



Programmable Automation Controllers
MELSEC MX Controller



Ezi-STEP® CC-Link IE TSN
Micro Stepping System **ALL**

접속 가이드

MELSEC MX Controller and **Ezi-STEP**® CC-Link IE TSN
Micro Stepping System **ALL**

미쓰비시 전기 제품

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

파스텍 제품

Ezi-STEP CC-Link IE TSN ALL

시작하기 전에

- 저희 회사의 제품을 이용해 주셔서 감사합니다.
- Ezi-STEP CC-Link IE TSN ALL은 32비트 고성능 ARM 프로세서를 탑재한 드라이브와 다양한 모터로 구성된 스테핑모터 유닛으로, CC-Link IE TSN 네트워크에서 리모트국으로 사용됩니다.
- Ezi-STEP 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 MX 컨트롤러에 Ezi-STEP 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-STEP 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-STEP ALL] Micro Stepping System	
[접속가이드][CC-Link IE TSN][MELSEC MX Controller][Ezi-STEP ALL]	

- 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-STEP 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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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-STEP CC-Link IE TSN ALL 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>)

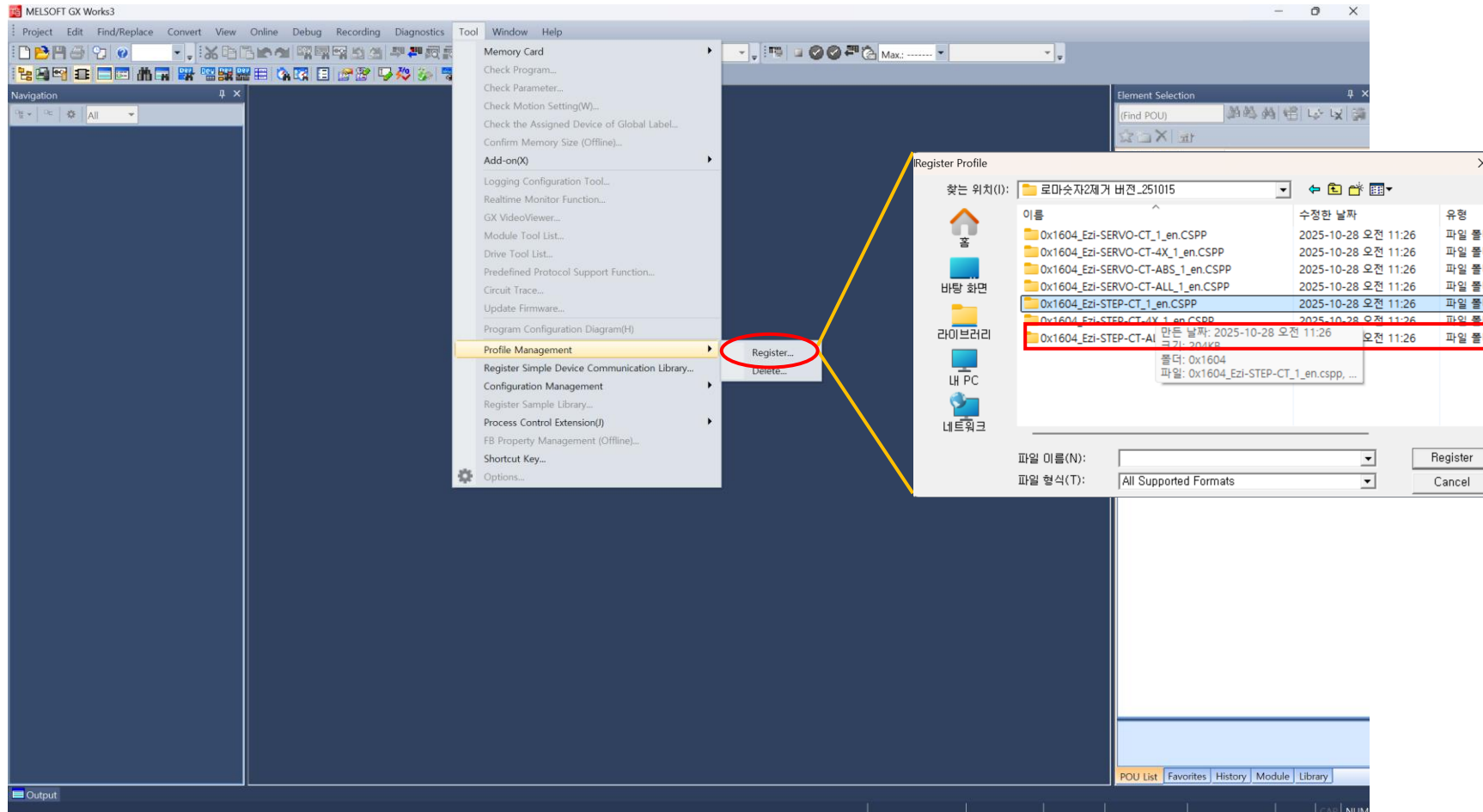
◆ 리모트국: Ezi-STEP CC-Link IE TSN ALL

- CSP+ 파일 다운로드 주소: <https://cltsn.fastech-motions.com/download/quick>
- 파일명 : 0x1604_Ezi-STEP-CT-ALL_1_en_CSPP

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

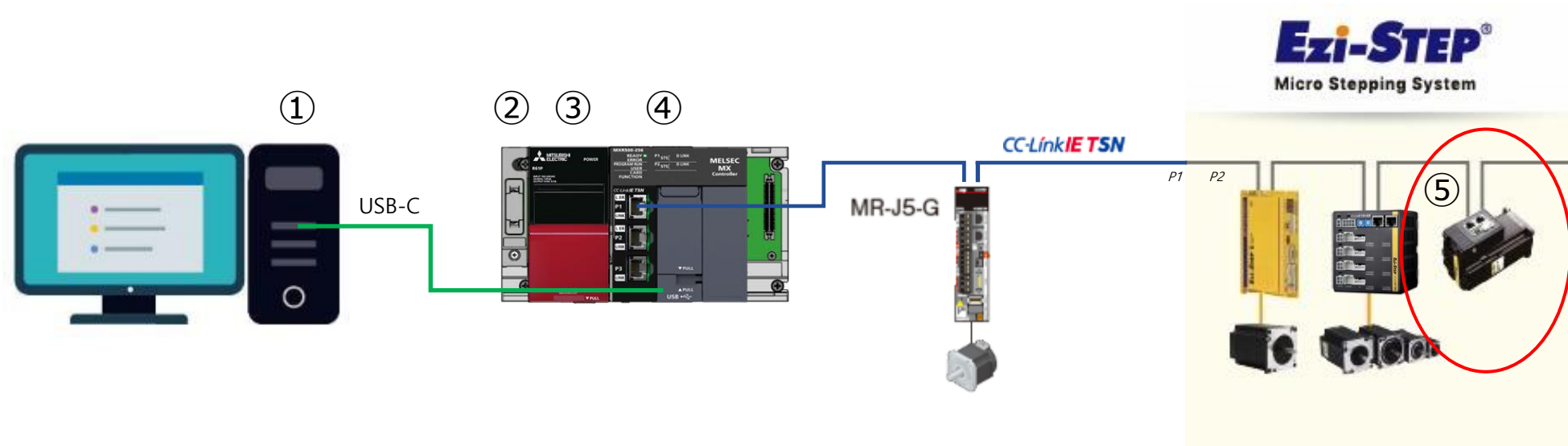
● CSP+ 등록

- [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	컨트롤러	MXR300-16
⑤	드라이브 + 모터	Ezi-STEP-CT-ALL-42S-R

1-3. CC-Link IE TSN 구성

- Ezi-STEP 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-STEP, MX 컨트롤러 파라미터 설정

No	항목	내용
1	Ezi-STEP 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	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-STEP 동작 확인 	MX 컨트롤러와 Ezi-STEP이 올바르게 설정되어 있는지 확인하기 위한 프로그램을 작성합니다. 라벨을 조작해 모터가 정상적으로 작동하는지 확인합니다

1-4. 설정 순서

● Ezi-STEP 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-STEP)

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.
폴로 업(Follow up) 기능	이 제품은 반드시 서보 ON 시에 원점복귀를 실시해 주십시오. 오픈 루프 제어 시스템이므로 서보 OFF 상태에서는 'Position actual value (Index:6064h, Subindex: 00h)'를 업데이트하지 않습니다. 폴로 업 기능에서는 'Position actual value (Index:6064h, Subindex:00h)'를 기준으로 모터의 회전량을 컨트롤러의 명령에 반영하기 때문에, 서보 OFF 중에 모터가 회전한 만큼 컨트롤러 명령과 모터의 위치가 어긋납니다.
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

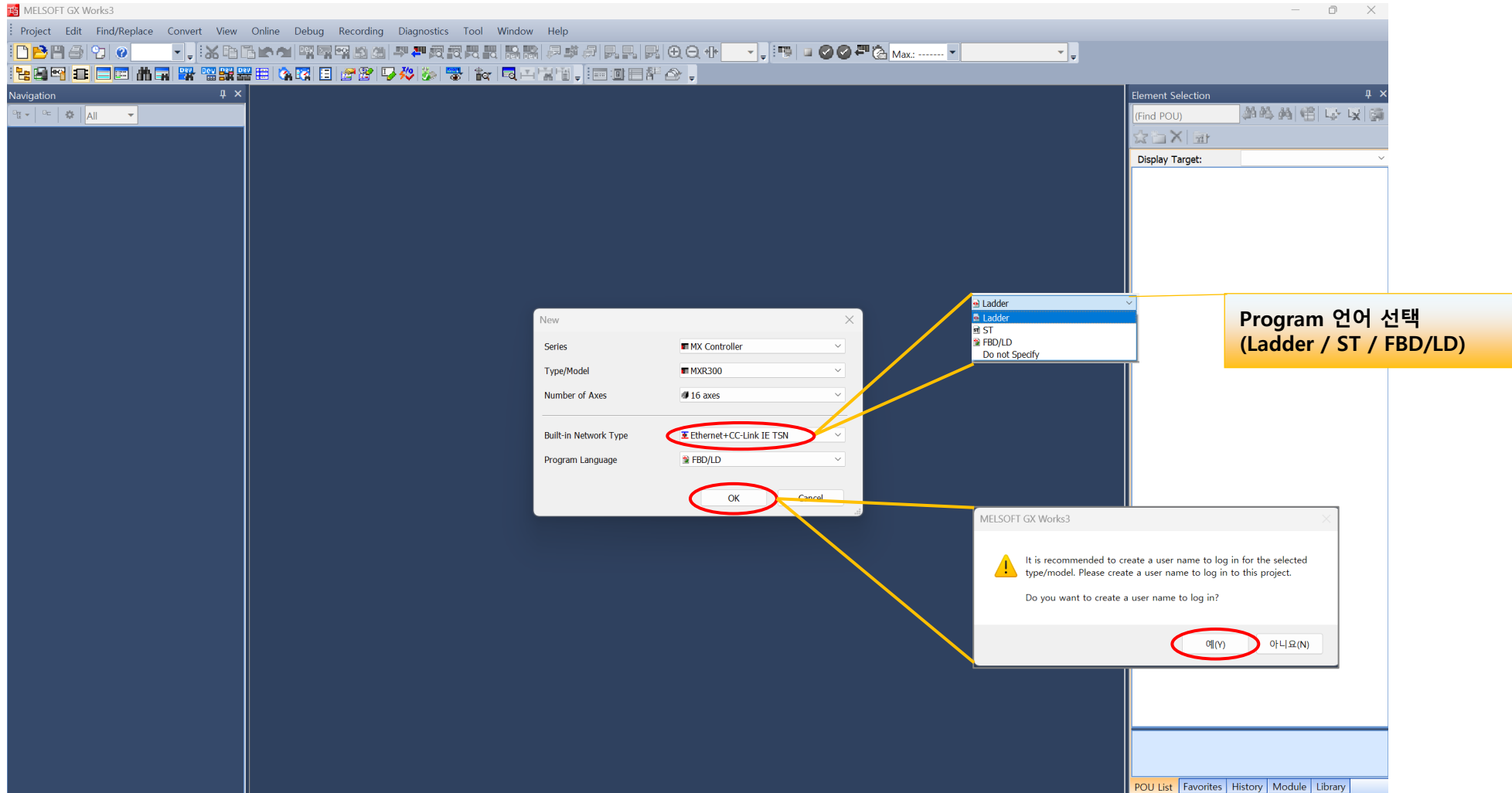
● 모션 제어 기능 제약 사항 (MX Controller와 Ezi-STEP)

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

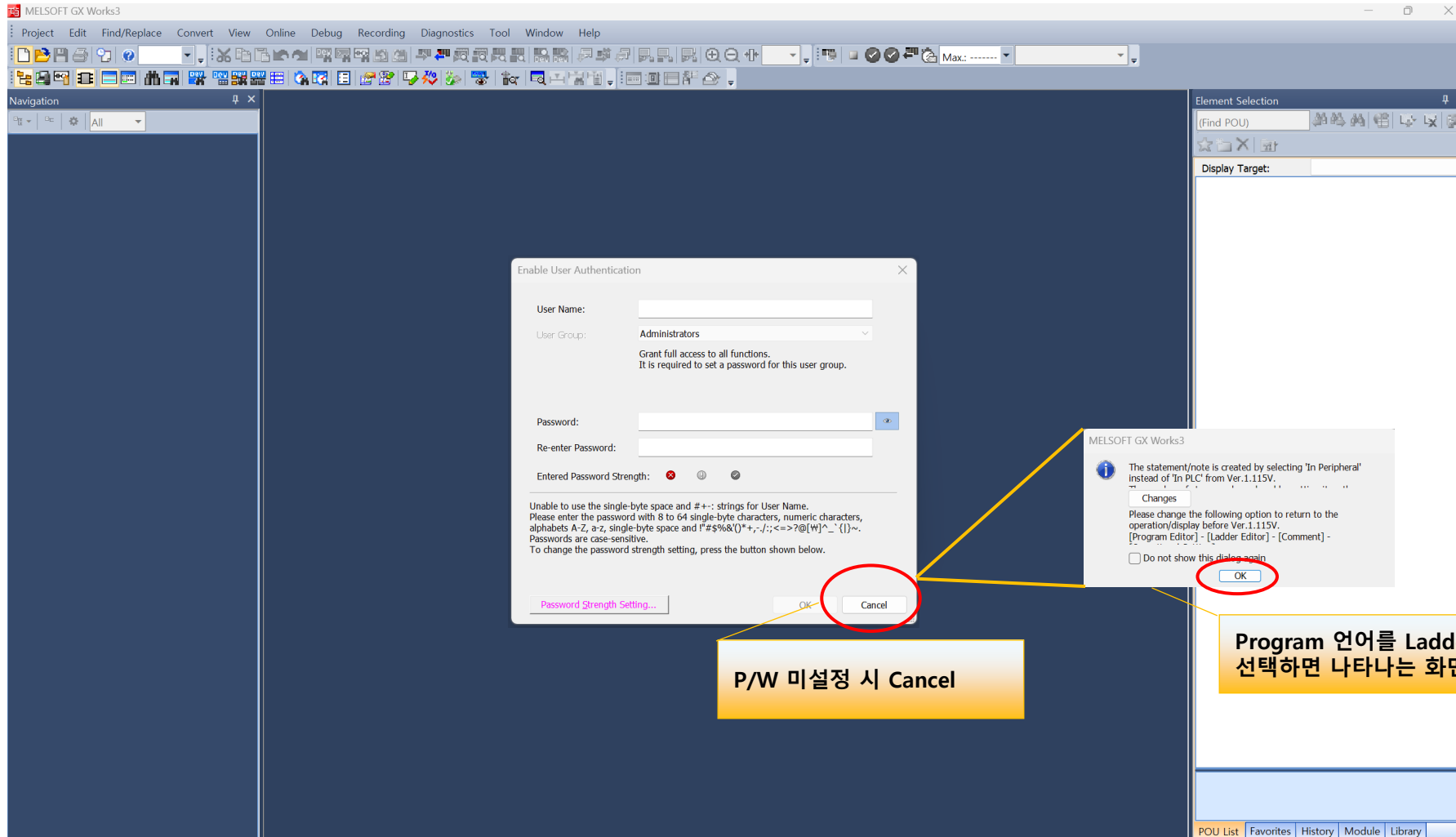
- 신규 Project 생성 시 MX Controller, 모델명, 사용 축수, Program 언어를 선택



2-2. User Authentication 설정

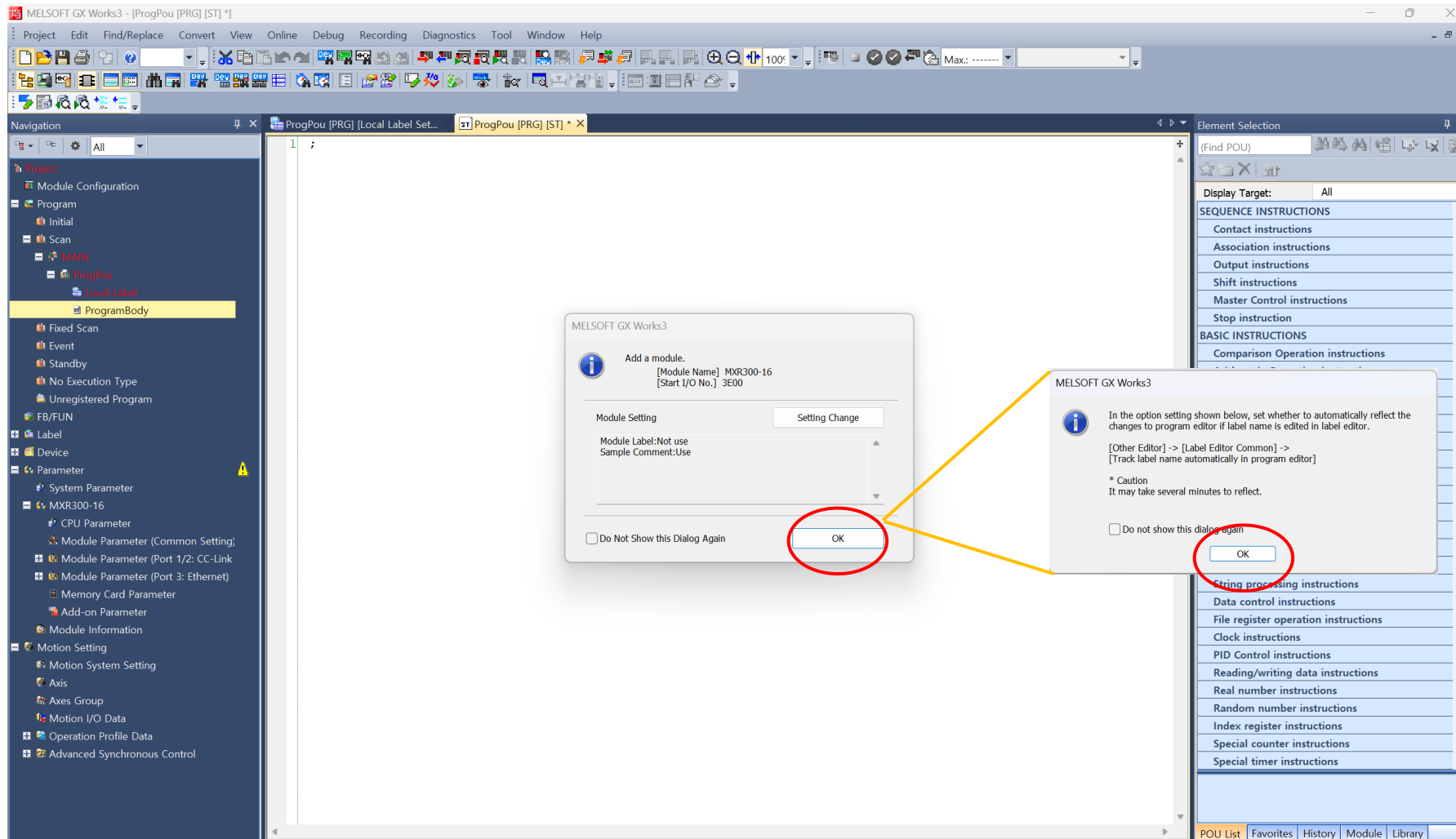
- 비밀번호 설정

※ 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 interface for Module Configuration. The left sidebar shows the project tree with 'Module Configuration' selected. The main workspace shows a rack configuration with a Main Base, CPU Module, and Power Supply. The right sidebar shows the 'Element Selection' list with various modules and their slot requirements. A yellow box highlights the 'Main Base' section, and a red box highlights the 'R32SB' module. A yellow box highlights the 'Power Supply' section, and a red box highlights the 'R61P' module. A yellow box highlights the 'MX Controller' section, and a red box highlights the 'R32SB' module. A yellow box highlights the 'MX Controller' section, and a red box highlights the 'R32SB' module.

1. Module Configuration

2. 마우스 클릭 & 드래그

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

4. MX Controller

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

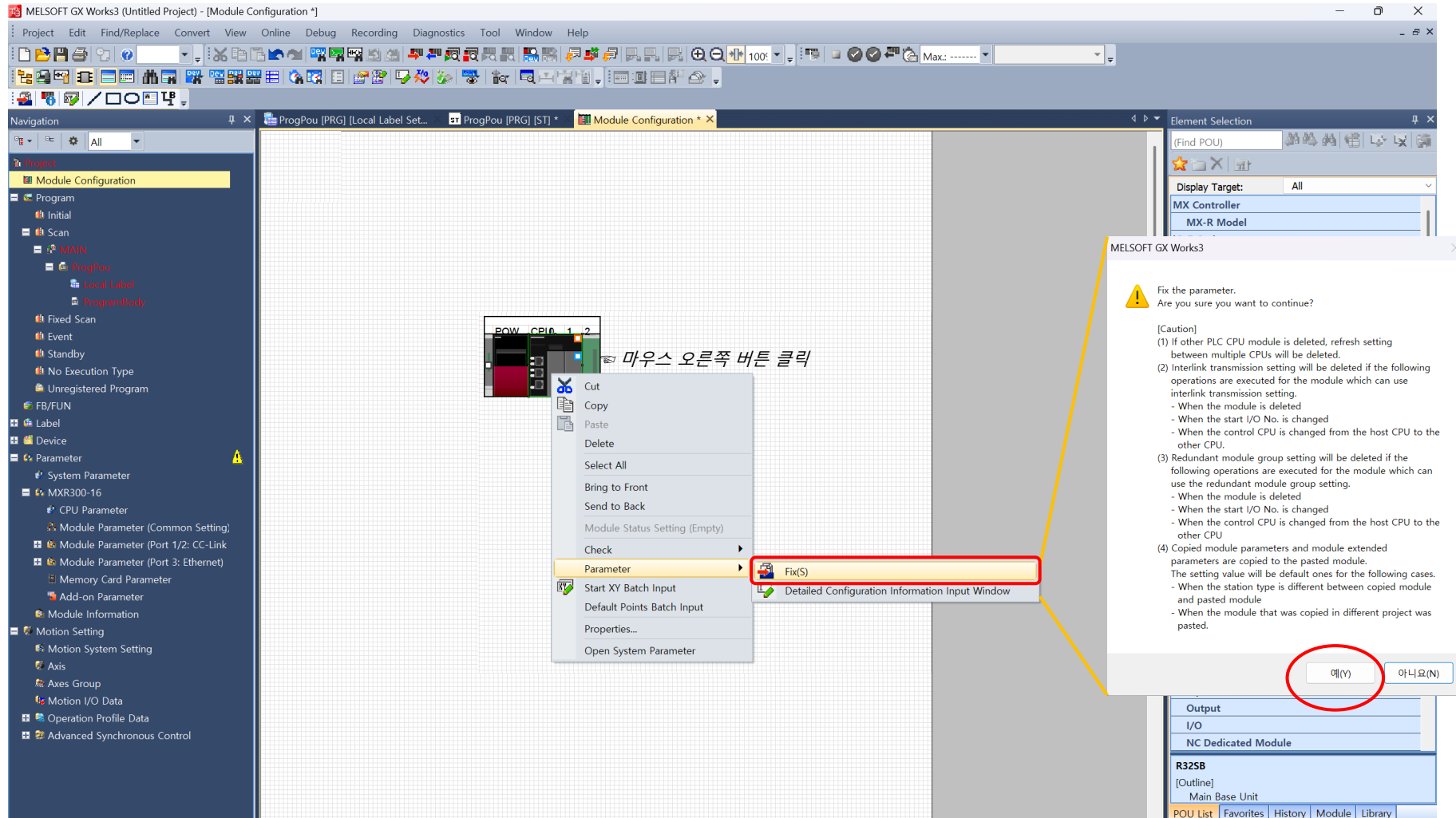
R64RP 9.0A output (Redundant)

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
- Module Configuration
- Program
- Initial
- Scan
- MAIN
- Program
- 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 IE TSN) **1**
- Network Label Setting
- 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

Setting Item List

Input the Setting Item to Search

Setting Item

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 2
Subnet Mask	
Default Gateway	

Element Selection

(Find POU)

Display Target: All

IP Address : 192.168.3.253
※ 참고: Ezi-STEP CC-Link IE TSN ALL
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 **3**

POU List Favorites History Module Library

2-5. Module Parameter – N/W Configuration

● Network Configuration Settings

The screenshot displays the MELSOFT GX Works3 interface for configuring the MXR300-16 module. The Project tree on the left shows the 'Module Parameter (Port 1/2: CC-Link)' selected. The Setting Item List in the center shows the 'Basic Settings' for 'Network Configuration Settings (CC-Link IE TSN Configuration)'. The detailed configuration window on the right shows the 'Network Configuration Settings (CC-Link IE TSN Configuration)' with various parameters like Station Type, Network No., and Communication Period Setting. A 'Module List' window is also visible, showing the selected module.

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

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

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

The detailed configuration window shows the following settings:

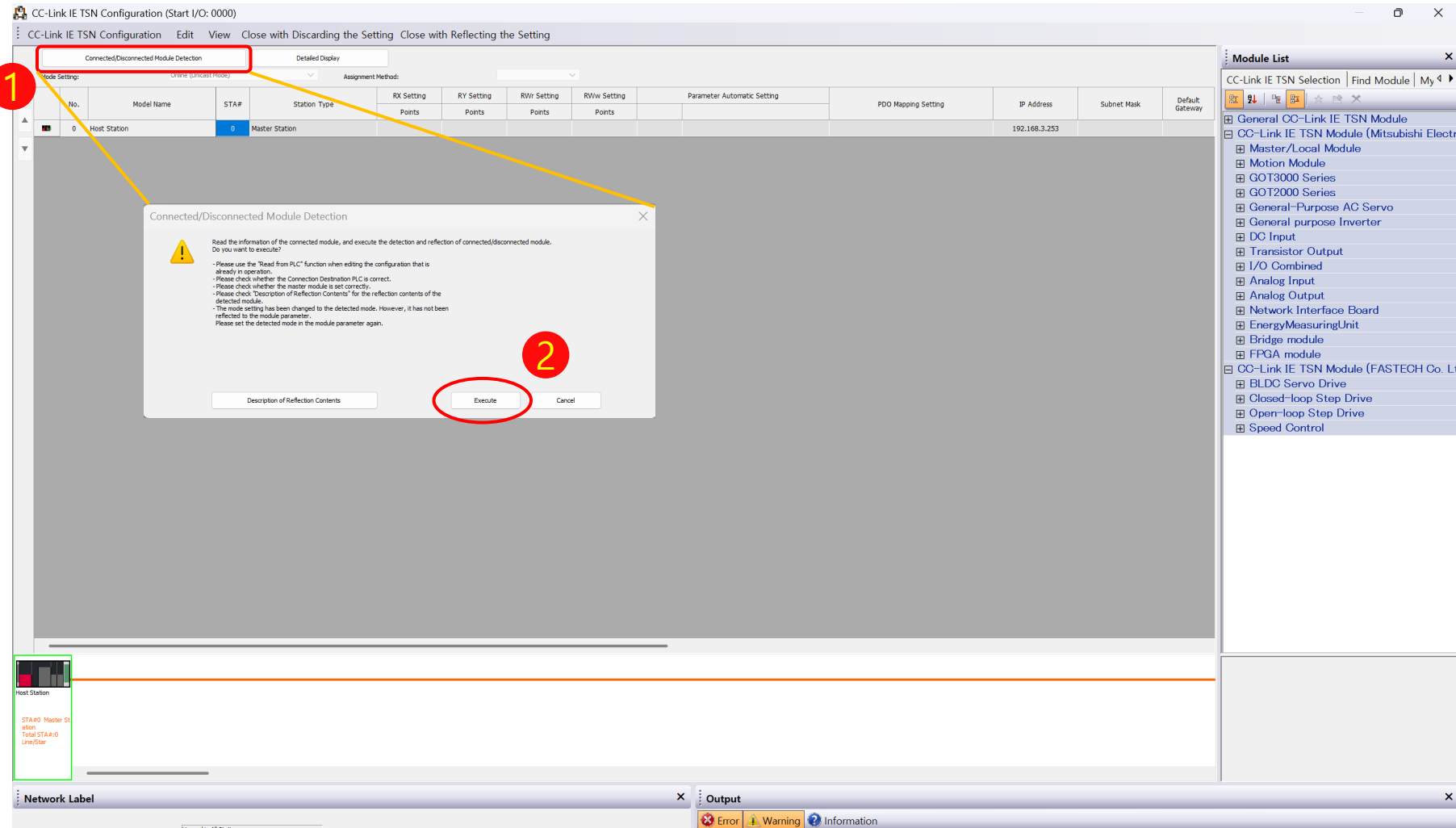
- Station Type: Master Station
- Network No.: 0
- Parameter Setting Method: Station No./IP Address Setting
- Station No./IP Address Setting: 0
- Network Topology: Line/Star
- Communication Period Setting: Not Set
- Setting in Units of 1us: 2000.00 us
- Communication Period Interval Setting (Do not Set it in Units of 1us): 2000.00 us
- Communication Period Interval Setting (Set it in Units of 1us): 20.00 us
- System Reservation Time: 1000.00 us
- Cyclic Transmission Time: 980.00 us
- Multiple Period Setting: x4
- Normal-Speed: x16
- Low-Speed: x16
- Connection Device Information: CC-Link IE TSN Class B Only
- CC-Link IE TSN Class A Group Send Upper Limit Size Setting: 2K bytes
- TSN HUB Setting: Not to Use TSN HUB
- Disconnection Detection Setting: 4 times

The 'Module List' window shows the following modules:

- General CC-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

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 **자동**으로 Ezi-STEP CC-Link IE TSN ALL를 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-STEP-CT-ALL	1	Remote Station				16	16	<Detail Setting>	192.168.3.1		
2	Ezi-STEP-CT-ALL	3	Remote Station				16	16	<Detail Setting>	192.168.3.18		
3	Ezi-STEP-CT-ALL	6	Remote Station				16	16	<Detail Setting>	192.168.3.19		

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

A confirmation dialog box from MELSOFT GX Works3 is shown in the center, stating: 'Connected/Disconnected Module Detection is completed. Please execute Write to PLC if necessary. - Please execute system configuration check because the system configuration is changed.' The '확인' (OK) button is circled in red.

On the right, the 'Module List' pane shows the 'CC-Link IE TSN Selection' tree with various modules listed.

At the bottom left, a network diagram shows the 'Host Station' connected to three 'Ezi-STEP-CT-ALL' modules, which are highlighted with a red box.

At the bottom right, an orange callout box contains the following text:

[Ezi-STEP CC-Link IE TSN ALL 3축 구성 예]
[Ezi-STEP CC-Link IE TSN ALL 드라이버에 설정된 IP Address]

1. 192.168.3.17
2. 192.168.3.18
3. 192.168.3.19

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

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

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

Mode Setting: Online (Unicast Mode) Assignment Method:

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-STEP-CT-ALL	1	Remote Station				16	16	<Detail Setting>	192.168.3.1		
2	Ezi-STEP-CT-ALL	2	Remote Station				16	16	<Detail Setting>	192.168.3.2		
3	Ezi-STEP-CT-ALL	3	Remote Station				16	16	<Detail Setting>	192.168.3.3		

등록에 따라 생성됨

2

[Ezi-STEP 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)

Module List

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

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

(x16) (x1)

[Manufacturer Name]
FASTECH Co. Ltd
[Station Type]

Network Label

Output

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: 0C00)

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	RWr Setting Points	RWv 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-STEP-CT-ALL	1	Remote Station			16	16		<Detail Setting>	192.168.3.17		
2	Ea-STEP-CT-ALL	2	Remote Station			16	16		<Detail Setting>	192.168.3.18		
3	Ea-STEP-CT-ALL	3	Remote Station			16	16		<Detail Setting>	192.168.3.19		

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

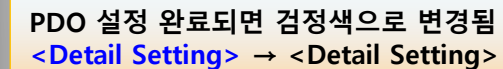
Network Label

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)



반복으로 모든 축 PDO 설정

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

- CC-Link IE TSN Module Setting 반영

The screenshot displays the 'CC-Link IE TSN Configuration' window. A red circle highlights the 'Close with Reflecting the Setting' button in the top menu bar. A yellow arrow points from this button to a warning dialog box titled 'MELSOFT GX Works3'. The dialog box contains the text: 'Warning(s) in the CC-Link IE TSN Configuration. Are you sure you want to close the CC-Link IE TSN Configuration window?'. The '예(Y)' (Yes) button is circled in red. The background window shows a table of module settings and a 'Module List' on the right.

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-STEP-CT-ALL	Slave Station				16	16	<Detail Setting>	192.168.3.17		
2	Ezi-STEP-CT-ALL	Slave Station				16	16	<Detail Setting>	192.168.3.18		
3	Ezi-STEP-CT-ALL	Slave Station				16	16	<Detail Setting>	192.168.3.19		

등록에 따라 생성됨

Module List

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi Electric)
- Master/Local Module
- Motion Module
- GOT3000 Series
- GOT2000 Series
- General-Purpose AC Servo
- General purpose Inverter
- DC Input
- Transistor Output
- I/O Combined
- Analog Input
- Analog Output
- Network Interface Board
- EnergyMeasuringUnit
- Bridge module
- FPGA module
- CC-Link IE TSN Module (FASTECH Co. Ltd.)
- BLDC Servo Drive
- Closed-loop Step Drive
- Open-loop Step Drive
- Ezi-STEP-CT
- Ezi-STEP-CT-4X
- Ezi-STEP-CT-ALL
- Speed Control

Outline

Step Drive, All-in-One

Specification

Open-Loop Step Drive

Motor: Max. NEMA 24

Mode: Homing, CSP, PP

CC-Link IE TSN Class B

All in One

Manufacturer Name]

FASTECH Co. Ltd

Station Type]

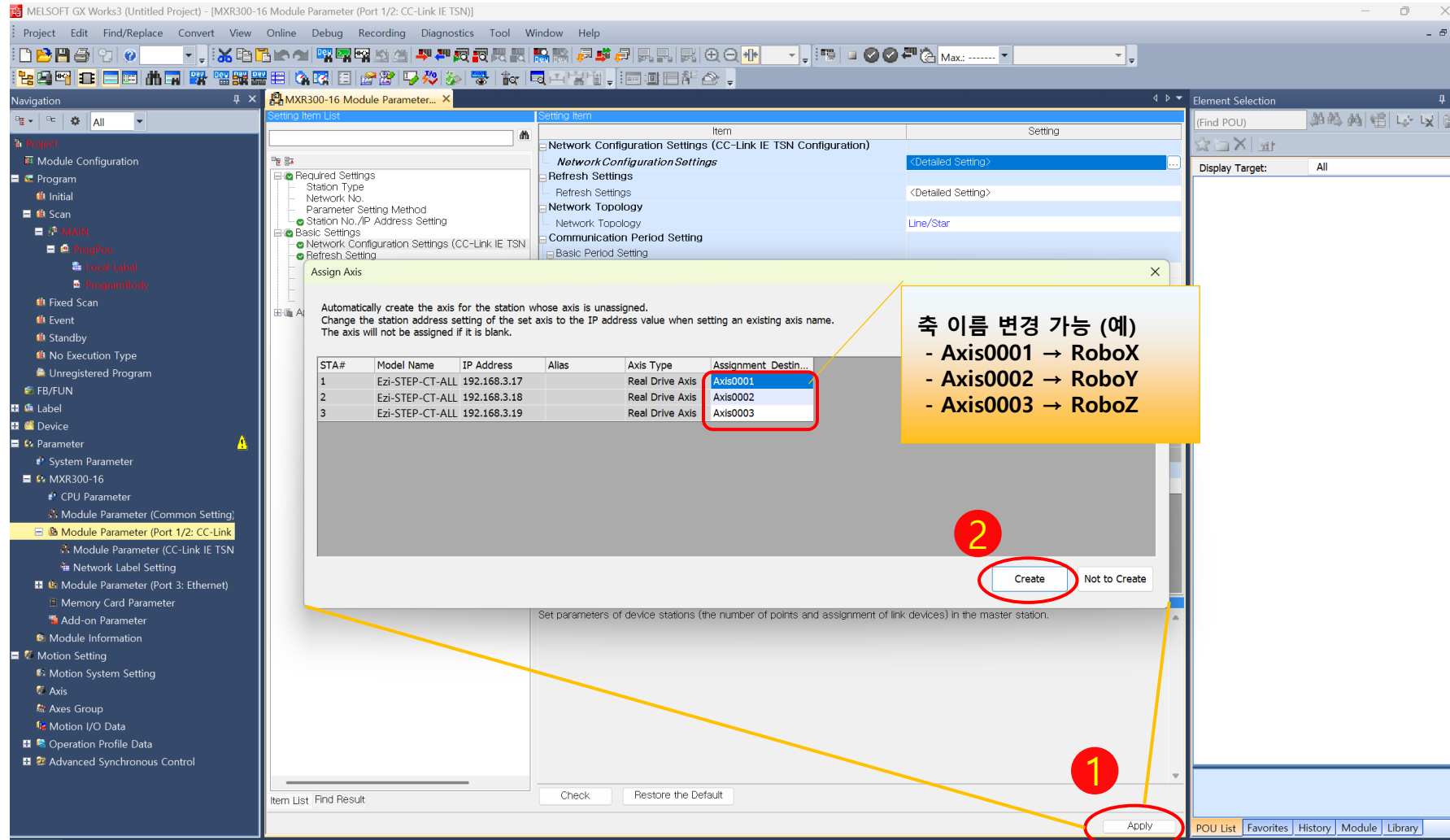
Network Label

Output

Error:0 Warning:0 Information:0

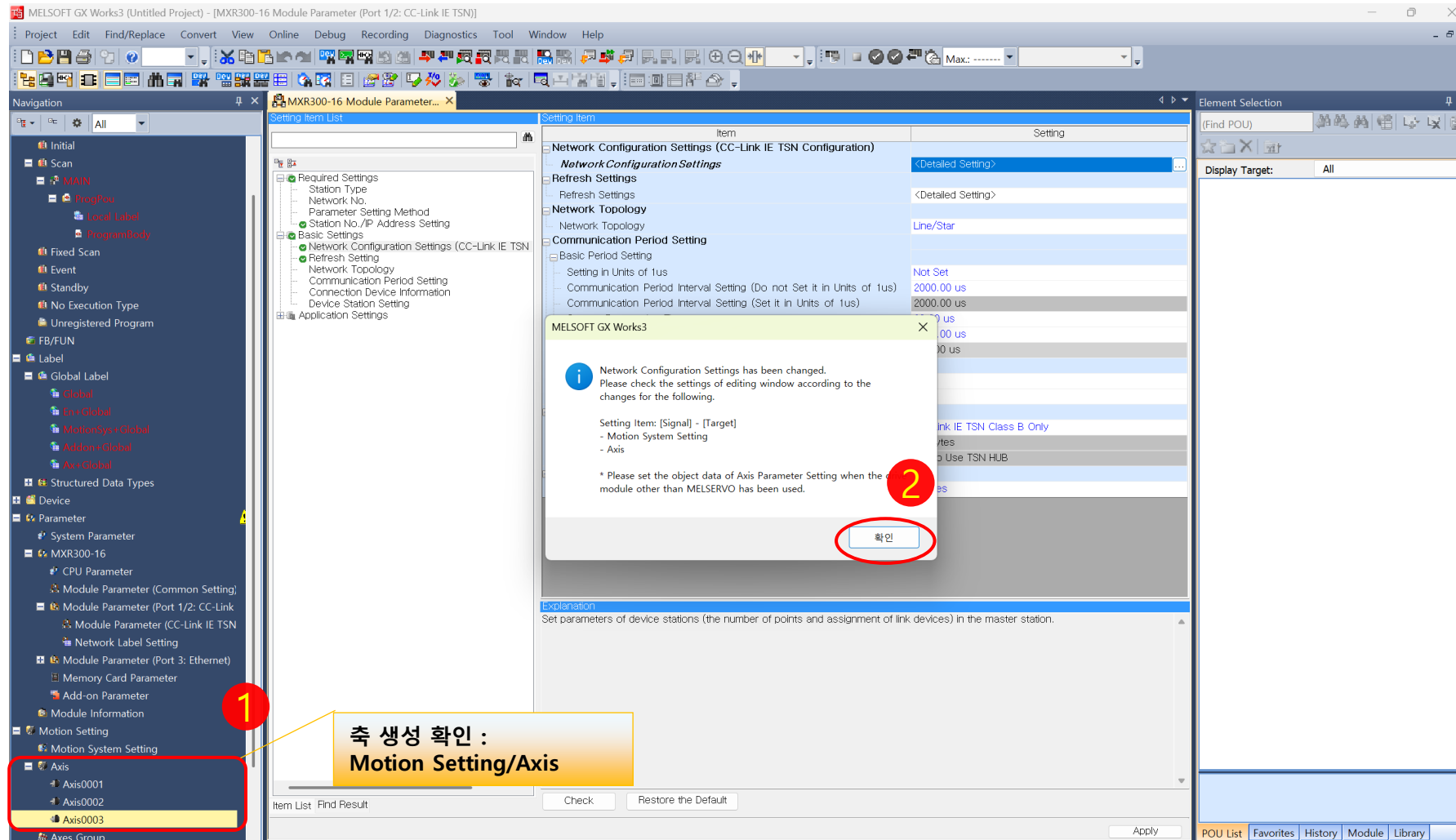
2-5. Module Parameter – CC-Link IE TSN Configuration

● 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 left sidebar shows the project tree with 'Network Label Setting' selected under 'Module Parameter'. The main table lists three device stations (Ezi-STEP-CT-001, Ezi-STEP-CT-002, Ezi-STEP-CT-003) with their respective digital input/output labels. Red circles and numbers 1, 2, and 3 highlight the following steps:

- 1**: Selecting the data type for each label (e.g., 'Word [Unsigned]/Bit Str...' for digital outputs and 'Word [Unsigned]/Bit Str...' for digital inputs).
- 2**: Clicking the 'Create Label' button at the bottom of the window.
- 3**: Confirming the 'Start creating the label on the basis of the following content. Are you sure you want to continue?' dialog box by clicking '예(Y)' (Yes).

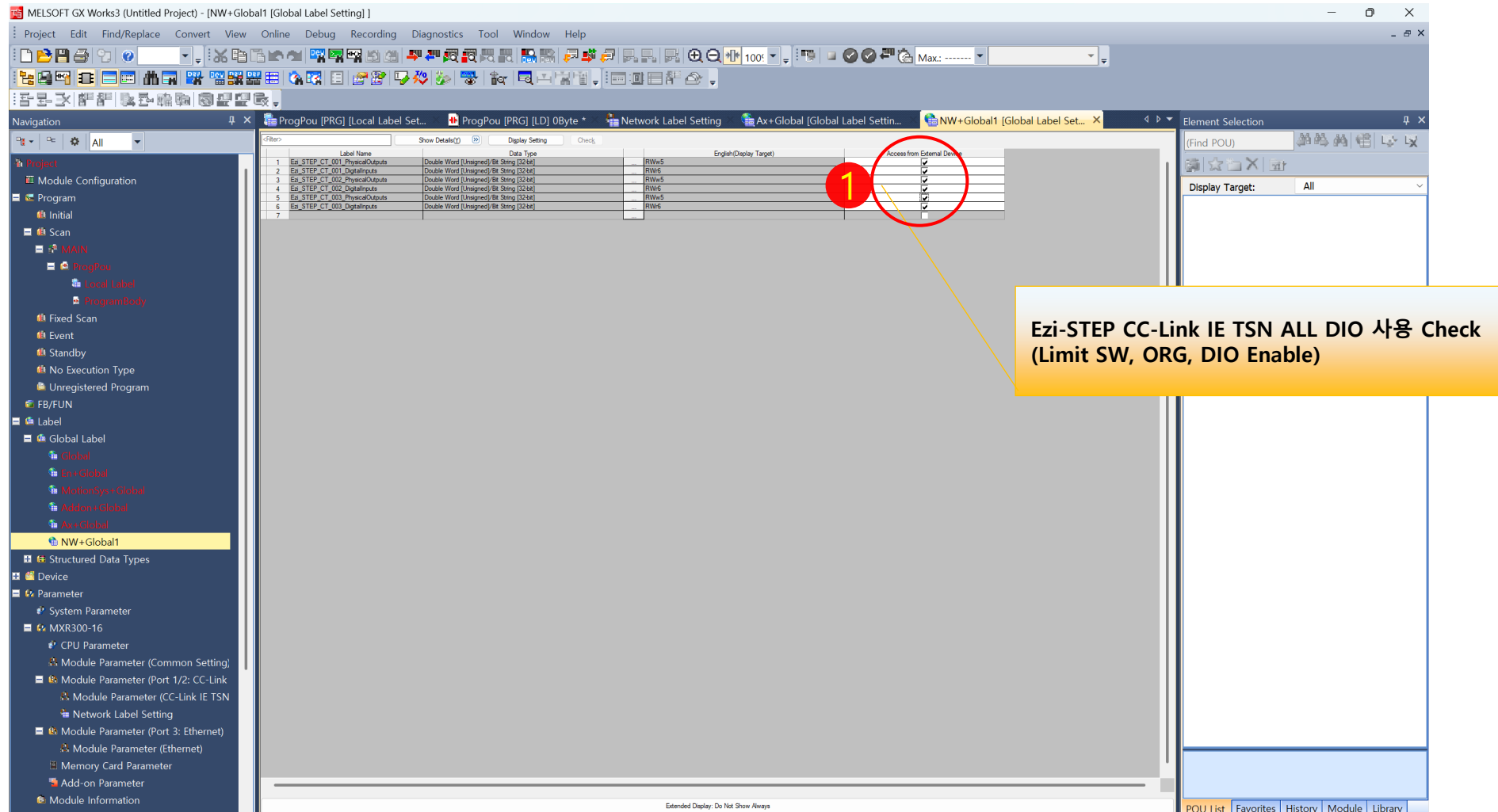
Annotations on the right side of the image provide additional context:

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

The bottom of the window shows the 'Structure Array Setting...' and 'Update Network Configuration Info' buttons, along with the 'Create Label' button.

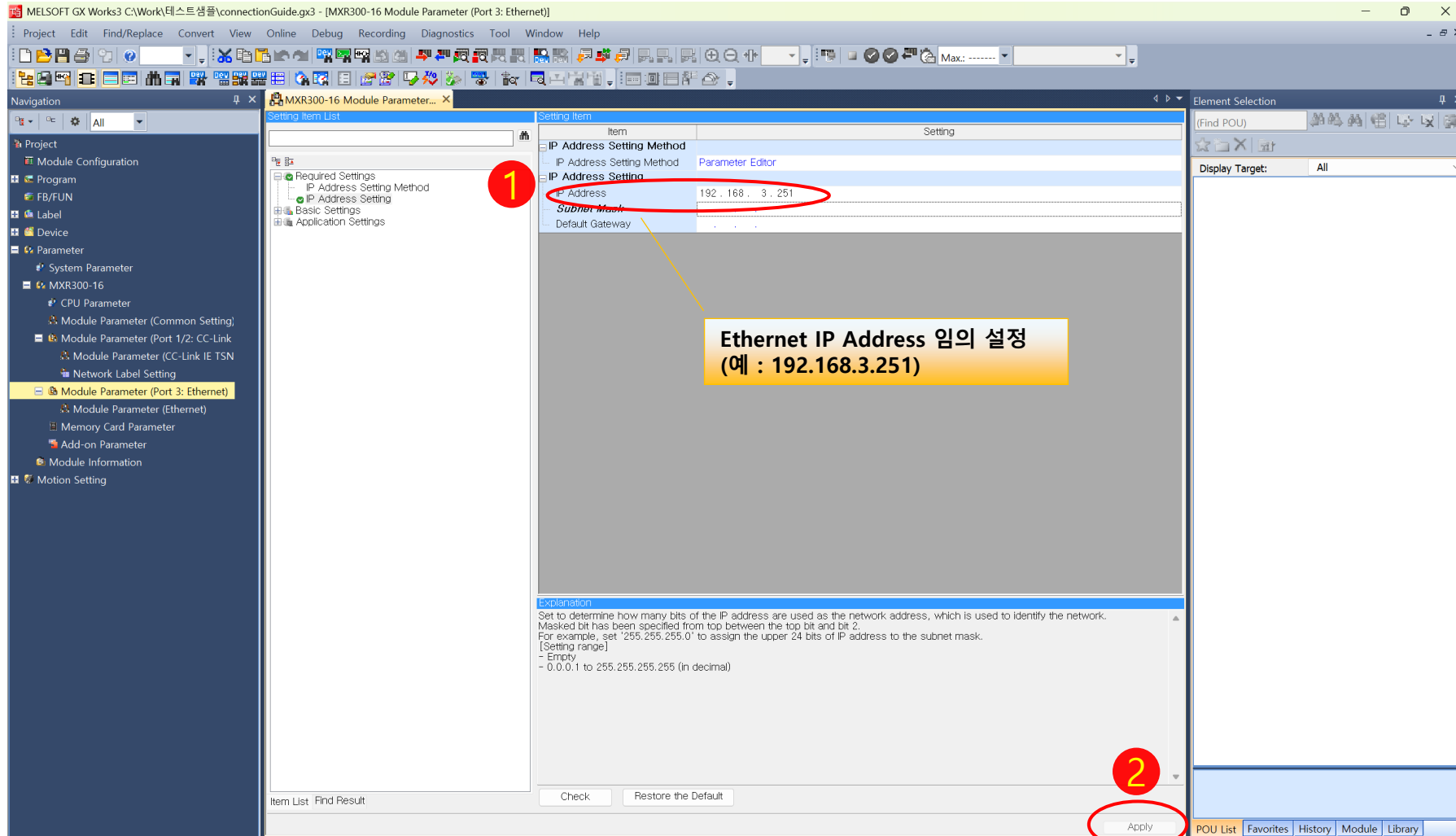
2-5. Module Parameter – CC-Link IE TSN Configuration

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



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-STEP CC-Link IE TSN ALL Object Data 등록

1 Navigation pane: Select 'Axis' under 'Motion Setting'.

2 Setting Item List: Select 'Object Data' under 'Basic Parameter'.

3 Set Basic Parameter table: Select 'ControlWord' for Axis0001.

4 Object Data Setting (Axis0001) dialog: Select 'Restore the Data' button.

5 Set default data. Are you sure you want to continue? dialog: Select '예(Y)' (Yes).

6 The specified station address refers to a non-MELSERVO device. Do you want to set to generic default values? dialog: Select '예(Y)' (Yes).

Ezi-STEP CC-Link IE TSN ALL Object Data

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Object Data 설정(2/3)

*Ezi-STEP CC-Link IE TSN ALL Object Data 등록

The screenshot shows the MELSOFT GX Works3 interface with the 'Axis Parameter Setting' dialog open for 'Axis0002'. The 'Object Data' section is selected, and the 'ControlWord' field is highlighted with a red circle labeled '7'. The 'OK' button is circled with a red circle labeled '8'. A yellow callout box at the bottom left contains the text '[OBJ] 변경된 내용 확인'.

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	Axis0001	Axis0002	Axis0003
ControlWord	[OBJ]0x60400010	[OBJ]0x60400010	[OBJ]0x60400010
EncoderIncrements	[OBJ]0x608F0120	[OBJ]0x608F0120	[OBJ]0x608F0120
FollowingErrorActualValue	[OBJ]0x60F40020	[OBJ]0x60F40020	[OBJ]0x60F40020
GearRatioMotorRevolutions	[OBJ]0x607C0020	[OBJ]0x607C0020	[OBJ]0x607C0020
HomeOffset	[OBJ]0x60800020	[OBJ]0x60800020	[OBJ]0x60800020
MaxMotorSpeed	[OBJ]0x60720010	[OBJ]0x60720010	[OBJ]0x60720010
MaxTorque	[OBJ]0x60600008	[OBJ]0x60600008	[OBJ]0x60600008
ModesOfOp	[OBJ]0x60610008	[OBJ]0x60610008	[OBJ]0x60610008
ModesOfOpDiso	[OBJ]0x60E10010	[OBJ]0x60E10010	[OBJ]0x60E10010
NegativeTorqueLimitValue	[OBJ]0x607E0008	[OBJ]0x607E0008	[OBJ]0x607E0008
Polarity	[OBJ]0x60640000	[OBJ]0x60640000	[OBJ]0x60640000
PosActualValue	[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. Values depending on the drive unit connected. Check the manual of object data settings.

Buttons: Import..., Export..., Restore the Defa..., OK, Cancel

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Object Data 설정(3/3)

*Ezi-STEP CC-Link IE TSN ALL Object Data 등록

The screenshot shows the 'Axis Parameter Setting' window for 'Axis0001'. The 'Object Data' tab is selected, and a red circle highlights the 'Ezi-STEP CC-Link IE TSN ALL' object data entry. A yellow callout box points to this entry with the text 'Ezi-STEP CC-Link IE TSN ALL 모든 축 [OBJ] 변경된 내용 확인'. The 'Apply' button at the bottom right is also circled in red.

Item	Axis0001	Axis0002	Axis0003
Set Axis Information			
Axis No.	1	2	3
Set Basic Parameter			
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
Object Data			
ControlWord	[OBJ]0x6040001	[OBJ]0x6040001	[OBJ]0x6040001
EncoderIncrements	[OBJ]0x608F012	[OBJ]0x608F012	[OBJ]0x608F012
FollowingErrActualValue	[OBJ]0x60F4002	[OBJ]0x60F4002	[OBJ]0x60F4002
GearRatioMotorRevolutions	[OBJ]0x607C002	[OBJ]0x607C002	[OBJ]0x607C002
HomeOffset	[OBJ]0x6080002	[OBJ]0x6080002	[OBJ]0x6080002
MaxMotorSpeed	[OBJ]0x6072001	[OBJ]0x6072001	[OBJ]0x6072001
MaxTorque	[OBJ]0x6060000	[OBJ]0x6060000	[OBJ]0x6060000
ModesOfOpDisp	[OBJ]0x6061000	[OBJ]0x6061000	[OBJ]0x6061000
NegativeTorqueLimitValue	[OBJ]0x60E1001	[OBJ]0x60E1001	[OBJ]0x60E1001
Polarity	[OBJ]0x607E000	[OBJ]0x607E000	[OBJ]0x607E000
PosActualValue	[OBJ]0x6064002	[OBJ]0x6064002	[OBJ]0x6064002
PosEncoderResolution	[OBJ]0x608F000	[OBJ]0x608F000	[OBJ]0x608F000
PosEncoderResolutionMotorRevolutions	[OBJ]0x608F022	[OBJ]0x608F022	[OBJ]0x608F022
Request the drive unit to switch status.	[OBJ]0x60E0001	[OBJ]0x60E0001	[OBJ]0x60E0001
Request the drive unit to switch status.	[OBJ]0x60A8002	[OBJ]0x60A8002	[OBJ]0x60A8002
Request the drive unit to switch status.	[OBJ]0x60A9002	[OBJ]0x60A9002	[OBJ]0x60A9002
Request the drive unit to switch status.	[OBJ]0x6041001	[OBJ]0x6041001	[OBJ]0x6041001
Request the drive unit to switch status.	[OBJ]0x6502002	[OBJ]0x6502002	[OBJ]0x6502002

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.

Axis Information: Set Axis Information (Axis No. 1, 2, 3).

Basic Parameter: Set Basic Parameter (Station Address Setting, Axis Type Setting, Axis Emulation Enabled, Control Cycle Setting, Object Data).

Absolute Position Control Setting: 0:Disable Absc, -1:Automatic Set, -1:Automatic Set.

Limit Parameter: Set Limit Parameter (Torque Limit Maximum Value, Negative Direction Torque Limit, Initial Value).

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

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Position Command Unit 설정 (Ezi-STEP ALL 10,000ppr)

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

기어비 설정 방법은 기존방법과 동일함

1. Position Command Unit: degree

2. Calculate reduction ratio by teeth or diameters: ☒

3. Calculate Axis Para

4. Click OK to reflect to the axis parameters.

5. 예(Y)

2-6. Motion Setting – Basic Parameter

- Real Drive Axis / Basic Parameter / Position Command Unit 설정 (Ezi-STEP ALL 10,000ppr)

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.

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

Item	Axis0001	Axis0002	Axis0003
Axis Information	Set Axis Information		
Axis No.	1	2	3
Basic Parameter	Set Basic Parameter		
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
Position Command Unit String			
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
Limit Parameter	Set Limit Parameter		
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			
Signal			
Target			
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

Explanation: <Axis Parameter> Axis.Pr.Unit.Position Set the position command unit to use in motion control.

Robot or Stage 이동 단위 선택

Ezi-STEP CC-Link IE TSN ALL 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

Axis Parameter Setting

Setting Item List

Setting Item

Item	Axis0001	Axis0002	Axis0003
Ring Counter Enabled Selection	0:Disabled	0:Disabled	0:Dis...
Ring Counter Upper Limit Value	10000000000.0 degree	10000000000.0 m	1000...
Ring Counter Lower Limit Value	-10000000000.0 degree	-10000000000.0	-100...
Position Command Unit	mm	mm	mm
Position Command Unit String			
Velocity Command Unit	U/s	U/s	U/s
Velocity Bias Value	0.0 degree/s	0.0 mm/s	0.0 m...
Driver Unit Conversion Numerator	10000 pulse	10000 pulse	1000...
Driver Unit Conversion Denominator	360 degree	5 mm	10 m...
Limit Parameter	Set Limit Parameter		
Torque Limit Maximum Value	1000.0 %	1000.0 %	1000...
Negative Direction Torque Limit Initial Value	300.0 %	300.0 %	300.C
Positive Direction Torque Limit Initial Value	300.0 %	300.0 %	300.C
Upper Limit Signal			
Signal	[VAR](BOOL)Ezi_STEP_CT_001_DigitalInputs.1		
Target			
Signal Detection Method	0:Detection at TRUE	0:Detect...	0:De...
Compensation Time	0.0 s	0.0 s	0.0 s
Filter Time	0.0 s	0.0 s	0.0 s
Lower Limit Signal			
Signal	[VAR](BOOL)Ezi_STEP_CT_001_DigitalInputs.0		
Target			
Signal Detection Method	0:Detection at TRUE	0:Detect...	0:De...
Compensation Time	0.0 s	0.0 s	0.0 s
Filter Time	0.0 s	0.0 s	0.0 s
Velocity Limit	Set Velocity Limit		
Positive Direction Velocity Limit Value	2500000000.0 degree/s		

Explanation

Specify the logic of the signal.
The selectable setting values are different depending on the function. Check the Manual of each function.

[Setting Range]
0:Detection at TRUE
1:Detection at FALSE
2:Detection at FALSE -> TRUE (Rising Edge)
3:Detection at TRUE -> FALSE (Falling Edge)
4:Detection at Rising Edge/Falling Edge

Ezi-STEP CC-Link IE TSN ALL +Limit Switch 설정은 Ezi_STEP_CT_001_DigitalInputs.1

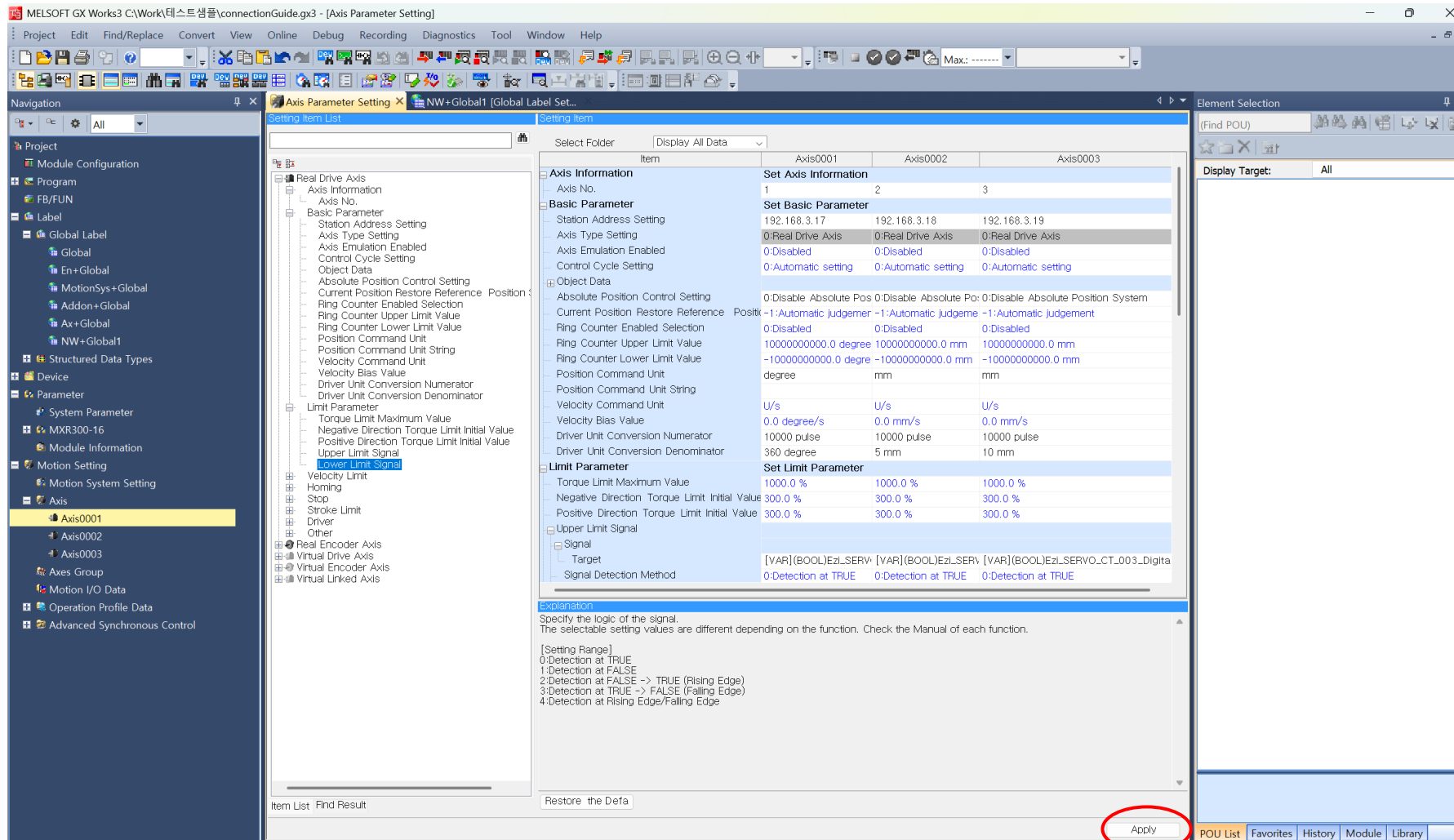
Ezi-STEP CC-Link IE TSN ALL -Limit Switch 설정은 Ezi_STEP_CT_001_DigitalInputs.0

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

Apply

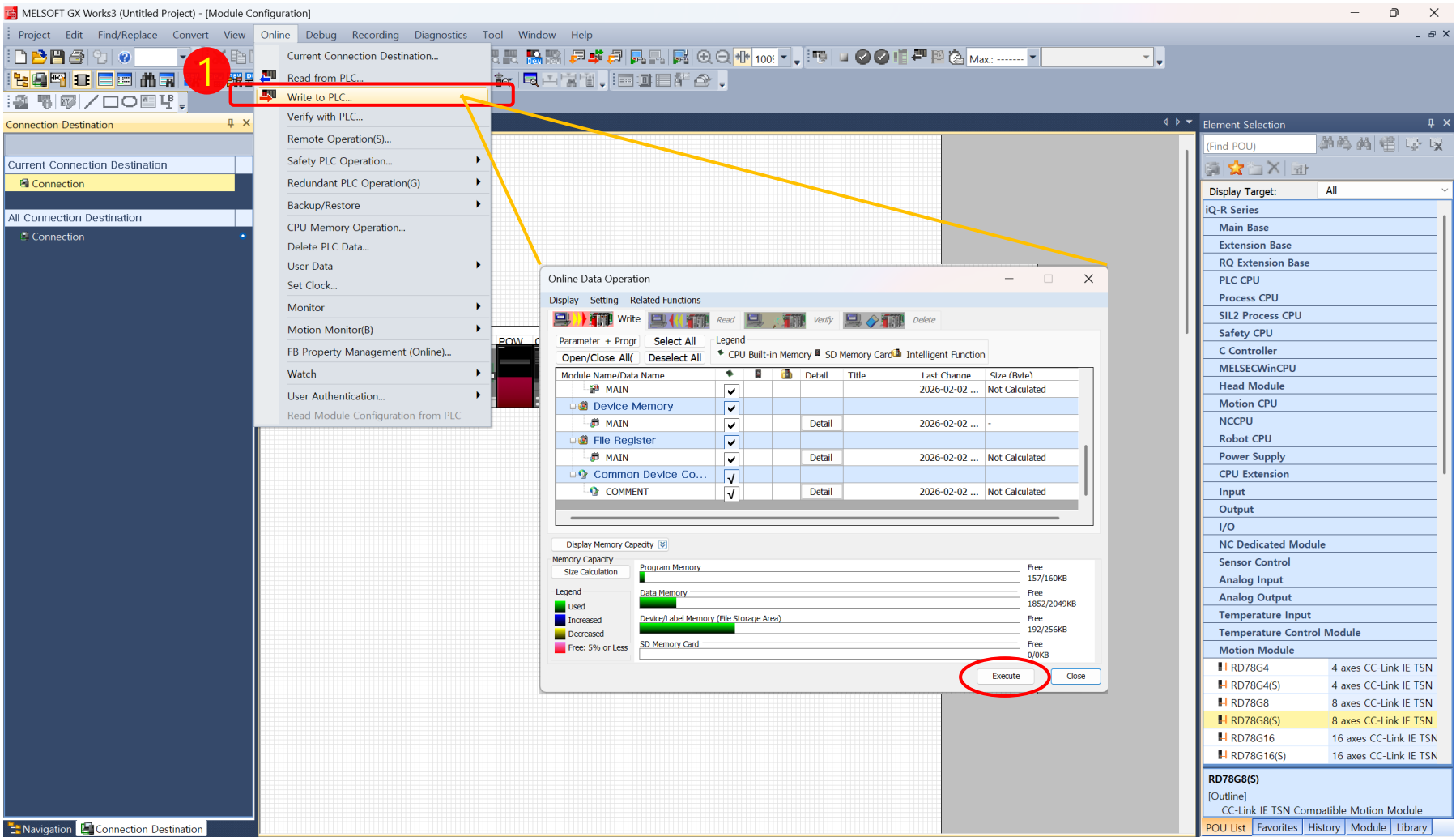
2-6. Motion Setting – Parameter 등록

- Parameter 등록으로 Motion Setting 완료



2-8. 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)

MELSOFT GX Works3 C:\Work\테스트샘플\connectionGuide.gx3 - [ProgPou [PRG] [LD] (Read Only) 10Byte]

Navigation

- 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
 - Axis
 - Axis0001
 - Axis0002
 - Axis0003
 - Axes Group
 - Motion I/O Data
 - Operation Profile Data

Read Mntr

1 (0)

2

3

4

5

6

7

8

9

10

11

12

MC_Power 1 (MC_Power)

Axis :DUT

B: Enable

B: ServoON

ReadyStat :B

Busy :B

Error :B

ErrorID :UW

END

마우스 클릭 & 드래그

Element Selection

(Find POU)

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

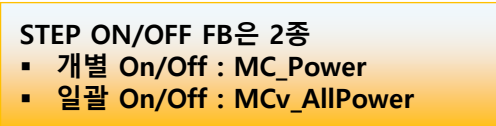
MC_AbortTrigger

[Version]

00A

POU List Favorites History Module Library

- **Ezi-STEP CC-Link IE TSN ALL Enable/STEP ON Program**



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

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

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

47/59

3-4. [Ladder] Ezi-STEP 원점복귀 실행

- 원점복귀 실행 (MC_Home)

The screenshot displays the MELSOFT GX Works3 software interface for editing a ladder logic program. The main window shows a ladder logic diagram for the 'MC_Home' (Home) operation. The diagram is organized into a table with columns for step numbers (1-12) and rows for different data types (DUT: Axis, B: Execute, UD: Parameter, L: Value, W: Execution, UD: Options, SDO: Error, SDO: Status).

Left Panel (Project Tree): Shows the project structure, including 'Program' and 'ProgramBody'. The 'ProgramBody' is expanded, showing various settings 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)', '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', and 'Operation Profile Data'.

Main Ladder Logic Editor: The diagram shows a sequence of steps. Step 12 is a 'Write' instruction for 'MC_WriteParameter_1'. Step 13 is a 'DUT: Axis' instruction for 'Axis0001.A'. Step 14 is a 'B: Execute' instruction for 'Done B'. Step 15 is a 'UD: Parameter' instruction for 'UD: Param...'. Step 16 is a 'L: Value' instruction for 'L: Value'. Step 17 is a 'W: Execution' instruction for 'ErrorID_UW'. Step 18 is a 'UD: Options' instruction for 'SDOError_UD'. Step 19 is a 'SDO: Status' instruction for 'SDOStat_UW'. Step 20 is a 'bAx1HomeSL' instruction. Step 21 is a 'bAx1Home' instruction. Step 22 is a 'MC_Home_1 (MC_Home)' instruction. Step 23 is a 'DUT: Axis' instruction for 'Axis0001.A'. Step 24 is a 'B: Execute' instruction for 'Done B'. Step 25 is a 'L: Position' instruction for '0.0'. Step 26 is a 'DUT: AbsSwit...' instruction for 'Active B'. Step 27 is a 'UD: Options' instruction for 'Command... B'. Step 28 is an 'Error B' instruction. Step 29 is an 'ErrorID_UW' instruction.

Right Panel (Element Selection): This panel lists various function blocks and parameters. The 'Motion Control Function/Function Block' section is expanded, showing 'Administrative' and 'Motion - Individual' blocks. The 'MC_Home' block is selected, and its parameters are displayed in the 'MC_Home' section at the bottom right.

MC_Home Parameters:

Parameter	Value
MC_CamIn	Cam Operation Start
MC_CombineAxes	Addition/Subtraction I
MC_GearIn	Gear Operation Start
MC_GroupStop	Group Forced Stop
MC_Home	OPR
MC_MoveAbsolute	Absolute Value Positic
MC_MoveRelative	Relative Value Positor
MC_MoveVelocity	Speed Control
MC_Stop	Forced Stop
MC_TorqueControl	Torque Control
MCv_AdvancedSync	Advanced Synchronou
MCv_BacklashComp	Backlash Compensatic
MCv_CyclicPosition	Motion Cyclic Positor

3-5. [Ladder] Ezi-STEP 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) with various logic elements. A red circle highlights the EDMOV instruction in step 11, which is set to 3600.0 and edAx1Pos1. A yellow callout box provides additional information about the position setting.

MC_MoveAbsolute_1 (MC_M...)

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	0.0		
W: Direction	K3		
W: BufferMo...			
UD: Options			

MC_MoveAbsolute

[Version]

00A

POU List Favorites History Module Library

3-6. [Ladder] Ezi-STEP DIO 동작 실행

- Digital Input, Output 동작 실행

The screenshot displays the MELSOFT GX Works3 interface. The main workspace shows a ladder logic program with a table of parameters for a move operation. The parameters are as follows:

Write	1	2	3	4	5	6	7	8	9	10	11	12
13					180000.0	L: Decelerati...	ErrorID :UW					
14					0.0	L: Jerk						
15					K3	W: Direction						
16						W: BufferMode						
17						UD: Options						

The ladder logic diagram shows a sequence of digital input and output operations. A dashed yellow box highlights the digital input section, which includes a DMOV instruction followed by a series of digital input (D1.4 to D1.9) and output (bAx1In[0] to bAx1In[5]) operations. Another dashed yellow box highlights the digital output section, which includes a DMOV instruction followed by a series of digital output (D3.1 to D3.5) and output (MC_MoveAbsolute) operations. The right-hand pane shows the 'Element Selection' dialog, which lists various modules and instructions. The 'Ezi_STEP_CT_ALL_001_DigitalInputs' and 'Ezi_STEP_CT_ALL_001_PhysicalOutputs' labels are overlaid on the diagram to indicate the specific digital input and output operations being performed.

3-6. [Ladder] Ezi-STEP 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

부 록

[동작 확인] Axis Monitor

- 각 축의 상태, 위치, 원점 복귀, Error 등을 모니터

The screenshot shows the MELSOFT GX Works3 interface with the Axis Monitor window open. The main window displays a table of real-time data for five axes. The 'Motion Common Monitor' panel on the right provides additional status information.

	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

- 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 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

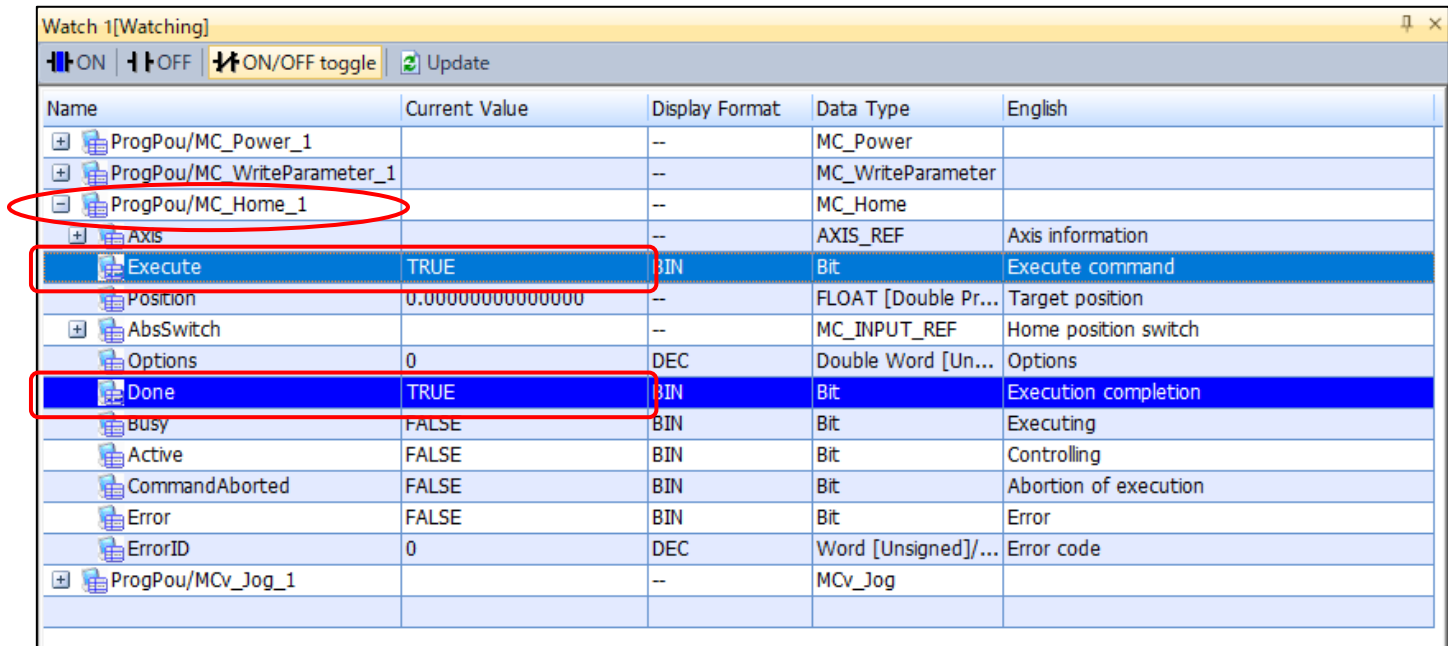
Watch 1[Watching]				
ON OFF ON/OFF toggle Update				
Name	Current Value	Display Format	Data Type	English
ProgPou/MC_Power_1		--	MC_Power	
ProgPou/MC_WriteParameter_1		--	MC_WriteParameter	
Axis		--	AXIS_REF	Axis information
Execute	TRUE	BIN	Bit	Execute command
ParameterNumber	H60980008	HEX	Word [Unsigned]/...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

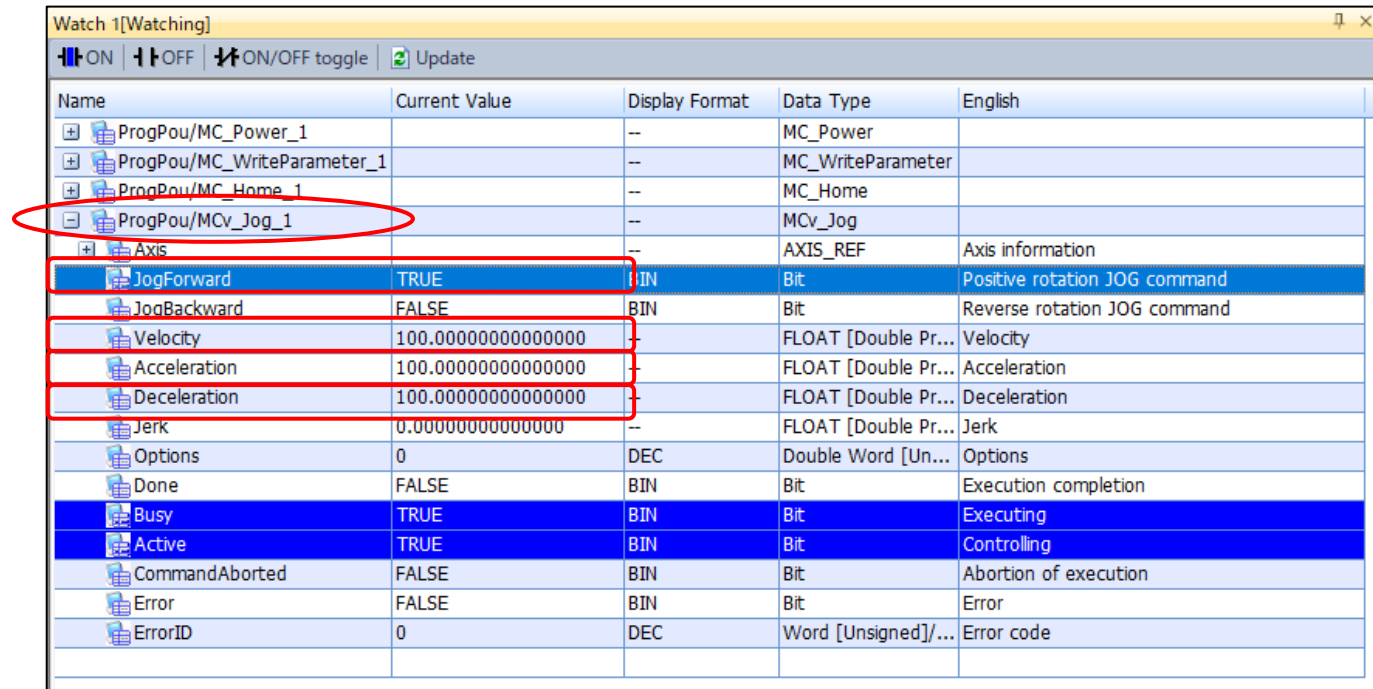
- Ezi-STEP CC-Link IE TSN ALL의 LIMIT+ / LIMIT- 신호를 하드웨어 스트로크 리밋으로 사용하는 경우, 기동(시작) 전에 아래의 축 제어 데이터를 설정해 주십시오.

[AxisName.Cd.HwStrokeLimit_Override] → 'DISABLE'

[동작 확인] Jog 운전

- 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	0.0000000000000000	--	FLOAT [Double Pr...	Jerk
Options	0	DEC	Double Word [Un...	Options
Done	FALSE	BIN	Bit	Execution completion
Busy	TRUE	BIN	Bit	Executing
Active	TRUE	BIN	Bit	Controlling
CommandAborted	FALSE	BIN	Bit	Abortion of execution
Error	FALSE	BIN	Bit	Error
ErrorID	0	DEC	Word [Unsigned]/...	Error code

[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	2024/10/10 15:15:07.512565336	System	OK	00000	Home Request (H-H) OK
00002	2024/10/10 15:15:07.517015112	System	OK	00001	Current Position Extension Completion
00003	2024/10/10 15:15:07.527855334	System	OK	00002	servo System Extension Start
00004	2024/10/10 15:15:08.630189398	Operation	OK	20710	Follow-up Motion Execution

Detailed Information

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

00000

Home Request was OK.
- Absolute position error in driver data was detected. (Detail Code: 00004)
- An absolute position error in the driver data was detected. (Detail Code: 00004)
- The axis type was changed. (Detail Code: 00001)
- Drive object: 'Polarity (00001)' b7 position polarity was changed. (Detail Code: 00001)
- Change of the drive of motion encoder was detected. (Detail Code: 00001)
- Machine home was detected. (Detail Code: 00001)
- Drive unit connection (friction/rotation) of the axis was detected. (Detail Code: 00001)
- Machine home 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-STEP 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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