



Programmable Automation Controllers
MELSEC MX Controller



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

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

접속 가이드

MELSEC MX Controller and

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

미쓰비시 전기 제품

MXR300-16 / MXR300-32 / MXR300-64
MXR300-128 / MXR300-256 / MXF100-8
MXF100-16

파스텍 제품

Ezi-ROBO CC-Link IE TSN IGH
(Ezi-SERVO CC-Link IE TSN 4X)

시작하기 전에

- 저희 회사의 제품을 이용해 주셔서 감사합니다.
- Ezi-ROBO IGH의 제어부는 Ezi-SERVO CC-Link IE TSN 4X으로 이하 연결 가이드 설명은 Ezi-SERVO CC-Link IE TSN 4X으로 합니다.
- Ezi-SERVO CC-Link IE TSN 4X는 32비트 고성능 ARM 프로세서를 탑재한 드라이브와 다양한 모터로 구성된 스테핑모터 유닛으로, CC-Link IE TSN 네트워크에서 리모트국으로 사용됩니다.
- Ezi-SERVO CC-Link IE TSN 4X는 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 MX 컨트롤러에 Ezi-SERVO CC-Link IE TSN 4X를 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 4X 매뉴얼은 파스텍 홈페이지에서 다운로드할 수 있습니다.

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

매뉴얼 명칭	매뉴얼 번호
[매뉴얼][CC-Link IE TSN][Ezi-SERVO 4X] Closed Loop Stepping System	
[접속가이드][CC-Link IE TSN][MELSEC MX Controller][Ezi-ROBO IGH Ezi-SERVO 4X]	

- MELSEC MX 컨트롤러 매뉴얼은 미쓰비시 전기 홈페이지에서 다운로드할 수 있습니다.

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

매뉴얼 명칭	매뉴얼 번호
MELSEC MX Controller (MX-R Model) User's Manual	SH-082640
MELSEC MX Controller (MX-R Model) Programming Manual	SH-082643
GX Works3 Operating Manual	SH-081214

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 MX 컨트롤러가 이에 해당합니다.
리모트국	비트 단위의 입출력 신호와 워드 단위의 입출력 데이터를 사이클릭 전송하는 국으로, 트랜지언트 전송도 가능합니다. Ezi-SERVO CC-Link IE TSN 4X가 이에 해당합니다.
PDO	Process Data Object의 약칭입니다. 여러 CANopen 노드 간에 주기적으로 전송되는 애플리케이션 오브젝트의 집합체입니다.
오브젝트	CANopen에 대응하는 디바이스국이 보유한 다양한 데이터입니다.

목차

1. 개요

- 1-1. 개요
- 1-2. Ezi-SERVO CC-Link IE TSN 4X CSP+ 파일 등록
- 1-3. CC-Link IE TSN 구성
- 1-4. 설정 순서
- 1-5. 제약 사항

2. MX 컨트롤러 설정

- 2-1. Project 생성
- 2-2. User Authentication 설정
- 2-3. Module 등록
- 2-4. Module Configuration – H/W
- 2-5. Module Parameter
- 2-6. Motion Setting
- 2-7. Convert
- 2-8. Write to PLC

3. Program 따라 하기

- 3-1. Motion 제어 명령어 살펴보기
- 3-2. [Ladder] SERVO Enable, SERVO ON
- 3-3. [Ladder] Ezi-SERVO 원점복귀 방법 지정
- 3-4. [Ladder] Ezi-SERVO 원점복귀 실행
- 3-5. [Ladder] Ezi-SERVO 이동 동작 실행
- 3-6. [Ladder] Ezi-SERVO DIO 동작 실행

부록

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

1. 개 요

1-1. 개요

- MELSEC MX 컨트롤러와 Ezi-SERVO CC-Link IE TSN 4X 접속 가이드

- ◆ 마스터국: MXR300-16 / MXR300-32 / MXR300-64 / MXR300-128 / MXR300-256
MXF100-8 / MXF100-16

- 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
 - 최신 파일은 미쓰비시 전기 홈페이지를 참조하시기 바랍니다.
(<https://www.mitsubishielectric.com/fa/download/index.html>)

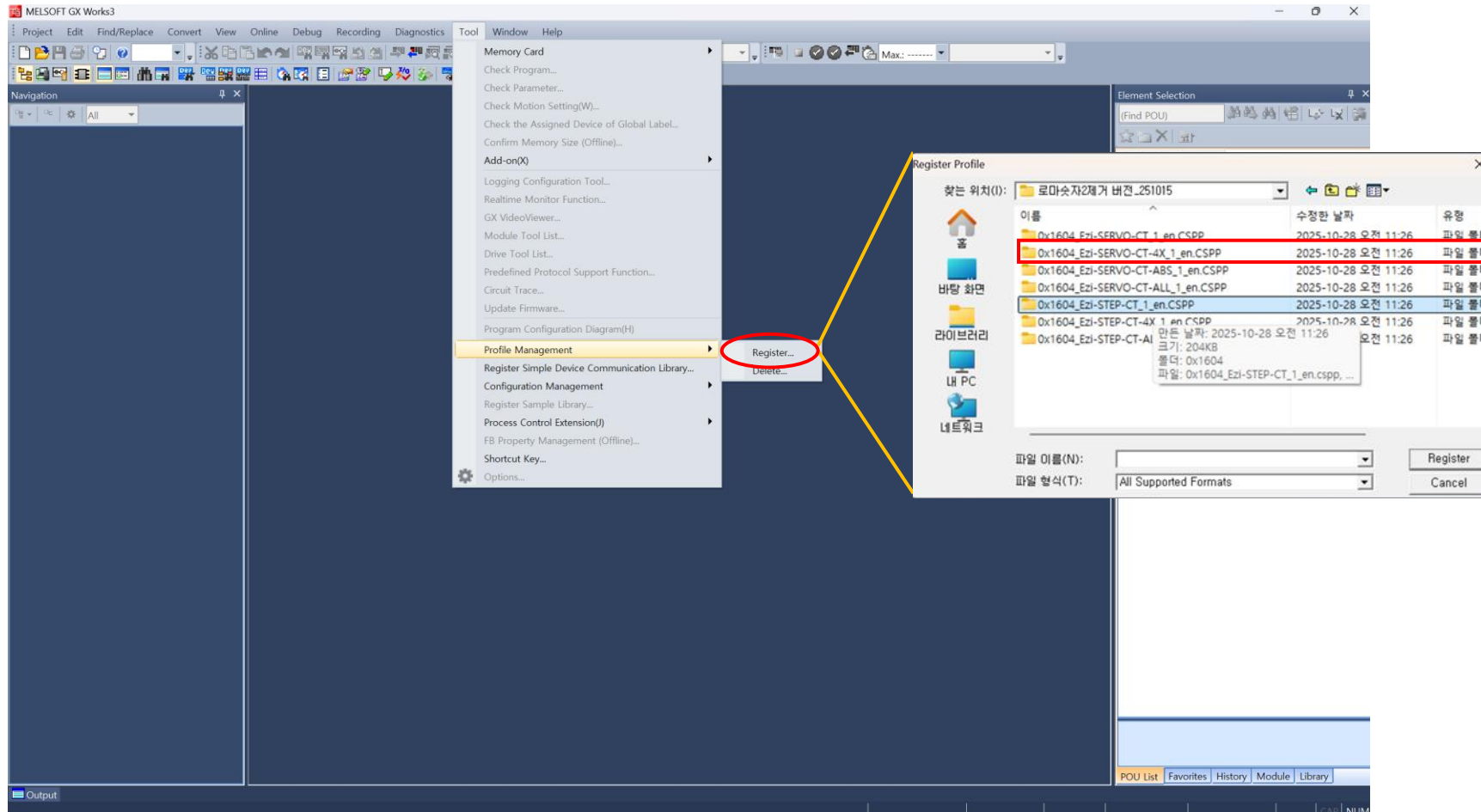
- ◆ 리모트국: Ezi-SERVO CC-Link IE TSN 4X

- CSP+ 파일 다운로드 주소: <https://cltsn.fastech-motions.com/download/quick>
 - 파일명 : 0x1604_Ezi-SERVO-CT-4X_1_en_CSPP

1-2. Ezi-SERVO CC-Link IE TSN 4X CSP+ 파일 등록

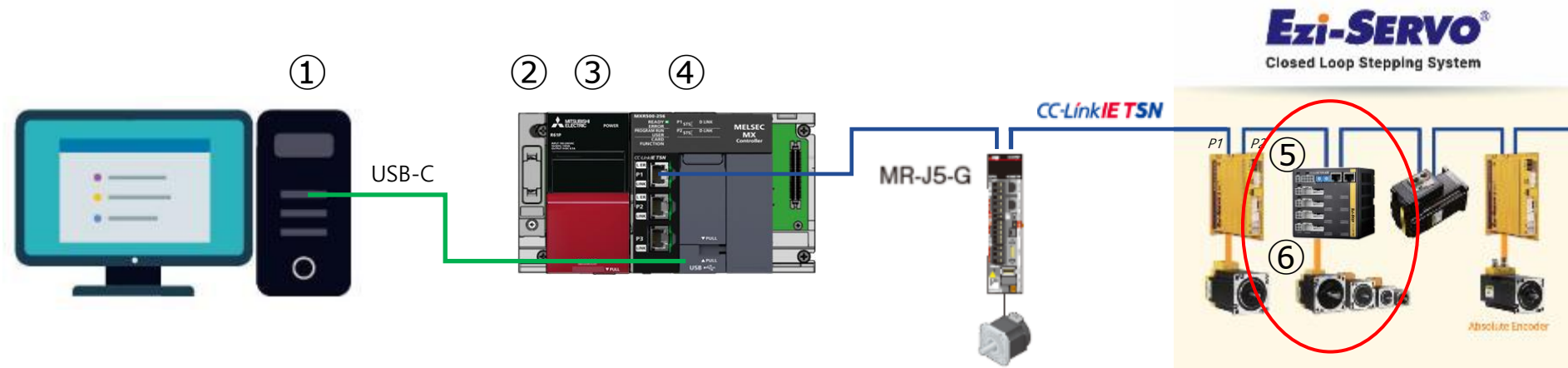
● CSP+ 등록

- [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	컨트롤러	MXR300-16	192.168.3.253
⑤	드라이브	EzS2-CT-4X	192.168.3.1
⑥	모터	EzM2-42S-A	-

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, MX 컨트롤러 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 홈페이지에서 다운로드하시기 바랍니다. ※ 주소: https://cltsn.fastech-motions.com/download/quick
2	MX 컨트롤러 설정 	GX-Works3를 사용해 MX 컨트롤러의 프로젝트를 만든 다음, 유닛 파라미터(통신 방식, 접속 대상)와 축 파라미터(모션 제어용)를 설정합니다.
3	MX 컨트롤러 + Ezi-SERVO 동작 확인 	MX 컨트롤러와 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 (MX 컨트롤러와 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

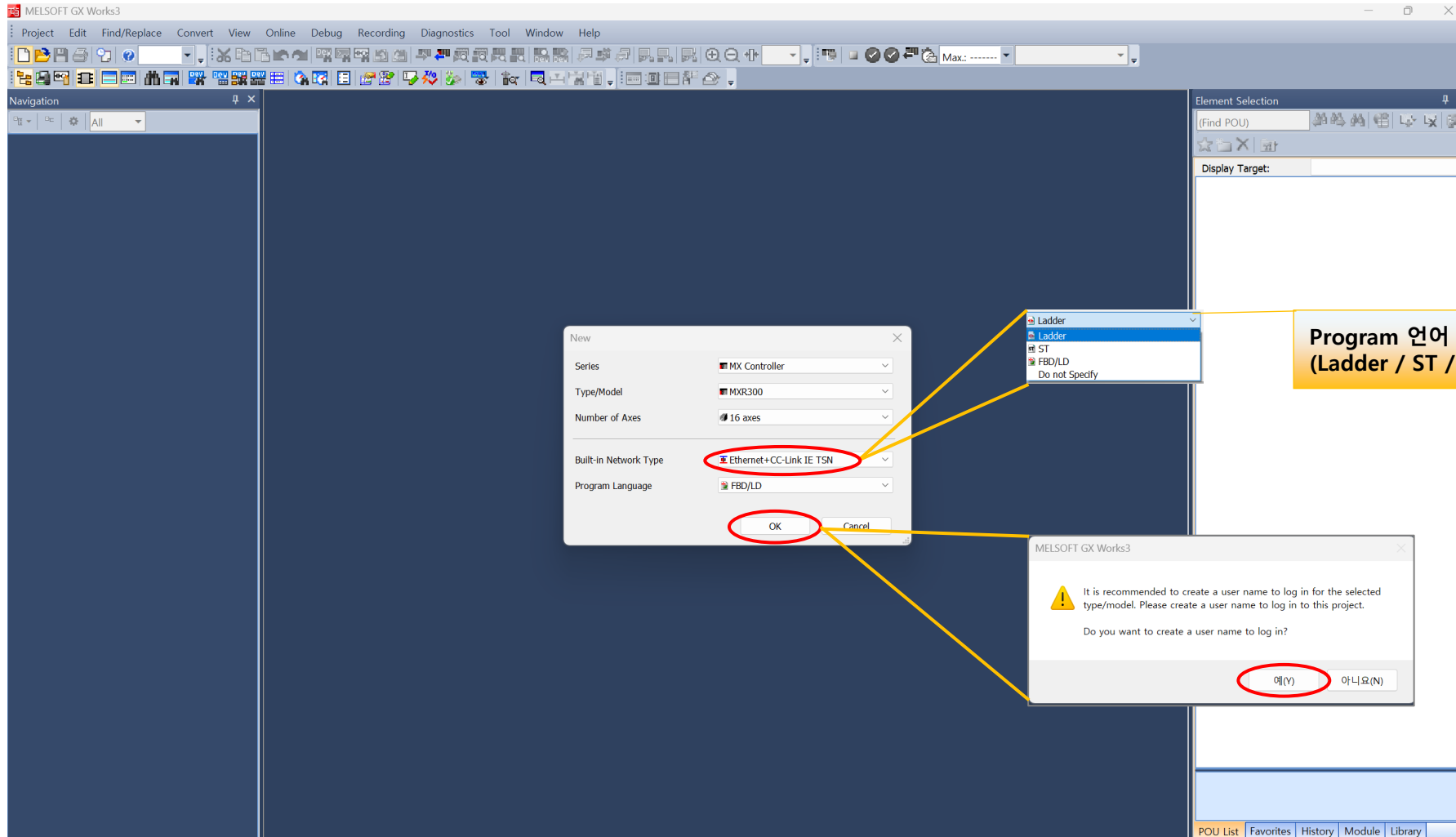
● 모션 제어 기능 제약 사항 (MX 컨트롤러와 Ezi-SERVO)

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. MX 컨트롤러 설정

2-1. Project 생성

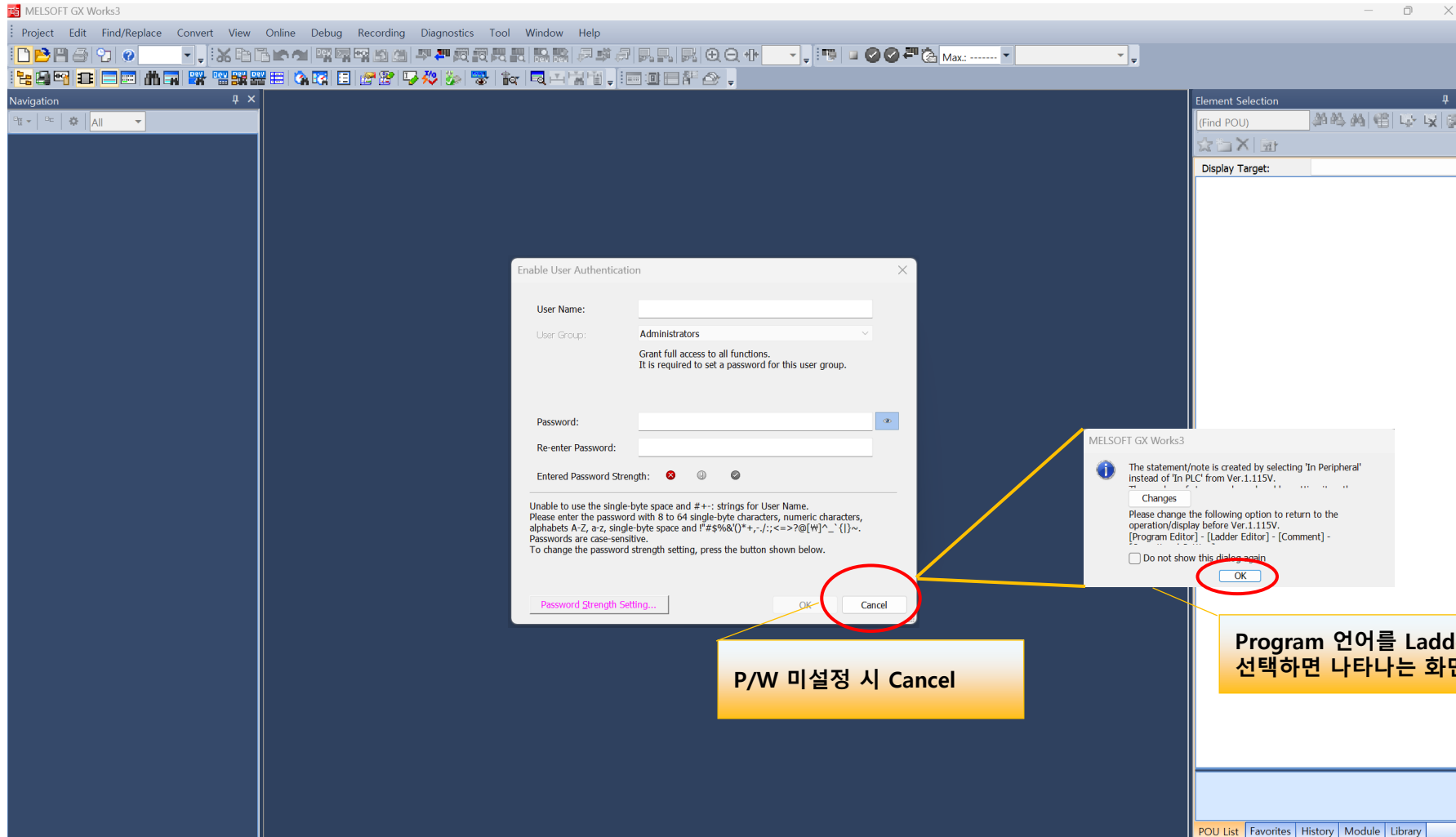
- 신규 Project 생성 시 MX Controller, 모델명, 사용 축수, Program 언어를 선택



2-2. User Authentication 설정

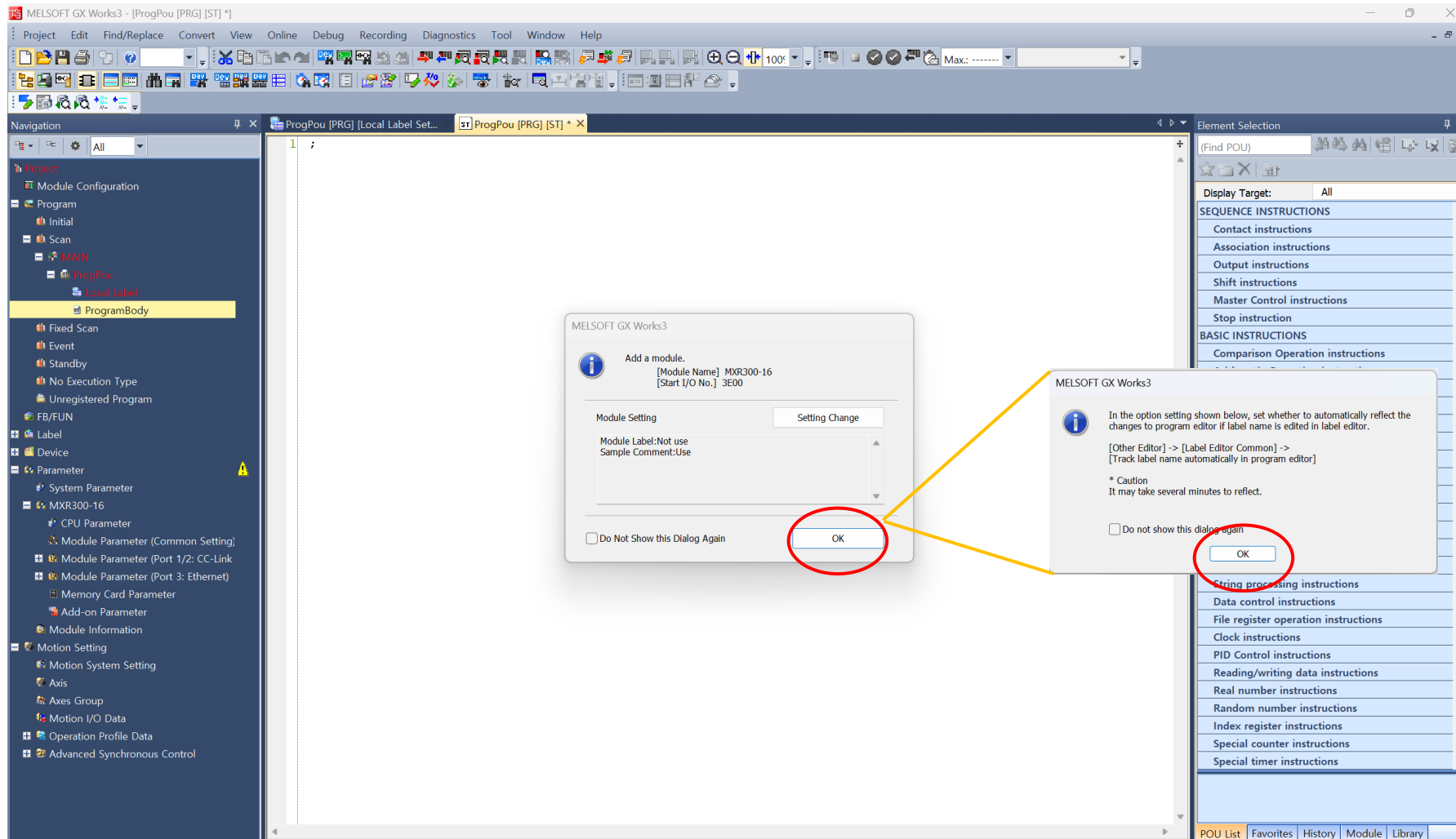
- 비밀번호 설정

※ 이 장에서는 Password 미설정으로 Cancel합니다.



2-3. Module 등록

- MXR300-xx 등록



2-4. Module Configuration – H/W

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

The screenshot displays the MELSOFT GX Works3 software interface for module configuration. The main workspace shows a rack configuration with a Main Base, CPU Module, and Power Supply. The Element Selection panel on the right lists various modules, with R32SB, R33B, and R61P highlighted. A callout box provides instructions for the click-and-drag process.

1 Module Configuration

2 마우스 클릭 & 드래그

3 [클릭 & 드래그]
1. Main Base
2. Power Supply
3. MX Controller 장착

4

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

Module Configuration

Module Parameter (Common Setting)

Module Parameter (Port 1/2: CC-Link)

Module Parameter (Port 3: Ethernet)

Memory Card Parameter

Add-on Parameter

Module Information

Motion Setting

Motion System Setting

Axis

Axis Group

Motion I/O Data

Operation Profile Data

Advanced Synchronous Control

Element Selection

(Find POU)

Display Target: All

MX Controller

MX-R Model

iQ-R Series

Main Base

R32SB 2 Slots (Type requiring s)

R33B 3 Slots (Type requiring p)

R33SB 3 Slots (Type requiring s)

R35B 5 Slots (Type requiring p)

R35SB 5 Slots (Type requiring s)

R38B 8 Slots (Type requiring p)

R38RB-HT 8 Slots (Extended temper)

R310B-HT 10 Slots (Extended temp)

R310RB 10 Slots (Type requiring)

R312B 12 Slots (Type requiring)

Extension Base

RQ Extension Base

PLC CPU

Process CPU

SIL2 Process CPU

Safety CPU

C Controller

MELSECWinCPU

Head Module

Motion CPU

NCCPU

Robot CPU

Power Supply

R61SP 2.5A output (Slim type p)

R62P 3.5A output

R61P 6.5A output

R63P 6.5A output

R63RP 6.5A output (Redundant)

R64P 9.0A output

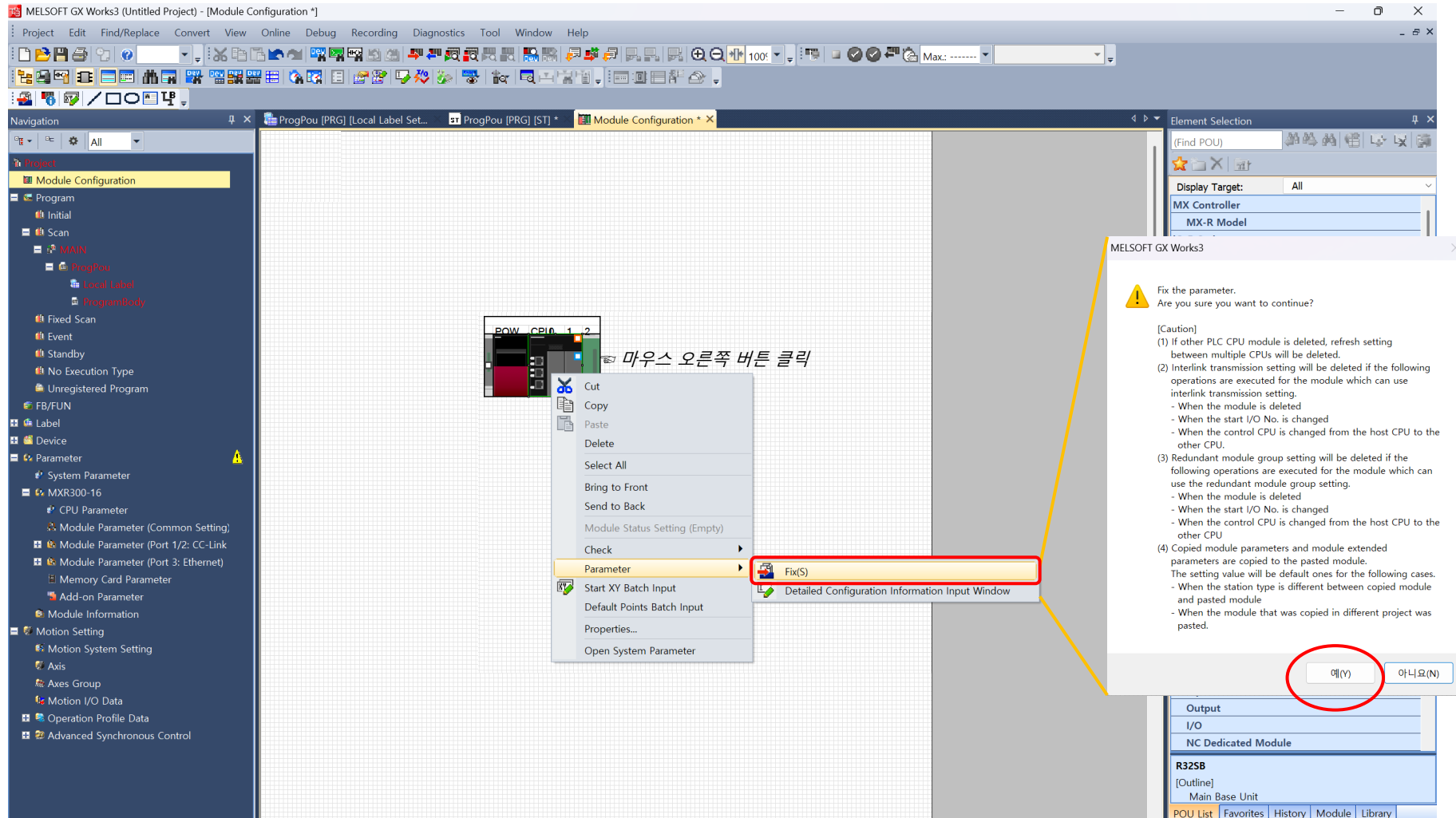
R64RP 9.0A output (Redundant)

R69P 9.0A output

R69RP 9.0A output (Redundant)

2-4. Module Configuration – H/W

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



2-5. Module Parameter

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

MELSOFT GX Works3 (Untitled Project) - [MXR300-16 Module Parameter (Port 1/2: CC-Link IE TSN)]

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

Setting Item List: Input the Setting Item to Search

Setting Item Table:

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

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

IP Address : 192.168.3.253
※ 참고: Ezi-SERVO-4X
Default IP: 192.168.3.xxx

Explanation: Set the IP address for the own node. Ensure that the own node and the external device to be communicated with have the same class and subnet address. Set the IP address to use for CC-Link IE TSN communication.

[Setting Range] 0.0.0.1 to 223.255.255.254 (00.00.00.01 to FF.FF.FF.FE)

Item List Find Result: Check, Restore the Default

Apply

2-5. Module Parameter – N/W Configuration

● Network Configuration Settings

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

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

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

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

No.	Host Station	Model Name	STA#	Station Type
0	Host Station		0	Master Station

Module List

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

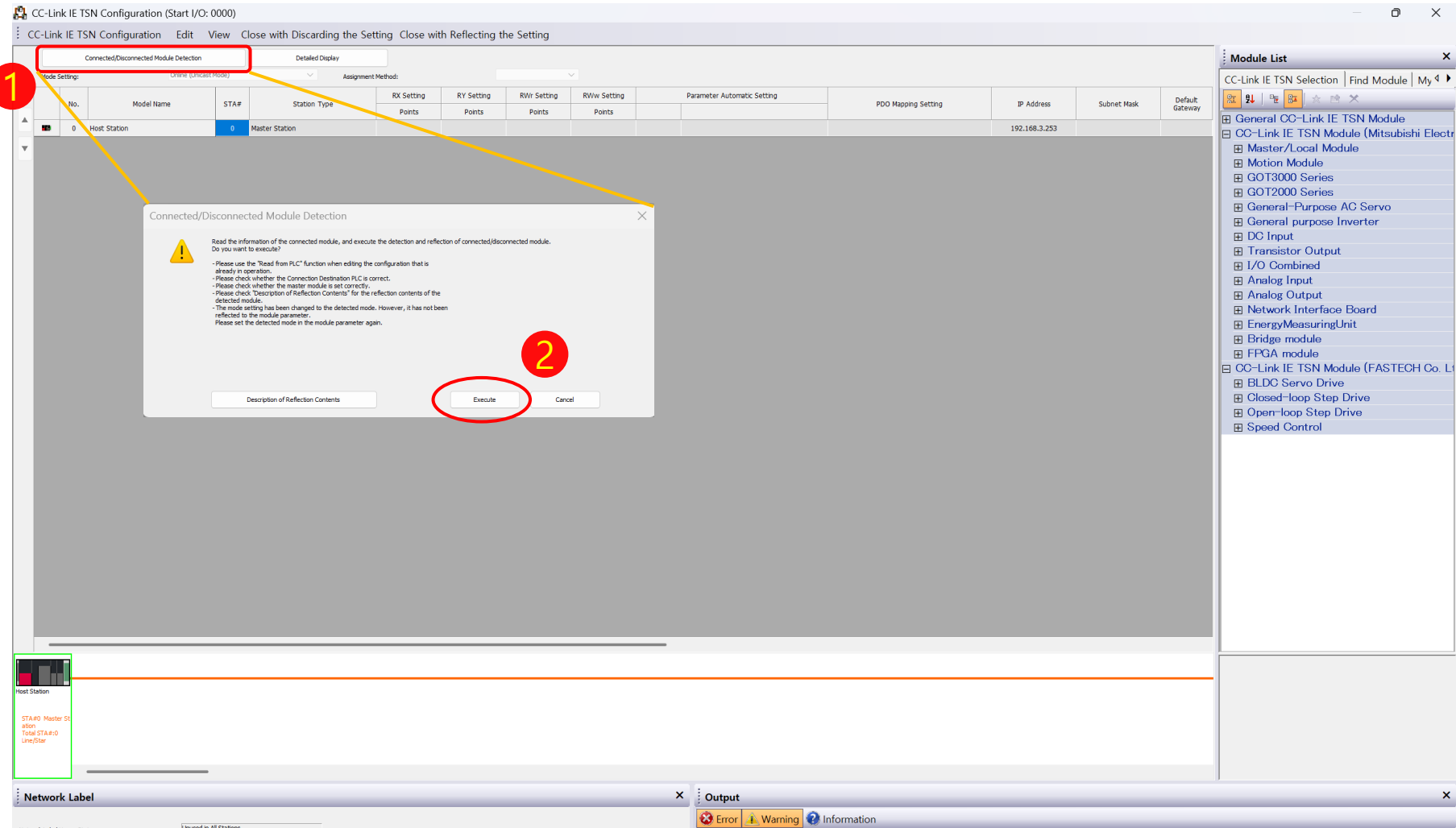
Network Label

Network Label Usage Status: Unused in All Stations

*The network label only can be used by the remote station.

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

- N/W 연결된 상태 : CC-Link IE TSN Module을 자동으로 찾아서 구성



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

- N/W 연결된 상태 : CC-Link IE TSN Module을 자동으로 Ezi-SERVO CC-Link IE TSN 4X를 찾아서 구성

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

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

A yellow starburst callout points to the table with the text: "자동으로 찾은 Module" (Module found automatically).

A confirmation dialog box is shown in the center:

MELSOFT GX Works3

Connected/Disconnected Module Detection is completed.
Please execute Write to PLC if necessary.

- Please execute system configuration check because the system configuration is changed.

확인 (Confirm)

A yellow callout box on the right lists the IP addresses for the 4 modules:

[Ezi-SERVO CC-Link IE TSN 4X 4축 구성 예]
[Ezi-SERVO CC-Link IE TSN 4X 드라이버에
설정된 IP Address]

1. 192.168.3.17
2. 192.168.3.18
3. 192.168.3.19
4. 192.168.3.20

The bottom of the window shows a 'Network Label' section with a diagram of the station configuration, including a Host Station and four Remote Stations (STA#1 to STA#4) connected to the CC-Link IE TSN network.

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

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

등록에 따라 생성됨

2

[Ezi-SERVO CC-Link IE TSN 4X IP Address 임의로 수정]

1. 192.168.3.17
2. 192.168.3.18
3. 192.168.3.19
4. 192.168.3.20

※ IP Address 변경 후 전원 RESET 필요

1

마우스 클릭 & 드래그 (반복)

[참고] Ezi-SERVO CC-Link IE TSN 4X IP Address 설정 16진수 로터리 스위치

[Station Type]
Remote Station

Network Label

Output

Error Warning Information

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

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

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

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

Mode Setting: Online (Unicast Mode) Assignment Method:

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

Network Label

Host Station

STA#0 Master Station Total STA#3 LineStar

Ea-SERVO-CT-4K Ea-SERVO-CT-4K Ea-SERVO-CT-4K Ea-SERVO-CT-4K

Output

Error:0 Warning:0 Information:0

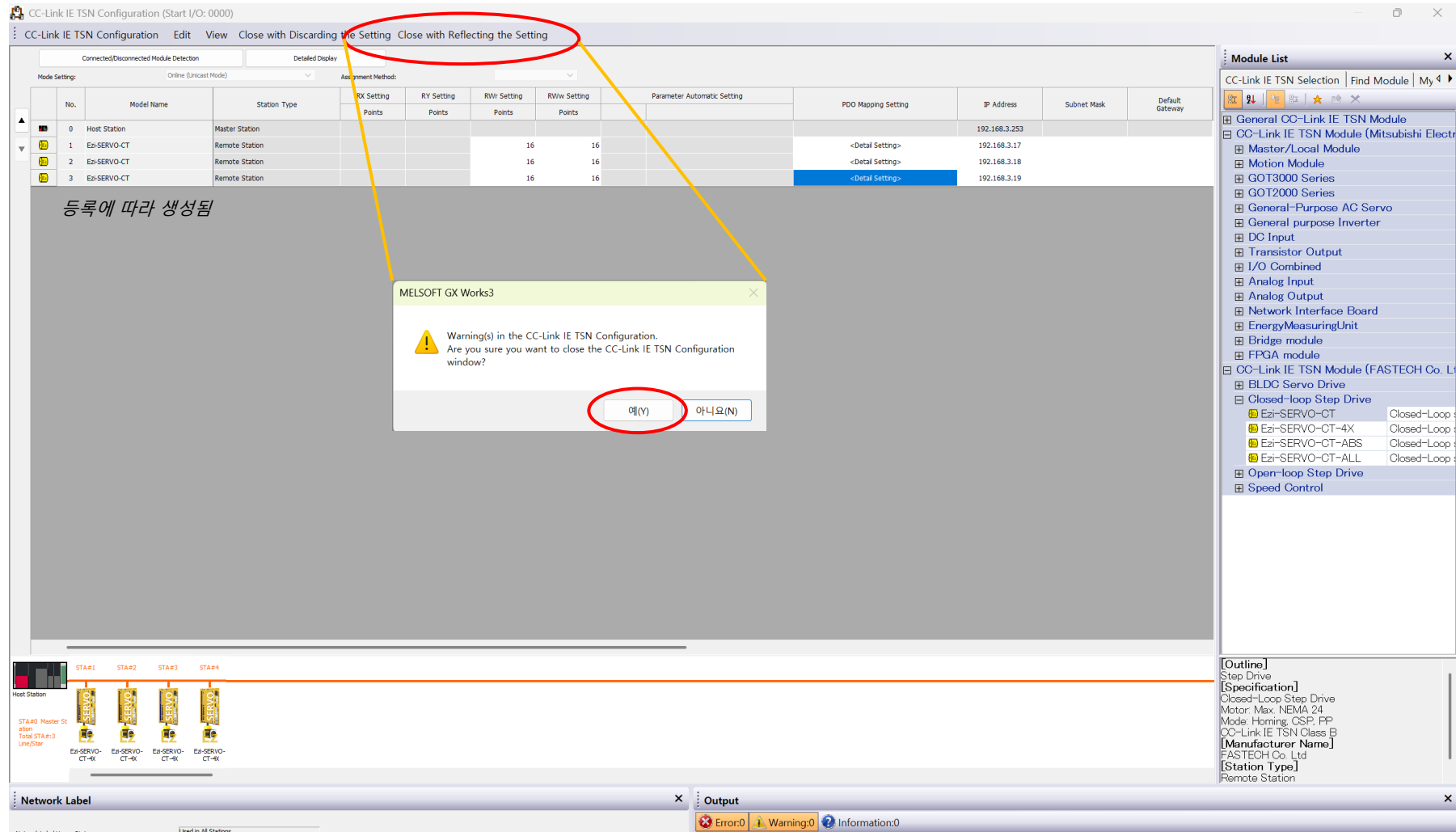
[Outline]
Step Drive
[Specification]
Closed-Loop Step Drive
Motor: Max. NEMA 24
Mode: Homing, CSP, PP
CC-Link IE TSN Class B
[Manufacturer Name]
FASTECH Co. Ltd
[Station Type]
Remote Station

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



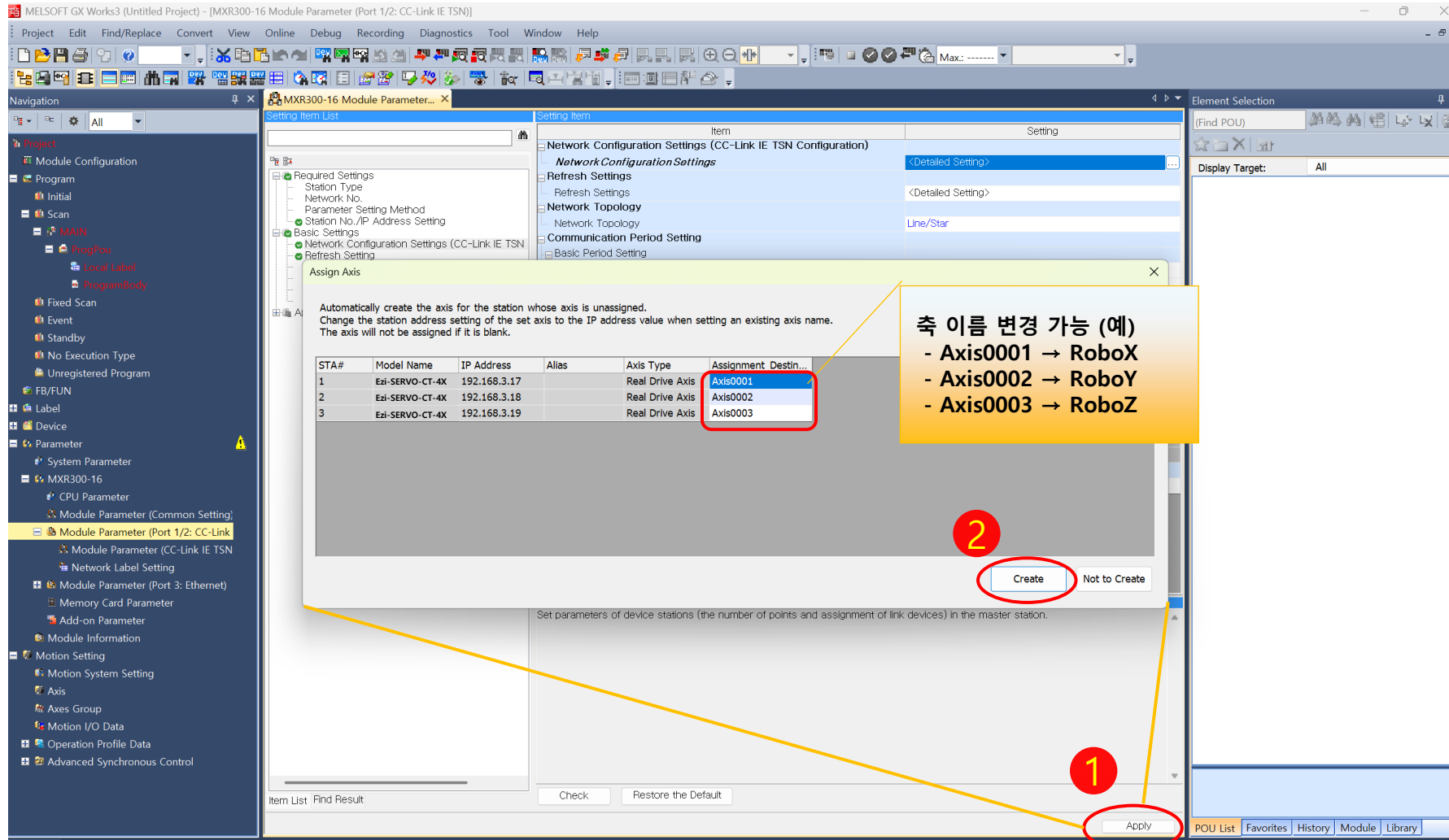
2-5. Module Parameter – CC-Link IE TSN Configuration

- CC-Link IE TSN Module Setting 반영



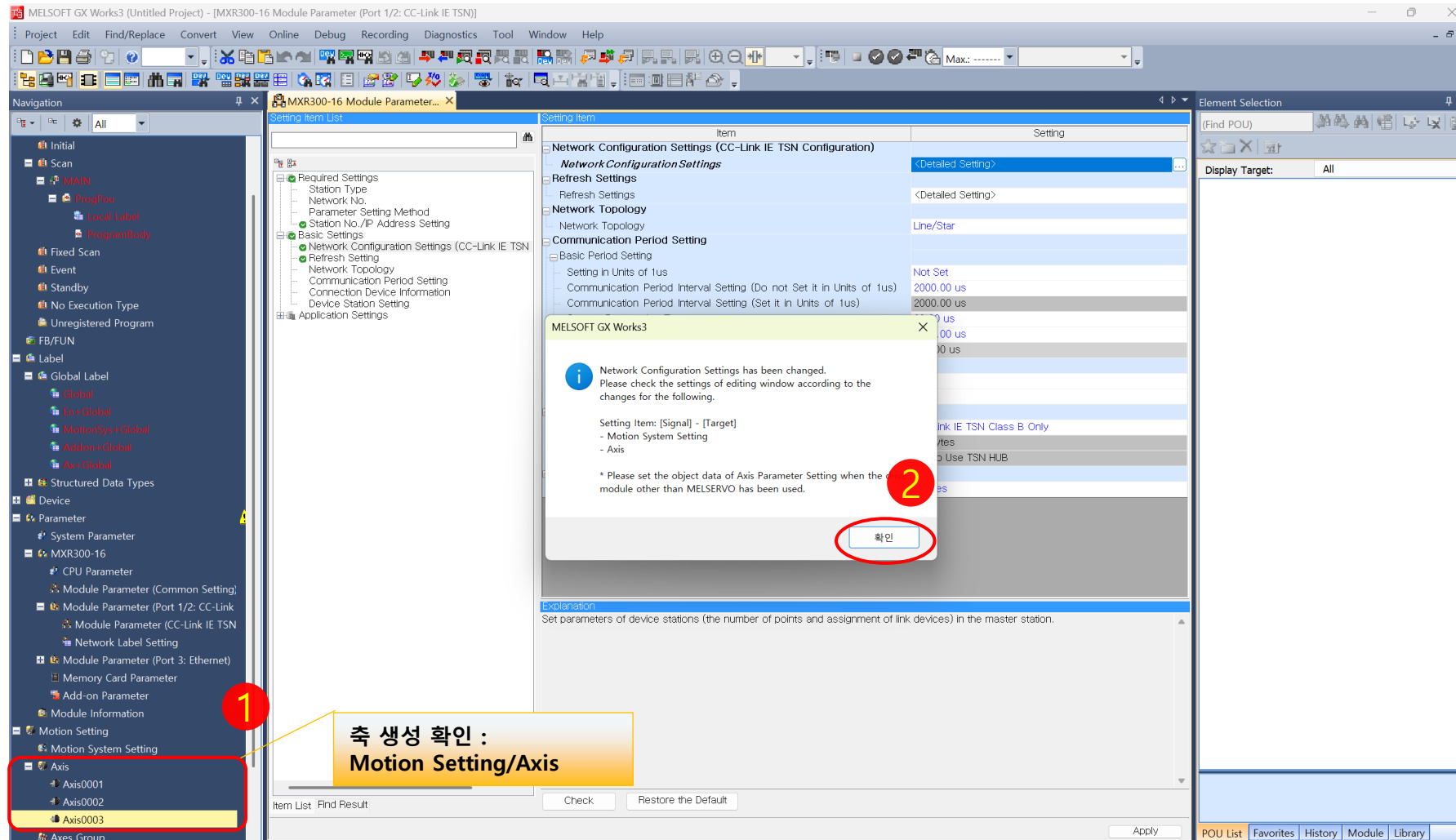
2-5. Module Parameter – CC-Link IE TSN Configuration

● 축 생성



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

- 축 생성 확인



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

● Network Label Setting – 축별 Digital In/Output 설정

The screenshot displays the 'Network Label Setting' window in MELSOFT GX Works3. The window is divided into several panes. On the left is a 'Navigation' pane with a tree view showing the project structure, including 'Label' and 'Network Label Setting'. The main area contains a table with columns: 'N', 'IP Address', 'Model Name', 'Device Label/Structure...', 'Data Type', 'Labeling Target', 'Arranged Target', 'Label Data Type', 'Label Name', and 'English Display'. The table lists parameters for three servo modules (Ezi-SERVO_CT_001, Ezi-SERVO_CT_002, and Ezi-SERVO_CT_003). Red circles and numbers highlight the following steps:

- 1**: Selecting the 'Labeling Target' column for the 'Digital Output' section.
- 2**: Clicking the 'Create Label' button at the bottom of the window.
- 3**: Confirming the 'Start creating the label on the basis of the editing content.' dialog box.

On the right side, two yellow callout boxes provide additional context:

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

At the bottom right, a 'POU List' pane shows a list of parameters including 'Ezi-SERVO_CT_001_WatchdogCount...', 'Ezi-SERVO_CT_001_Controlword...', 'Ezi-SERVO_CT_001_ModesOfOperation...', 'Ezi-SERVO_CT_001_TargetPosition...', 'Ezi-SERVO_CT_001_PhysicalOutputs...', 'Ezi-SERVO_CT_001_WatchdogCount...', 'Ezi-SERVO_CT_001_Statusword...', 'Ezi-SERVO_CT_001_ErrorCode...', 'Ezi-SERVO_CT_001_PositionActualVa...', and 'Ezi-SERVO_CT_001_DigitalInputs...'.

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

- Network Label Setting – 축별 Digital In/Output Enable *Limit SW, ORG SW, DIO 사용 가능 설정

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

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

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

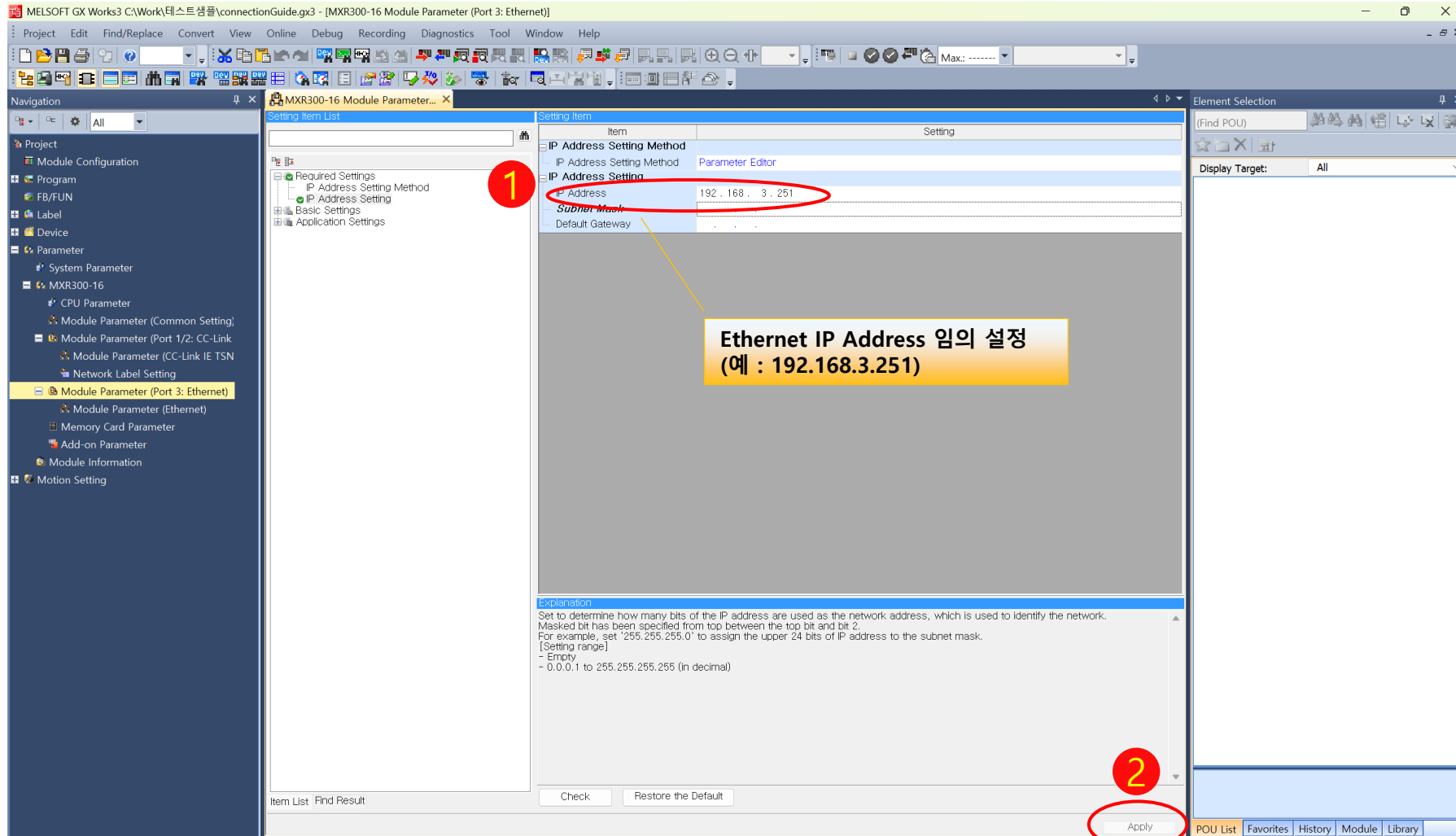
1

Ezi-SERVO CC-Link IE TSN 4X DIO 사용 Check (Limit SW, ORG, DIO Enable)

POU List | Favorites | History | Module | Library

2-5. Module Parameter – Port 3 : Ethernet

● Ethernet IP Address Setting



2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Object Data 설정(1/3) *Ezi-SERVO CC-Link IE TSN 4X Object Data 등록

1. In the left sidebar, expand the tree view to **Axis** and select **Axis0001**.

2. In the main table, under the **Basic Parameter** section, select **ControlWord**.

3. In the main table, under the **Object Data** section, select **ControlWord**.

4. In the **Object Data Setting (Axis0001)** dialog box, click the **Restore the Data** button.

5. In the **Set default data** dialog box, click **예(Y)** (Yes).

6. In the **The specified station address refers to a non-MELSERVO device** dialog box, click **예(Y)** (Yes).

Ezi-SERVO CC-Link IE TSN 4X Object Data

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Object Data 설정(2/3) *Ezi-SERVO CC-Link IE TSN 4X Object Data 등록

MELSOFT GX Works3 C:\Work\테스트샘플\connectionGuide.gx3 - [Axis Parameter Setting]

Navigation: Project, Module Configuration, Program, FB/FUN, Label, Device, Parameter, System Parameter, MXR300-16, CPU Parameter, Module Parameter (Common Setting), Module Parameter (Port 1/2: CC-Link), Module Parameter (CC-Link IE TSN), Network Label Setting, Module Parameter (Port 3: Ethernet), Memory Card Parameter, Add-on Parameter, Module Information, Motion Setting, Motion System Setting, Axis, Axis0001, Axis0002, Axis0003, Axes Group, Motion I/O Data, Operation Profile Data, Advanced Synchronous Control

Setting Item List: Real Drive Axis, Axis Information, Basic Parameter, Station Address Setting, Axis Type Setting, Axis Emulation Enabled, Control Cycle Setting, Object Data, Absolute Position Control Setting, Current Position Restore Reference, Position, Ring Counter Enabled Selection, Ring Counter Upper Limit Value, Ring Counter Lower Limit Value, Position Command Unit, Position Command Unit String, Velocity Command Unit, Velocity Bias Value, Driver Unit Conversion Numerator, Driver Unit Conversion Denominator, Limit Parameter, Velocity Limit, Homing, Stop, Stroke Limit, Driver, Other, Real Encoder Axis, Virtual Drive Axis, Virtual Encoder Axis, Virtual Linked Axis

Setting Item: Set Axis Information, Set Basic Parameter, Station Address Setting, Axis Type Setting, Axis Emulation Enabled, Control Cycle Setting, Object Data, ControlWord, EncoderIncrements

Object Data Setting (Axis0002)

Target Device: Ezi-SERVO-CT

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

Item	Address	Value
ControlWord	[OBJ]0x60400010	Controlword
EncoderIncrements	[OBJ]0x60400010	Encoder increments
FollowingErrActualValue	[OBJ]0x60400010	Following error actual value
GearRatioMotorRevolutions	[OBJ]0x607C0020	Gear ratio motor revolutions
HomeOffset	[OBJ]0x60800020	Home offset
MaxMotorSpeed	[OBJ]0x60720010	Max motor speed
MaxTorque	[OBJ]0x60600008	Max torque
ModesOfOp	[OBJ]0x60610008	Modes of operation
ModesOfOpDispl	[OBJ]0x60E10010	Modes of operation display
NegativeTorqueLimitValue	[OBJ]0x607E0008	Negative torque limit value
Polarity	[OBJ]0x60640000	Polarity
PosActualValue	[OBJ]0x60640000	Position actual value

7

8

[OBJ] 변경된 내용 확인

Item List Find Result

Restore the Defa

Apply

POU List Favorites History Module Library

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Object Data 설정(3/3) *Ezi-SERVO CC-Link IE TSN 4X Object Data 등록

MELSOFT GX Works3 C:\Work\테스트샘플\connectionGuide.gx3 - [Axis Parameter Setting]

Navigation: Project, Module Configuration, Program, FB/FUN, Label, Device, Parameter, System Parameter, MXR300-16, CPU Parameter, Module Parameter (Common Setting), Module Parameter (Port 1/2: CC-Link), Module Parameter (CC-Link IE TSN), Network Label Setting, Module Parameter (Port 3: Ethernet), Memory Card Parameter, Add-on Parameter, Module Information, Motion Setting, Motion System Setting, Axis, Axis0001, Axis0002, Axis0003, Axis Group, Motion I/O Data, Operation Profile Data, Advanced Synchronous Control.

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

Setting Item: Axis Information, Basic Parameter, Control Word, EncoderIncrements, FollowingErrActualValue, GearRatioMotorRevolutions, HomeOffset, MaxMotorSpeed, MaxTorque, ModesOfOp, ModesOfOpDisp, NegativeTorqueLimitValue, Polarity, PosActualValue, PosEncoderResolution, PosEncoderResolutionMotorRevolutions, Virtual Encoder Axis.

Axis0001, Axis0002, Axis0003

Set Axis Information

Axis No.	Axis0001	Axis0002	Axis0003
1	2	3	

Set Basic Parameter

Station Address Setting	Axis0001	Axis0002	Axis0003
192.168.3.17	192.168.3.18	192.168.3.19	

0:Real Drive Axis 0:Real Drive Axis 0:Real Drive Axis

0:Disabled 0:Disabled 0:Disabled

0:Automatic setting 0:Automatic setting 0:Automatic setting

Control Word

Object Data	Axis0001	Axis0002	Axis0003
[OBJ]0x6040001	[OBJ]0x6040001	[OBJ]0x6040001	
[OBJ]0x608F012	[OBJ]0x608F012	[OBJ]0x608F012	
[OBJ]0x60F4002	[OBJ]0x60F4002	[OBJ]0x60F4002	
[OBJ]0x607C002	[OBJ]0x607C002	[OBJ]0x607C002	
[OBJ]0x6080002	[OBJ]0x6080002	[OBJ]0x6080002	
[OBJ]0x6072001	[OBJ]0x6072001	[OBJ]0x6072001	
[OBJ]0x6060000	[OBJ]0x6060000	[OBJ]0x6060000	
[OBJ]0x6061000	[OBJ]0x6061000	[OBJ]0x6061000	
[OBJ]0x60E1001	[OBJ]0x60E1001	[OBJ]0x60E1001	
[OBJ]0x607E000	[OBJ]0x607E000	[OBJ]0x607E000	
[OBJ]0x6064002	[OBJ]0x6064002	[OBJ]0x6064002	
[OBJ]0x608F000	[OBJ]0x608F000	[OBJ]0x608F000	
[OBJ]0x608F022	[OBJ]0x608F022	[OBJ]0x608F022	
[OBJ]0x60E0001	[OBJ]0x60E0001	[OBJ]0x60E0001	
[OBJ]0x60A8002	[OBJ]0x60A8002	[OBJ]0x60A8002	
[OBJ]0x60A9002	[OBJ]0x60A9002	[OBJ]0x60A9002	
[OBJ]0x6041001	[OBJ]0x6041001	[OBJ]0x6041001	
[OBJ]0x6502002	[OBJ]0x6502002	[OBJ]0x6502002	

Ezi-SERVO CC-Link IE TSN 4X 모든 축 [OBJ] 변경된 내용 확인

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

Apply

2-6. Motion Setting – Basic Parameter

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

MELSOFT GX Works3 C:\Work\테스트\샘플\connectionGuide.gx3 - [Axis Parameter Setting]

Navigation: Project, Module Configuration, Program, FB/FUN, Label, Device, Parameter, System Parameter, MXR300-16, CPU Parameter, Module Parameter (Common Setting), Module Parameter (Port 1/2: CC-Link), Module Parameter (CC-Link IE TSN), Network Label Setting, Module Parameter (Port 3: Ethernet), Memory Card Parameter, Add-on Parameter, Module Information, Motion Setting, Motion System Setting, Axis.

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

Setting Item: Axis Information, Basic Parameter, Absolute Position Control Setting, Limit Parameter.

Axis0001, Axis0002, Axis0003

Set Axis Information

Item	Axis0001	Axis0002	Axis0003
Axis No.	1	2	3
Station Address Setting	192.168.3.17	192.168.3.18	192.168.3.19
Axis Type Setting	0:Real Drive Axis	0:Real Drive Axis	0:Real Drive Axis
Axis Emulation Enabled	0:Disabled	0:Disabled	0:Disabled
Control Cycle Setting	0:Automatic Setting	0:Automatic Setting	0:Automatic Setting

Set Basic Parameter

Item	Axis0001	Axis0002	Axis0003
Current Position Restore Reference Position	0:Disable Absc	-1:Automatic Set	-1:Automatic Set
Ring Counter Enabled Selection	0:Disable Absolute Position System	-1:Automatic Setting (Acquire from Connected Device)	-1:Automatic Setting (Acquire from Connected Device)
Ring Counter Upper Limit Value	-10000000000.0	-10000000000.0	-10000000000.0
Ring Counter Lower Limit Value	0 pulse	0 pulse	0 pulse
Position Command Unit	U/s	U/s	U/s
Position Command Unit String	0.0 pulse/s	0.0 pulse/s	0.0 pulse/s
Velocity Command Unit	1 pulse	1 pulse	1 pulse
Velocity Bias Value	1 pulse	1 pulse	1 pulse
Driver Unit Conversion Numerator	1000.0 %	1000.0 %	1000.0 %
Driver Unit Conversion Denominator	300.0 %	300.0 %	300.0 %
Initial Value	300.0 %	300.0 %	300.0 %

Set Limit Parameter

Item	Axis0001	Axis0002	Axis0003
Torque Limit Maximum Value	1000.0 %	1000.0 %	1000.0 %
Negative Direction Torque Limit Initial Value	300.0 %	300.0 %	300.0 %
Initial Value	300.0 %	300.0 %	300.0 %

Explanation: <Axis Parameter Constant> Axis.PrConst.PosRestoration_AbsPosEnable Set the absolute position control setting. [Setting Range] 0:Disable Absolute Position System 1:Enable Absolute Position System -1:Automatic Setting (Acquire from Connected Device)

Apply

Ezi-SERVO CC-Link IE TSN 4X는 Disable Absolute Position System으로 선택

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Position Command Unit 설정 (Ezi-SERVO CC-Link IE TSN 4X 인코더 10,000ppr)

Ezi-SERVO CC-Link IE TSN 4X의 Encoder Resolution Setting Range는 10,000 pulse/rev

기어비 설정 방법은 기존방법과 동일함

1. Select Folder: Display All Data

2. Position Command Unit: degree

3. Encoder Resolution: 10000 [pulse/rev]

4. Calculate Axis Parameters

5. Reflects the calculation result to the axis parameters. Values currently set will be deleted and updated to the values of calculation result. Are you sure? 예(Y) 아니오(N)

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Position Command Unit 설정 (Ezi-SERVO CC-Link IE TSN 4X 인코더 10,000ppr)

The screenshot displays the MELSOFT GX Works3 interface for setting axis parameters. The left sidebar shows the project structure, with 'Axis0001' selected under 'Motion Setting'. The main window shows the 'Set Basic Parameter' table for Axis0001, Axis0002, and Axis0003. The 'Position Command Unit' section is highlighted with a red box, showing settings for degree, mm, and mm. The 'Driver Unit Conversion Numerator' and 'Driver Unit Conversion Denominator' are also highlighted with a red box, showing values of 10000 pulse and 360 degree, 5 mm, and 10 mm respectively. The right sidebar shows the 'Element Selection' panel with 'Display Target' set to 'All'.

Item	Axis0001	Axis0002	Axis0003
Axis Information	Set Axis Information		
Axis No.	1	2	3
Station Address Setting	192.168.3.17	192.168.3.18	192.168.3.19
Axis Type Setting	0:Real Drive Axis	0:Real Drive Axis	0:Real Drive Axis
Axis Emulation Enabled	0:Disabled	0:Disabled	0:Disabled
Control Cycle Setting	0:Automatic settin	0:Automatic settin	0:Automatic settin
Object Data	0:Disable Absolut 0:Disable Absolut 0:Disable Absolut		
Absolute Position Control Setting	0:Disable Absolut	0:Disable Absolut	0:Disable Absolut
Current Position Restore Reference	-1:Automatic judg	-1:Automatic judg	-1:Automatic judg
Ring Counter Enabled Selection	0:Disabled	0:Disabled	0:Disabled
Ring Counter Upper Limit Value	10000000000.0	10000000000.0	10000000000.0
Ring Counter Lower Limit Value	-10000000000.0	-10000000000.0	-10000000000.0
Position Command Unit	degree	mm	mm
Velocity Command Unit	U/s	U/s	U/s
Velocity Bias Value	0.0 degree/s	0.0 mm/s	0.0 mm/s
Driver Unit Conversion Numerator	10000 pulse	10000 pulse	10000 pulse
Driver Unit Conversion Denominator	360 degree	5 mm	10 mm
Torque Limit Maximum Value	1000.0 %	1000.0 %	1000.0 %
Negative Direction Torque Limit Initial Value	300.0 %	300.0 %	300.0 %
Positive Direction Torque Limit Initial Value	300.0 %	300.0 %	300.0 %
Upper Limit Signal	0:Detection at TRL 0:Detection at TRL 0:Detection at TRL		
Signal Detection Method	0:Detection at TRL	0:Detection at TRL	0:Detection at TRL
Compensation Time	0.0 s	0.0 s	0.0 s

Robot or Stage 이동 단위 선택

Ezi-SERVO CC-Link IE TSN 4X Encoder 10,000 pulse/rev

모터 1회전당 이동 거리/각도 설정

Apply

2-6. Motion Setting – Basic Parameter

● Real Drive Axis / Basic Parameter / Limit Parameter

Ezi-SERVO CC-Link IE TSN 4X +Limit Switch 설정은 Ezi_SERVO_CT_001_DigitalInputs.1

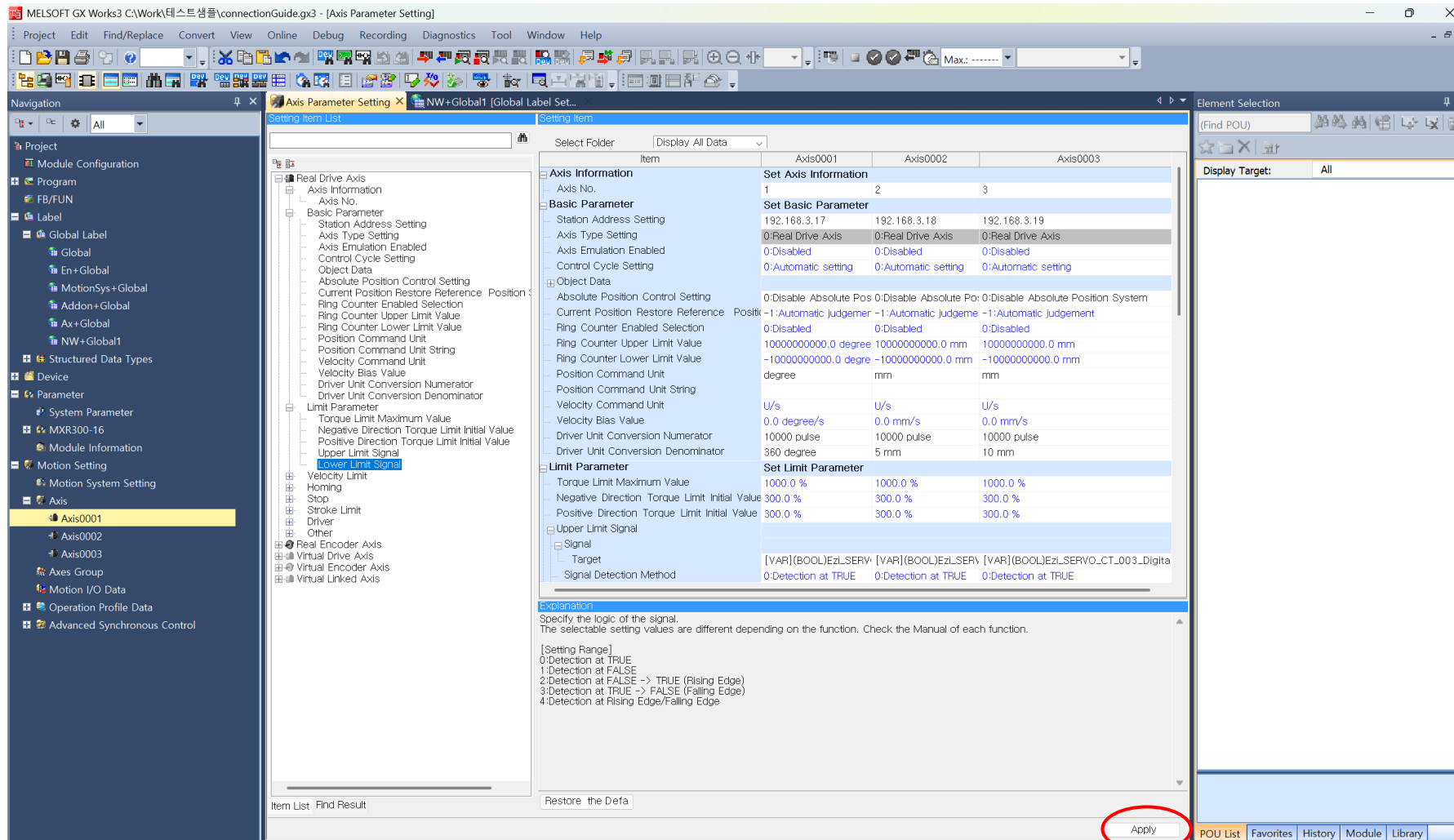
Ezi-SERVO CC-Link IE TSN 4X -Limit Switch 설정은 Ezi_SERVO_CT_001_DigitalInputs.0

주) Ezi_SERVO_CT_xxx_DigitalInputs.x 라벨 설정이 안될 경우
 1. PDO Mapping Setting 확인 (16~17page)
 2. Network Label Setting 확인 (21~22page)

Apply

2-6. Motion Setting – Parameter 등록

- Parameter 등록으로 Motion Setting 완료



2-7. Convert

- Parameter 설정 등에 대하여 “Create Execution Programs after Conversion” 하기

The screenshot shows the MELSOFT GX Works3 interface with the 'Rebuild All' dialog box open. The dialog box has three main sections: 'Rebuild All', 'Create Execution Programs', and 'Conversion Setting'. The 'Rebuild All' section contains a warning icon and text: 'Rebuild all programs in the Project. The next time you rebuild after writing data to PLC, last execution information of device/label and riser will be initialized.' The 'Create Execution Programs' section has two radio buttons: 'Conversion Only' and 'Create Execution Programs after Conversion'. The 'Conversion Setting' section has an information icon and text: 'Execute rebuild with the following settings. Please check details in Options.' The 'OK' button is circled in red. A yellow callout box with the text 'MX Controller는 반드시 Create Execution Programs after Conversion' is overlaid on the dialog box.

1. Rebuild All (Menu Item)

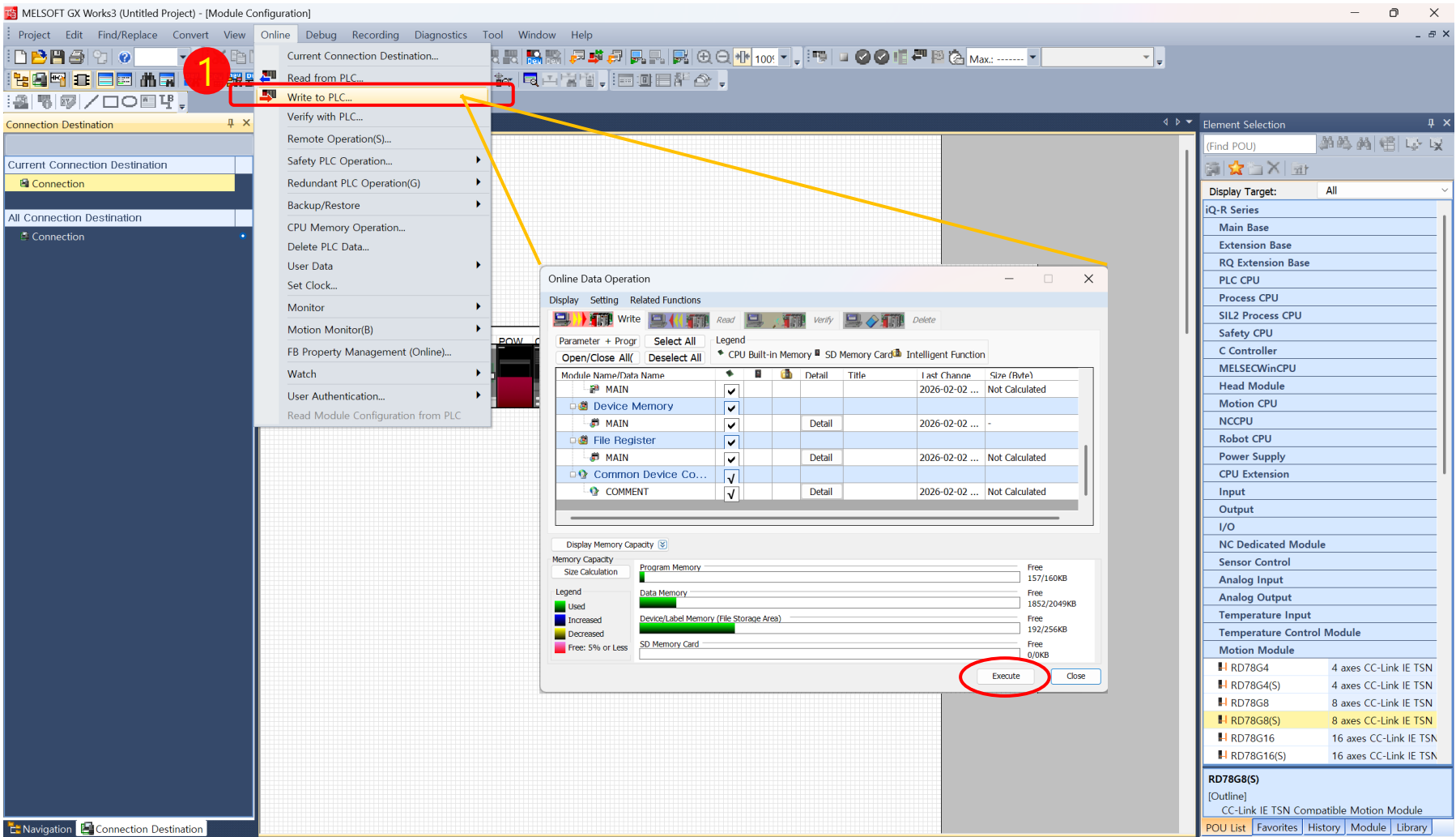
2. Create Execution Programs after Conversion (Radio Button)

3. OK (Button)

MX Controller는 반드시 Create Execution Programs after Conversion

2-8. Write to PLC

- Online Data Operation



3. Program 따라 하기

3-1. Motion 제어 명령어 살펴보기

● Motion Control Function/Function Block 명령어 – Element Selection (좌측 메뉴)

The screenshot displays the MELSOFT GX Works3 interface. On the left, the Project tree shows the 'ProgramBody' folder selected. The main workspace shows a ladder logic program with a 'MC_Power 1 (MC_Power)' block. A yellow dotted arrow points from the 'MC_Power 1 (MC_Power)' block to the 'Element Selection' menu on the right. The 'Element Selection' menu is open, showing a list of Motion Control Function/Function Block elements. The 'MC_Power' element is highlighted. The 'MC_AbortTrigger' element is also visible. The 'MC_Power' element is highlighted in the list, and its details are shown in the bottom right pane.

마우스 클릭 & 드래그

Motion Control Function/Function Block	
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 Resi
MC_GroupSetOverri	Axes Group Override
MC_Power	Operation Available
MC_ReadParameter	Parameter Read
MC_Reset	Axis Error Reset
MC_SetOverride	Override Value Setting
MC_SetPosition	Current Position Chan
MC_TouchProbe	Touch Probe Enabled
MC_WriteParameter	Parameter Write
MCv_AdvCamSetPos	Advanced Synchron
MCv_AdvPositionPe	Advanced Synchron
MCv_AllPower	All Axes Operation Av
MCv_ChangeCycle	Current Value Change
MCv_MotionErrorRe	Motion Error Reset
MCv_SetTorqueLimi	Torque Limit Value
MCv_SyncOperation	Control Operation Cyc
Motion - Individual	
General FB	
MC_AbortTrigger	
[Version]	
00A	

POU List Favorites History Module Library

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

- Ezi-SERVO Enable/SERVO ON Program

The screenshot displays the MELSOFT GX Works3 interface for a ladder logic program. The main workspace shows a ladder logic diagram with the following components:

- Read Mtrr** (Block 1): (0)
- DUT: Axis** (Block 6): MC_Power 1 (MC_Power)
- B: Enable** (Block 3): bAx1SrvEnbl
- B: ServoON** (Block 4): bAx1SrvOn
- END** (Block 8): (9)

A yellow callout box contains the following text:

SERVO ON/OFF FB은 2종

- 개별 On/Off : MC_Power
- 일괄 On/Off : MCv_AllPower

The right sidebar shows the **Element Selection** panel with the following categories:

- Display Target:** All
- Selection**
 - String
 - Bit Shift
 - Edge Detection
 - Counter
 - Timer
 - Bistable
- Motion Control Function/Function Block**
 - Administrative**
 - MC_AbortTrigger (Touch Probe Disabled)
 - MC_CamTableSelect (Cam Table Selection)
 - MC_DigitalCamSwitch (Outputs the digital ca)
 - MC_GroupDisable (Axes Group Disabled)
 - MC_GroupEnable (Axes Group Enabled)
 - MC_GroupReset (Axes Group Error Resi)
 - MC_GroupSetOverri (Axes Group Override)
 - MC_Power (Operation Available)
 - MC_ReadParameter (Parameter Read)
 - MC_Reset (Axis Error Reset)
 - MC_SetOverride (Override Value Setting)
 - MC_SetPosition (Current Position Chan)
 - MC_TouchProbe (Touch Probe Enabled)
 - MC_WriteParameter (Parameter Write)
 - MCv_AdvCamSetPos (Advanced Synchron)
 - MCv_AdvPositionPe (Advanced Synchron)
 - MCv_AllPower (All Axes Operation Av)
 - MCv_ChangeCycle (Current Value Change)
 - MCv_MotionErrorRe (Motion Error Reset)
 - MCv_SetTorqueLimi (Torque Limit Value)
 - MCv_SyncOperation (Control Operation Cyc)
- Motion - Individual**
- General FB**
- MC_AbortTrigger**
 - [Version]
 - 00A

The bottom of the sidebar shows the **POU List** with tabs for Favorites, History, Module, and Library.

3-3. [Ladder] Ezi-SERVO 원점복귀 방법 지정

- 원점복귀 방법 지정하기 (MC_WriteParameter, 33: Homing index pu

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 settings:

- DUT: Axis: Axis001 A
- UD: Param...: dwAxisPara
- L: Value: edAxisMeth
- W: Execution...: 0
- UD: Options: H0

Comparison table:

Time	Data Type	Single Numeric Variable	Selection	String	Bit Shift	Edge Detection	Counter	Timer	Bistable	Motion Control Function/Function Block
00A	MC_AbortTrigger	Touch Probe Disabled								
00A	MC_CamTableSelect	Cam Table Selection								
00A	MC_DigitalCamSwitch	Outputs the digital ca								
00A	MC_GroupDisable	Axes Group Disabled								
00A	MC_GroupEnable	Axes Group Enabled								
00A	MC_GroupReset	Axes Group Error Rese								
00A	MC_GroupSetOverri	Axes Group Override								
00A	MC_Power	Operation Available								
00A	MC_ReadParameter	Parameter Read								
00A	MC_Reset	Axis Error Reset								
00A	MC_SetOverride	Override Value Setting								
00A	MC_SetPosition	Current Position Chan								
00A	MC_TouchProbe	Touch Probe Enabled								
00A	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 two main sections, each enclosed in a dashed yellow box. The top section, labeled 'MC_WriteParameter_1 (MC_...', contains logic for writing parameters to the servo motor. It includes a network with a normally open contact labeled 'bAx1WParam' and a coil labeled 'bAx1ParamD...'. The bottom section, labeled 'MC_Home_1 (MC_Home)', contains logic for the home return operation. It includes a network with a normally open contact labeled 'bAx1HomeSL' and a coil labeled 'bAx1HomeDo...'. The right-hand side of the interface shows the 'Element Selection' panel, which lists various function blocks and parameters. The 'MC_Home' function block is highlighted in the list. The bottom status bar shows the 'POU List' tab, indicating the current position in the program structure.

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 shows the MELSOFT GX Works3 interface with a ladder logic program for MC_MoveAbsolute. The program is organized into steps (1-18) and includes various logic elements such as bAx1Pos1, bAx1Pos2, bAx1Run, and bAx1MoveDone. A red circle highlights the EDMOV instructions in steps 10 and 11, which set the position to 3600.0 and 0.0 respectively. A yellow callout box on the right provides additional information about the position setting.

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

MC_MoveAbsolute

[Version]

00A

POU List Favorites History Module Library

3-6. [Ladder] Ezi-SERVO DIO 동작 실행

- Digital Input, Output 동작 실행

MELSOFT GX Works3 C:\Work\테스트샘플\connectionGuide.gx3 - [MoveProgram [PRG] [LD] 57Byte]

Navigation: Project, Module Configuration, Program, Initial, Scan, MAIN, ProgPou, Local Label, ProgramBody, MoveProgram, Local Label, ProgramBody, Fixed Scan, Event, Standby, No Execution Type, Unregistered Program, FB/FUN, Label, Device, Parameter, System Parameter, MXR300-16, CPU Parameter, Module Parameter (Common Setting), Module Parameter (Port 1/2: CC-Link), Module Parameter (CC-Link IE TSN), Network Label Setting, Module Parameter (Port 3: Ethernet), Memory Card Parameter, Add-on Parameter, Module Information, Motion Setting, Motion System Setting, Axis, Axis0001, Axis0002, Axis0003.

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

13: L: Decelerati... ErrorID :UW

14: L: Jerk

15: W: Direction

16: W: BufferMode

17: UD: Options

18: (30) SM400

19: (32) D1.4

20: (34) D1.5

21: (36) D1.6

22: (38) D1.7

23: (40) D1.8

24: (42) D1.9

25: (44) bAx1Out[0]

26: (46) bAx1Out[1]

27: (48) bAx1Out[2]

28: (50) bAx1Out[3]

29: (52) bAx1Out[4]

30: (54) SM400

31: DMOV D0

32: DMOV D2

Ezi_SERVO_CT_001_DigitalInputs

Ezi_SERVO_CT_001_PhysicalOutputs

File operation instructions

CC-Link IE TSN Network module

Add-on instructions

Standard Function/Function Block

Bit Type Boolean

Type Conversion

Arithmetic Operation

Comparison

Time Data Type

Single Numeric Variable

Selection

String

Bit Shift

Edge Detection

Counter

Timer

Bistable

Motion Control Function/Function Block

Administrative

Motion - Individual

MC_CamIn Cam Operation Start

MC_CombineAxes Addition/Subtraction I

MC_GearIn Gear Operation Start

MC_MoveAbsolute Absolute Value Posit

MC_MoveAbsolute

[Version]

00A

POU List Favorites History Module Library

3-6. [Ladder] Ezi-SERVO DIO 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

부록

[동작 확인] Axis Monitor

- 각 축의 상태, 위치, 원점복귀, Error 등을 모니터

MELSOFT GX Works3 C:\Work\테스트샘플\connectionGuide.gx3 - [MoveProgram [PRG] [LD] 57Byte]

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

Display Selection: Upper Pane
Monitor Type: Real Drive Axis
Monitor Item Selection
Monitor Axis Selection

Font Size: 9pt

Display Selection: Lower Pane
Monitor Type: Real Drive Axis
Monitor Item Selection
Monitor Axis Selection

	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

[Version] 00A
POU List Favorites History Module Library

[동작 확인] 원점복귀 방법 변경

- 모션 제어 FB을 사용하여 원점복귀 방식 변경 가능

- ① ParameterNumber 지정 : H60980008
- ② Value(Homing Method) 지정 : 33.0
- ③ ExecutionMode : 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

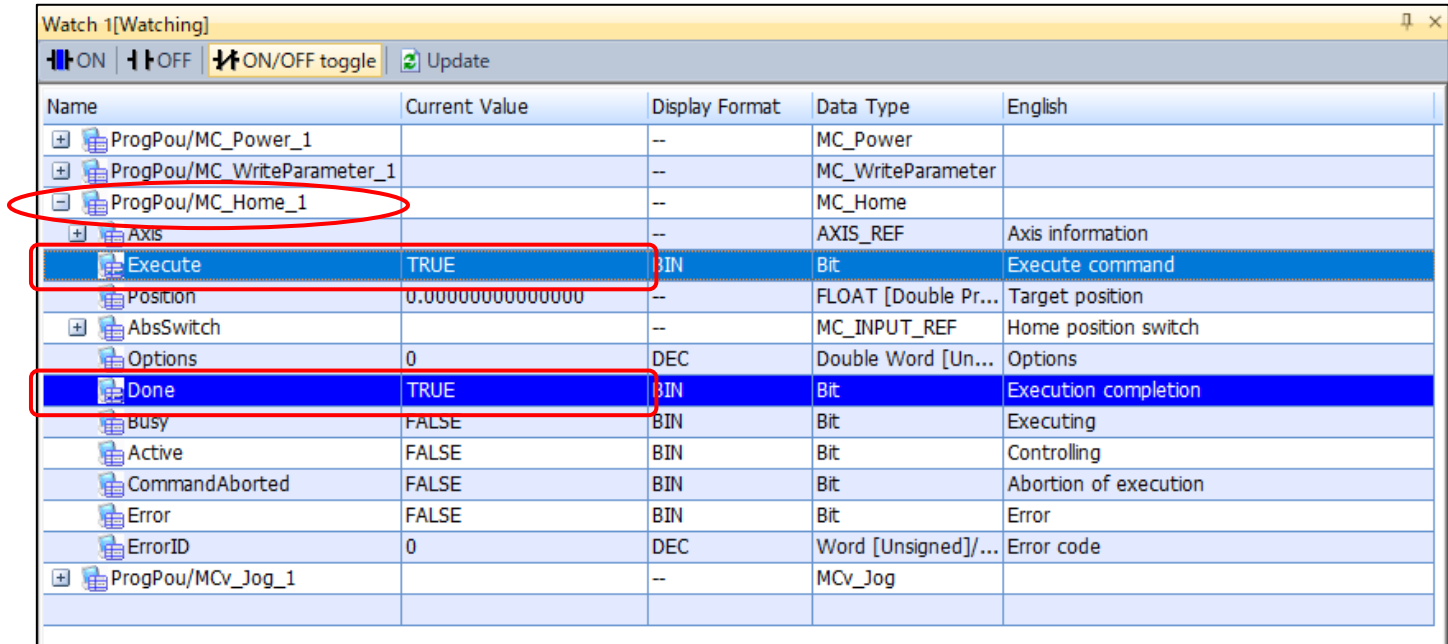
Watch 1[Watching]				
ON OFF ON/OFF toggle Update				
Name	Current Value	Display Format	Data Type	English
ProgPou/MC_Power_1		--	MC_Power	
ProgPou/MC_WriteParameter_1		--	MC_WriteParameter	
Axis		--	AXIS_REF	Axis information
Execute	TRUE	BIN	Bit	Execute command
ParameterNumber	H60980008	HEX	Word [Unsigned]	Setting value
Value	37.00000000000000	BIN	Double Word [Unsigned]	Setting value
ExecutionMode	0	DEC	Word [Signed]	Execution mode
Options	0	DEC	Double Word [Unsigned]	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 [Unsigned]	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

[동작확인] 원점복귀

- 모션 제어 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	

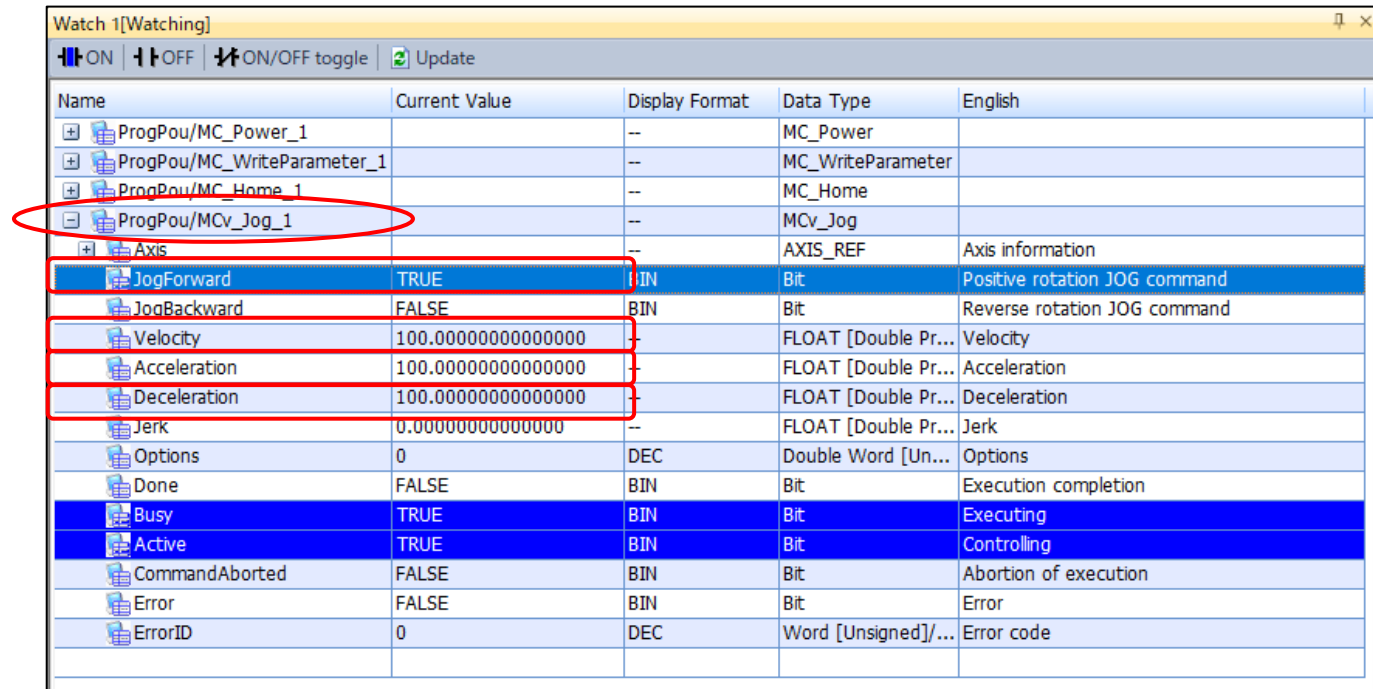
- Ezi-SERVO의 LIMIT+ / LIMIT- 신호를 하드웨어 스트로크 리밋으로 사용하는 경우, 기동(시작) 전에 아래의 축 제어 데이터를 설정해 주십시오.

[AxisName.Cd.HwStrokeLimit_Override] → 'DISABLE'

[동작 확인] Jog 운전

- 모션 제어 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]

The screenshot shows the 'Motion Control Setting Function (Untitled Project)' software. The 'Motion Monitor' menu is open, and 'Event History' is selected. The 'Event History: [0000RD78G64]' window is displayed, showing a table of events. A yellow callout box points to the 'Detailed Information' section of the event log.

No.	Occurrence Date	Event Type	Status	Event Code	Description
00001	2024/10/15 15:15:07.512565336	System	OK	00000	Homing Request (H- to OK)
00002	2024/10/15 15:15:07.517015512	System	OK	00001	Current Position Extension Completion
00003	2024/10/15 15:15:07.527855334	System	OK	00002	servo System Extension Start
00004	2024/10/15 15:15:08.630189398	Operation	OK	20710	Follow-up Motion Execution

Detailed Information

Axis Type: Dual Drive Axis
Event Occurrence: 00000/00001/00002
Event Code: 00000

00000

Motion request was OK.
- Absolute position error in driver side was detected. (Detail Code: 00004)
- An absolute position error in the Master side was detected. (Detail Code: 00004)
- The axis type was changed. (Detail Code: 00001)
- Slave object: 'Polarity (00701)' b7 position polarity was changed. (Detail Code: 00001)
- Change of the drive of motion request was detected. (Detail Code: 00001)
- Machine homing was detected. (Detail Code: 00001)
- Driver unit connection (frictionless connection) of the axis was detected. (Detail Code: 00001)
- Machine homing has been detected after the system started. (Detail Code: 00001)

이벤트를 상세하게 확인

[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 4X 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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