



Programmable Controllers
MELSEC iQ-F
series



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

접속 가이드

MELSEC iQ-F series and **Ezi-STEP**® CC-Link IE TSN
Micro Stepping System **ALL**

미쓰비시 전기 제품
FX5-40SSC-G, FX5-80SSC-G

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 iQ-F FX5-SSC-G에 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][Ezi-STEP][CC-Link IE TSN ALL]Open Loop Stepping System	
[접속가이드] [KOR] MELSEC FX5-SSC-G and Ezi-STEP CC-Link IE TSN ALL	

- MELSEC iQ-F FX5-SSC-G 매뉴얼은 미쓰비시 전기 홈페이지에서 다운로드할 수 있습니다.

<https://www.MitsubishiElectric.co.jp/fa>

매뉴얼 명칭	매뉴얼 번호
MELSEC iQ-F モーションユニット ユーザーズマニュアル(スタートアップ編)	IB-0300405
MELSEC iQ-F モーションユニット ユーザーズマニュアル(ネットワーク編)	IB-0300425
MELSEC iQ-F モーションユニット ユーザーズマニュアル(シンプルモーションモード応用編)	IB-0300571
MELSEC iQ-F モーションユニット ユーザーズマニュアル(シンプルモーションモードアドバンスト同期制御編)	IB-0300574
GX Works3 オペレーティングマニュアル	SH-081214

용어

- 접속 가이드에서 사용되는 용어와 관련된 내용입니다.

용어	내용
CC-Link IE TSN	표준 이더넷 규격을 확장한 'TSN(Time-Sensitive Networking)'을 채택하여, 실시간성을 확보한 제어와 다른 오픈 네트워크의 정보를 동시에 처리할 수 있는 오픈 네트워크입니다.
마스터국(매니저국)	네트워크 전체를 관리하는 국으로, 모든 국과 사이클릭 전송 및 트랜지언트 전송을 할 수 있습니다. MELSEC iQ-F FX5 모션 모듈이 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.

목차

1. 개요

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

2. FX5-40SSC-G 모션 모듈 설정

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

3. 동작 확인

- 3-1. 프로그램 작성
- 3-2. Axis 모니터링
- 3-3. Axis 동작 확인

[부록]

[부록1] 원점복귀 방법

1. 개요

1-1. 개요

- MELSEC iQ-F FX5-SSC-G와 Ezi-STEP CC-Link IE TSN ALL 접속 가이드

- ◆ 마스터국: FX5-40SSC-G / FX5-80SSC-G

- PLCopen®Motion Control FB(Function Block)

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

- ◆ 엔지니어링 소프트웨어

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

- ※ 최신 파일은 미쓰비시 전기 홈페이지를 참조하시기 바랍니다.

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

- ◆ 리모트국: Ezi-STEP CC-Link IE TSN ALL

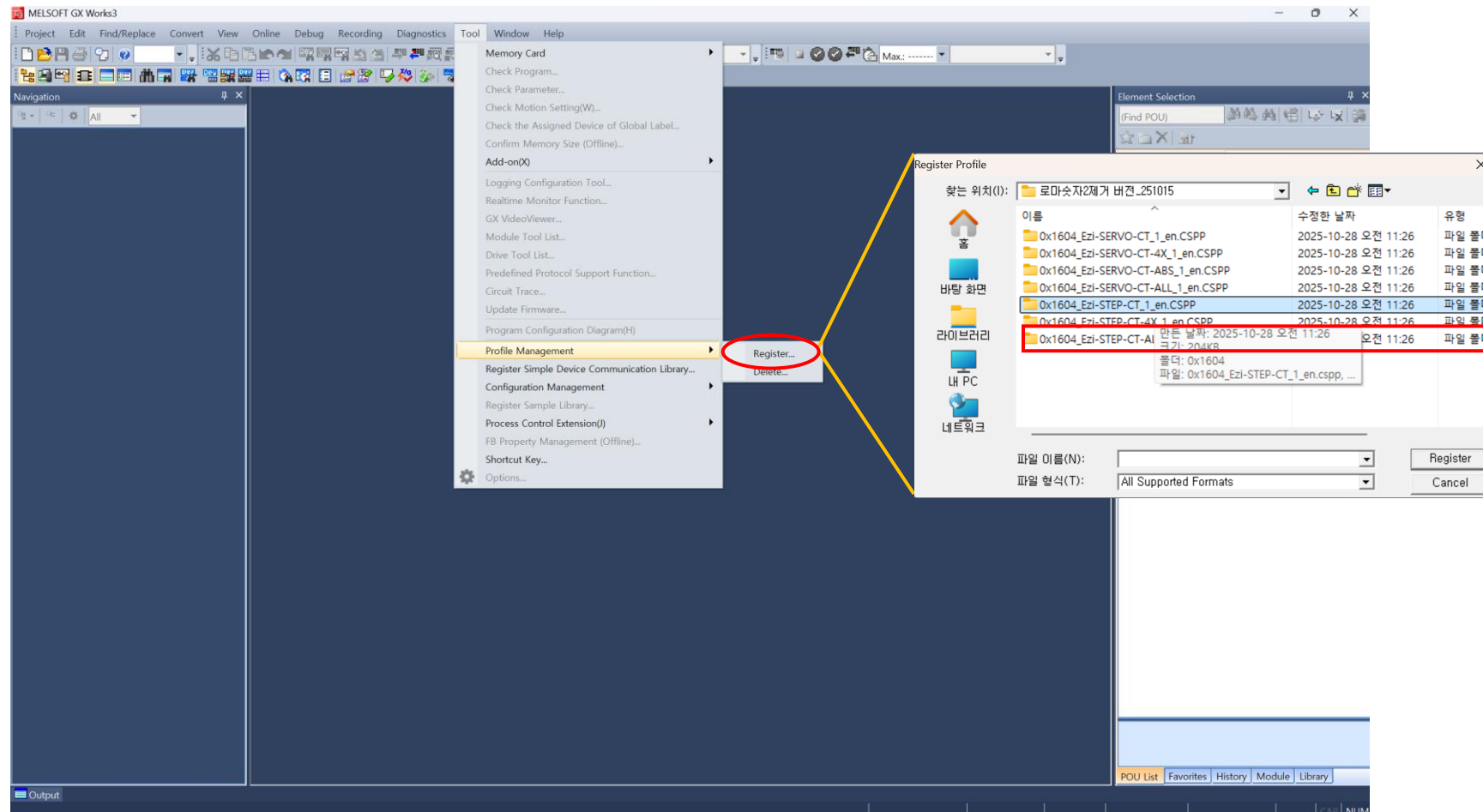
- 다운로드 주소 : <https://cltsn.fastech-motions.com/download/quick>
 - 파일명 : 0x1604_Ezi-STEP-CT-ALL_1_en_CSPP

- ※ CSP+(Cyclic Synchronous Position Plus)는 산업용 네트워크를 통해 위치 명령을 주기적으로 전달하면서, 위치·속도·가속도(또는 토크) 정보를 함께 활용하여 보다 부드럽고 정밀한 궤적 제어를 가능하게 하는 제어 방식입니다.

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

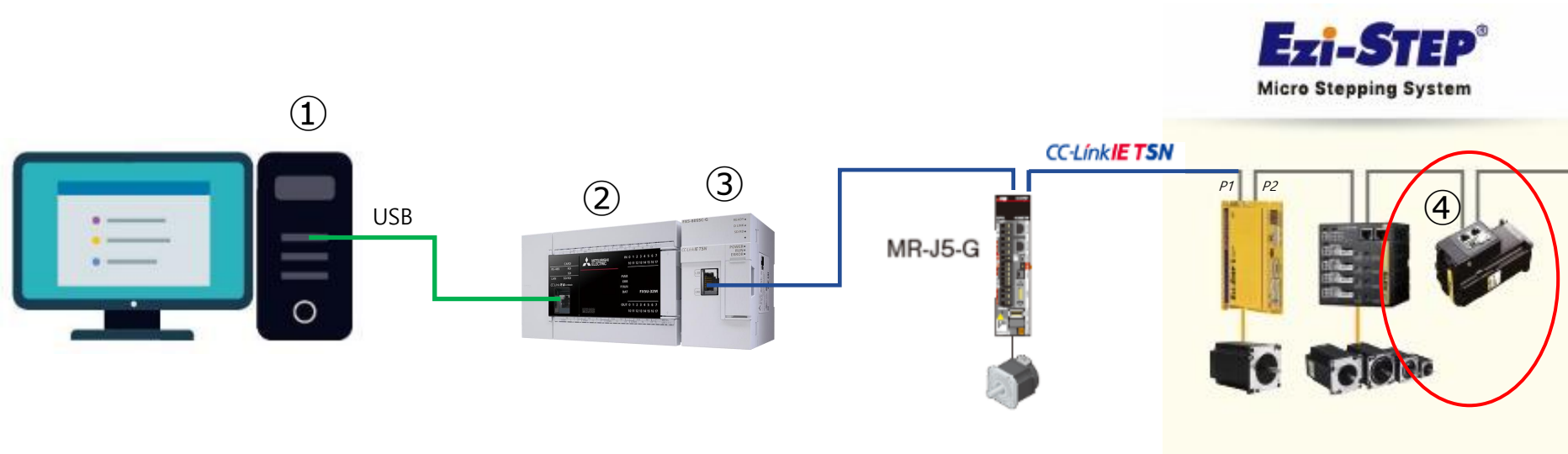
● CSP+ 등록

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



1-3. CC-Link IE TSN 구성

- 네트워크 연결



구성	품명	IP 주소	
①	엔지니어링 소프트웨어	GX Works3	-
②	CPU 모듈	FX5U	
③	모션 모듈	FX5-40SSC-G(S)	192.168.3.253
④	드라이브 + 모터	Ezi-STEP CC-Link IE TSN ALL	192.168.3.1




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, FX5 파라미터 설정

No.	항목	내용
1	Ezi-STEP 설정 	<p>드라이브 설정 프로그램(Ezi-CT Manager)을 이용하여 파라미터를 설정합니다. 설정 프로그램과 사용 방법은 주파스텍 홈페이지에서 다운로드하시기 바랍니다.</p> <p>※ 주소: https://cltsn.fastech-motions.com/download/quick</p>
2	PLC FX5 CPU 설정 	<p>GX-Works3를 사용해 FX5 CPU 모듈의 프로젝트를 만든 다음, 유닛 파라미터(통신 방식, 접속 대상)와 축 파라미터(모션 제어용)를 설정합니다.</p>
3	FX5 + Ezi-STEP 동작 확인 	<p>FX5 CPU 모듈과 Ezi-STEP이 올바르게 설정되어 있는지 확인하기 위한 프로그램을 작성합니다.</p> <p>라벨을 조작해 모터가 정상적으로 작동하는지 확인합니다</p>

1-4. 설정 플로우

● Ezi-STEP 설정 참고 사항

항목	내용
IP 주소 설정	<ul style="list-style-type: none"> ① 드라이브의 로터리 스위치로 설정 ② 로터리 스위치 → '00', IP address (Index: 2101h, Subindex: 01~04h) 값으로 설정
드라이브 원점복귀 방법 설정	<ul style="list-style-type: none"> ① Homing method (Index: 6098h, Subindex:00h) 설정 - '0'(초깃값) → '33' 등 원점복귀 방법 설정 ※ [부록1] 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 (FX5와 Ezi-STEP)

항목	제약 사항
속도 제어	드라이브가 사이클릭 동기 속도 모드(CSV)를 지원하지 않으므로 속도 제어를 사용할 수 없습니다.
토크 제어	드라이브가 사이클릭 동기 토크 모드(CST)를 지원하지 않으므로 토크 제어를 사용할 수 없습니다.
정압 제어	MELSERVO만 정압 제어를 지원하므로, 정압 제어를 사용할 수 없습니다.
어드밴스트 동기 제어	[Pr.320 : 동기 인코더 축 종류]에 '서보 앰프 경유 동기 인코더'를 설정할 수 없습니다.
토크 제한 기능	드라이브가 아래 오브젝트를 지원하지 않아 토크 제한 기능을 사용할 수 없습니다. <ul style="list-style-type: none"> • 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
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.
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.59 1~594: 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

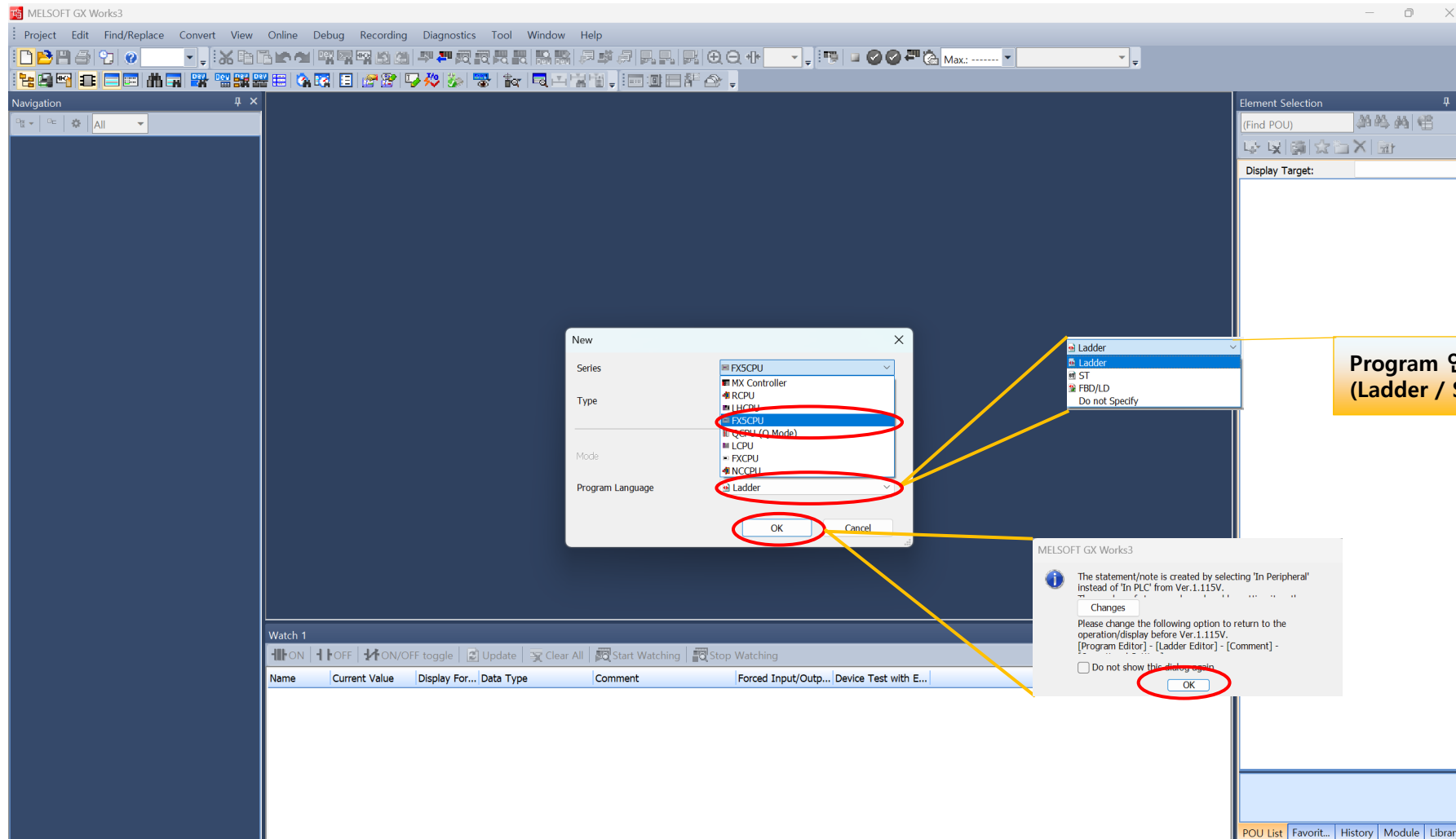
● 모션 제어 기능 제약 사항 (FX5와 Ezi-STEP)

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. <ul style="list-style-type: none"> · 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. <ul style="list-style-type: none"> · 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. FX5-40SSC-G 설정

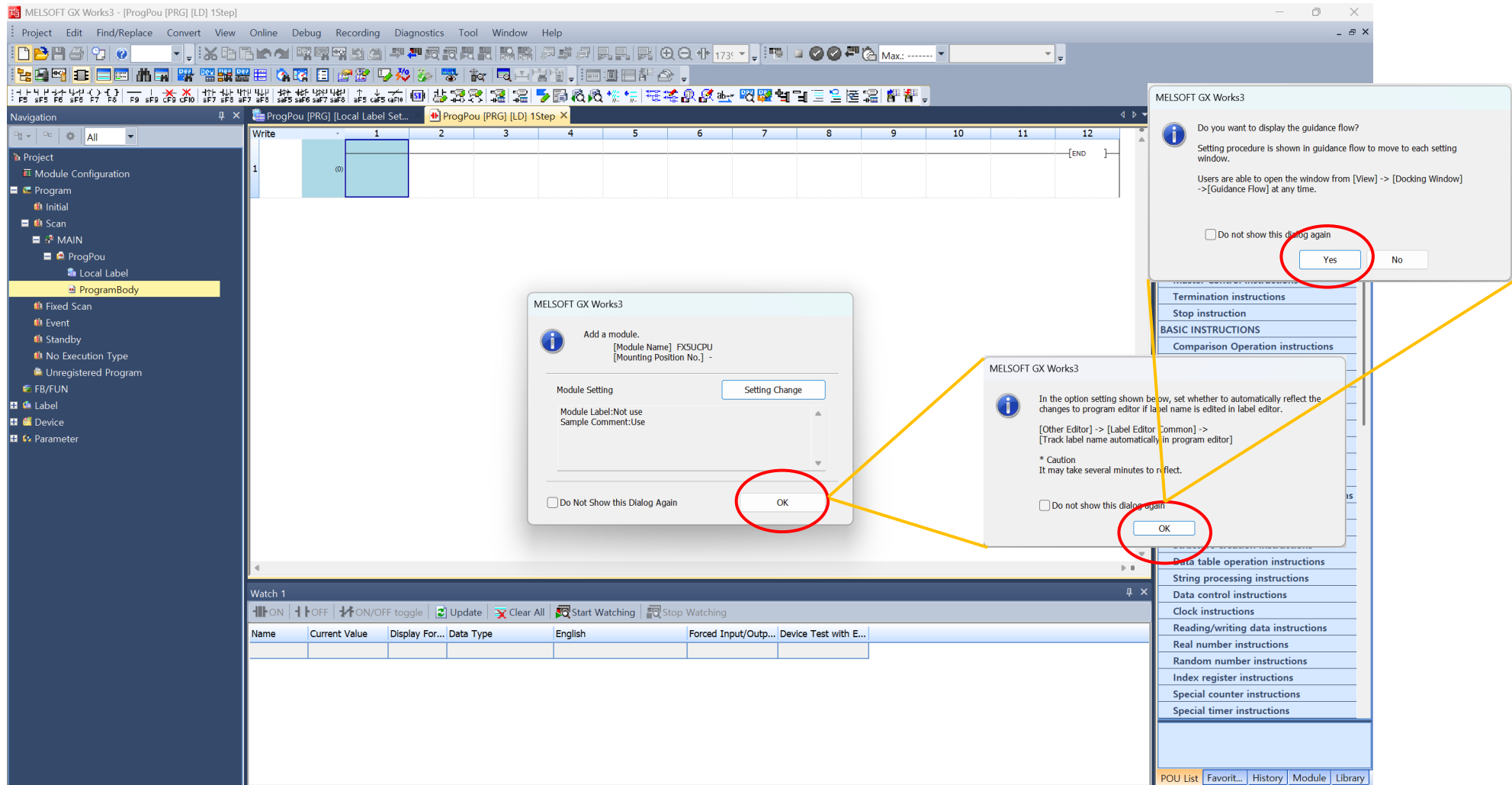
2-1. Project 생성

- 신규 Project 생성 시 FX5CPU, 모델명, 사용 축수, Program 언어를 선택



2-2. Module 등록

● FX5UCPU 등록



2-2. Module 등록

● FX5UCPU 등록

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

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

Navigation

Project

- Module Configuration
- Program
 - Initial
 - Scan
 - MAIN
 - ProgPou
 - Local Label
 - ProgramBody
 - Fixed Scan
 - Event

Element Selection

(Find POU)

Display Target: All

FX5 Series

- Communication Adapter
- Analog Adapter
- Extension Power Supply Module
- Input
- Output
- I/O
- Analog Input
- Analog Output
- Temperature Control
- Multiple Input
- Motion Module
 - FX5-40SSC-G(S) 4 axes CC-Link IE TSN**
 - FX5-80SSC-G(S) 8 axes CC-Link IE TSN
- Simple Motion
- Pulse I/O, Positioning
- Information Module
- Network Module
- FX5/FX Bus Conversion Module
- Safety Extension Module
- General Module
 - FX5 Series General Module
- Configuration Module
- Figure

Watch 1

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

[클릭 & 드래그]
1. FX5UCPU가 생성됨.
2. FX5-40SSC-G(S)

2-3. Module Configuration – H/W

- 마우스의 오른쪽 버튼을 클릭하여 Fix(S) 선택으로 Module 구성 완료 (1/2)

The screenshot shows the MELSOFT GX Works3 interface in the Module Configuration mode. A context menu is open over a CPU module, with the 'Parameter' option selected and the 'Fix(S)' sub-option highlighted. A red circle '1' is around 'Parameter' and a red circle '2' is around 'Fix(S)'. A yellow arrow points from the 'Fix(S)' option to a warning dialog box. The dialog box contains the following text:

MELSOFT GX Works3

⚠ Fix the parameter.
Are you sure you want to continue?

[Caution]
Copied module parameters and module extended parameters are copied to the pasted module.
The setting value will be default ones for the following cases.
- When the station type is different between copied module and pasted module
- When the module that is copied in different project was pasted.

At the bottom of the dialog box, there are two buttons: '예(Y)' (Yes) and '아니오(N)' (No). A red circle '3' is around the '예(Y)' button.

Below the dialog box, a list of modules is visible:

- Simple Motion
- Pulse I/O, Positioning
- Information Module
- Network Module
- FX5/FX Bus Conversion Module
- Safety Extension Module
- General Module
- FX5 Series General Module
- Configuration Module
- Figure

At the bottom right, the 'FX5-40SSC-G(S)' module is selected, with its outline and 'CC-Link IE TSN Compatible Motion Module' description visible.

At the bottom left, the 'Watch 1' window is visible, showing a table with columns: Name, Current Value, Display For..., Data Type, English, Forced Input/Outp..., Device Test with E...

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

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

1 (Navigation Tree)

2 (IP Address Setting)

3 (Apply Button)

Network 국번 : 1

IP Address : 192.168.3.253
Subnet Mask : 255.255.255.0
※ 참고: Ezi-STEP Default IP는 192.168.3.xxx

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

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

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

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

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

● Network Configuration Settings

The screenshot displays the MELSOFT GX Works3 interface for configuring a 1[U1]:FX5-40SSC-G(S) module. The navigation tree on the left (1) shows the 'Module Information' section selected. The main area (2) displays the 'Network Configuration Settings' for the selected module. A red box highlights the 'Network Configuration Settings' item in the tree. The main settings area shows 'Network Configuration Settings' with a '<Detailed Setting>' button (3) highlighted in red. A yellow arrow points from the detailed settings button to the 'Module List' window on the right. The 'Module List' window shows a list of modules, including 'General CC-Link IE TSN Module' and 'CC-Link IE TSN Module (Mitsubishi Ele)'. A table in the 'Module List' window shows the following data:

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

The 'Watch 1' window at the bottom shows a table with columns: Name, Current Value, Display For..., Data Type, English, Forced Input/Outp..., and Device Test with E... The table is currently empty.

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

- CC-Link IE TSN Module을 수동(클릭&드래그)으로 구성

The screenshot shows the 'CC-Link IE TSN Configuration' software interface. The main window displays a table of modules with columns for Station Type, IP Address, and Subnet Mask. A red box highlights the 'Ezi-STEP-CT-ALL' module with IP address 192.168.3.1. A yellow callout box with a red '2' contains the text: '[Ezi-STEP CC-Link IE TSN ALL IP Address 수정] 1. 192.168.3.1'. A red box in the 'Module List' on the right highlights 'Ezi-STEP-CT-ALL'. A red '1' and a yellow callout box with the text '마우스 클릭 & 드래그 (반복)' indicate the manual configuration process. A yellow callout box with the text '[참고] Ezi-STEP CC-Link IE TSN ALL IP Address 설정 16진수 로터리 스위치' and an image of a rotary switch is also present. The bottom left shows a 'Host Station' diagram with 'Ezi-STEP-CT-ALL' connected to 'STA#1'. The bottom right shows the 'Station Type' as 'Remote Station'.

Station Type	IP Address	Subnet Mask
Host Station	192.168.3.253	255.255.255.0
Remote Station	192.168.3.1	255.255.255.0

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

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

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

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

The screenshot displays the 'CC-Link IE TSN Configuration' software interface. The main window shows a configuration table for stations. A red box highlights the 'Motion Control Station' checkbox for station 1, with a callout box labeled '1' containing the text 'Motion Control Station - Check (마우스 클릭)'. Another red box highlights the 'Synchronous' option in the 'Network Synchronous Communication' dropdown menu, with a callout box labeled '2' containing the text 'Synchronous 선택'. The 'Module List' panel on the right shows the 'CC-Link IE TSN Module (Mitsubishi Electr)' expanded, with 'Motion Module' selected. The bottom status bar shows 'STA#0 Master Station' and 'STA#1 Ezi-STEP-CT ALL'. A small diagram at the bottom left shows the physical connection between the host station and the remote station.

Mode Setting	Cyclic Transmission Time (Min.)	Host Name	STA#	Station Type	Communication Period Interval (Min.)	Points	R/W Setting	Parameter Automatic Setting	PDO Mapping Setting	IP Address	Subnet Mask	Default Gateway	Reserved/Error Invalid Station	Network Synchronous Communication
0	17.00	Host Station	0	Master Station	250.00					192.168.3.253	255.255.255.0			
1		Ezi-STEP-CT-ALL	1	Remote Station		16	16		<Detail Setting>	192.168.3.1	255.255.255.0		No Setting	Asynchronous

1 Motion Control Station - Check (마우스 클릭)

2 Synchronous 선택

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
 - EnergyMeasuringUnit
 - Bridge module
 - FPGA module
- CC-Link IE TSN Module (FASTECH Co. L)
 - Closed-loop Step Drive
 - Open-loop Step Drive
 - Ezi-STEP-CT Open-Loop st
 - Ezi-STEP-CT-4X Open-Loop st
 - Ezi-STEP-CT-ALL Open-Loop st

[Outline]
Step Drive

[Specification]
Closed-Loop Step Drive
Motor: Max. NEMA 24
Mode: Homing, OSP, FP
CC-Link IE TSN Class B

[Manufacturer Name]
FASTECH Co. Ltd

[Station Type]
Remote Station

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

- PDO Mapping Setting은 아래와 같이 자동으로 할당되어 설정됩니다.

■ TPDO

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

■ RPDO

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

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

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

The screenshot displays the 'CC-Link IE TSN Configuration' software interface. The main window shows a table of stations and their configurations. A red circle highlights the 'Setting' button in the top menu bar, with a yellow callout box containing the Korean text '클릭하면 바로 반영됨' (Click to be reflected immediately). The 'Module List' panel on the right shows the selection of 'Ezi-STEP-CT-ALL' under the 'CC-Link IE TSN Module' category. The bottom status bar shows the selected module and its configuration details.

Station No.	Station Name	Station Type	Communication Period Interval (Min.)	Points	Points	RWr Setting	RWw Setting	Parameter Automatic Setting	PDO Mapping Setting	IP Address	Subnet Mask
0	Host Station	Master Station	17.00	us						192.168.3.253	255.255.255.0
1	Ezi-STEP-CT-ALL	Remote Station					16	16	<Detail Setting>	192.168.3.2	255.255.255.0

클릭하면 바로 반영됨

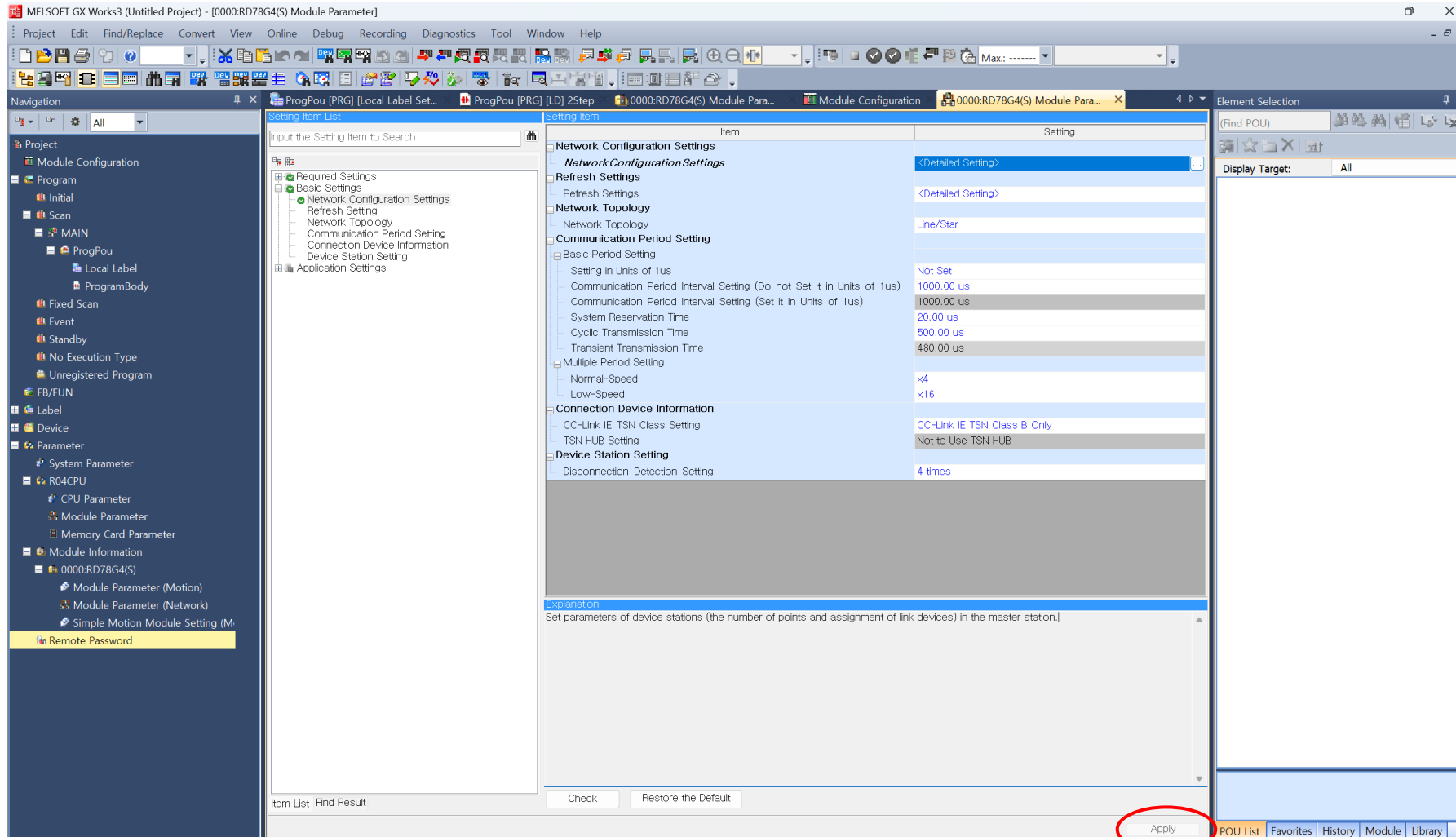
Module List

- 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
- EnergyMeasuringUnit
- Bridge module
- FPGA module
- CC-Link IE TSN Module (FASTECH Co. L
- Closed-loop Step Drive
- Open-loop Step Drive
- Ezi-STEP-CT
- Ezi-STEP-CT-4X
- Ezi-STEP-CT-ALL

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

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

- Network Configuration Settings 적용



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

● Simple Motion Module Setting 프로그램 실행하기

The screenshot shows the MELSOFT GX Works3 interface. The left navigation pane is expanded to show the 'Parameter' folder, with 'Simple Motion Module Setting (M)' highlighted in a red box. A red circle with the number '1' is placed next to this box. The main window displays the 'Simple Motion Module Setting Function' dialog box. The 'Display Filter' is set to 'Electronic Gear Setting'. The dialog box contains several sections:

- Common parameters**: Pr. 82: Forced stop valid/invalid selection (1: Invalid), Pr. 152: Maximum number of control axes (0), Pr. 156: Manual pulse generator smoothing time constant (0 ms).
- Servo network composition parameters**: A table with columns for Axis #1, #2, #3, and #4. The table indicates that the parameter does not rely on axis and relate to the whole system. The table shows 'No Setting' for all axes.
- Basic parameters 1**: Set according to the machine and applicable motor when system is started up (It will be valid according to PLC ready signal).

Item	Axis #1	Axis #2	Axis #3	Axis #4
Servo network composition parameters Set the device to be used and the network according to the system configuration. (It will be valid after the power supply ON or PLC CPU reset.)				
Connected device	No Setting	No Setting	No Setting	No Setting
Pr. 141: IP address				
Pr. 142: Multidrop number	0	0	0	0
Pr. 101: Virtual servo amplifier setting	0: Use Real Servo Amplifier	0: Use Real Servo Amplifier	0: Use Real Servo Amplifier	0: Use Real Servo Amplifier

2-5. Simple Motion Module Setting

- Parameter / STEP network composition parameters / Pr.141:IP address 설정

The screenshot displays the MELSOFT Simple Motion Module Setting Function interface. The main window shows a tree view on the left with 'Parameter' selected. The main area displays a table of parameters for 'Electronic Gear Setting'. A dialog box titled 'Station Address Setting' is open, showing a table with the following data:

IP Address	Model	Alias
192.168.3.1	E2-STEP-CT-ALL	

The dialog box also features an 'OK' button and a 'Cancel' button. Red annotations highlight the 'Pr.141:IP address' parameter in the main window (1), the IP address field in the dialog box (2), and the 'OK' button (3).

2-5. Simple Motion Module Setting

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

The screenshot shows the MELSOFT Simple Motion Module Setting Function interface. The 'Parameter' section is expanded to 'Basic parameters 1', and 'Pr.7: Bias speed at start' is highlighted with a red circle and the number '1'. The value is set to 500 pulse/s. A callout box with a yellow background contains the text: 'Bias speed at start: 500 pulse/s' and '※ 모터에 장착된 인코더 규격에 따라 설정을 변경할 수 있습니다.' Below the table, there is a detailed description for Pr.7: Bias speed at start, including its function and setting range.

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

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

Setting Range
0 to 200000 pulse/s

2-5. Simple Motion Module Setting

- Parameter / HPR parameters / Pr.46:HPR speed(500 pulse/s) 설정

The screenshot shows the MELSOFT Simple Motion Module Setting Function interface. The 'Parameter' section is expanded, and 'Pr.46:HPR speed' is highlighted with a red circle. The value '500 pulse/s' is entered in the field. A yellow callout box contains the following text:

HPR speed: 500 pulse/s
※ Bias speed(Pr.7)값보다 HPR speed(Pr.46)값이 크면 (1C15H:원점복귀속도Error)가 발생합니다.

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

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

Setting Range
1 to 200000 pulse/s

2-5. Simple Motion Module Setting

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

The screenshot displays the MELSOFT Simple Motion Module Setting Function interface. The left sidebar shows the project structure, with 'Parameter' selected. The main window shows the 'Electronic Gear Setting' dialog for Axis #1. The 'Basic parameters 1' section is expanded, and 'Pr. 2: Number of pulses per rotation' is highlighted with a red box and the number 1. The 'Electronic Gear Setting' dialog is open, showing the 'Movement Amount per Load Rotation (dSL)' set to 10000 pulse (highlighted with a red box and the number 2) and the 'Encoder Resolution' set to 10000 pulse (highlighted with a red box and the number 3). The 'Calculate Electronic Gear' button is circled in red with the number 4. A callout box on the right contains the following text:

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

The 'Calculation Result' section shows the following parameters:

* Basic Parameters 1	Value
Unit Setting	3:pulse
Number of Pulses per Rotation	10000 pulse
Movement Amount per Rotation	10000 pulse
Unit Magnification	1x1 Times

The 'OK' button in the dialog is circled in red with the number 5.

2-5. Simple Motion Module Setting

● Parameter / HPR parameters / Pr.46:HPR speed(500 pulse/s) 설정

Pr. 2: Number of pulses per rotation
Set the number of pulses required for a complete rotation of the motor shaft.
Set it taking the electronic gear of the servo amplifier into consideration.
Number of pulses per rotation (AP) = Encoder resolution x Electronic gear denominator / Electronic gear numerator

When the encoder resolution is 67108864 pulses, the electronic gear (numerator / denominator) of the servo amplifier is rewritten with 16/1 inside RD78G(S).
Therefore, set the number of pulses per rotation (AP) as 4194304 pulses in such a case.

"Electronic gear function" coordinates the output pulses calculated from the values set as the pulses per rotation and the movement amount per rotation with the actual movement amount of a machine.
Using the electronic gear setting allows users to configure the electronic gear easily.

* Basic Parameters 1	
Unit Setting	3:pulse
Number of Pulses per Rotation	10000 pulse
Movement Amount per Rotation	10000 pulse
Unit Magnification	1x1 Times

Movement Amount per Pulse

As a result of calculation, no error occurs in the movement amount.
Applying the calculation result above,
you want to perform is about 0 [pulse] the error for the movement amount 0 [pulse] Error Calculation

Click OK to reflect to the basic parameters 1.

OK Cancel

2-5. Simple Motion Module Setting

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

1

Pr.8:Speed limit value 500000 pulse/s
Pr.9:Acceleration time 0 200 ms
Pr.10:Deceleration time 0 200 ms

✓ Pr8 : Speed limit value → 500,000 (Encoder 10,000 pulse의 경우)
✓ Pr9 : Acceleration time 0 → 200ms (Ezi-STEP는 100ms도 가능)
✓ Pr10: Deceleration time 0 → 200ms (Ezi-STEP는 100ms도 가능)

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

Setting Range
1 to 1000000000 pulse/s

Speed limit value

Acceleration time 0 Deceleration time 0

2-5. Simple Motion Module Setting

- Convert / Rebuild All

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

Project Edit View Online Window Help

Navigation 100%

Project

0000:RD78G8(S)

System Setting

Parameter

Positioning Data

Axis #1 Positioning Data

Axis #2 Positioning Data

Axis #3 Positioning Data

Axis #4 Positioning Data

Axis #5 Positioning Data

Axis #6 Positioning Data

Axis #7 Positioning Data

Axis #8 Positioning Data

Block Start Data

Synchronous Control Parameter

Cam Data

Simple Motion Monitor

Digital Oscilloscope

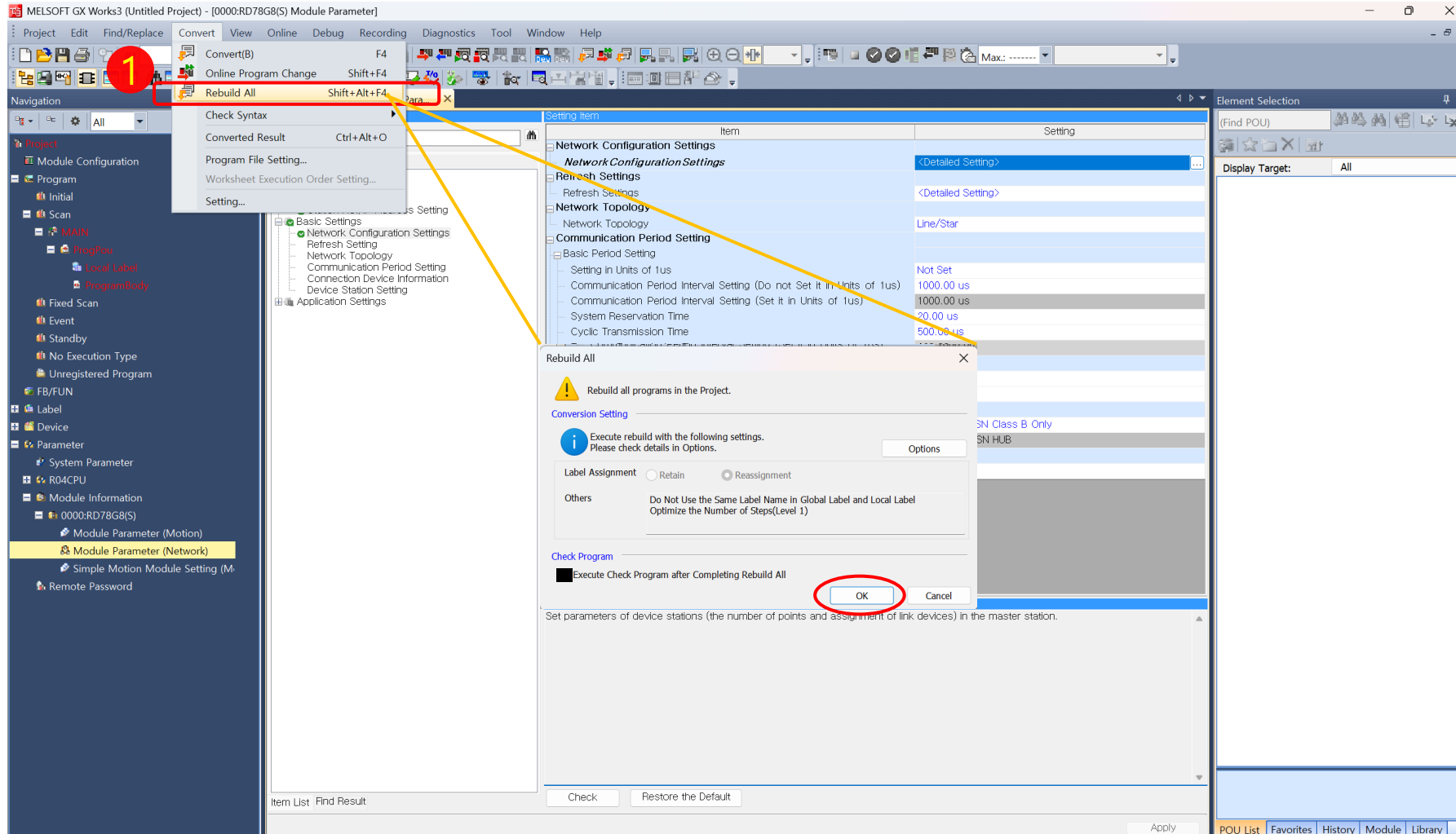
Display Filter Display All Electronic Gear Setting

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

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

2-6. Convert

● Convert / Rebuild All



2-7. Write to PLC

● Online Data Operation

The screenshot shows the MELSOFT GX Works3 interface. The 'Online' menu is open, and 'Write to PLC...' is highlighted with a red circle and a yellow arrow. The 'Online Data Operation' dialog box is also open, with a red circle around the 'Common Device Co...' option in the table. A yellow callout box contains the following text:

Common Device Co... 체크 시 전송 불가 Error가 발생할 수 있으니 체크하지 않고 전송합니다.

Module Name/Data Name	Detail	Title	List Class	Class (Data)
MAIN	<input checked="" type="checkbox"/>			
Device Memory	<input checked="" type="checkbox"/>	Detail		
MAIN	<input checked="" type="checkbox"/>			
File Register	<input checked="" type="checkbox"/>	Detail		
MAIN	<input checked="" type="checkbox"/>	Detail		
Common Device Co...	<input type="checkbox"/>	Detail		
COMMENT	<input type="checkbox"/>	Detail		

Memory Capacity

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

Execute Close

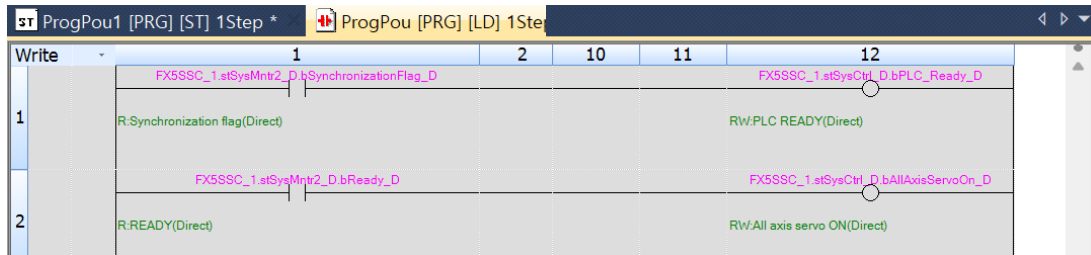
3. 동작 확인

3.1 프로그램 작성

● PLC Motion Module : Ready / Servo On

Label(변수) 방식

[Ladder Program]



- ① 시퀀스 레디 신호 (FX5SSC_1.stSysCtrl_D.bPLC_Ready_D) : ON 되면
- ② 동기용 플래그 (FX5SSC_1.stSysMntr2_D.bSynchronizationFlag_D) : ON 요구
- ③ 준비완료신호 (FX5SSC_1.stSysMntr2_D.bReady_D) : ON 되면
- ④ 전축 Servo (FX5SSC_1.stSysCtrl_D.bAllAxisServoOn_D) : ON 요구

Label(변수) 방식

[ST Program]

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

3.1 프로그램 작성

- Jog 설정 : 속도, 한계 속도, 가속시간, 감속시간

The screenshot displays the MELSOFT GX Works3 interface with a ladder logic program for setting JOG parameters. The program is organized into steps:

- Step 1:** Initial conditions: `FXSSSC_1 a6SyMpl_D bPLC_Ready_D` (RW PLC READY(Direct)) and `FXSSSC_1 a6SyMpl2_0 aSynchronizationFlag_D` (R Synchronization flag(Direct)).
- Step 2:** Ready conditions: `FXSSSC_1 a6SyMpl2_D bReady_D` (R READY(Direct)) and `FXSSSC_1 a6SyMpl2_0 bAllAxisServoOn_D` (RW All axis servo ON(Direct)).
- Step 3:** Parameter setting: `bSetJogParam` (12) is executed, leading to `DMOV K5000 FXSSSC_1 a6AvCrtf_D0 udJOG_Speed_D` (RW JOG speed(Direct)).
- Step 4:** Parameter setting: `DMOV K50000 FXSSSC_1 a6AvPm_D0 udJogSpeedLimD` (RW JOG speed limit value(Direct)).
- Step 5:** Parameter setting: `DMOV K200 FXSSSC_1 a6AvPm_D0 udAccelerationTimeD` (RW Acceleration time(Direct)).
- Step 6:** Parameter setting: `DMOV K200 FXSSSC_1 a6AvPm_D0 udDecelerationTimeD` (RW Deceleration time(Direct)).
- Step 7:** End of the program: `[END]`.

The right-hand side of the interface shows the **Element Selection** panel, listing various module functions for the FX5-40SSC-G(S) module. The selected function is `M+FX5SSC_JOG_01A`, which is described as "JOG/inching operation".

M+FX5SSC_JOG_01A
[Japanese]
JOG運転 / インチング運転を行います。
POU List | Favorites | History | Module | Library

3.1 프로그램 작성

- Jog 동작 프로그램 : Module FB (MFX5SSC_JOG_01A1 클릭&드래그)

The screenshot displays the MELSOFT GX Works3 interface. The main window shows a ladder logic program with a network containing several DMOV instructions. A dialog box titled "FB Instance Name" is open, showing the selection of "M+FX5SSC_JOG_01A1" as the instance name. A red box highlights this selection in the dialog. A yellow callout box with a checkmark and the text "✓ JOG 동작 FB 생성 : OK" is positioned below the dialog. On the right side, the "Element Selection" panel is visible, listing various module functions. A red circle with the number "1" and a dashed arrow points to the "M+FX5SSC_JOG_01A1" entry in the list, which is also highlighted with a red box. The bottom of the software window shows the selected function's details, including its name "M+FX5SSC_JOG_01A1" and a brief description in Japanese: "JOG運転/インテグレーション運転を行います。"

3.1 프로그램 작성

● Jog 동작 프로그램 : Module FB 설정 / 동작 / 결과

The screenshot displays the MELSOFT GX Works3 interface for a ladder logic program. The main workspace shows a network with a call to the `M+FX5SSC_JOG_01A` module. The call includes parameters for execution command (`bJogOperationCmd`), target axis (`K1`), and speed (`K5000`). A red box highlights the output signal `bJogOk`, which is labeled as the jog completion output.

Annotations on the left side of the screen identify key elements:

- ✓ JOG 동작 실행 지령 (JOG operation execution command)
- ✓ Jog Forward 지령 (Jog Forward command)
- ✓ Jog Reverse 지령 (Jog Reverse command)
- ✓ Jog 속도 지령 (Jog speed command)
- ✓ Jog 결과 출력 (Jog completion output)

The right-hand panel shows the `Module Label` list for `FX5-40SSC-G(S)`, with `M+FX5SSC_JOG_01A` selected. The description for this module is "JOG/inching operation".

3.2 Axis 모니터링

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



Axis Monitor

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

Module Information List

- PLC ready(Y0)
- READY(X0)
- Synchronization flag(X1)
- All axes servo ON(Y1)
- Md.108:Servo status 1 : READY ON
- Md.108:Servo status 1 : Servo ON
- Md.50:Forced stop input(U0WG4231)
- BUSY
- Md.31:Status : Error detection
- Md.31:Status : Axis warning detection
- Md.1:In test mode flag(U0WG4000)
- Md.133:Operation cycle over flag(U0WG4239)
- Md.64:Network error No.(U0WG31504)
- Md.132:Operation cycle setting(U0WG4238)
- Md.134:Operation time(U0HG4008)
- Md.135:Maximum operation time(U0WG4009)
- Md.19:Number of write accesses to flash ROM(U0WG...
- Md.52:Communication between amplifiers axes search...
- Md.131:Digital OSC. running flag(U0WG4011)

[동작 확인 : ON 시 녹색]

- ✓ Synchronization flag(X1) : CPU - Motion Module 간 연결 가능 상태
- ✓ PLC Ready(Y0) : Motion Module 활성화 지시
- ✓ READY(X0) : Motion Module 제어 가능 상태
- ✓ All axes servo ON(Y1) : 모든축 Servo ON 지시

3.3 Axis 동작 확인

- Jog 동작 - 설정 및 이동 (Jog 동작 가능 확인 : FX5SSC_1.stnAxMntr_D[0].uServoStatus1_D.1 → TRUE)

Program 방식(Ladder, Label)

bSetJogSpeed,
 bSetJogSpeedLimit,
 bSetJogAccel,
 bSetJogDesel
 ON/OFF로 값 설정

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

Jog 동작 확인
 bJogMoveCW : ON → CW회전, OFF → 정지
 bJogMoveCCW : ON → CWW회전, OFF → 정지

Watch 방식

Watch 1[Watching]

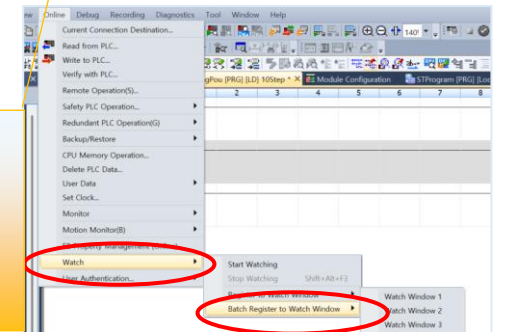
ON OFF ON/OFF toggle Update Clear All

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

✓ Jog 동작을 위한 라벨 등록

[동작 확인]

- ✓ Jog Speed/SpeedLimit/Accel/Decel에는 위와 같은 값으로 키인
- ✓ Jog 동작 확인
 ...uStartForwardJOG_D : 1 → CW회전, 0 → 정지
 ...uStartReverseJOG_D : 1 → CWW회전, 0 → 정지



3.3 Axis 동작 확인

- Jog 동작 : 정지 → 이동

1[U1]:FX5-40SSC-G(S) - Axis Monitor

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

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

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

Module Information List

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

JOG 동작

1[U1]:FX5-40SSC-G(S) - Axis Monitor

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

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

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

Module Information List

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

부 록

[부록1] 원점복귀 방법

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



Fast Accurate Smooth Motion

스마트 팩토리 구축 가속화를 위한

CC-Link *IE* TSN

Ezi-SERVO[®] **25**th ANNIVERSARY
2001-2026
Closed Loop Stepping System

Ezi-STEP[®]
Micro Stepping System

Ezi-POS[®]
Servo Control System

Ezi-SPEED[®]
BLDC Motor Speed Control System

Ezi-ROBO[®]
Precise Actuator System

Ezi-IO[®]
Network Input/Output