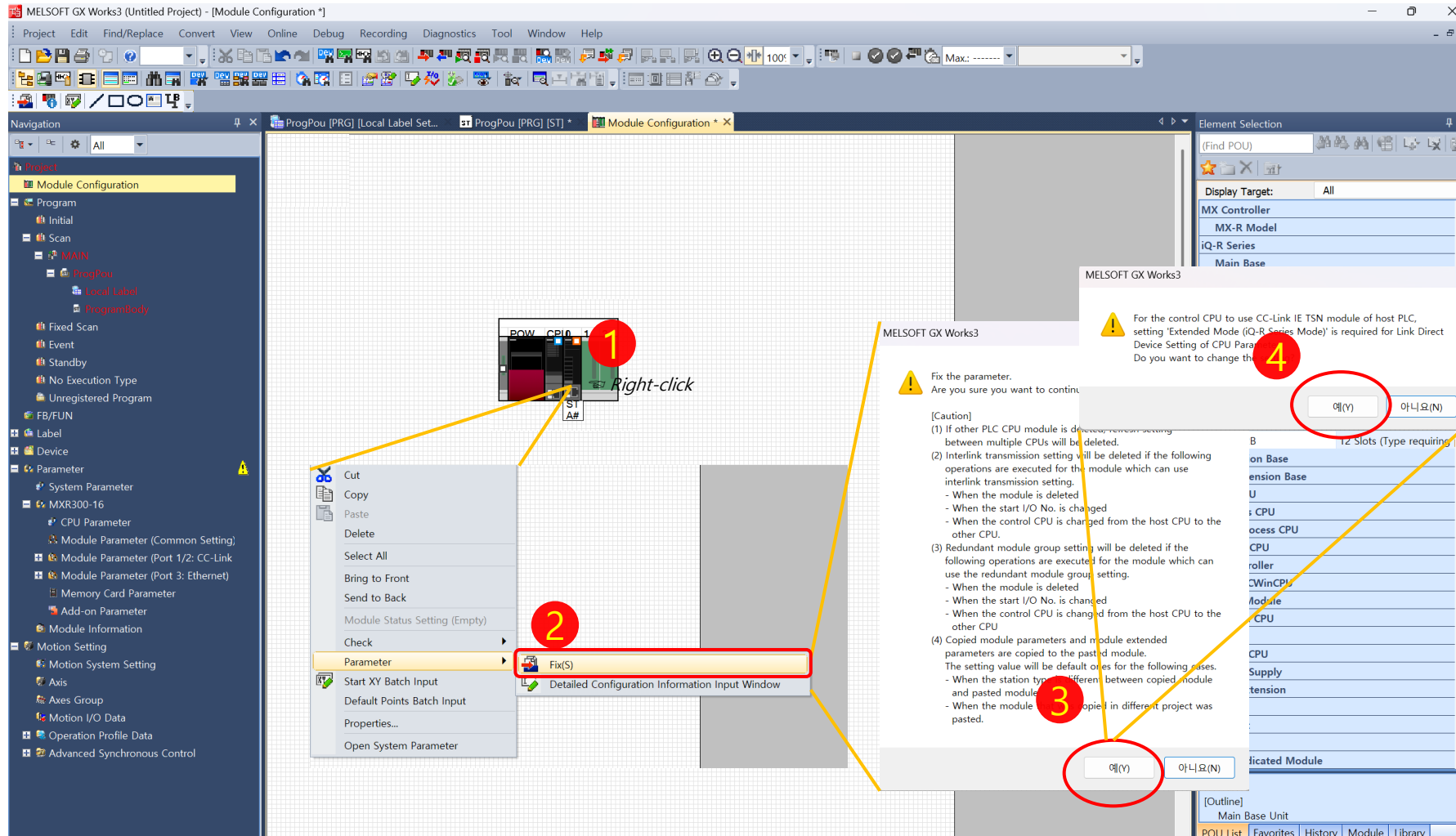
☐ Do not show this dialog again.

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

OK

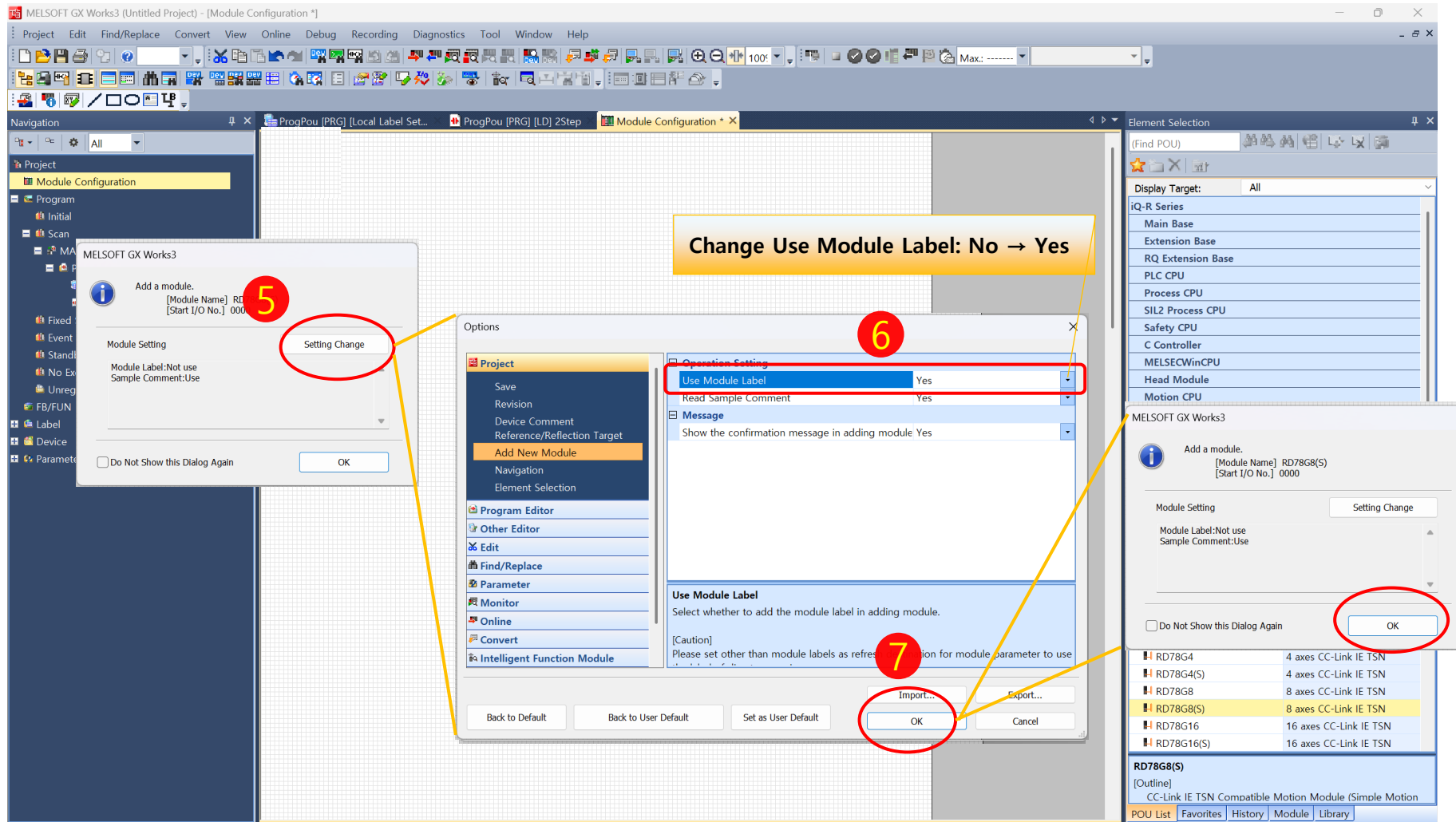
2-3. Module Configuration – H/W

- 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 / 0000:RD78G4(S)

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

The screenshot displays the MELSOFT GX Works3 interface for configuring a 0000:RD78G4 module. The navigation tree on the left (labeled 1) shows the 'Module Parameter (Network)' option selected. The central settings area (labeled 2) contains a table for 'Station No./IP Address Setting' with the following values:

Item	Setting
Station Type	Master Station
Network No.	1
Station No.	0
IP Address	192 . 168 . 3 . 253
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	

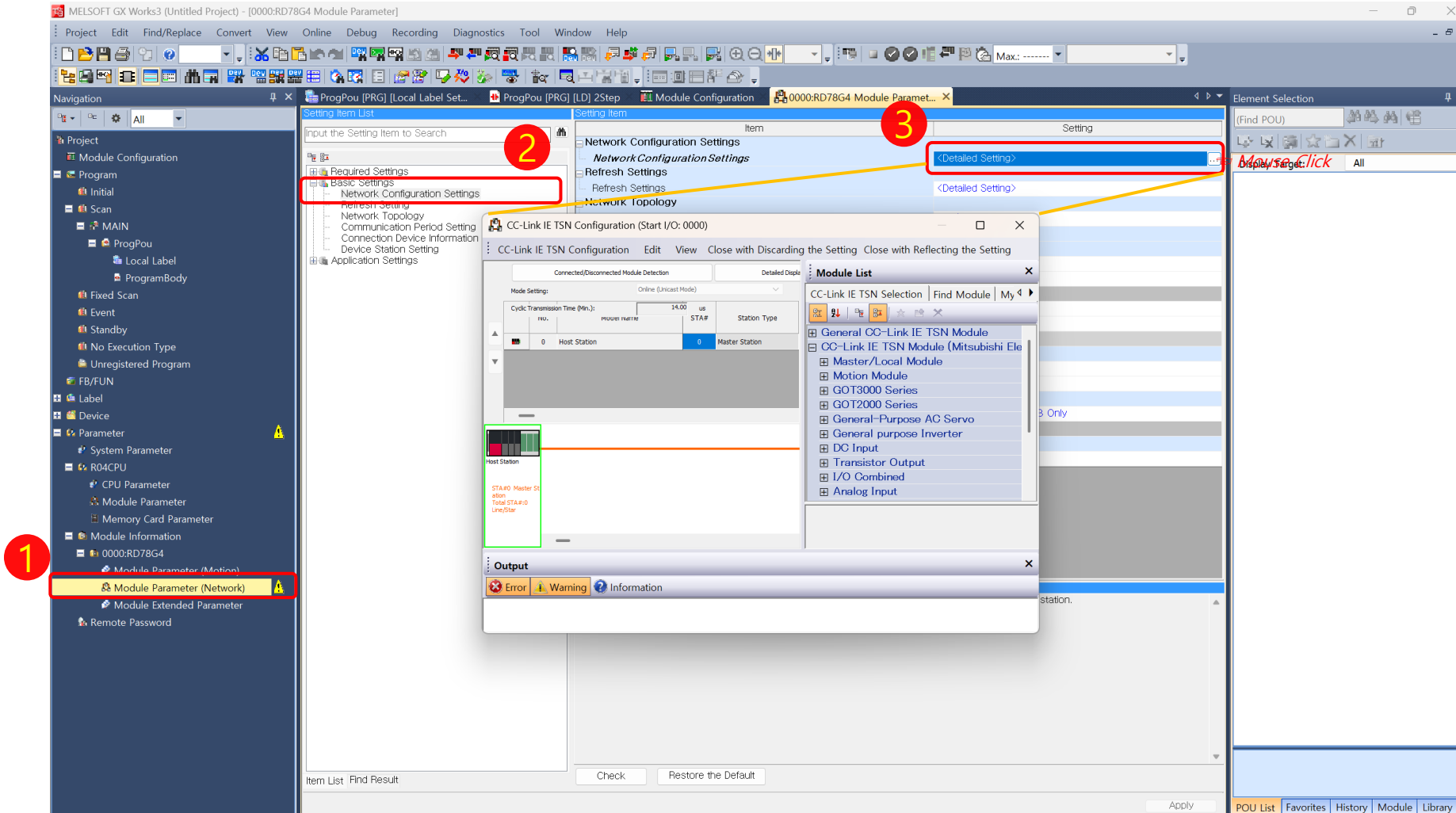
A yellow callout box (labeled 3) provides the following information:

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

The 'Apply' button at the bottom right is also highlighted with a red circle (labeled 3).

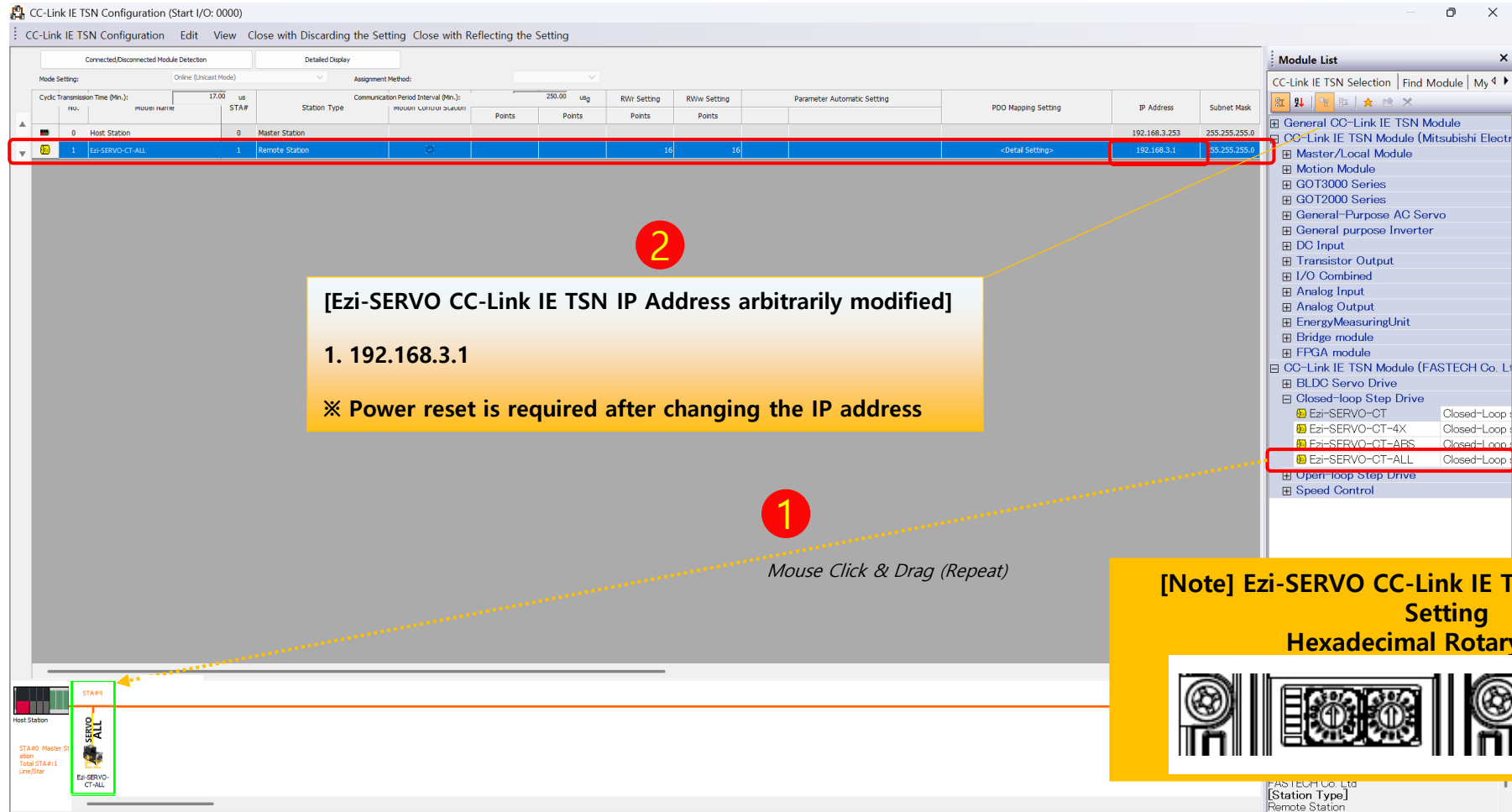
2-4. Parameter / Module Information / 0000:RD78G4(S)

● Network Configuration Settings



2-4. Parameter / Module Information / 0000:RD78G4(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: Connected/Disconnected Module Detection Detailed Display

Online (Unicast Mode) Assignment Method:

Cycle Transmission Time (Min.)	Station Type	Communication Period Interval (Min.)	R/Wr Setting	R/Ww Setting	Parameter Automatic Setting	PDO Mapping Setting	IP Address	Subnet Mask
0	Host Station	17.00 us					192.168.3.253	255.255.255.0
1	Ezi-SERVO-CT-ALL	1	Remote Station	10	10	<Detail Setting>	192.168.3.1	255.255.255.0

2

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

1. 192.168.3.1

※ Power reset is required after changing the IP address

1

Mouse Click & Drag (Repeat)

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

FASTECH Co., Ltd.
[Station Type]
Remote Station

2-4. Parameter / Module Information / 0000:RD78G4(S)

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

The screenshot displays the 'CC-Link IE TSN Configuration (Start I/O: 0000)' window. The main table lists the configuration for two stations:

Station	Points	Points	Points	Points	RWw Setting	Parameter Automatic Setting	PDO Mapping Setting	IP Address	Subnet Mask	Default Gateway	Reserved/Error Invalid Station	Network Synchronous Communication
0 Host Station	0	0	0	0				192.168.3.253	255.255.255.0			
1 Ezi-SERVO-CT-ALL	1	1	1	1	16	16	<Detail Setting>	192.168.3.1	255.255.255.0		No Setting	Asynchronous

Annotations and actions:

- 1** Motion Control Station – Check (mouse click): Points to the 'Station Type' column for Station 1.
- 2** Select Synchronous: Points to the 'Network Synchronous Communication' dropdown menu, which is currently set to 'Asynchronous'.

The right sidebar shows the 'Module List' with the following structure:

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

The bottom status bar shows the 'STA#0' configuration:

- Host Station
- STA#0 Master St
- ation
- Total STA#1
- UnitStar
- Ezi-SERVO-CT-ALL

The bottom right corner displays the following information:

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

2-4. Parameter / Module Information / 0000:RD78G4(S)

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

■ TPDO

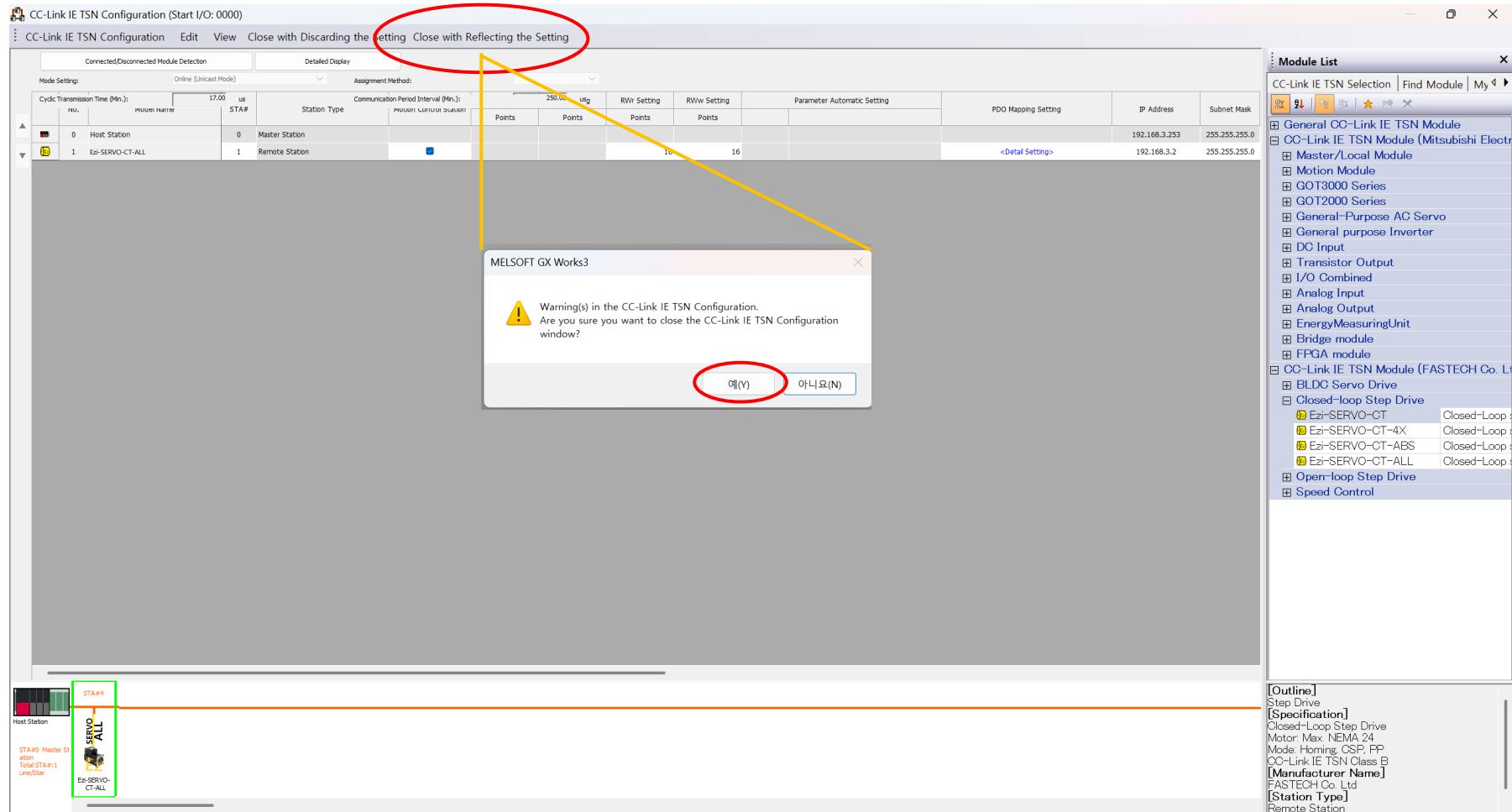
Index	Sub index	Data Type	Content
1D02	01	U16	Watchdog counter UL 1
6061	00	I8	Operating mode display
0000	00	U8	GAP
6064	00	I32	Position Actual Value
60F4	00	I32	Following error actual value
6041	00	U16	Status word
2B12	00	U16	Status DO 1
603F	00	U16	Error code
60FD	00	U32	Digital inputs
0000	00	U32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

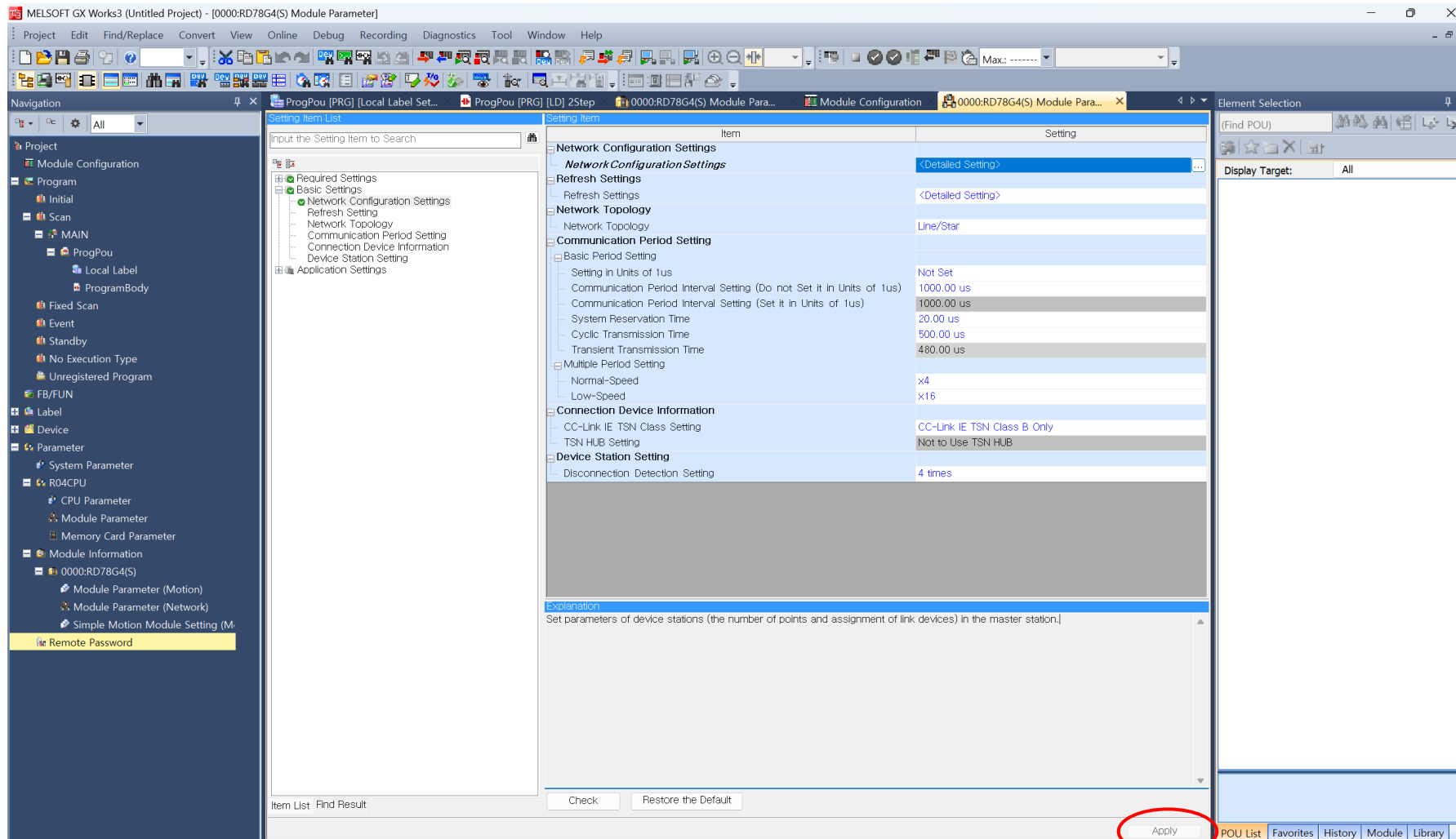
2-4. Parameter / Module Information / 0000:RD78G4(S)

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



2-4. Parameter / Module Information / 0000:RD78G4(S)

- Apply Network Configuration Settings



2-4. Parameter / Module Information / 0000:RD78G4(S)

- Running the Simple Motion Module Setting Program

1

The screenshot displays the MELSOFT GX Works3 interface. On the left, the 'Navigation' pane shows a tree structure under '0000:RD78G4(S)' with 'Simple Motion Module Setting (M)' highlighted. A yellow arrow points from this item to the main window. The main window shows the 'Simple Motion Module Setting Function' for '0000:RD78G4(S)'. It features a 'Setting Item List' on the left and a 'Setting Item' table on the right. The table is divided into 'Common parameters' and 'Servo network composition parameters'. The 'Electronic Gear Setting' tab is active, showing a table with columns for 'Item', 'Axis #1', 'Axis #2', 'Axis #3', and 'Axis #4'. The 'Basic parameters 1' section is also visible at the bottom of the main window.

Item	Axis #1	Axis #2	Axis #3	Axis #4
Common parameters 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			
Servo network composition parameters 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				
Pr.142:Multidrop number	0			
Pr.101:Virtual servo amplifier setting	0:Use Real Servo Amplifier	0:Use Real Servo Amplifier	0:Use Real Servo Amplifier	0:Use Real Servo Amplifier

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).

2-5. Simple Motion Module Setting

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

The screenshot displays the MELSOFT Simple Motion Module Setting Function interface. The left sidebar shows the project structure, with 'Parameter' selected under '0000:RD78G4(S)'. The main window shows the 'Servo network composition parameters' section. A red box highlights 'Pr.141:IP address' in the left sidebar (1). A yellow arrow points from this box to a 'Station Address Setting' dialog box (2). In the dialog box, the 'IP Address' field is highlighted with a red box (3) and contains the value '192.168.3.1'. The 'OK' button is also circled in red.

Station Address Setting

IP Address	Model	Alias
192.168.3.1	E6-SERVO-ALL-CT	

OK Cancel

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) - [0000:RD78G4(S)]-Parameter

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

Project: 0000:RD78G4(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. 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
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).			
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
Pr. 7: Bias speed at start	500 pulse/s	0 pulse/s	0 pulse/s	0 pulse/s
Basic parameters 2	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
Detailed parameters 1	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) - [0000:RD78G4(S)]-Parameter

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

Project: 0000:RD78G4(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
HPR parameters	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
Pr.46:HPR speed	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
External input signal assign...	Set the link device to assign external input signal.			
Forced stop signal	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) - [0000:RD78G8(S)]-Parameter window. The interface is divided into several sections:

- Navigation:** A tree view on the left shows the project structure, including System Setting, Parameter, Positioning Data, Block Start Data, Synchronous Control Parameter, Cam Data, Simple Motion Monitor, Module Monitor, Axis Monitor, Starting History, Position Value History, and Digital Oscilloscope.
- Parameter List:** A table of parameters is shown, categorized into Common parameters, Servo network composition parameters, Basic parameters 1, Basic parameters 2, and Detailed parameters 1. The 'Basic parameters 1' section is expanded, showing parameters like Pr. 1: Unit setting, Pr. 2: Number of pulses per rotation, Pr. 3: Movement amount per rotation, Pr. 4: Unit magnification, Pr. 7: Bias speed at start, Pr. 8: Speed limit value, Pr. 9: Acceleration time, Pr. 10: Deceleration time, Pr. 11: Backlash compensation amount, Pr. 12: Software stroke limit upper limit value, Pr. 13: Software stroke limit lower limit value, Pr. 14: Software stroke limit selection, Pr. 15: Software stroke limit valid/invalid setting, Pr. 16: Command in-position width, Pr. 17: Torque limit setting value, Pr. 18: M-code ON signal output timing, Pr. 19: Speed switching mode, Pr. 20: Interpolation speed designation method, Pr. 21: Command position value during speed control, and Pr. 22: Inout signal logic selection.
- Electronic Gear Setting - Axis #1:** A dialog box is open, showing the 'Entry' section. It includes fields for 'Machine Components' (Others), 'Unit Setting' (3:pulse), 'Movement Amount per Load Rotation (dSL)' (10000 [pulse]), and 'Encoder Resolution' (10000 [pulse]). The 'Calculate Electronic Gear' button is highlighted.
- Calculation Result:** A section showing the results of the calculation, including 'Basic Parameters 1' (Unit Setting: 3:pulse, Number of Pulses per Rotation: 10000 pulse, Movement Amount per Rotation: 10000 pulse, Unit Magnification: 1x1 Times) and 'Movement Amount per Pulse'.

Red circles and arrows indicate the following steps:

1. Select 'Pr. 2: Number of pulses per rotation' in the parameter list.
2. Enter '10000 pulse' in the 'Movement Amount per Load Rotation (dSL)' field.
3. Enter '10000 pulse' in the 'Encoder Resolution' field.
4. Click the 'Calculate Electronic Gear' button.
5. Click the 'OK' button in the 'Calculation Result' dialog.

Checkmarks and text in the bottom right corner confirm the settings:

- ✓ 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

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) - [0000:RD78G8(S)]-Parameter

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

Project: 0000:RD78G8(S) | 0000:RD78G8(S)-Parameter | 0000:RD78G8(S)-Axis #1 Posit...

Display Filter: Display All | Electronic Gear Setting

Item	Axis #1	Axis #2	Axis #3	Axis #4
Common parameters 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			
Servo network composition parameters 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		
Basic parameters 1 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	1x1 Times	1x1 Times		
Pr.7: Bias speed at start	500 pulse/s	500 pulse/s		
Basic parameters 2 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
Detained parameters 1 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		
Pr.12: Software stroke limit upper limit value	2147483647 pulse	2147483647 pulse		
Pr.13: Software stroke limit lower limit value	-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		
Pr.15: Software stroke limit valid/invalid setting	0: Valid	0: Valid		
Pr.16: Command in-position width	100 pulse	100 pulse		
Pr.17: Torque limit setting value	300.0 %	300.0 %		
Pr.18: M-code ON signal output timing	0: WITH Mode	0: WITH Mode		
Pr.19: 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		
Pr.21: Command position value during speed control	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		

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.

- ✓ 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

- Convert / Rebuild All

MELSOFT Simple Motion Module Setting Function (Untitled Project) - [0000:RD78G8(S)]-Parameter

Project Edit View Online Window Help

Navigation 100%

Project

- 0000:RD78G8(S)
- System Setting
- Parameter
- Positioning Data
 - Axis #1 Positioning Data
 - Axis #2 Positioning Data
 - Axis #3 Positioning Data
 - Axis #4 Positioning Data
 - Axis #5 Positioning Data
 - Axis #6 Positioning Data
 - Axis #7 Positioning Data
 - Axis #8 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. 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).			
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

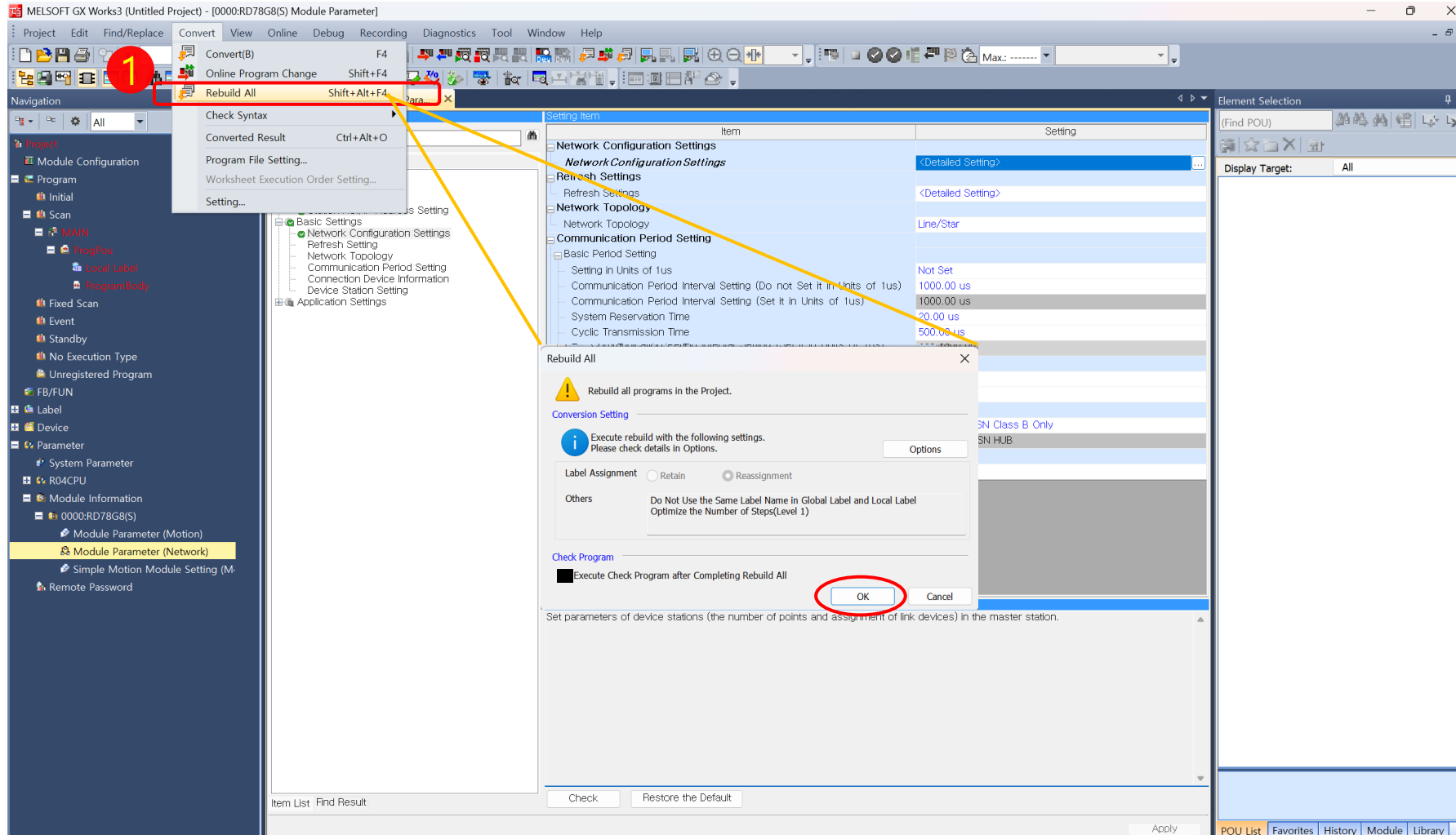
Basic parameters 1
Set according to the machine and applicable motor when system is started up (It will be valid according to PLC ready signal).

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

To test Ezi-SERVO operation without connecting the Limit Sensor, set Pr.116, Pr.117, and Pr.118 all to Invalid.

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 selected. The 'Online Data Operation' dialog box is displayed, showing the 'Module Name/Data Name' list. The 'Common Device Co...' option is highlighted with a red circle. 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.'

The 'Online Data Operation' dialog box also shows the 'Memory Capacity' section with the following data:

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

The 'Execute' button is also circled in red.

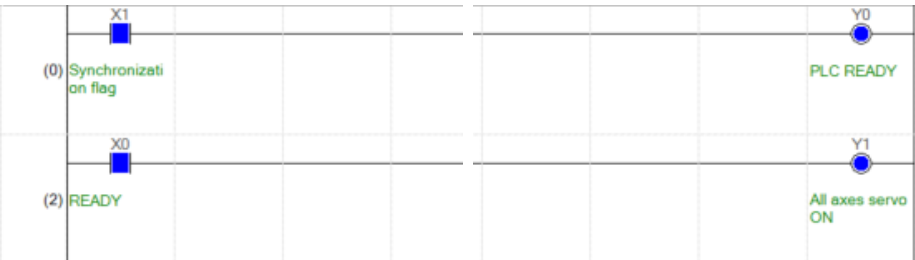
3. Verify Operation

3-1. Program Development

- PLC Motion Module: Ready / STEP On

Memory Map Method

[Ladder Program]



Simple Motion supports two types of programs

No	Item	Signal Transmission	Memory Map	Label
1	RD78G(S) Synchronization On	RD78G(S) → iQ-R CPU	X1	RD78G(S)_1.bSynchronizationFlag_D
2	RD78G(S) ON Instruction	iQ-R CPU → RD78G(S)	Y0	RD78G(S)_1.bPLC_Ready_D
3	RD78G(S) Ready	RD78G(S) → iQ-R CPU	X0	RD78G(S)_1.bReady_D
4	All Axis STEP On	iQ-R CPU → RD78G(S)	Y1	RD78G(S)_1.bAllAxisStepOn_D

Label (Variable) Method

[Ladder Program]



[ST Program]

```

1 IF SM400 & RD78GS_1.bSynchronizationFlag_D THEN
2     RD78GS_1.bPLC_Ready_D := TRUE;
3 END_IF;
4
5 IF RD78GS_1.bReady_D THEN
6     RD78GS_1.bAllAxisServoOn_D := TRUE;
7 END_IF;
8

```

3-1. Program Development

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

The screenshot displays the MELSOFT GX Works3 interface for configuring the RD78G(S) module parameters. The main window shows a ladder logic program with the following steps:

- Step 1: (0) R W PLC READY(Direct)
- Step 2: (6) R READY(Direct)
- Step 3: (12) bSetJogParam
- Step 4: (12) DMOV K5000 RD78G(S) aJogSpeed_D (JOG speed(Direct))
- Step 5: (12) DMOV K50000 RD78G(S) aJogSpeedLimit_D (JOG speed limit value(Direct))
- Step 6: (12) DMOV K200 RD78G(S) aAccTime_D (Acceleration time(Direct))
- Step 7: (12) DMOV K200 RD78G(S) aDecTime_D (Deceleration time(Direct))
- Step 8: [END]

The right-hand pane shows the 'Element Selection' window with a list of module functions. The selected function is 'M+ RD78G(_JOG_01A) JOG/inching operation'. The bottom status bar indicates the current function is 'M+RD78G(_JOG_01A) JOG運転 / インチング運転を行います。' (JOG operation / Inching operation).

3-1. Program Development

- Jog Operation Program: Module FB (Click & Drag MRD78G(S)_JOG_01A1)

The screenshot displays the MELSOFT GX Works3 interface for a project named '0000:RD78G8(S) Module Parameter'. The main workspace shows a ladder logic program with steps 1 through 12. A red box highlights the 'FB Instance Name' dialog box, which is open over the program. The dialog box contains the text 'Local Label (ProgPou)' and 'RD78G(S)_JOG_01A1'. A red circle with the number '1' is placed next to the 'RD78G(S)_JOG_01A1' entry in the 'Element Selection' pane on the right. A yellow callout box with a checkmark and the text '✓ JOG Operation FB Creation: OK' is positioned below the dialog box. The 'Element Selection' pane on the right lists various module functions, including 'M+ RD78G(S)_SetPositioningData', 'M+ RD78G(S)_StartPositioning_01A', 'M+ RD78G(S)_JOG_01A', 'M+ RD78G(S)_MPG_01A', 'M+ RD78G(S)_ChangeSpeed_01A', 'M+ RD78G(S)_ChangeAccDecTime', 'M+ RD78G(S)_ChangePosition_01A', 'M+ RD78G(S)_Restart_01A', 'M+ RD78G(S)_OperateError_01A', 'M+ RD78G(S)_InitializeParameter_0', 'M+ RD78G(S)_WriteFlash_00A', 'M+ RD78G(S)_ChangeTorqueContr', 'M+ RD78G(S)_ChangeSpeedContr', 'M+ RD78G(S)_ChangePositionContr', 'M+ RD78G(S)_ChangeContinuousTr', 'M+ RD78G(S)_Sync_01A', 'M+ RD78G(S)_ChangeSyncEncoder', 'M+ RD78G(S)_DisableSyncEncoder', 'M+ RD78G(S)_EnableSyncEncoder', 'M+ RD78G(S)_ResetSyncEncoderEr', 'M+ RD78G(S)_ConnectSyncEncode', 'M+ RD78G(S)_MoveCamReference', 'M+ RD78G(S)_ChangeCamPositionI', 'M+ RD78G(S)_ChangeMainShaftGe', 'M+ RD78G(S)_ChangeAuxiliaryShaft', 'M+ RD78G(S)_MoveCamPositionPe', 'M+ RD78G(S)_MakeRotaryCutterCa', 'M+ RD78G(S)_CalcCamCommandP', and 'M+ RD78G(S)_CalcCamPositionPerI'. The 'M+ RD78G(S)_JOG_01A' entry is highlighted in blue.

✓ JOG Operation FB Creation: OK

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

MELSOFT GX Works3 (Untitled Project) - [0000:RD78G(S) Module Parameter]

Project | Module Configuration | Program | Initial | Scan | MAIN | ProgPou | Local Label | ProgramBody | Fixed Scan | Event | Standby | Inregistered Program | FB/FUN | M_FBLIB | M+FXSSSC_JOG_01A JOG/inching op | Label | Device | Parameter

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

4 DMOV K50000 RD78G(_JOG_01A) udJogSpeedLimit_D R/W JOG speed limit value(Direct)

5 DMOV K200 RD78G(_JOG_01A) udAccelerationTime0_R/W Acceleration time 0(Direct)

6 DMOV K200 RD78G(_JOG_01A) udDecelerationTime0_R/W Deceleration time 0(Direct)

7 (42) bJogOperationCmd

8 B: L bJEN o_bENO B Execution command status

9 DOUT L udM o_bOK B Module label Normal completion

10 K1 U/W L udAxis o_bErr B Target axis Error completion

11 bJogForwardReq

12 bJogReverseReq

13 K5000 UD: L udJog Cd 17 : JOG speed

14 K1 U/W L udInch Cd 16 : Inching movement amount

15 (END)

297

Element Selection (Find POU)

Display Target: All

Module Label

Module FB

RD78G(S)

- M+ RD78G(_SetPositioningData_ Positioning data set
- M+ RD78G(_StartPositioning_01A Positioning start FB
- M+ RD78G(_JOG_01A JOG/inching operat
- M+ RD78G(_MPG_01A Manual pulse gener
- M+ RD78G(_ChangeSpeed_01A Speed change FB
- M+ RD78G(_ChangeAccDecTime Acc./dec. time SV c
- M+ RD78G(_ChangePosition_01A Target position cha
- M+ RD78G(_Restart_01A Restart FB
- M+ RD78G(_OperateError_01A Error operation FB
- M+ RD78G(_InitializeParameter_0 Parameter Initializati
- M+ RD78G(_WriteFlash_00A Flash ROM writing f
- M+ RD78G(_ChangeTorqueContr Torque control moc
- M+ RD78G(_ChangeSpeedContrc Speed control mod
- M+ RD78G(_ChangePositionCont Position control mo
- M+ RD78G(_ChangeContinuousTr Continuous torque)
- M+ RD78G(_Sync_01A Starting/ending syn
- M+ RD78G(_ChangeSyncEncoder Sync encoder posit
- M+ RD78G(_DisableSyncEncoder Sync encoder coun
- M+ RD78G(_EnableSyncEncoder_ Sync encoder coun
- M+ RD78G(_ResetSyncEncoderEr Sync encoder error
- M+ RD78G(_ConnectSyncEncode Sync encoder Conn
- M+ RD78G(_MoveCamReference Cam reference posi
- M+ RD78G(_ChangeCamPositionl Cam position per c
- M+ RD78G(_ChangeMainShaftGe MG Positon per cyc
- M+ RD78G(_ChangeAuxiliaryShaf AG position per cyc
- M+ RD78G(_MoveCamPositionPe Cam position per c
- M+ RD78G(_MakeRotaryCutterCa Cam for rotary cuttr
- M+ RD78G(_CalcCamCommandP Cam command pos
- M+ RD78G(_CalcCamPositionPerf Cam position per c

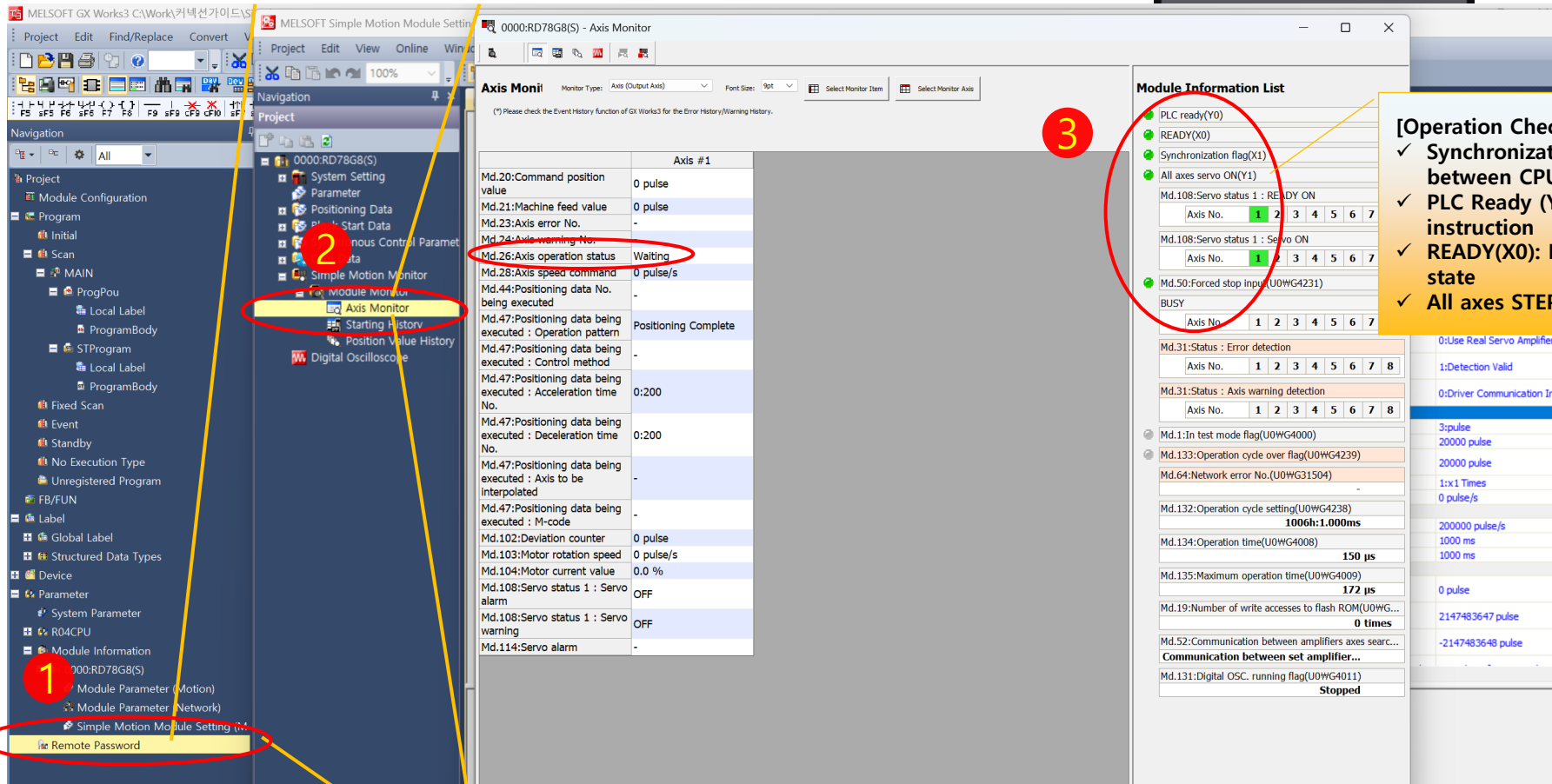
M+RD78G(_JOG_01A

[Japanese]

JOG運転 / インチング運転を行います。

POU List | Favorites | History | Module | Library

- RD78G(S) PROGRAM RUN: D LINK Green LED lit
- Axis Monitor



3-3. Axis Operation Verification

● Jog Operation – Setting and Movement

Program Mode (Ladder, Label)

✓ **bSetJogSpeed, bSetJogSpeedLimit, bSetJogAccel, bSetJogDecel**
Set value using ON/OFF

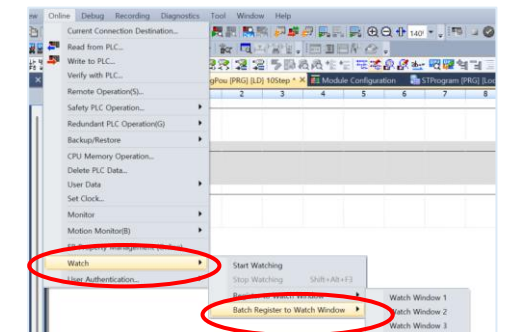
✓ **Jog Operation Verification**
bJogMoveCW : ON → CW rotation, OFF → Stop
bJogMoveCCW : ON → CCW rotation, OFF → Stop

Watch Mode

Watch 1[Watching]		
ON OFF ON/OFF toggle Update Clear All		
Name	Current Value	English
RD78GS_1.bPLC_Ready_D	TRUE	RW:PLC READY(Direct)
RD78GS_1.bAllAxisServoOn_D	TRUE	RW:All axis servo ON(Direct)
RD78GS_1.stnAxCtrl1_D[0].udJOG_Speed_D	5,000	RW:JOG speed(Direct)
RD78GS_1.stnAxCtrl1_D[0].udJOG_SpeedLimit_D	50,000	RW:JOG speed limit value(Di...
RD78GS_1.stnAxCtrl1_D[0].udAccelerationTime0_D	200	RW:Acceleration time 0(Direct)
RD78GS_1.stnAxCtrl1_D[0].udDecelerationTime0_D	200	RW:Deceleration time 0(Direct)
RD78GS_1.stnAxCtrl2_D[0].uStartForwardJOG_D	0	RW:Forward run JOG start(D...
RD78GS_1.stnAxCtrl2_D[0].uStartReverseJOG_D	0	RW:Reverse run JOG start(Di...

[Operation Verification]

- ✓ Enter the following values for Jog Speed/SpeedLimit/Accel/Decel
- ✓ Jog Operation Verification
 - ...uStartForwardJOG_D : 1 → Clockwise rotation, 0 → Stop
 - ...uStartReverseJOG_D : 1 → CCW rotation, 0 → Stop



3-3. Axis Operation Verification

● Jog Operation: Stop → Move

0000:RD78G8(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)
- BUSY
- 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

0000:RD78G8(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)
- BUSY
- 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 Methods

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



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