



Programmable Controllers
MELSEC iQ-R
series



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

접속 가이드

MELSEC iQ-R RD78G (H) and **Ezi-SERVO**® CC-Link IE TSN
Closed Loop Stepping System **ALL**

미쓰비시 전기 제품

RD78G4 / RD78G8 / RD78G16
RD78G32 / RD78G64
RD78G4HV / RD78GHW

파스텍 제품

Ezi-SERVO CC-Link IE TSN ALL

시작하기 전에

- 저희 회사의 제품을 이용해 주셔서 감사합니다.
- Ezi-SERVO CC-Link IE TSN ALL은 32비트 고성능 ARM 프로세서를 탑재한 드라이브와 다양한 모터로 구성된 스테핑모터 유닛으로, CC-Link IE TSN 네트워크에서 리모트국으로 사용됩니다.
- Ezi-SERVO CC-Link IE TSN ALL은 산업용 제품입니다. 다른 용도로는 사용하지 말아 주십시오. 이를 준수하지 않아 손해가 발생한 경우에 저희 회사에서는 어떠한 책임도 지지 않습니다.
- 저희 회사에서 제공하는 이 접속 가이드는 미쓰비시 전기의 MELSEC iQ-R RD78G(H)에 Ezi-SERVO CC-Link IE TSN ALL을 연결하는 방법을 안내하는 자료로, CSP+ 파일 등록과 시스템 구성, 파라미터 설정, 프로그램 방법 등을 설명합니다.
- PLC 프로그램을 작성하기 전에 이 접속 가이드를 반드시 읽고, 내용을 정확히 이해하신 후 제품을 올바르게 사용하시기 바랍니다.
- 이 접속 가이드는 예고 없이 변경될 수 있습니다. 최신 버전이 필요하신 경우에는 저희 회사의 CC-Link IE TSN 홈페이지 (cltsn.fastech-motions.com)를 참고하시기 바랍니다.

매뉴얼 정보

- Ezi-SERVO CC-Link IE TSN ALL 매뉴얼은 파스텍 홈페이지에서 다운로드할 수 있습니다.
<https://cltsn.fastech-motions.com/download/quick>

매뉴얼 명칭	매뉴얼 번호
[매뉴얼][CC-Link IE TSN][Ezi-SERVO ALL] Closed Loop Stepping System	
[접속가이드][CC-Link IE TSN][MELSEC iQ-R RD78G(H)][Ezi-SERVO ALL]	

- MELSEC iQ-R RD78G(H) 매뉴얼은 미쓰비시 전기 홈페이지에서 다운로드할 수 있습니다.
<https://www.mitsubishielectric.com/fa/index.html>

Manual Name	Manual Number
MELSEC iQ-R Motion Unit User's Manual (Startup Edition)	IB-0300405
MELSEC iQ-R Motion Unit User's Manual (Application Edition)	IB-0300410
MELSEC iQ-R Motion Unit User's Manual (Network Edition)	IB-0300425
MELSEC iQ-R Programming Manual (Motion Unit Instructions/General-Purpose FUN/General-Purpose FB Edition)	IB-0300430
MELSEC iQ-R Programming Manual (Motion Control FB Edition)	IB-0300532
MELSEC iQ-R Motion Unit User's Manual (Simple Motion Mode Applications Edition)	IB-0300571
MELSEC iQ-R Motion Unit User's Manual (Simple Motion Mode Advanced Synchronous Control Edition)	IB-0300574
GX Works3 Operating Manual	SH-081214

용어

- 접속 가이드에서 사용되는 용어와 관련된 내용입니다.

용어	내용
CC-Link IE TSN	표준 이더넷 규격을 확장한 'TSN(Time-Sensitive Networking)'을 채택하여, 실시간성을 확보한 제어와 다른 오픈 네트워크의 정보를 동시에 처리할 수 있는 오픈 네트워크입니다.
마스터국(매니저국)	네트워크 전체를 관리하는 국으로, 모든 국과 사이클릭 전송 및 트랜지언트 전송을 할 수 있습니다. MELSEC iQ-R RD78G(H)가 이에 해당합니다.
리모트국	비트 단위의 입출력 신호와 워드 단위의 입출력 데이터를 사이클릭 전송하는 국으로, 트랜지언트 전송도 가능합니다. Ezi-SERVO CC-Link IE TSN ALL이 이에 해당합니다.
PDO	Process Data Object의 약칭입니다. 여러 CANopen 노드 간에 주기적으로 전송되는 애플리케이션 오브젝트의 집합체입니다.
오브젝트	CANopen에 대응하는 디바이스국이 보유한 다양한 데이터입니다.

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- [동작확인] 원점복귀 방법 변경
- [동작확인] 원점복귀
- [동작확인] Jog 운전
- [동작확인] 트러블 슈팅
- [파라미터] 원점복귀 파라미터 설정

1. 개 요

1-1. 개요

- MELSEC iQ-R RD78G(H)와 Ezi-SERVO CC-Link IE TSN ALL 접속 가이드

◆ 마스터국: RD78G4 (4축) / RD78G8 (8축) / RD78G16 (16축) / RD78G32 (32축) / RD78G64 (64축)
RD78G4HV (128축) / RD78GHW (256축)

PLCopen®Motion Control FB(Function Block)

- 국제 표준 규격인 PLCopen Motion Control FB 라이브러리를 사용하여 제어 프로그램을 쉽게 작성할 수 있습니다.
- 이 프로그램은 제3자도 내용을 쉽게 파악할 수 있기 때문에 설계 및 유지보수 시간을 크게 단축할 수 있습니다.

◆ 엔지니어링 소프트웨어

- GX Works3 : Ver. 1.105K 이상
- 모션 제어 설정 기능 : Ver. 1.055H 이상

※ 최신 파일은 미쓰비시 전기 홈페이지를 참조하시기 바랍니다.

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

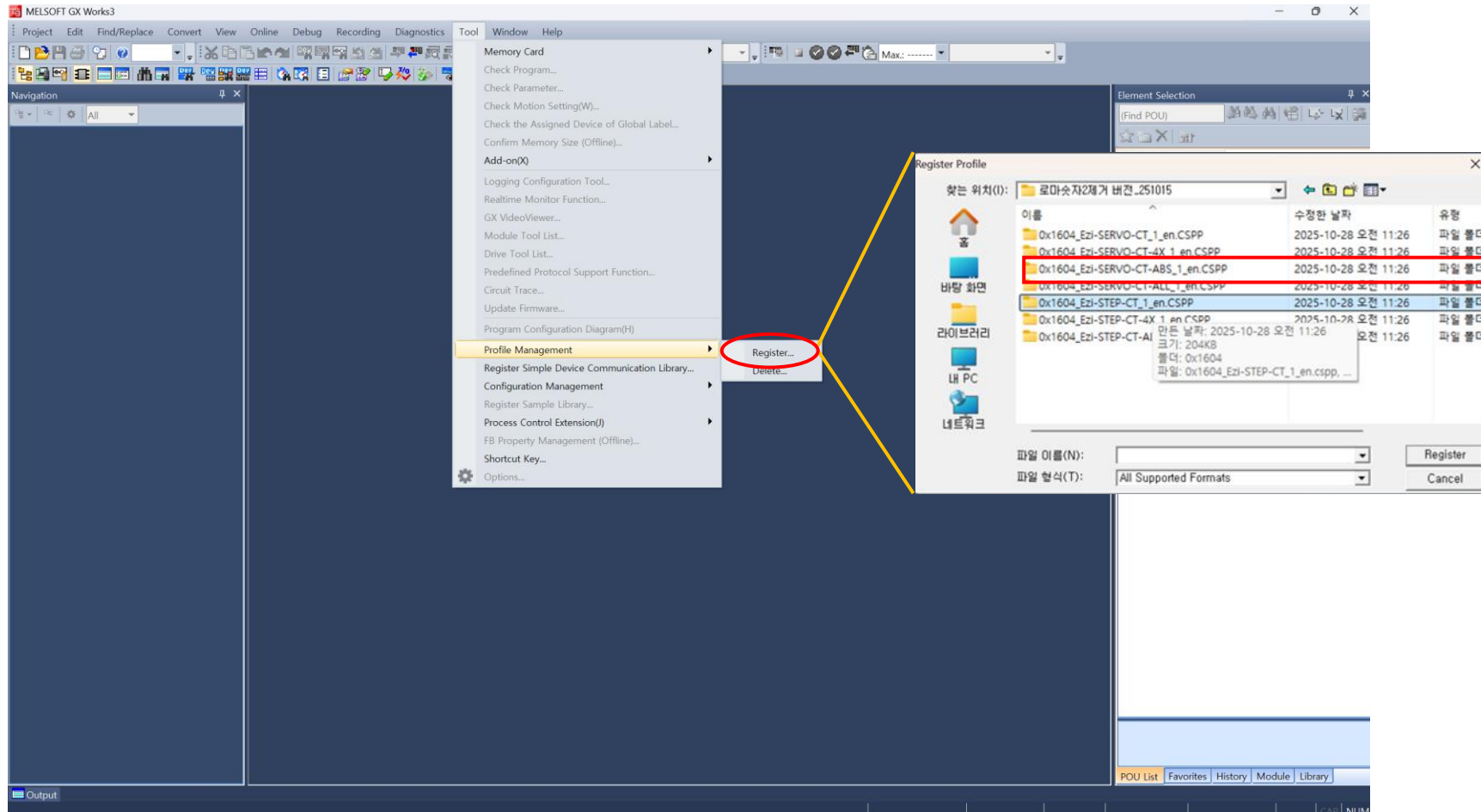
◆ 리모트국: Ezi-SERVO CC-Link IE TSN ALL

- CSP+ 파일 다운로드 주소: <https://cltsn.fastech-motions.com/download/quick>
- 파일명 : 0x1604_Ezi-SERVO-CT_ALL_1_en_CSPP

1-2. Ezi-SERVO CC-Link IE TSN ALL CSP+ 파일 등록

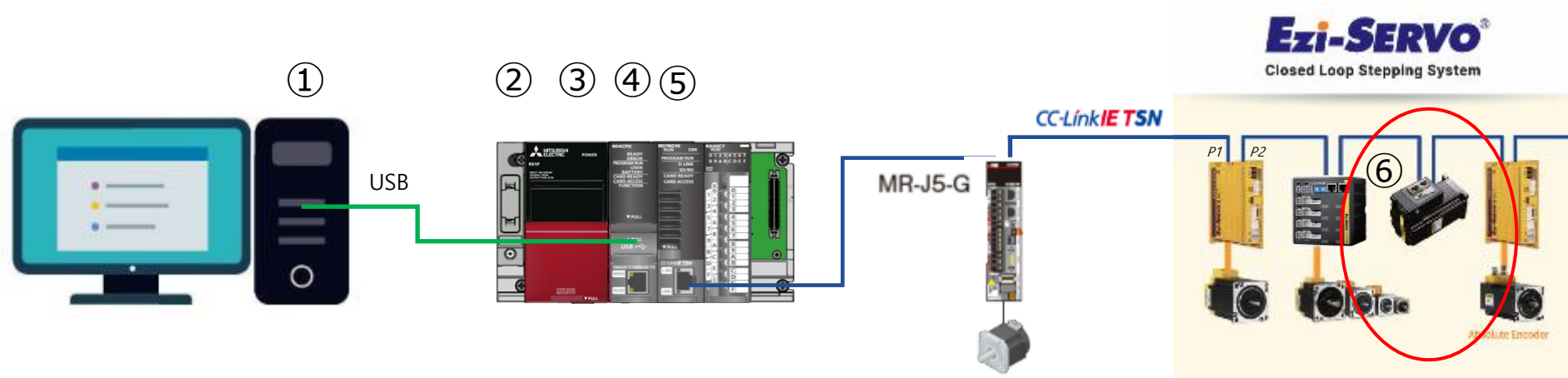
● CSP+ 등록

- [GX Works3] Tool / Profile Management / Register ※ Project를 열기 전에만 등록할 수 있습니다.



1-3. CC-Link IE TSN 구성

● 시스템 구성



구성	품명	IP 주소
①	엔지니어링 소프트웨어	GX Works3
②	기본 베이스	R33B
③	전원 모듈	R61P
④	CPU 모듈	iQ-R04
⑤	모션 모듈	RD78G4
⑥	드라이브 + 모터	Ezi-SERVO-CT-ALL-42S-A-R
		192.168.3.253
		192.168.3.1

1-3. CC-Link IE TSN 구성

- Ezi-SERVO 규격

항목		규격
통신 프로토콜		CC-Link IE TSN Class B
통신 속도		1Gbps / 100Mbps
동작 모드		CiA402 드라이브 프로파일 : 사이클릭 동기 위치 모드 (CSP) / 프로파일 위치 모드 (PP) / 원점복귀 모드 (HM)
동기 방식	시각 동기 방식	IEEE1588 / IEEE802.1AS
	통신 주기	최소 250 μ s
	네트워크 동기 통신	동기 통신 (CSP, PP, HM) / 비동기 통신 (PP, HM)
인코더 타입		인크리멘탈 타입

1-4. 설정 순서

● Ezi-SERVO, RD78G(H) 파라미터 설정

No.	항목	내용
1	Ezi-SERVO 설정 	드라이브 설정 프로그램(Ezi-CT Manager)을 이용하여 파라미터를 설정합니다. 설정 프로그램과 사용 방법은 (주)파스텍 홈페이지 에서 다운로드하시기 바랍니다. ※ 주소: https://cltsn.fastech-motions.com/download/quick
2	RD78G(H) 설정 	GX-Works3를 사용해 RD78G(H)의 프로젝트를 만든 다음, 유닛 파라미터(통신 방식, 접속 대상)와 축 파라미터(모션 제어용)를 설정합니다.
3	RD78G(H) + Ezi-SERVO 동작 확인 	RD78G(H)와 Ezi-SERVO가 올바르게 설정되어 있는지 확인하기 위한 프로그램을 작성합니다. 라벨을 조작해 모터가 정상적으로 작동하는지 확인합니다

1-4. 설정 순서

● Ezi-SERVO 설정 참고 사항

항목	내용
IP 주소 설정	① 드라이브의 로터리 스위치로 설정 ② 로터리 스위치 → '00', IP address (Index: 2101h, Subindex: 01~04h) 값으로 설정
드라이브 원점복귀 방법 설정	① Homing method (Index: 6098h, Subindex:00h) 설정 - '0'(초깃값) → '33' 등 원점복귀 방법 설정 ※ [부록] 원점복귀 방법 참조 ② Home offset (Index: 607Ch, Subindex:00h) → '0' 설정 필요 주의) 0이 아닌 값을 설정하면, 원점복귀가 완료될 때 급가속하거나 급감속하는 경우가 있습니다.
리미트 정지 방법 설정	① Limit stop method (Index:2003h, Subindex:00h) 설정 - 0: PP, HM → 급정지 / CSP → 정지하지 않음 - 1: PP, HM → 감속 정지 / CSP → 정지하지 않음 ② '0' 또는 '1'이 아닌 값을 설정하면, 하드웨어 스트로크 리미트를 감지할 때 '1ED0H: 드라이브 오류'가 발생할 수 있습니다
인포지션 범위	① In-position range (Index:2B21h, Subindex:00h, Data type:Unsigned32) 설정 - 사용 환경을 고려하여 인포지션 범위(5~20000 pulse) 내의 값을 등록 ② [Md.102: 편차 카운터 값]이 이 설정값보다 작을 경우, [Md.108: 서보 상태 1: 인포지션]이 ON됩니다. 이 오브젝트는 공개하지 않는 것이 원칙이므로 FX5 CPU 모듈의 서보 트랜지언트 전송 기능을 이용하여 설정해 주십시오.

1-5. 제약 사항

● 모션 제어 기능 제약 사항 (RD78G(H)와 Ezi-SERVO)

항목	제약 사항
토크 제한 기능	드라이브가 아래 오브젝트를 지원하지 않아 토크 제한 기능을 사용할 수 없습니다. • Positive torque limit value (Index:60E0h, Subindex:00h) • Negative torque limit value (Index:60E1h, Subindex:00h)
절대 위치 시스템	인코더가 인크리멘탈 타입이기 때문에 절대 위치 시스템을 사용할 수 없습니다.
가상 서보 앰프 기능	MR-J5-G로 에뮬레이트됩니다.
마크 검출 기능	[Pr.800: 마크 검출 신호 설정]에 드라이브의 TPR1(터치 프로브 1)을 사용할 수 없습니다.
임의 데이터 모니터 기능	임의 데이터 모니터 기능을 사용할 경우, [Pr.91~94: 임의 데이터 모니터 데이터 종류 설정 1~4]와 [Pr.591~594: 임의 데이터 모니터 데이터 종류 확장 설정 1~4]에 모니터링할 오브젝트를 설정해 주십시오. 초깃값은 "0: 미설정"입니다. 따라서 [Md.109~112: 임의 데이터 모니터 출력 1~4]는 '0'이 됩니다.

1-5. 제약 사항

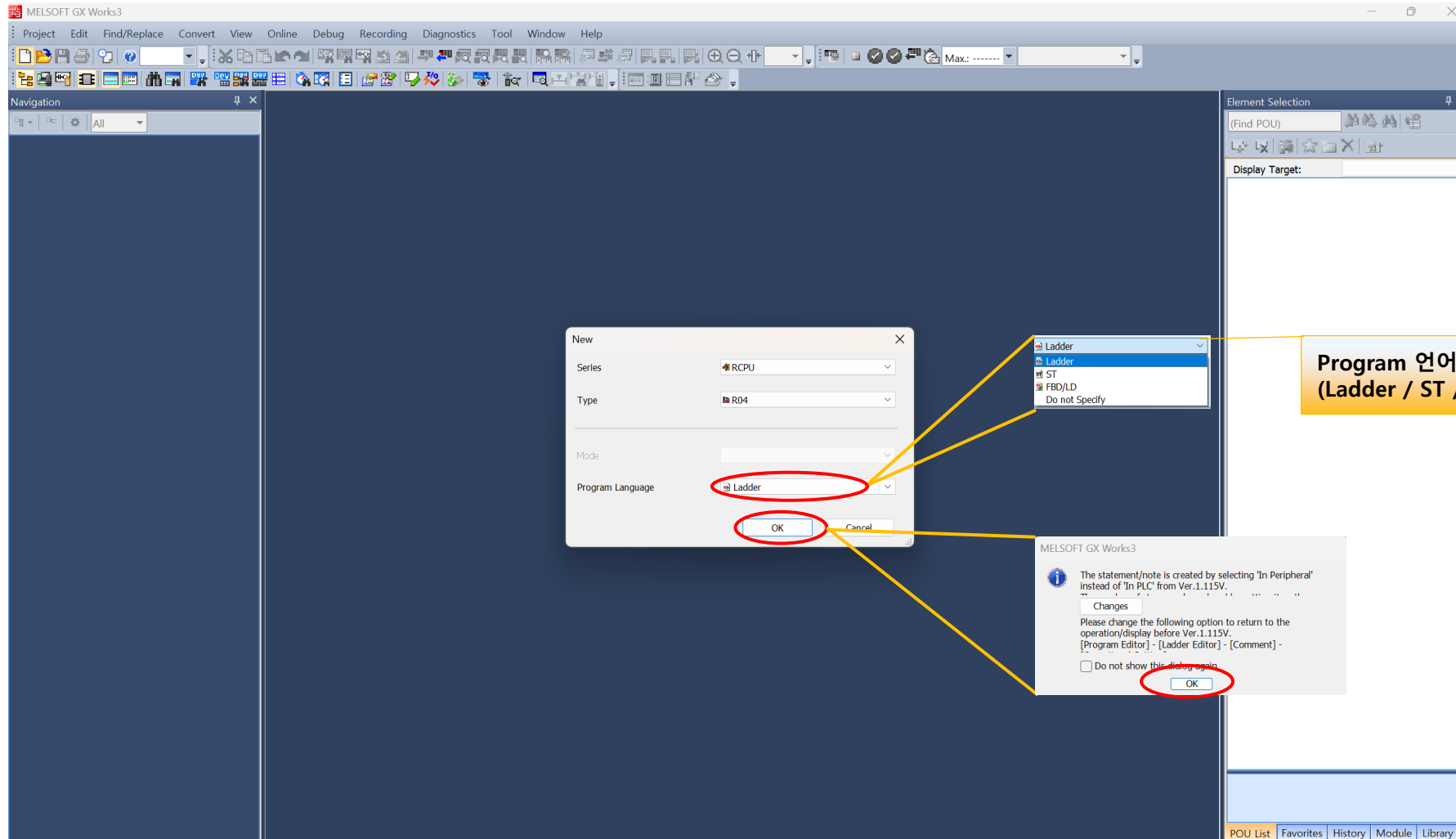
● 모션 제어 기능 제약 사항 (RD78G(H)와 Ezi-SERVO)

항목	제약 사항
Md.103: 모터 회전수	드라이브가 'SI unit velocity (Index:60A9h, Subindex:00h)'를 지원하지 않기 때문에 pulse/s 단위로 모터 회전수를 출력합니다.
Md.104: 모터 전류값	드라이브가 'Torque actual value (Index:6077h, Subindex:00h)'를 지원하지 않기 때문에 항상 "0"으로 표시됩니다.
Md.108: 서보 상태 1	모니터 데이터 중 아래 비트는 항상 'OFF' 상태입니다. · 게인 전환 중 (b4) · 풀 클로즈드 제어 전환 중(b5) · 토크 제한 중(b13) · 절대 위치 소실 중 (b14) · 경고 중(b15)
Md.119: 서보 상태 2	모니터 데이터 중 아래 비트는 항상 'OFF' 상태입니다. · 영점 통과(b0) · 영속도 중(b3) · 속도 제한 중(b4) · PID 제어 중(b8)
Md.115: 서보 알람 상세 번호	지원되지 않습니다. 이 모니터 데이터는 항상 '0'으로 표시됩니다
Cd.108: 게인 전환 명령 플래그	지원되지 않습니다. MELSERVO만 이 데이터에 대응합니다.
Cd.133: 세미-풀 전환 요구	지원되지 않습니다. MELSERVO만 이 데이터에 대응합니다..
Cd.136: PI-PID 전환 요구	지원되지 않습니다. MELSERVO만 이 데이터에 대응합니다.

2. RD78G(H) 설정

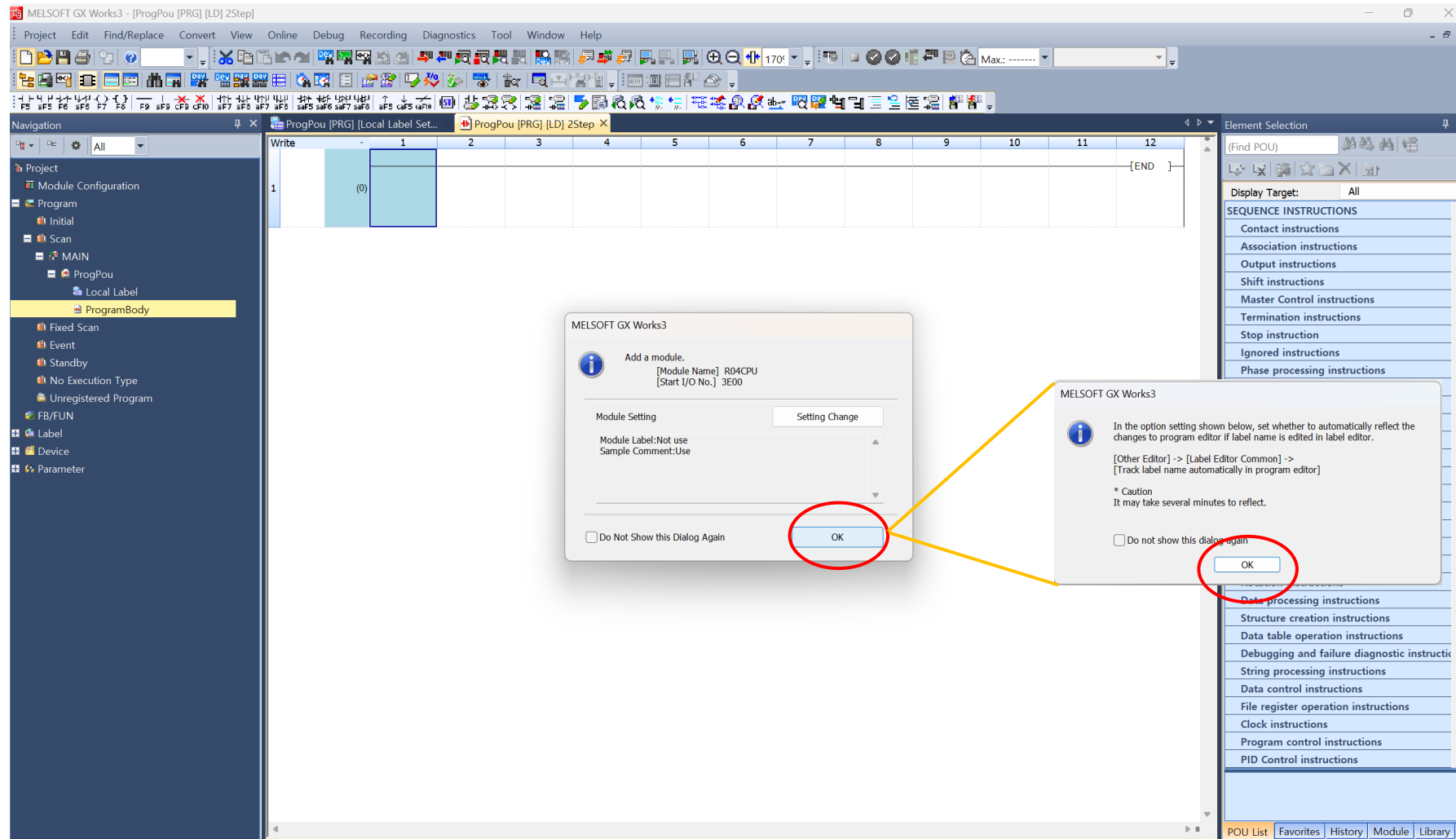
2-1. Project 생성

- 신규 Project 생성 시 iQ-R RD78G(H), 모델명, 사용 축수, Program 언어를 선택



2-2. Module 등록

- iQ-R CPU 등록



2-3. Module Configuration – H/W

- 마우스로 클릭&드래그 하여 Main Base, CPU Module, Power Supply를 구성

MELSOFT GX Works3 (Untitled Project) - [Module Configuration]

Project tree: Project, Module Configuration, Program, Initial, Scan, MAIN, ProgPou, Local Label, ProgramBody, Fixed Scan, Fixed.

Element Selection panel:

Module	Slots	Requirements
iQ-R Series		
Main Base		
R32SB	2 Slots	(Type requirein)
R33B	3 Slots	(Type requirein)
R33SB	3 Slots	(Type requirein)
R35B	5 Slots	(Type requirein)
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		

Callouts:

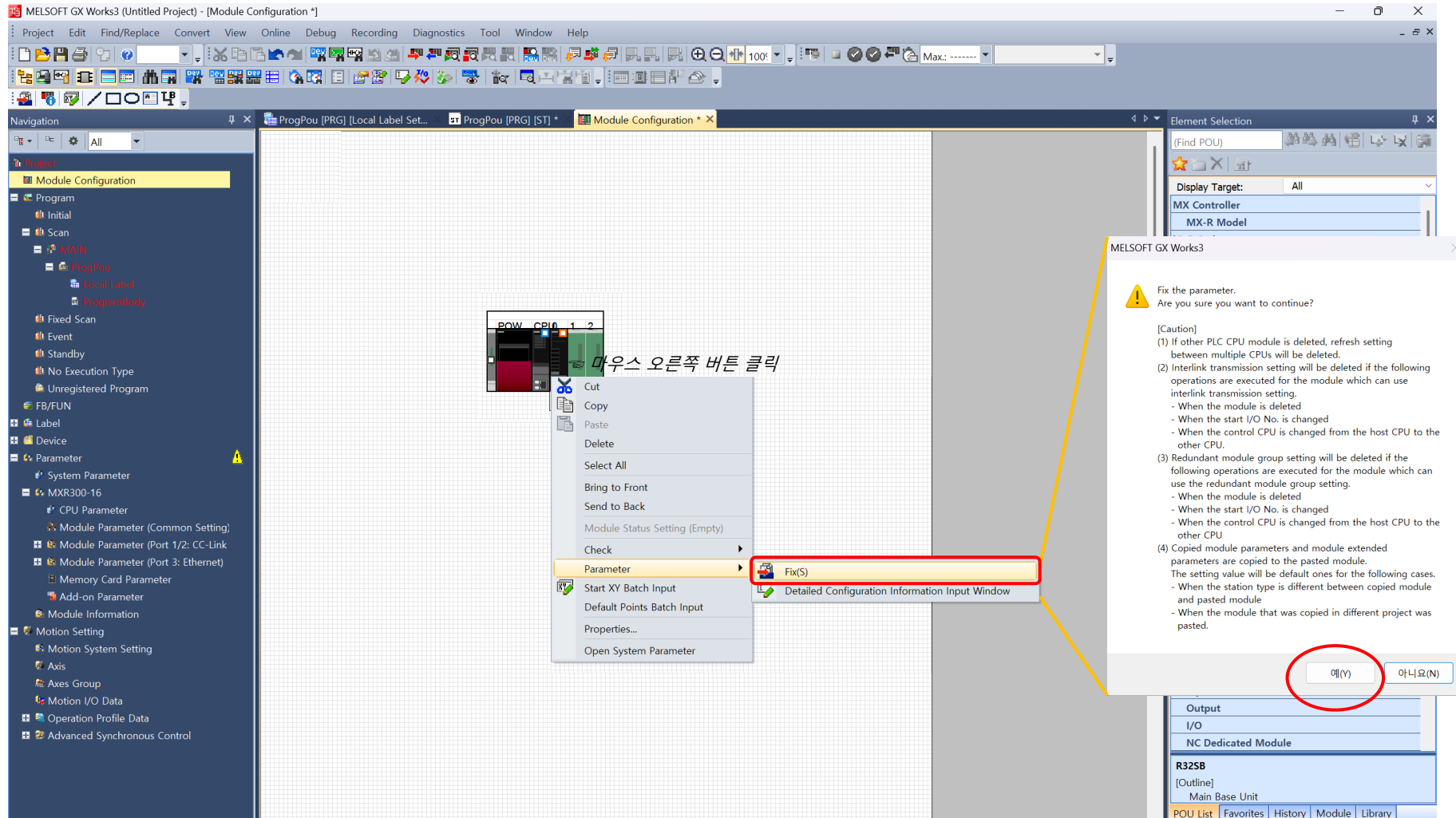
1. Main Base
2. Power Supply
3. CPU iQ-R 장착
4. RD78(H) 장착

Text box: [클릭 & 드래그]

Dialog box: 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]

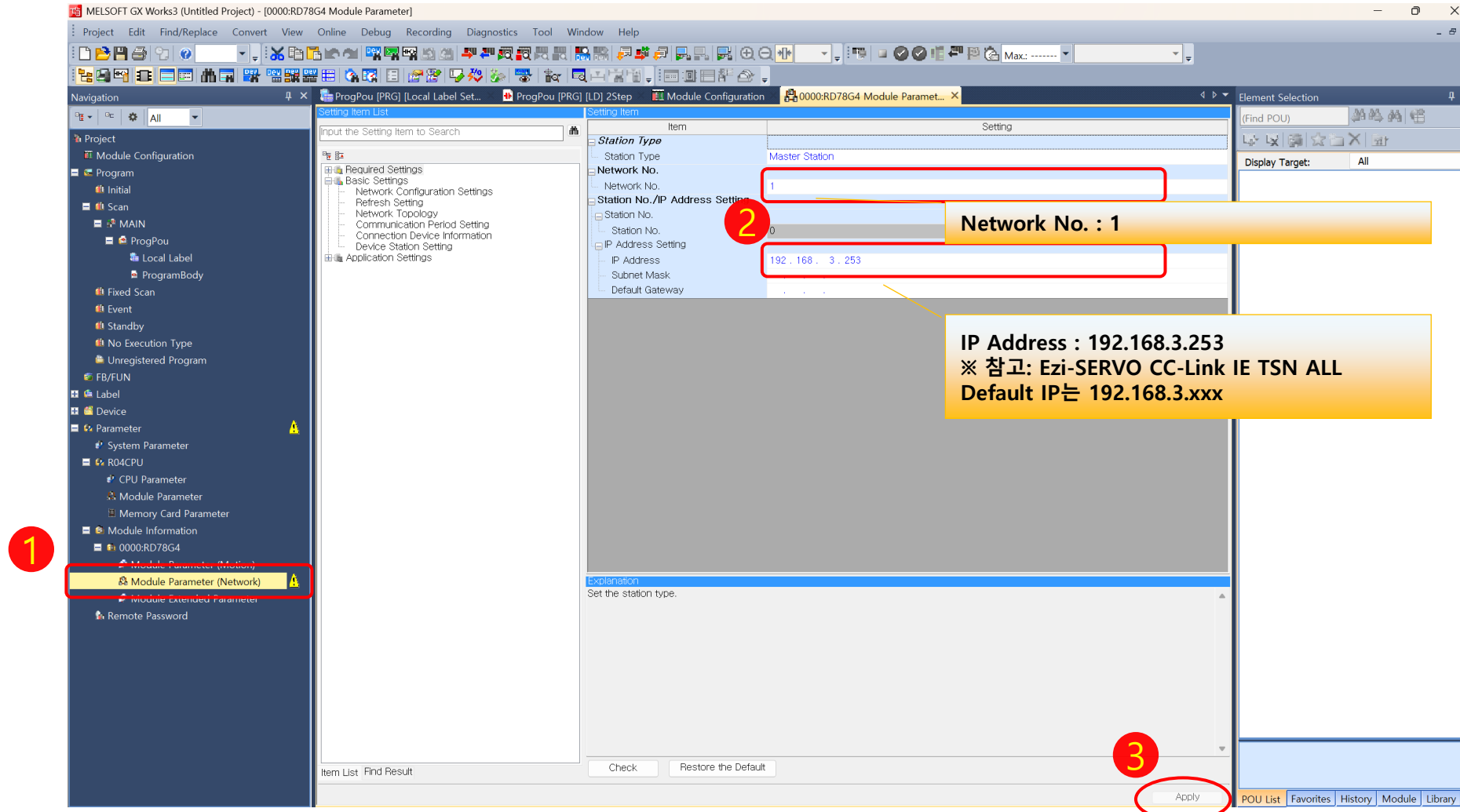
2-3. Module Configuration – H/W

- 마우스의 오른쪽 버튼을 클릭하여 Fix(S) 선택으로 Module 구성 완료



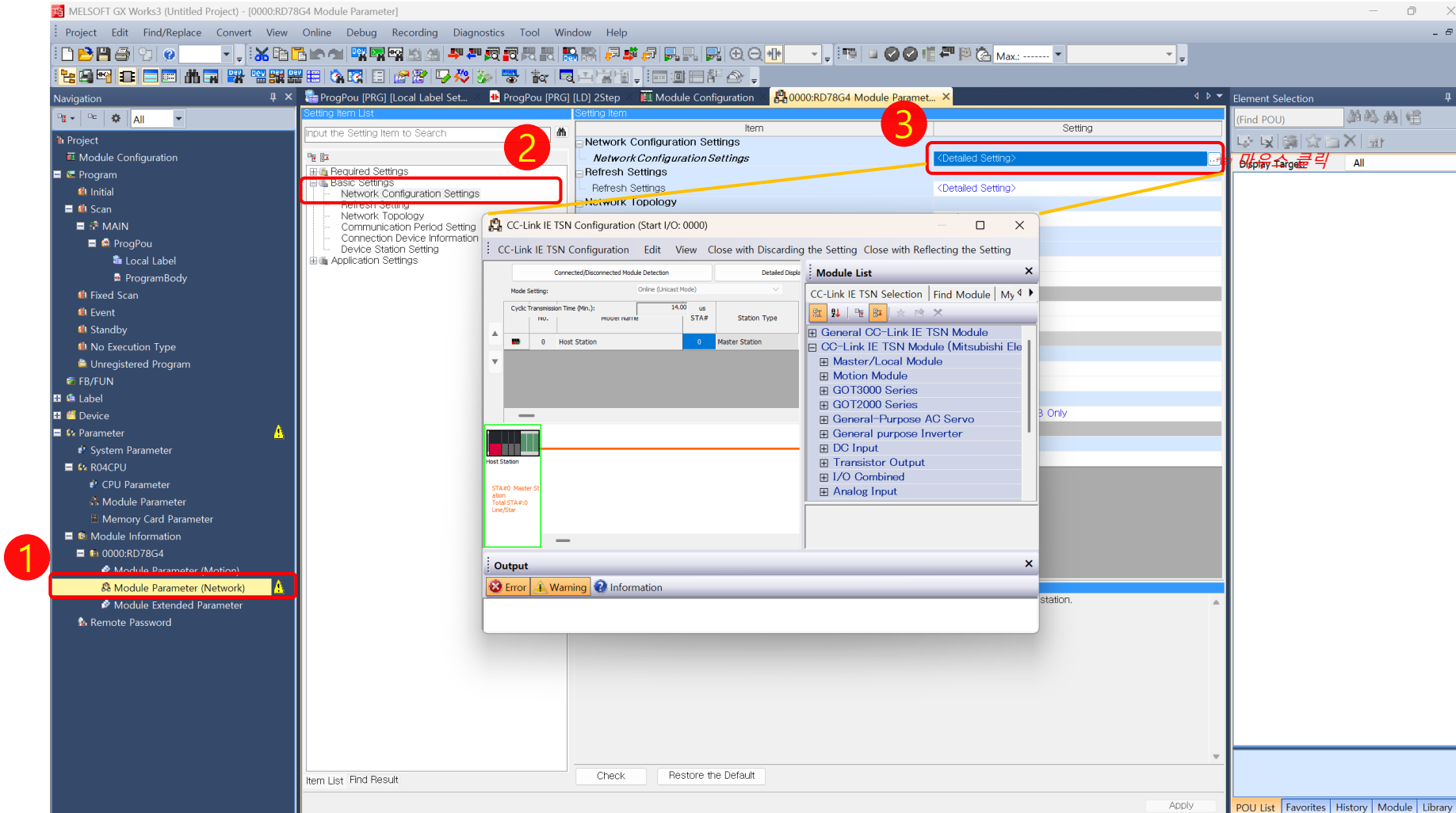
2-4. Parameter / Module Information / 0000:RD78G4

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



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

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



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

- N/W 미연결 상태 : CC-Link IE TSN Configuration : Module을 수동(클릭&드래그)으로 구성

등록에 따라 생성됨

2

[Ezi-SERVO CC-Link IE TSN ALL IP Address 임의로 수정]

1. 192.168.3.1
2. 192.168.3.2
3. 192.168.3.3

※ IP Address 변경 후 전원 RESET 필요

1

마우스 클릭 & 드래그 (반복)

[참고] Ezi-SERVO CC-Link IE TSN ALL IP Address 설정 16진수 로터리 스위치

FASTECH Co. Ltd
[Station Type]
Remote Station

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

- CC-Link IE TSN Configuration : Module을 Motion Control Station 및 Synchronous 선택

The screenshot displays the 'CC-Link IE TSN Configuration' window. The main table lists three stations (1, 2, 3) of type 'Est-SERVO-ALL-CT'. A red box labeled '1' highlights the 'Motion Control Station' checkbox, which is checked. Another red box labeled '2' highlights the 'Network Synchronous Communication' dropdown menu, where 'Synchronous' is selected. A yellow callout box points to the 'Synchronous' selection with the text 'Synchronous 선택'. The right sidebar shows the 'Module List' with 'CC-Link IE TSN Module' expanded, showing 'Closed-loop Step Drive' and 'Open-loop Step Drive' options. The bottom status bar shows the 'Host Station' and 'STAN Master Station'.

Station	Module	Cyclic Transmission Time (Min.)	us	Assignment Method	RX Setting	Communication Period Interval (Min.)	us	Network Synchronous Communication	Communication Period Setting
0	Host Station	22.00				125.00			
1	Est-SERVO-ALL-CT					16	16	Synchronous	Basic Period
2	Est-SERVO-ALL-CT					16	16	Synchronous	Basic Period
3	Est-SERVO-ALL-CT					16	16	Synchronous	Basic Period

1 Motion Control Station - Check (마우스 클릭)

2 Synchronous 선택

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

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

- CC-Link IE TSN Configuration : Module PDO Mapping Setting (축별 설정)

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

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method:

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

등록에 따라 생성됨

PDO Mapping Setting

Link Device Points

PDO Mapping Parameter

PDO Mapping Pattern Selection (1/2)

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

Link Device (RW) Points: 16

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

Back Next Cancel

PDO Mapping Pattern Selection (2/2)

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

Link Device (RW) Points: 16

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

Back OK Cancel

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

Network Label

Output

Error:0 Warning:0 Information:0

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

- CC-Link IE TSN Configuration : Module PDO Mapping Setting (축별 설정)

The screenshot displays the 'CC-Link IE TSN Configuration' software interface. The main window shows a table of modules with columns for No., Model Name, STA#, Station Type, RX Setting, RY Setting, RWr Setting, RWw Setting, Parameter Automatic Setting, PDO Mapping Setting, IP Address, Subnet Mask, and Default Gateway. The 'PDO Mapping Setting' column for the 'Ezi-SERVO-ALL-CT' modules is highlighted with a red box, showing '<Detail Setting>'.

A 'PDO Mapping Setting' dialog box is open, showing the 'Link Device Points' and 'PDO Mapping Parameter' table. The table has columns for Link Device, Index [Hexadecimal], Sub-Index [Hexadecimal], Entry Name, Comment, and Data Type. The 'Link Device' column is highlighted with a red box, showing 'RWr0000' through 'RWr000F'.

An orange callout box contains the text: 'PDO 설정 완료되면 검정색으로 변경됨 <Detail Setting> → <Detail Setting> 반복으로 모든 축 PDO 설정'.

The bottom of the interface shows a 'Network Label' section with a diagram of the network topology, including a 'Host Station' and three 'Ezi-SERVO-ALL-CT' modules. The 'Output' section at the bottom right shows 'Error:0', 'Warning:0', and 'Information:0'.

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

- CC-Link IE TSN Configuration : Module Setting 반영

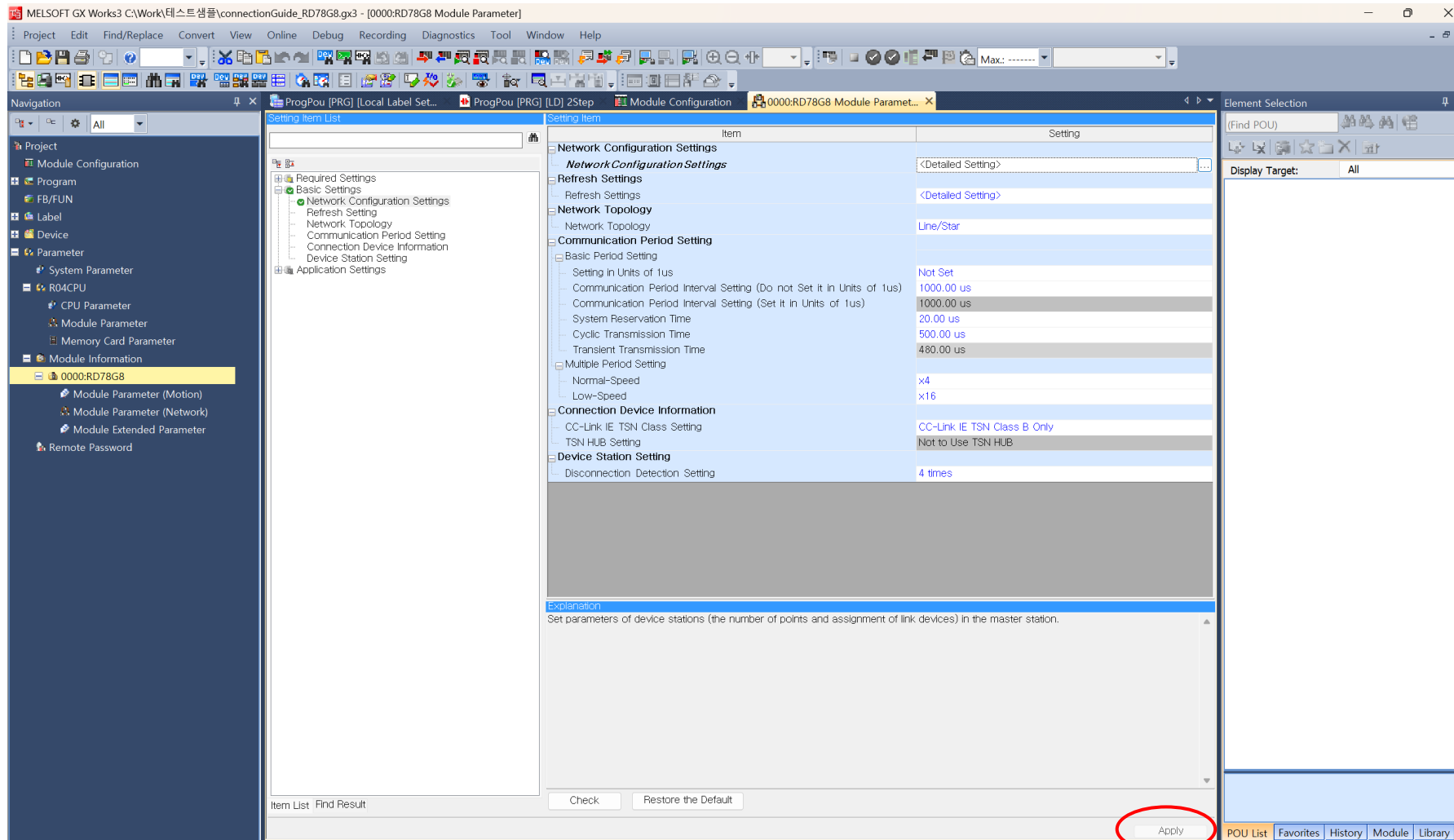
The screenshot displays the 'CC-Link IE TSN Configuration' software window. The main table lists station information:

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

A warning dialog box from MELSOFT GX Works3 is overlaid on the screen, asking: "Warning(s) in the CC-Link IE TSN Configuration. Are you sure you want to close the CC-Link IE TSN Configuration window?". The '예(Y)' (Yes) button is circled in red. A red circle also highlights the 'Close with Reflecting the Setting' option in the software's menu bar. A yellow arrow points from this menu option to the dialog box. The background shows a network diagram with stations STA#0, STA#1, STA#2, and STA#3, and a 'Module List' on the right side.

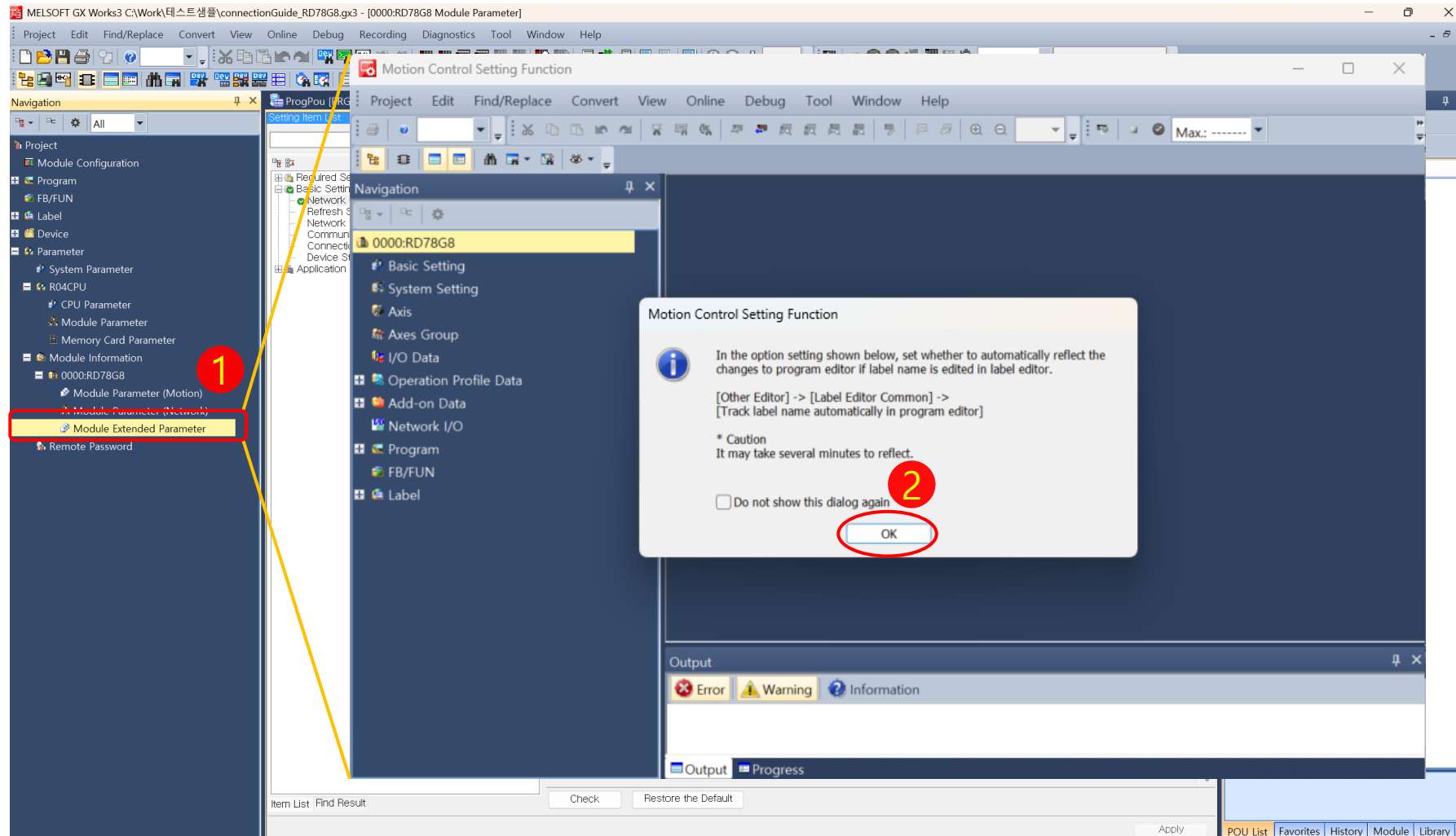
2-4. Parameter / Module Information / 0000:RD78G4

● Network Configuration Settings 적용



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

- Module Extended Parameter



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

- Axis - Axis0001 생성

마우스 오른쪽 클릭

1

2

3

New Data

Basic Setting

Data Type: Axis

(Data Name): Axis0001

Detailed Setting

Axis Information

Axis No.: 1

Axis Parameter Constant

Station Address Setting: ...

Axis Type Setting: 0:Real Drive Axis

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

OK Cancel

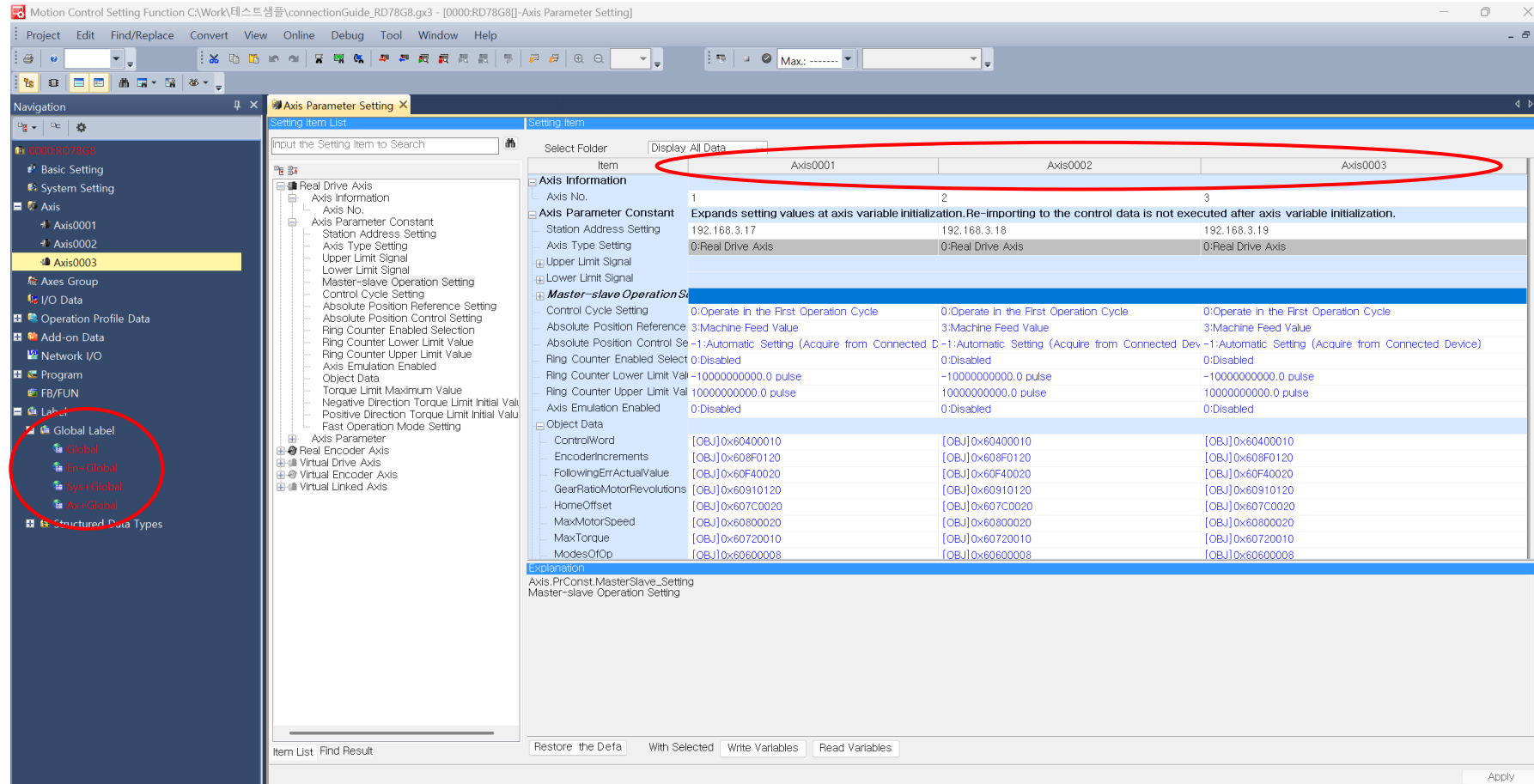
Station Address Setting

IP Address	Model Name	Alias
192.168.3.1	Ezi-SERVO-ALL-CT	
192.168.3.1	Ezi-SERVO-ALL-CT	
192.168.3.1	Ezi-SERVO-ALL-CT	

OK Cancel

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

- Axis - Axis0001, Axis0002, Axis0003 생성 (반복)



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

- Axis - Axis0001... - Object Data Setting (Ezi-SERVO CC-Link IE TSN ALL Object Data로 설정)

Motion Control Setting Function C:\Work\테스트샘플\connectionGuide_RD78G8.gx3 - [0000:RD78G8]-Axis Parameter Setting

Navigation: 0000:RD78G8, Basic Setting, System Setting, Axis, Axis0001, Axis0002, Axis0003, Axes Group, I/O Data, Operation Profile Data, Add-on Data, Network I/O, Program, FB/FUN, Label, Global Label, Global, Em Global, Sys Global, As Global, Structured Data Types

Setting Item List: Input the Setting Item to Search

Select Folder: Display All Data

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

Object Data Setting (Axis0001)

Target Device: Ezi-SERVO-CT

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

ControlWord: [OBJ]0x60400010

EncoderIncrements: [OBJ]0x608F0120

FollowingErrorActualValue: [OBJ]0x60F40020

Restore the Default

Import... Export... OK Cancel

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

MELSOFT GX Works3

Set default Are you sure you want to continue?

예(Y) 아니오(N)

MELSOFT GX Works3

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

Yes: Set to generic default values

No: Set default values for MELSERVO

예(Y) 아니오(N) 취소

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

No. Result Data Name Category Content

Error Code

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

- Axis - Axis0001... - Object Data Setting (Ezi-SERVO CC-Link IE TSN ALL Object Data로 설정)

The screenshot displays the 'Motion Control Setting Function' software interface. The 'Axis Parameter Setting' window is open, showing the 'Object Data' section for Axis0003. The 'ControlWord' parameter is highlighted, and three red circles are drawn around the 'ControlWord' parameter for Axis0001, Axis0002, and Axis0003, indicating the values to be changed. A yellow callout box points to the 'ControlWord' parameter with the text '[OBJ] 변경된 내용 확인'.

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

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

[OBJ] 변경된 내용 확인

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

- Axis – Position Command Unit (기어비 설정) ※ Ezi-SERVO CC-Link IE TSN ALL 인코더 10,000ppr

Ezi-SERVO CC-Link IE TSN ALL의 Encoder Resolution Setting Range는 10,000pulse/rev

기어비 설정 방법은 기존방법과 동일함

Setting Item

Item	Axis0001	Axis0002
Acceleration Limit Value	2147483647.0 degree/s ²	2147483647.0 pulse/s ²
Oper. Electronic Gear Setting Axis0001		
Com Entry		
Decel		
Drive		
Drive		
Position Command Unit	degree	
One Revolution	360.0000 [degree]	
Reduction Ratio (NL/NM) =	1 / 1	
Calculate reduction ratio by teeth or diameters	☒	
Encoder Resolution	10000 [pulse/rev]	
Setting Range		

Calculation Result

Axis Parameters

Parameter	Value
Position Command Unit	degree
Driver Unit Conversion Numerator	1
Driver Unit Conversion Denominator	3

Click OK to reflect to the axis parameters.

Position Command Unit

Parameter	Value
Position Command Unit	degree
Position Command Unit String	...
Velocity Command Unit	U/s
Velocity Bias Value	0.0 degree/s

Output

Parameter Check: Error: 0, Warning: 0, Information: 0

No. Result Data Name Category Content

Apply

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

- Axis – Position Command Unit (기어비 설정) ※ Ezi-SERVO CC-Link IE TSN ALL 인코더 10,000ppr

Ezi-SERVO CC-Link IE TSN ALL Encoder 10,000pulse/rev

모터 1회전당 이동 거리/각도 설정

Robot or Stage 이동 단위 선택

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

Apply

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

- Axis – Absolute Position Control Setting : Disable로 설정

Ezi-SERVO CC-Link IE TSN ALL은 Disable Absolute Position System으로 선택

Item	Axis0001	Axis0002	Axis0003
Axis Information			
Axis No.	1	2	3
Axis Parameter Constant			
Expands setting values at axis variable initialization. Re-importing to the control data is not executed after axis variable initialization.			
Station Address Setting	192.168.3.17	192.168.3.18	192.168.3.19
Axis Type Setting	0:Real Drive Axis	0:Real Drive Axis	0:Real Drive Axis
Upper Limit Signal			
Lower Limit Signal			
Master-slave Operation Setting	0:Operate in the First Operation Cycle	0:Operate in the First Operation Cycle	0:Operate in the First Operation Cycle
Control Cycle Setting	3:Machine Feed Value	3:Machine Feed Value	3:Machine Feed Value
Absolute Position Reference Setting	0:Disable Absolute Position System	-1:Automatic Setting (Acquire from Connected Device)	-1:Automatic Setting (Acquire from Connected Device)
Ring Counter Enabled Selection	0:Disabled	0:Disabled	0:Disabled
Ring Counter Lower Limit Value	1:Enable Absolute Position System	100000.0 mm	-10000000000.0 mm
Ring Counter Upper Limit Value	-1:Automatic Setting (Acquire from Connected Device)	10000.0 mm	10000000000.0 mm
Axis Emulation Enabled	0:Disabled	0:Disabled	0:Disabled
Object Data			
Torque Limit Maximum Value	1000.0 %	1000.0 %	1000.0 %
Negative Direction Torque Limit Initial	300.0 %	300.0 %	300.0 %
Positive Direction Torque Limit Initial	300.0 %	300.0 %	300.0 %
Fast Operation Mode Setting	0000	0000	0000
Axis Parameter			
Expands initial values at axis variable initialization. Re-importing to the control data is also executed after axis variable initialization.			
Acceleration Limit Value	2147483647.0 degree/s ²	2147483647.0 mm/s ²	2147483647.0 mm/s ²
Operation Selection at Start Acceleration	-1:Error (Not Started)	-1:Error (Not Started)	-1:Error (Not Started)
Position Command Unit	100.0 degree	100.0 mm	100.0 mm
Velocity Command Unit	2147483647.0 degree/s ²	2147483647.0 mm/s ²	2147483647.0 mm/s ²
Velocity Bias Value	10000	10000	10000
Negative Direction Velocity Limit Value	360 degree	5 mm	10 mm
Operation Setting at Overrun	1:Homming Required	1:Homming Required	1:Homming Required
Start Permission at Homming	2147483647.0 degree/s ³	2147483647.0 mm/s ³	2147483647.0 mm/s ³
Operation Setting at Velocity Limit	1:Immediate Stop	1:Immediate Stop	1:Immediate Stop
Positive Direction Velocity Limit Value	0:Flashlight	0:Flashlight	0:Flashlight

Apply

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

● Network I/O Setting – 축별 Digital In/Output 설정

The screenshot shows the 'Network I/O' configuration window in the Motion Control Setting Function software. The window displays a table with columns for IP Address, Model Name, Device Label, Data Type, Labeling Target, Data Type, Label Name, and Comment. The table is divided into three sections for different devices: Ezi-SERVO..., Ezi-SERVO..., and Ezi-STEP....

Red circles and numbers 1, 2, and 3 highlight specific settings and actions:

- 1**: Points to the 'Labeling Target' column, specifically the 'Digital Output' section.
- 2**: Points to the 'Create Label' button at the bottom right of the window.
- 3**: Points to the '예(Y)' (Yes) button in the confirmation dialog box.

Annotations on the right side of the window:

- Digital Output 라벨 설정** (Digital Output Label Setting)
- Digital Input 라벨 설정 - Limit +/-, ORG, Input** (Digital Input Label Setting - Limit +/-, ORG, Input)

Explanation text at the bottom of the window:

Registers the I/O data for cyclic communication between the motion module and the device stations under its management, as labels.

Executing 'Create Label' registers only 'Labeling Target' data to the global label list (NW+Global). After executing 'Create Label', you are unable to restore the label registration data before creation.

Contents edited in this window are not saved in the project and are only kept while the project is open. After the project is re-opened, the label registration data on the global label list (NW+Global) will be reflected in the displayed data.

Output section at the bottom:

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

No. Result Data Name Category Content Error Code

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

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

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

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

주) Ezi_SERVO_CT_xxx_DigitalInputs.x 라벨 설정이 안될 경우
1. Network Setting 확인 (27page)

Apply

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

No. Result Data Name Category Content

Output Progress

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

- Label – Global Label – Sys+Global

1

2

GX Works3에서 Label을 사용하려면 Enable 지정

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

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

Extd Dspl

Progress

Assigning global label...

Error: 0, Warning: 0

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

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

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

Checking Basic Setting...

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

Checking System Setting...

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

Checking Axis...

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

Checking Operation Profile Data...

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

Checking I/O Data...

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

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

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

- Label – Global Label – Ax+Global

1

2

GX Works3에서 Label을 사용하려면 Enable 지정

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

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

Extd Dspl

Progress

Assigning global label...

Error: 0, Warning: 0

==== Rebuild All/Parameter Check Starts Start Time: 2026/01/16 19:49:54, Processing Time (Seconds): 5.475 =====

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

Checking Basic Setting...

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

Checking System Setting...

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

Checking Axis...

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

Checking Operation Profile Data...

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

Checking I/O Data...

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

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

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

- Label – Global Label – Sys+Global

1

2

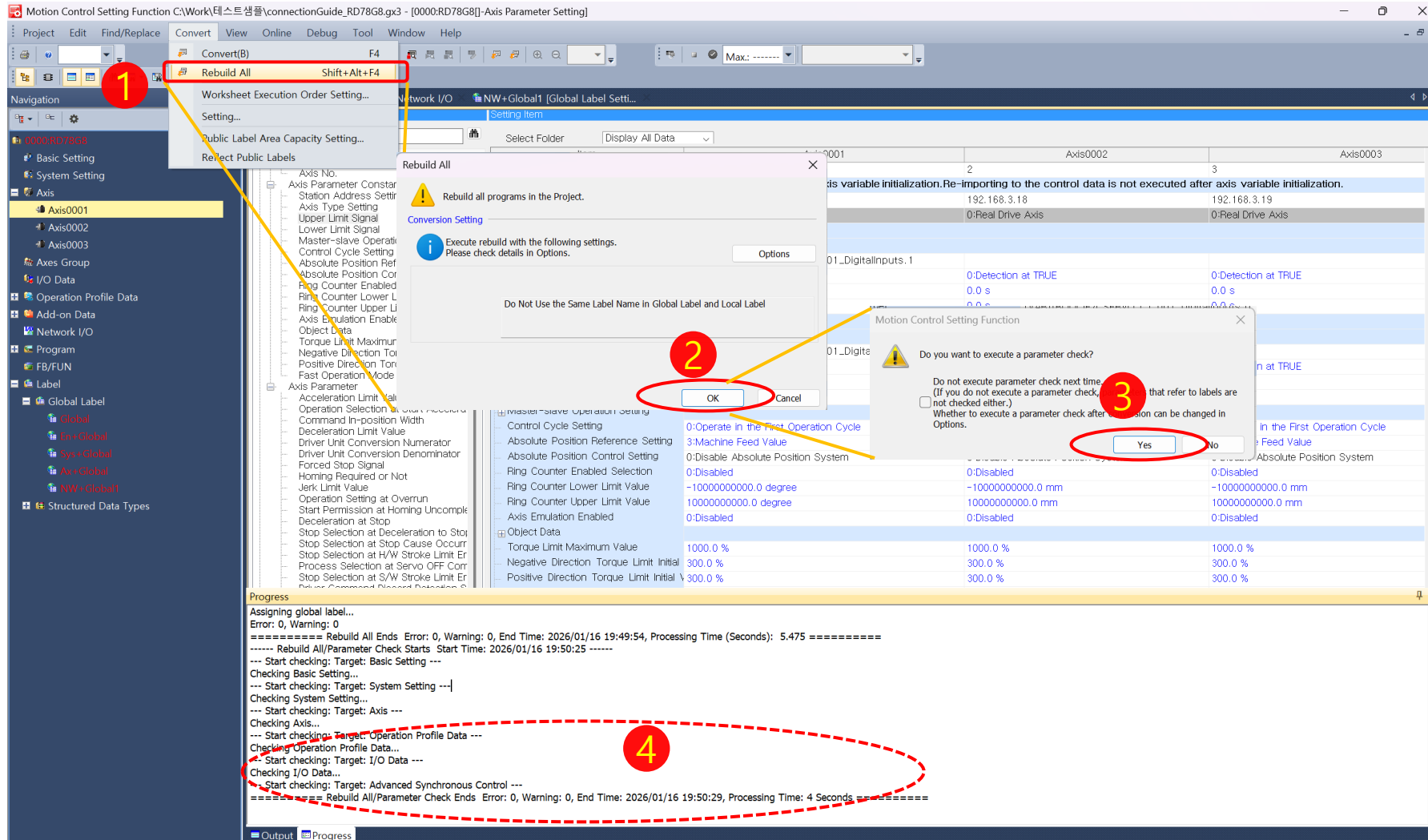
GX Works3에서 Label을 사용하려면 Enable 지정

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

Progress
Assigning global label...
Error: 0, Warning: 0
===== Rebuild All Ends Error: 0, Warning: 0, End Time: 2026/01/16 19:49:54, Processing Time (Seconds): 5.475 =====
----- Rebuild All/Parameter Check Starts Start Time: 2026/01/16 19:50:25 -----
--- Start checking: Target: Basic Setting ---
Checking Basic Setting...
--- Start checking: Target: System Setting ---
Checking System Setting...
--- Start checking: Target: Axis ---
Checking Axis...
--- Start checking: Target: Operation Profile Data ---
Checking Operation Profile Data...
--- Start checking: Target: I/O Data ---
Checking I/O Data...
--- Start checking: Target: Advanced Synchronous Control ---
===== Rebuild All/Parameter Check Ends Error: 0, Warning: 0, End Time: 2026/01/16 19:50:29, Processing Time: 4 Seconds =====

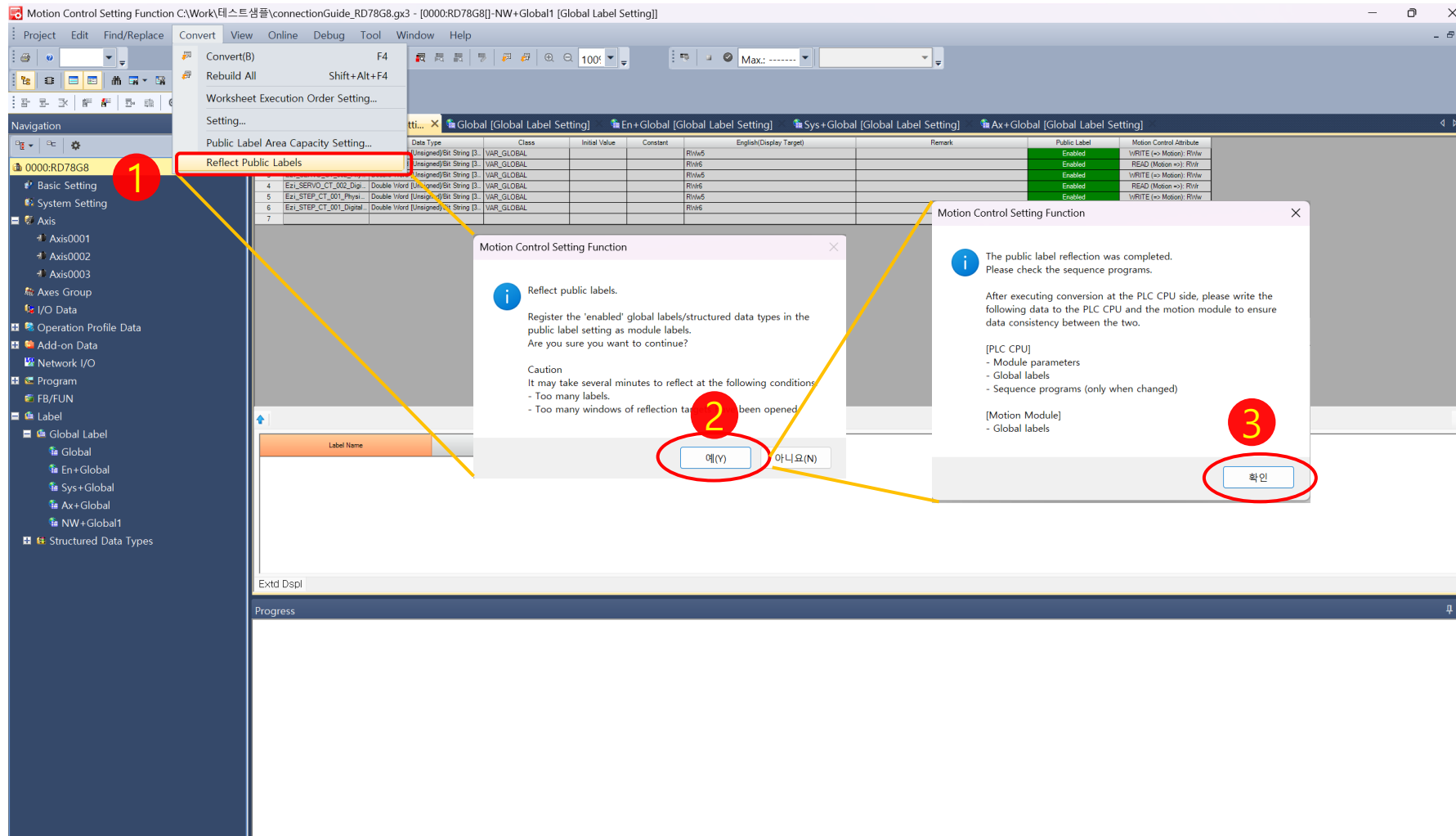
2-5. Module Extended Parameter – Motion Control Setting Function

- Convert – Rebuild All → Parameter Check



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

● Reflect Public Labels

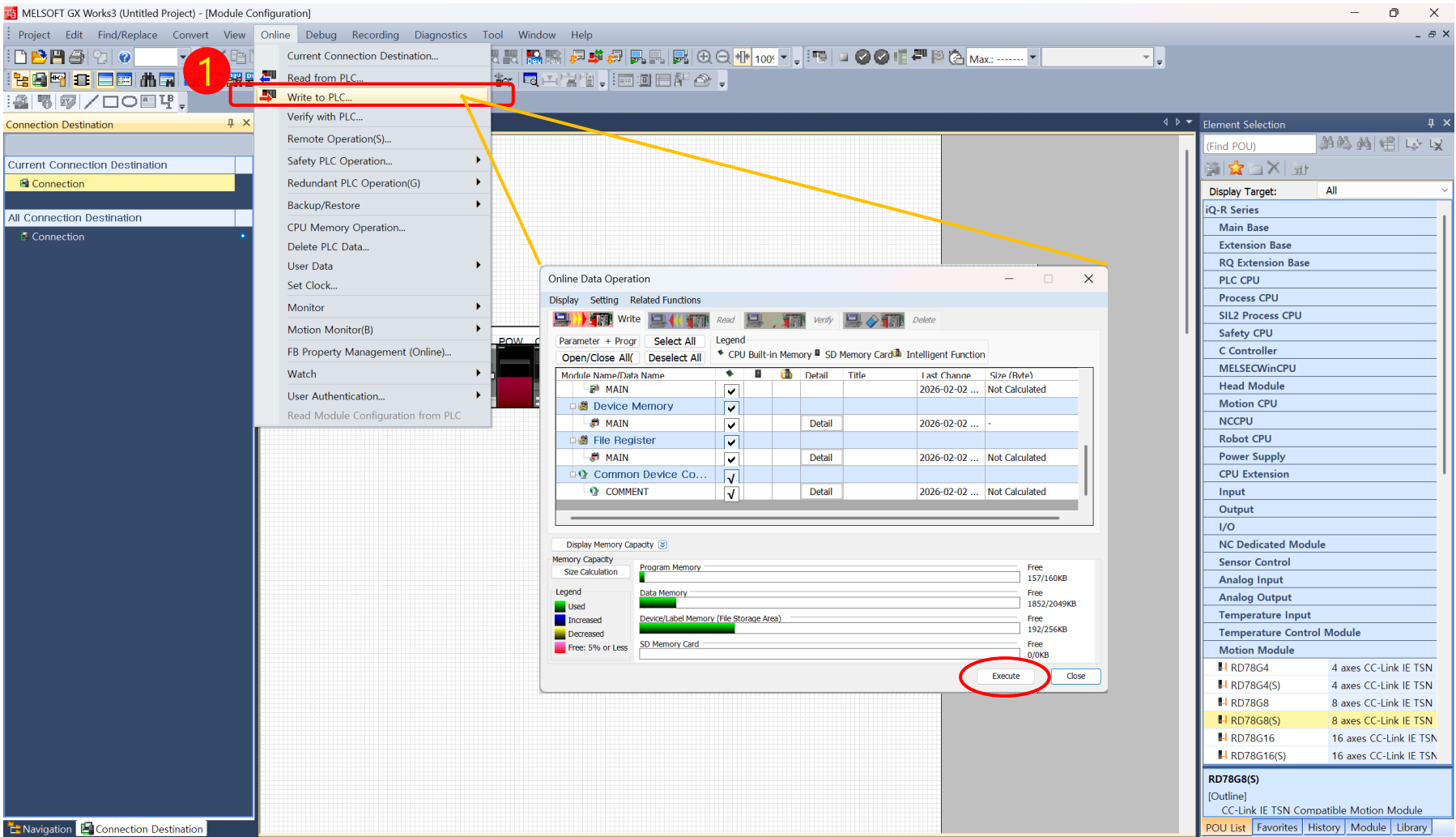


- **Convert – Rebuild All**



2-7. Write to PLC

- Online Data Operation



3. Program 따라 하기

3-1. Motion 제어 명령어 살펴보기

● Motion Control Function/Function Block 명령어 – Element Selection – Axis0001.AxisRef

The screenshot displays the MELSOFT GX Works3 interface. The main workspace shows a ladder logic program with a function block call for 'MC_Power'. The 'Element Selection' dialog is open on the right, showing a list of motion control functions. The 'MC_Power' function is highlighted in the list. A red circle with the number '1' is placed over the 'Library' tab at the bottom of the dialog. A red circle with the number '2' is placed over the 'MC_Power' function in the list. A yellow dotted arrow points from the 'MC_Power' function in the list to the 'MC_Power' function block in the ladder logic program. The text '마우스 클릭 & 드래그' (Mouse click & drag) is written next to the arrow.

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

Element Selection (Find POU): Display Target: All, User Library, Library, safety_R, MotionControl_RD78_1.12 MotionControl_RD78, FB, Management, MC_AbortTrigger Touch Probe Disabled, MC_CamTableSele Cam Table Selection, MC_GroupDisable Axis Group Disabled, MC_GroupEnable Axis Group Enabled, MC_GroupReset Axis Group Error Reset, MC_GroupSetOve Axis Group Override Change, MC_Power Operation Available, MC_ReadParamet Read Axis Parameters, MC_Reset Axis Error Reset, MC_SetOverride Axis Override Change, MC_SetPosition Current Position Change, MC_TouchProbe Touch Probe Enabled, MC_WriteParamet Write Axis Parameter, MCv_AdvCamSetP CamSetPosition Calculation, MCv_AdvPositionF Position Per Cycle Calculation, MCv_AllPower All Axes Operation Available, MCv_ChangeCycle Current Value Change per Cycle, MCv_MotionErrorf System Error Reset, MCv_SetTorqueLir Torque Limit Value, Operation-Individual, StandardFB, Global Label, Structured Data Type.

MC_Power [Version] 06G, POU List, Favorites, History, Module, Library.

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



3-3. [Ladder] Ezi-SERVO 원점복귀 방법 지정

- 원점복귀 방법 지정 하기 (MC_WriteParameter, 33: Homing index pulse)

원점복귀 방법은 Homing method(6098h)에 설정한 값에 따라 다음과 같이 분류됩니다.

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

원점복귀 파라미터 주소 : H60980008
원점복귀 방법 : 33 (Homing index pulse (negative direction))

FB : MC_WriteParameter

MC_WriteParameter_1 (MC_...)

Parameter	Value	Comment
MC_WriteParameter_1 (MC_...)	33	Homing index pulse (negative direction)

Comparison

Time	Data Type	Variable
00A	Single Numeric Variable	Selection
00A	String	Bit Shift
00A	Edge Detection	Counter
00A	Timer	Bistable

Motion Control Function/Function Block

Administrative	Administrative
MC_AbortTrigger	Touch Probe Disabled
MC_CamTableSelect	Cam Table Selection
MC_DigitalCamSwitch	Outputs the digital ca
MC_GroupDisable	Axes Group Disabled
MC_GroupEnable	Axes Group Enabled
MC_GroupReset	Axes Group Error Res
MC_GroupSetOverri	Axes Group Override
MC_Power	Operation Available
MC_ReadParameter	Parameter Read
MC_Reset	Axis Error Reset
MC_SetOverride	Override Value Setting
MC_SetPosition	Current Position Chan
MC_TouchProbe	Touch Probe Enabled
MC_WriteParameter	Parameter Write

MC_WriteParameter

[Version]
00A

POU List Favorites History Module Library

3-4. [Ladder] Ezi-SERVO 원점복귀 실행

- 원점복귀 실행 (MC_Home)

The screenshot displays the MELSOFT GX Works3 interface for editing a ladder logic program. The main workspace shows a ladder logic diagram for the 'MC_Home' function. The diagram is organized into a table with columns for step numbers (1-12) and various data fields including DUT, Axis, B, L, UD, and ErrorID.

Left Panel (Navigation): Shows the project structure with 'ProgramBody' selected. The 'ProgramBody' folder is expanded, showing sub-folders like 'Fixed Scan', 'Event', 'Standby', 'No Execution Type', 'Unregistered Program', 'FB/FUN', 'Label', 'Device', 'Parameter', 'System Parameter', 'MXR300-16', 'CPU Parameter', 'Module Parameter (Common Setting)', 'Module Parameter (Port 1/2: CC-Link)', 'Module Parameter (CC-Link IE TSN)', 'Module Parameter (Port 3: Ethernet)', 'Memory Card Parameter', 'Add-on Parameter', 'Module Information', 'Motion Setting', 'Motion System Setting', 'Axis', 'Axis Group', and 'Motion I/O Data'.

Right Panel (Element Selection): Lists various function blocks and parameters. The 'Motion Control Function/Function Block' section is expanded, showing 'Administrative' and 'Motion - Individual' categories. The 'MC_Home' block is highlighted under the 'Motion - Individual' category.

Main Ladder Logic Diagram:

- Step 12:** Ladder logic with a normally open contact labeled 'bAx1WParam' and a coil labeled 'bAx1ParamD...'.
- Step 13:** Ladder logic with a normally open contact labeled 'Axis0001.A' and a coil labeled 'DUT: Axis'.
- Step 14:** Ladder logic with a normally open contact labeled 'bAx1WParam' and a coil labeled 'B: Execute'.
- Step 15:** Ladder logic with a normally open contact labeled 'UD: Param...' and a coil labeled 'Busy B'.
- Step 16:** Ladder logic with a normally open contact labeled 'L: Value' and a coil labeled 'Error B'.
- Step 17:** Ladder logic with a normally open contact labeled 'W: Execution...' and a coil labeled 'ErrorID_UW'.
- Step 18:** Ladder logic with a normally open contact labeled 'H0' and a coil labeled 'UD: Options'.
- Step 19:** Ladder logic with a normally open contact labeled 'SDOStat_UW' and a coil labeled 'SDOStat_UW'.
- Step 20:** Ladder logic with a normally open contact labeled 'bAx1HomeSL' and a coil labeled 'bAx1HomeDo'.
- Step 21:** Ladder logic with a normally open contact labeled 'bAx1Home' and a coil labeled 'bAx1Home'.
- Step 22:** Ladder logic with a normally open contact labeled 'Axis0001.A' and a coil labeled 'DUT: Axis'.
- Step 23:** Ladder logic with a normally open contact labeled 'bAx1Home' and a coil labeled 'B: Execute'.
- Step 24:** Ladder logic with a normally open contact labeled 'L: Position' and a coil labeled 'Busy B'.
- Step 25:** Ladder logic with a normally open contact labeled 'DUT: AbsSwit...' and a coil labeled 'Active B'.
- Step 26:** Ladder logic with a normally open contact labeled 'H0' and a coil labeled 'UD: Options'.
- Step 27:** Ladder logic with a normally open contact labeled 'Command...' and a coil labeled 'Error B'.
- Step 28:** Ladder logic with a normally open contact labeled 'ErrorID_UW' and a coil labeled 'ErrorID_UW'.

3-5. [Ladder] Ezi-SERVO 이동 동작 실행

- 이동 동작 실행 (MC_MoveAbsolute)

임의 설정 이동 Position

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

The screenshot displays the MELSOFT GX Works3 interface. The main window shows a ladder logic program for the MC_MoveAbsolute function block. The program is organized into steps (1-12) and a final END step. The left sidebar shows the project structure, including the ProgramBody and its components. The right sidebar shows the Element Selection menu, which includes various motion control function blocks. The MC_MoveAbsolute block is highlighted in the list.

Step	Logic	Parameter	Value	Unit
1	bAx1Pos1	DUT: Axis	Axis : DUT	
2	bAx1Pos2	B: Execute	Done : B	
3	bAx1Pos1	B: Continuo...	Busy : B	
4	bAx1Pos2	L: Position	Active : B	
5	bAx1Run	L: Velocity	Command : B	
6	bAx1Run	L: Accelerati...	Error : B	
7	bAx1Run	L: Decelerati...	ErrorID : UW	
8	bAx1Run	L: Jerk	0.0	
9	bAx1Run	W: Direction	K3	
10	EDMOV	W: BufferMo...		
11	EDMOV	UD: Options		

3-6. [Ladder] Ezi-SERVO DIO 동작 실행

- Digital Input, Output 동작 실행

The screenshot displays the MELSOFT GX Works3 interface for a ladder logic program. The main workspace shows a ladder logic diagram with various parameters and digital inputs/outputs. The left sidebar contains a project tree with folders for Project, Module Configuration, Program, Initial, Scan, MAIN, ProgPou, Local Label, ProgramBody, Fixed Scan, Event, Standby, No Execution Type, Unregistered Program, FB/FUN, Label, Device, Parameter, System Parameter, MXR300-16, CPU Parameter, Module Parameter (Common Setting), Module Parameter (Port 1/2: CC-Link), Module Parameter (CC-Link IE TSN), Network Label Setting, Module Parameter (Port 3: Ethernet), Memory Card Parameter, Add-on Parameter, Module Information, Motion Setting, Motion System Setting, and Axis. The right sidebar shows the 'Element Selection' panel with a search bar and a list of modules. The 'Ezi_SERVO_CT_001_DigitalInputs' and 'Ezi_SERVO_CT_001_PhysicalOutputs' sections are highlighted in yellow. The ladder logic diagram includes a 'DMOV' instruction and a 'D2' instruction, both labeled 'Ezi_SERVO'. The digital inputs are connected to SM400 and the digital outputs are connected to bAx1Out[0] to bAx1Out[4].

Ezi_SERVO_CT_001_DigitalInputs

Ezi_SERVO_CT_001_PhysicalOutputs

3-6. [Ladder] Ezi-SERVO DIO 동작 실행 : 맵 참조

- Digital Inputs

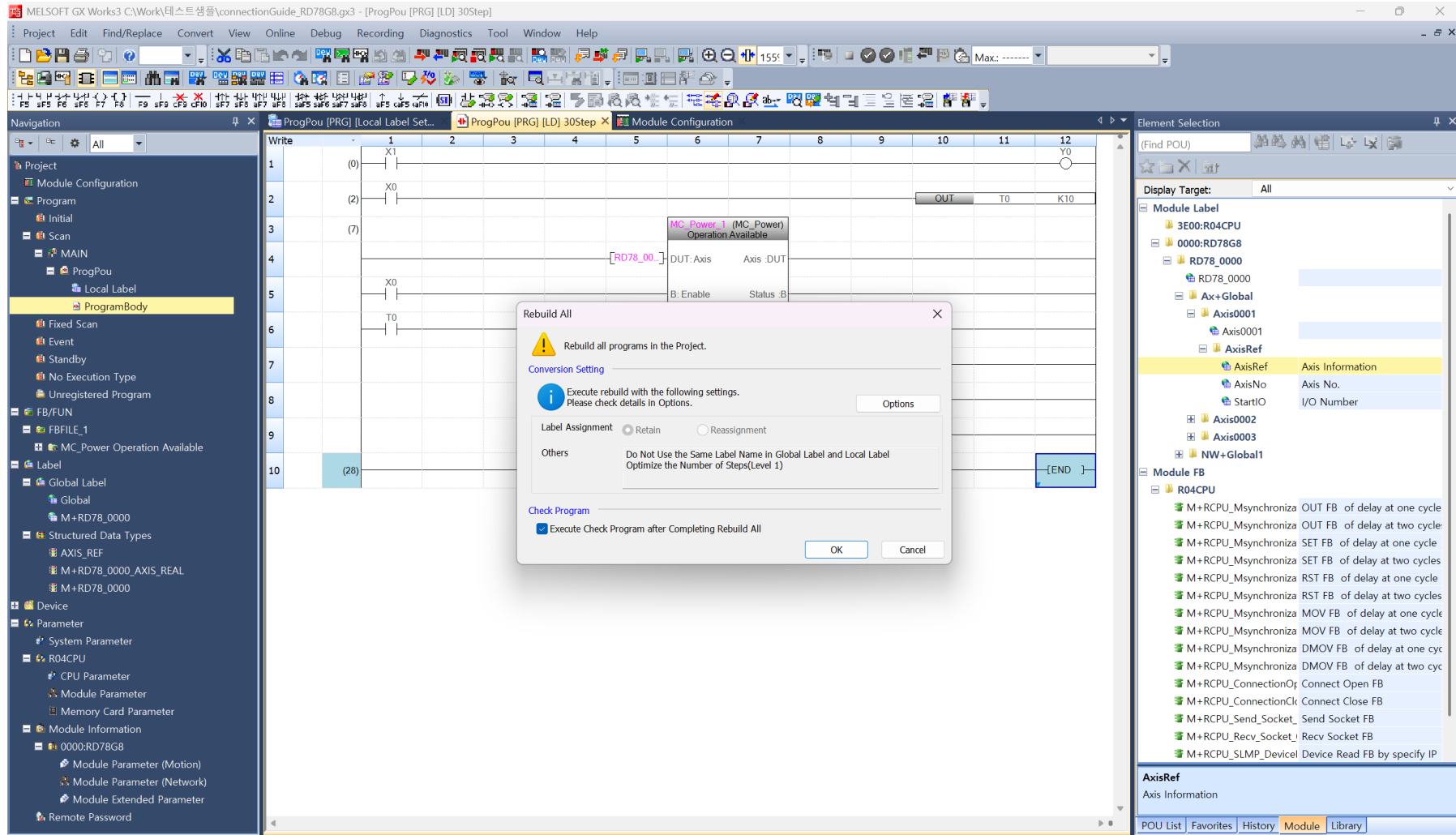
비트 31	비트 30	비트 29	비트 28	비트 27	비트 26	비트 25	비트 24
-	Motor Power	TQOFF2	TQOFF1	-	-	User input 6	User input 5
비트 23	비트 22	비트 21	비트 20	비트 19	비트 18	비트 17	비트 16
User input 4	User input 3	User input 2	User input 1	Reserved	Reserved	Reserved	
비트 15	비트 14	비트 13	비트 12	비트 11	비트 10	비트 9	비트 8
-	-	-	-	-	-	-	-
비트 7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

- Physical Outputs

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

3-7. [Ladder] Convert

- Convert – Rebuild All



부 록

[동작 확인] Axis Monitor

- 각 축의 상태, 위치, 원점복귀, Error 등을 모니터

Axis Monitor(CPU (PLC No. 1) Start I/O No. 3E00)

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

Motion Common Monitor

Monitor Item Selection

- Ready
- Synchronization flag
- Operation Cycle Monitor[1].Processing Time: 41000 ns
- Operation Cycle Monitor[1].Maximum Processing Time: 69960 ns
- Operation Cycle Monitor[1].Setting Cycle: 2000000 ns
- Operation Cycle Monitor[1].Cycle Over
- Operation Cycle Monitor[2].Processing Time: 36800 ns
- Operation Cycle Monitor[2].Maximum Processing Time: 73120 ns
- Operation Cycle Monitor[2].Setting Cycle: 8000000 ns
- Operation Cycle Monitor[2].Cycle Over
- Operation Cycle Monitor[3].Processing Time: 44440 ns
- Operation Cycle Monitor[3].Maximum Processing Time: 95960 ns
- Operation Cycle Monitor[3].Setting Cycle: 32000000 ns
- Operation Cycle Monitor[3].Cycle Over
- Forced Stop Cancelling
- Motion Area System Error Detection
- Latest Motion Area System Error Code: H0000
- Motion Area System Warning Detection
- Latest Motion Area System Warning Code: H0000

[동작 확인] 원점복귀 방법 변경

- 모션제어 FB을 사용하여 원점복귀 방식 변경 가능

- ① ParameterNumber 지정 : H60980008
- ② Value(Homing Method) 지정 : 33.0
- ③ ExcutionMode : TRUE (쓰기)
- ④ Done : TRUE가 됨

원점복귀 방법은 Homing method(6098h)에 설정한 값에 따라 다음과 같이 분류됩니다.

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

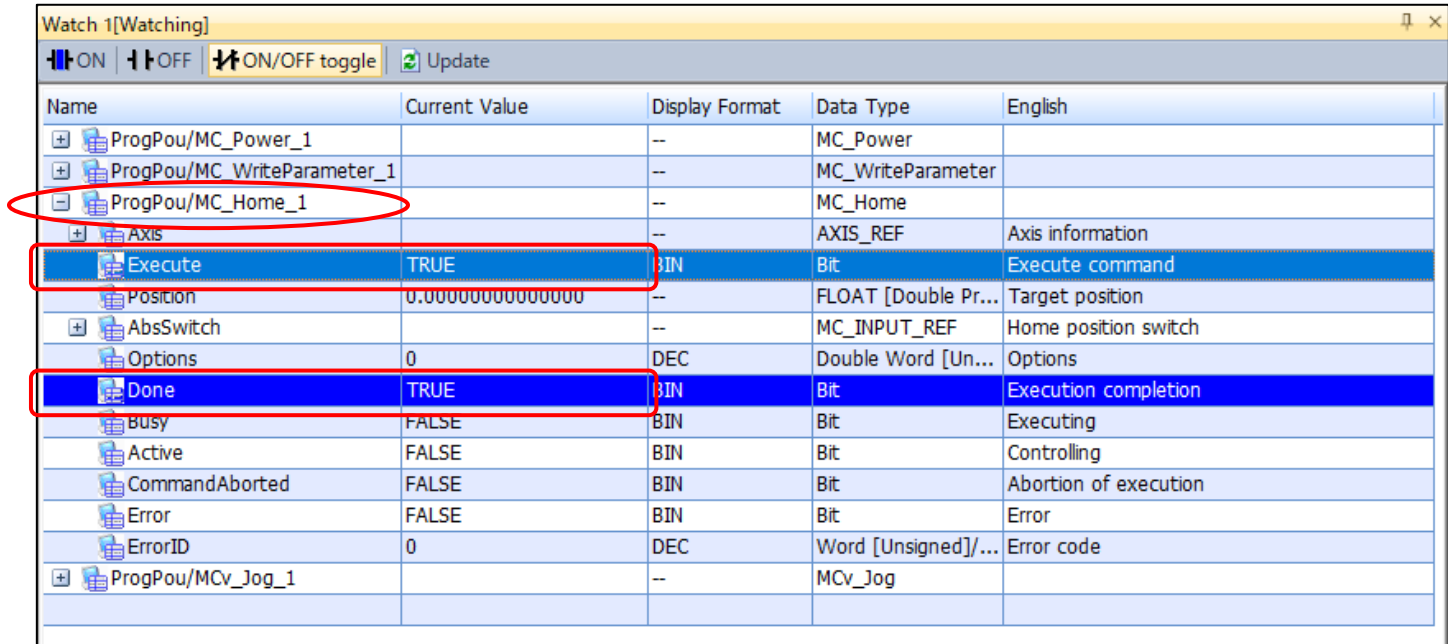
Watch 1[Watching]				
ON OFF ON/OFF toggle Update				
Name	Current Value	Display Format	Data Type	English
ProgPou/MC_Power_1		--	MC_Power	
ProgPou/MC_WriteParameter_1		--	MC_WriteParameter	
Axis		--	AXIS_REF	Axis information
Execute	TRUE	BIN	Bit	Execute command
ParameterNumber	H60980008	HEX	Word [Unsigned]/...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

표시 형식 : HEX 선택

[동작 확인] 원점복귀

- 모션제어 FB을 사용하여 원점복귀 실행

- ① Execute → TRUE (쓰기)
- ② Done → TRUE가 됨



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

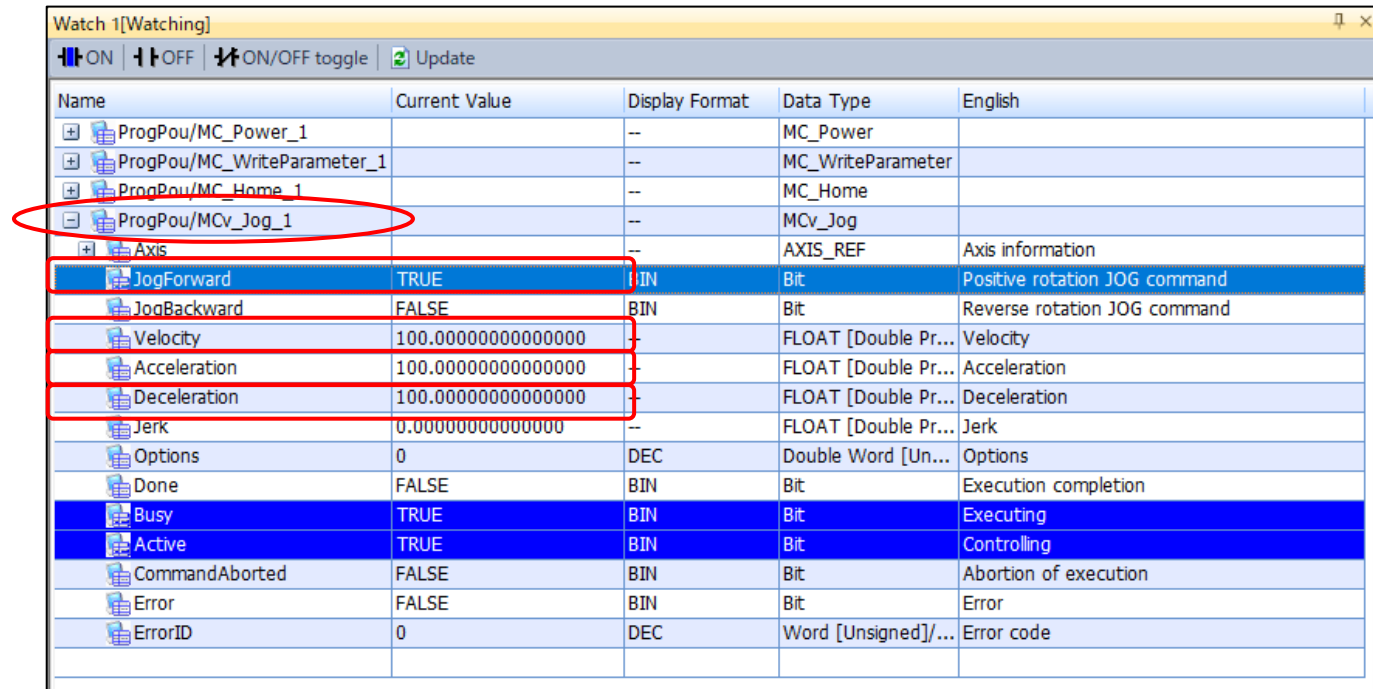
- Ezi-SERVO CC-Link IE TSN ALL의 LIMIT+ / LIMIT- 신호를 하드웨어 스트로크 리미트로 사용하는 경우, 기동(시작) 전에 아래의 축 제어 데이터를 설정해 주십시오.

[AxisName.Cd.HwStrokeLimit_Override] → 'DISABLE'

[동작 확인] Jog 운전

- 모션제어 FB을 사용하여 Jog 운전 실행

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



Name	Current Value	Display Format	Data Type	English
ProgPou/MC_Power_1		--	MC_Power	
ProgPou/MC_WriteParameter_1		--	MC_WriteParameter	
ProgPou/MC_Home_1		--	MC_Home	
ProgPou/MCv_Jog_1		--	MCv_Jog	
Axis		--	AXIS_REF	Axis information
JogForward	TRUE	BIN	Bit	Positive rotation JOG command
JogBackward	FALSE	BIN	Bit	Reverse rotation JOG command
Velocity	100.00000000000000		FLOAT [Double Pr...	Velocity
Acceleration	100.00000000000000		FLOAT [Double Pr...	Acceleration
Deceleration	100.00000000000000		FLOAT [Double Pr...	Deceleration
Jerk	0.00000000000000	--	FLOAT [Double Pr...	Jerk
Options	0	DEC	Double Word [Un...	Options
Done	FALSE	BIN	Bit	Execution completion
Busy	TRUE	BIN	Bit	Executing
Active	TRUE	BIN	Bit	Controlling
CommandAborted	FALSE	BIN	Bit	Abortion of execution
Error	FALSE	BIN	Bit	Error
ErrorID	0	DEC	Word [Unsigned]/...	Error code

[동작 확인] 트러블슈팅

- 에러 발생 시에는 이벤트 이력(기록)에서 원인을 확인

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

이벤트를 상세하게 확인

No.	Occurrence Date	Error Type	Status	Error Code	Description
00001	2024-10-15 15:15:07.512565336	System	OK	00001	Homing request error (OK to OK)
00002	2024-10-15 15:15:07.512565336	System	OK	00002	Current position restoration completion
00003	2024-10-15 15:15:07.512565336	System	OK	00003	servo system restoration start
00004	2024-10-15 15:15:07.512565336	Operation	OK	00004	Follow-up motion execution

Expanded Event Description (00001):

- Homing request was OK.
- An absolute position error in the homing process was detected. (Error code: 00001)
- The axis type was changed. (Detail Code: 00001)
- servo object: "Polarity (00001)" b7 position polarity was changed. (Detail Code: 00001)
- Change of the direction of motion request was detected. (Detail Code: 00001)
- Machine homing was successful. (Detail Code: 00001)
- Driver unit connection (communication) of the axis was disrupted. (Detail code: 00001)
- Machine homing has been successful after the system started. (Detail code: 00001)

[동작 확인] 트러블슈팅

- “SLMP 통신 이상”(1C43h) 이 발생한 경우
→ 축 파라미터 설정을 참조하여 오브젝트 데이터를 설정해 주십시오.
- “MELSERVO 이외의 드라이브 유닛 접속 설정 오류 경고”(0D4Ch) 가 발생한 경우
→ 축 파라미터 설정을 참조하여 절대 위치 시스템을 비활성화해 주십시오.
- MC_Home을 기동하면 “제어 모드 전환 이상”(1A1Dh) 이 발생하는 경우
→ 네트워크 구성 설정(드라이버 추가)에서
Network Synchronous Communication을 **“Synchronous”**로 설정해 주십시오.
- 드라이브의 **LIMIT+ / -** 신호를 사용하는 방식으로 **MC_Home**을 기동하면, 상/하한 리밋 신호를 검출하여 정지
→ [AxisName.Cd.HwStrokeLimit_Override] 를 ‘DISABLE’ 로 설정하고,축 제어 데이터를 프로그램 등에서 설정해 주십시오.

[파라미터] 원점복귀 파라미터 설정

- 원점복귀와 관련된 각종 설정은 다음 오브젝트에서 수행
 - MC_WriteParameter를 사용하여 설정값을 기록합니다.
 - 각 오브젝트의 상세 내용은 Ezi-SERVO CC-Link IE TSN ALL 매뉴얼을 참조해 주십시오.

오브젝트 명	Index: Subindex	설정 내용
Home offset	Obj.607C: 00h	기계 좌표계의 제로 위치와 원점복귀 위치의 차이
Homing method	Obj.6098: 00h	원점복귀 방식
Homing speeds	Obj.6099: 01h	원점복귀 속도
Homing speeds	Obj.6099: 02h	원점복귀 중 Cliff 속도
Homing acceleration	Obj.609A: 00h	원점복귀 중 가속도



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