



プログラマブルコントローラ
MELSEC iQ-F
series



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

接続ガイド

MELSEC iQ-F series and **Ezi-SERVO**® CC-Link IE TSN
Closed Loop Stepping System **ALL**

三菱電機製品
FX5-40SSC-G(S)、FX5-80SSC-G(S)

FASTECH製品
Ezi-SERVO CC-Link IE TSN ALL

はじめに

- 当社製品をご利用いただきありがとうございます。
- Ezi-SERVO CC-Link IE TSN ALLは、32ビット高性能ARMプロセッサを搭載したドライバと各種モータで構成されるステッピングモータユニットであり、CC-Link IE TSNネットワークにおいてリモート局として使用されます。
- Ezi-SERVO CC-Link IE TSN ALLは産業用製品です。他の用途には使用しないでください。これに違反して損害が発生した場合、当社では一切の責任を負いません。
- 当社が提供するこの接続ガイドは、三菱電機製MELSEC iQ-F FX5-SSC-GIにEzi-SERVO CC-Link IE TSN ALLを接続する方法を案内する資料であり、CSP+ファイル登録とシステム構成、パラメータ設定、プログラム方法などを説明します。
- PLCプログラムを作成する前に、この接続ガイドを必ずお読みいただき、内容を正確にご理解いただいた上で製品を正しくご使用ください。
- 本接続ガイドは予告なく変更される場合があります。最新版が必要な場合は、当社のCC-Link IE TSNホームページ (<https://cltsn.fastech-motions.com/jp>)をご参照ください。

マニュアル情報

- Ezi-SERVO CC-Link IE TSN ALL マニュアルは、FASTECHのホームページからダウンロードできます。

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

マニュアル名称	マニュアル番号
[マニュアル][CC-Link IE TSN][Ezi-SERVO ALL] Closed Loop Stepping System	
[接続ガイド][CC-Link IE TSN][MELSEC iQ-F FX5-SSC-G][Ezi-SERVO ALL]	

- MELSEC iQ-F FX5-SSC-G マニュアルは三菱電機ホームページからダウンロードできます。

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

マニュアル名称	マニュアル番号
MELSEC iQ-F FX5モーションユニット／シンプル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-0300250
MELSEC iQ-F FX5モーションユニット／シンプルモーションユニット ユーザーズマニュアル(応用編)	IB-0300252
MELSEC iQ-F FX5 モーションユニット／シンプルモーションユニット ユーザーズマニュアル（アドバンス同期制御編）	IB-0300254
MELSEC iQ-F FX5 モーションユニット ユーザーズマニュアル(CC-Link IE TSN編)	IB-0300567
GX Works3 オペレーティングマニュアル	SH-081214

用語

- 接続ガイドで使用する用語に関する内容です。

用語	内容
CC-Link IE TSN	標準イーサネット仕様を拡張した「TSN（Time-Sensitive Networking）」を採用し、リアルタイム性を確保した制御と他のオープンネットワークの情報を同時に処理できるオープンネットワークです。
マスタ局（マネージャ局）	ネットワーク全体を管理する局で、すべての局とサイクリック伝送およびトランジェント伝送を行うことができます。MELSEC iQ-F FX5 モーションモジュールがこれに該当します。
リモート局	ビット単位の入出力信号とワード単位の入出力データをサイクリック伝送する局で、トランジェント伝送も可能です。Ezi-SERVO CC-Link IE TSN ALLがこれに該当します。
PDO	Process Data Objectの略称です。複数のCANopenノード間で周期的に転送されるアプリケーションオブジェクトの集合体です。
オブジェクト	CANopenに対応するデバイス局が保有する様々なデータです。

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1. 概要

1-1. 概要

● MELSEC iQ-F FX5-SSC-GとEzi-SERVO CC-Link IE TSN ALL接続ガイド

◆ マスタ局: FX5-40SSC-G(S) / FX5-80SSC-G(S)

PLCopen® Motion Control FB(Function Block)

- 国際標準仕様である PLCopen Motion Control FB ライブラリを使用して、制御プログラムを簡単に作成できます。
- このプログラムは、第三者も内容を容易に把握できるため、設計および保守の時間を大幅に短縮できます。

◆ エンジニアリングソフトウェア

- GX Works3: Ver. 1.105K 以上
- モーション制御設定機能: Ver. 1.055H 以上

※ 最新のファイルについては、三菱電機ホームページをご覧ください。

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

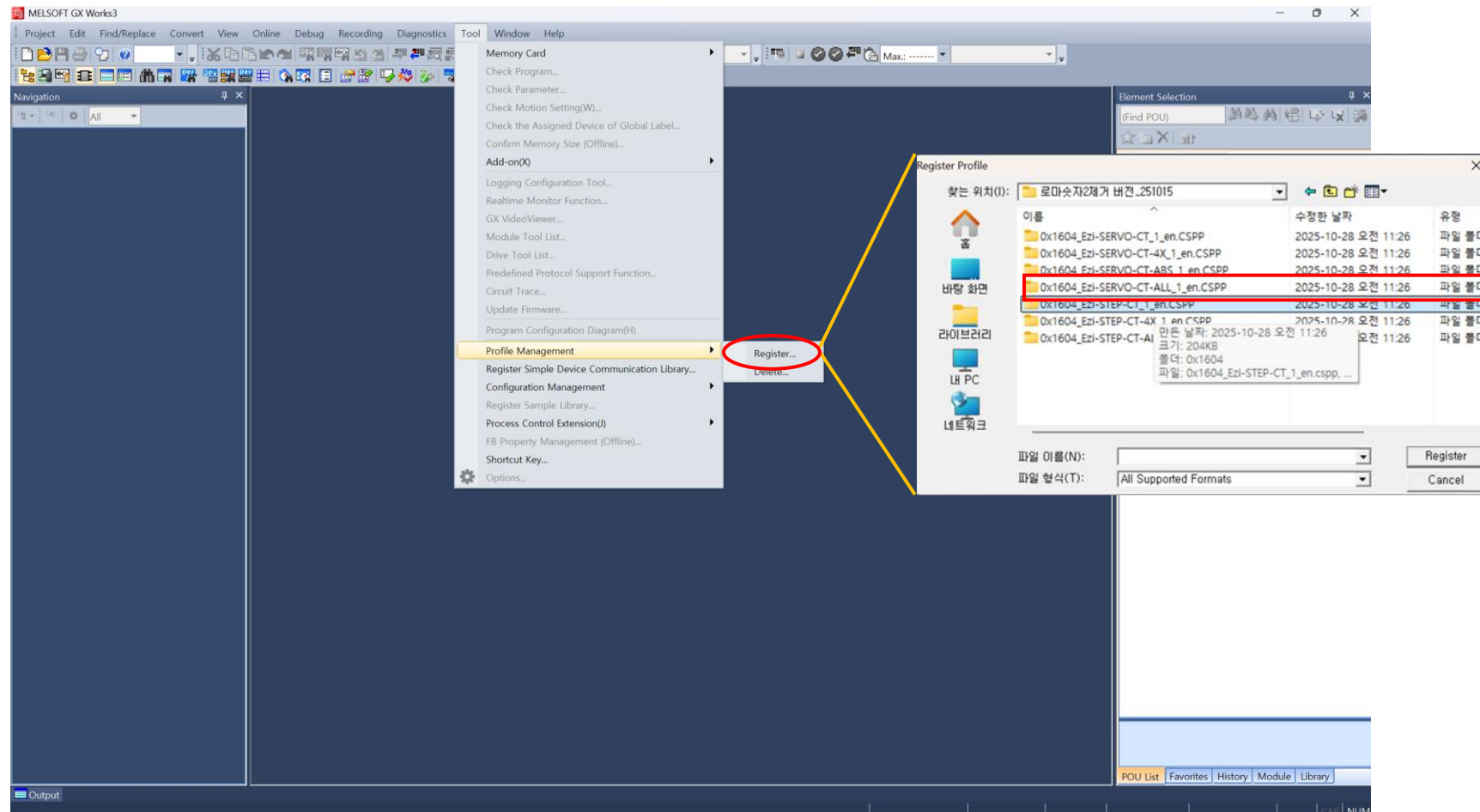
◆ リモート局: Ezi-SERVO CC-Link IE TSN ALL

- ダウンロードアドレス: <https://cltsn.fastech-motions.com/jp/download/quick>
- ファイル名: 0x1604_Ezi-SERVO-CT-ALL_1_en_CSPP

1-2. Ezi-SERVO CC-Link IE TSN ALL CSP+ ファイル登録

● CSP+ 登録

- [GX Works3] Tool / Profile Management / Register ※ プロジェクトを開く前にのみ登録できます。



1-3. CC-Link IE TSN 構成

- ネットワーク接続



構成	品名	IPアドレス
①	エンジニアリングソフトウェア	GX Works3
②	CPUモジュール	FX5U
③	モーションモジュール	FX5-40SSC-G(S)
④	ドライバ + モータ	Ezi-SERVO-CT-ALL-42S-A-R

1-3. CC-Link IE TSN構成

- Ezi-SERVO 仕様

項目		仕様
通信プロトコル		CC-Link IE TSN Class B
通信速度		1Gbps / 100Mbps
オペレーションモード		CiA402 ドライブプロファイル：サイクリック同期位置モード (CSP) / プロファイル位置モード (PP) / 原点復帰モード (HM)
同期方式	時刻同期方式	IEEE1588 / IEEE802.1AS
	通信周期	最小 250 μ s
	ネットワーク同期通信	同期通信 (CSP、PP、HM) / 非同期通信 (PP、HM)
エンコーダタイプ		インクリメンタルタイプ

1-4. 設定手順

● Ezi-SERVO、FX5 パラメータ設定

No	項目	内容
1	Ezi-SERVO設定 	ドライバ設定プログラム（Ezi-CT Manager）を使用してパラメータを設定します。設定プログラムと使用方法は、FASTECHのホームページからダウンロードしてください。 ※ アドレス: https://cltsn.fastech-motions.com/jp/download/quick
2	PLC FX5 CPU設定 	GX-Works3を使用してFX5 CPUモジュールのプロジェクトを作成した後、ユニットパラメータ（通信方式、接続対象）と軸パラメータ（モーション制御用）を設定します。
3	FX5 + Ezi-SERVO動作確認 	FX5 CPUモジュールとEzi-SERVOが正しく設定されていることを確認するためのプログラムを作成します。 ラベルを操作してモータが正常に動作するか確認します

1-4. 設定手順

● Ezi-SERVO設定に関する注意事項

項目	内容
IPアドレス設定	① ドライバのロータリースイッチで設定 ② ロータリースイッチ → '00'、IP address (Index: 2101h, Subindex: 01~04h)の値に設定
ドライバ原点復帰方法設定	① Homing method (Index: 6098h, Subindex:00h) 設定 - '0'(初期値) → '33' など原点復帰方法設定 ※ [付録1] 原点復帰方法参照 ② Home offset (Index: 607Ch, Subindex:00h) → '0' 設定が必要 注意) 0以外の値を設定すると、原点復帰完了時に急加速または急減速する場合があります。
リミット停止方法設定	① Limit stop method (Index:2003h, Subindex:00h) 設定 - 0: PP, HM → 急停止 / CSP → 停止しない - 1: PP, HM → 減速停止 / CSP → 停止しない ② '0'または'1'以外の値を設定すると、ハードウェアストロークリミットを検出する際に「1ED0H: ドライバエラー」が発生する可能性があります
インポジション範囲	① In-position range (インデックス:2B21h, サブインデックス:00h, データ型:Unsigned32) 設定 - 使用環境を考慮し、インポジション範囲 (5~20000パルス) 内の値を登録 ② [Md.102: 偏差カウンタ値]がこの設定値より小さい場合、[Md.108: サーボステータス1: インポジション]がONになります。このオブジェクトは公開しないことが原則ですので、FX5 CPUモジュールのサーボトランジェント伝送機能を利用して設定してください。

1-5. 制約事項

● モーション制御機能の制約事項 (FX5とEzi-SERVO)

項目	制約事項
速度制御	ドライバがサイクリック同期速度モード (CSV) をサポートしていないため、速度制御は使用できません。
トルク制御	ドライバはサイクリック同期トルクモード (CST) をサポートしていないため、トルク制御は使用できません。
押当て制御	MELSERVOのみ押当て制御をサポートしているため、押当て制御は使用できません。
アドバンス同期制御	[Pr.320 : 同期エンコーダ軸種別]に「サーボアンプ経由同期エンコーダ」を設定できません。
トルク制限機能	ドライバが以下のオブジェクトをサポートしていないため、トルク制限機能を使用できません。 ・ Positive torque limit value (Index:60E0h, Subindex:00h) ・ Negative torque limit value (Index:60E1h, Subindex:00h)
絶対位置システム	エンコーダが増分型であるため、絶対位置システムを使用できません。
仮想サーボアンプ機能	MR-J5-Gでエミュレートされます。
マーク検出機能	[Pr.800: マーク検出信号設定]でドライバのTPR1(タッチプローブ1)を使用できません。
任意データモニタ機能	任意データモニタ機能を使用する場合、[Pr.91～94 : 任意データモニタデータ種類設定 1～4] および [Pr.591～594 : 任意データモニターデータ種類拡張設定 1～4] に、モニタリングするオブジェクトを設定してください。初期値は「0 : 未設定」です。したがって、[Md.109～112 : 任意データモニター出力 1～4] は「0」になります。

1-5. 制約事項

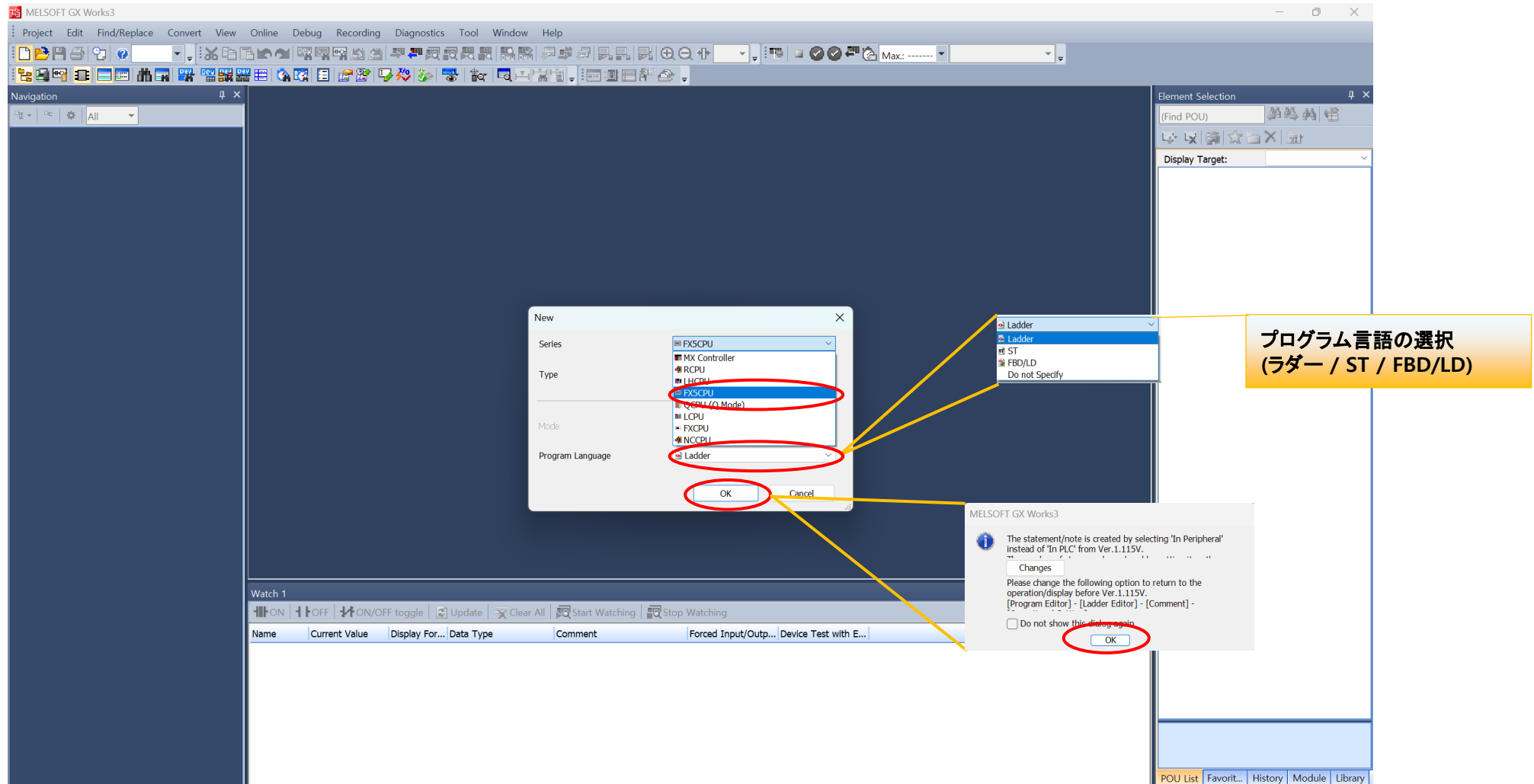
● モーション制御機能の制約事項 (FX5およびEzi-SERVO)

項目	制約事項
Md.103: モータ回転数	ドライバが「SI unit velocity (インデックス : 60A9h、サブインデックス : 00h)」をサポートしていないため、パルス/秒単位でモータ回転数を出力します。
Md.104: モータ電流値	ドライバが「Torque actual value (インデックス : 6077h、サブインデックス : 00h)」をサポートしていないため、常時「0」と表示されます。
Md.108: サーボステータス 1	モニターデータのうち、以下のビットは常時「OFF」状態です。 ・ゲイン切換え中 (b4) ・フルクロード制御切換え中(b5) ・トルク制限中(b13) ・絶対位置消失中 (b14) ・警告中(b15)
Md.119: サーボステータス 2	モニターデータのうち、以下のビットは常時「OFF」状態です。 ・零点通過(b0) ・零速度中(b3) ・速度制限中(b4) ・PID制御中(b8)
Md.115: サーボアラーム詳細番号	サポートされていません。このモニターデータは常時「0」と表示されます
Cd.108: ゲイン切換え指令フラグ	サポートされていません。MELSERVOのみがこのデータに対応します。
Cd.133: セミ・フル切換え要求	サポートされていません。MELSERVOのみがこのデータに対応します。
Cd.136: セミ・フル切換え要求	サポートされていません。MELSERVOのみがこのデータに対応します。

2. FX5-40SSC-G(S) 設定

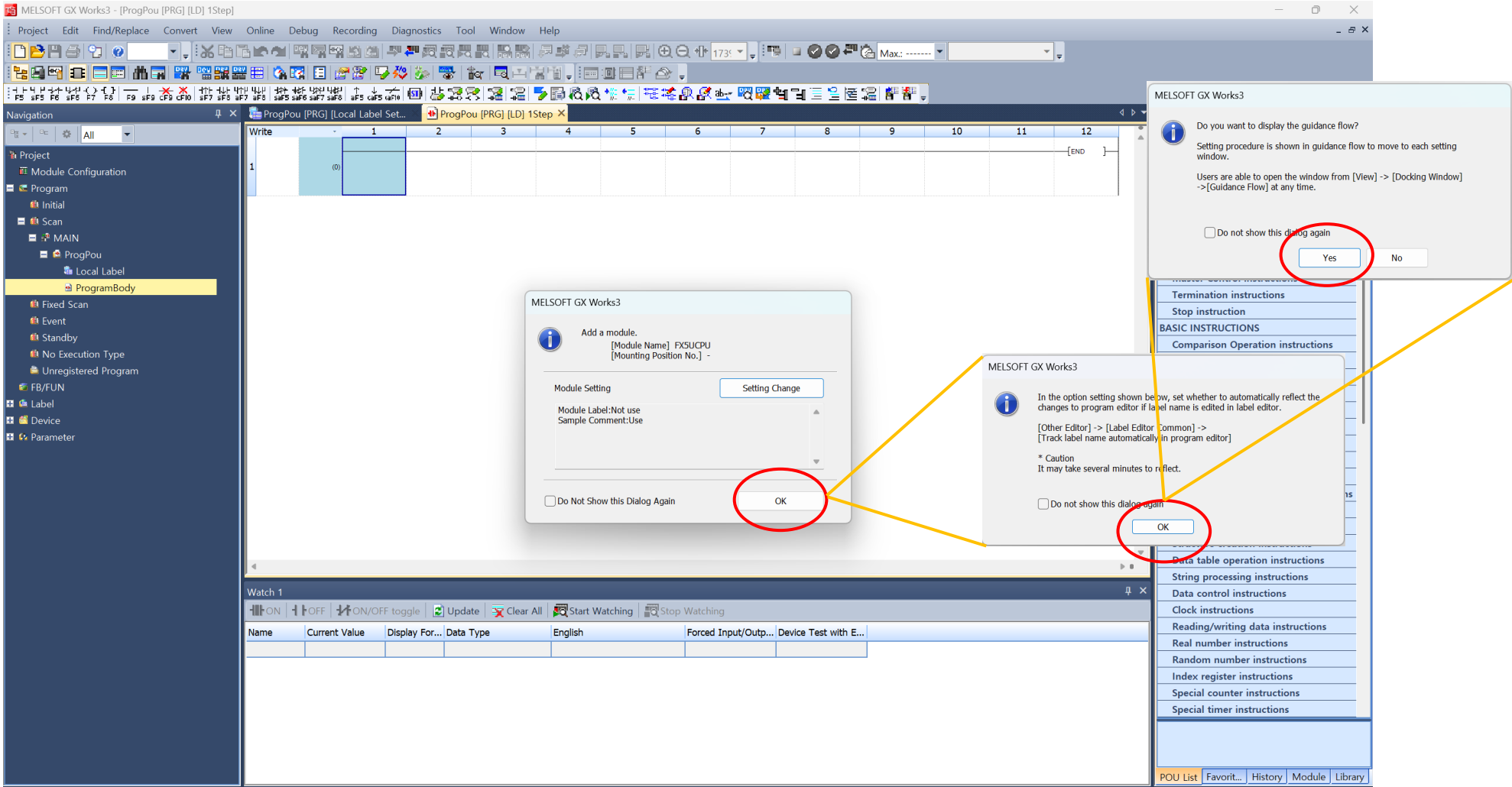
2-1. プロジェクトの作成

- 新規プロジェクト作成時にiQ-F FX5、モデル名、使用軸数、プログラム言語を選択



2-2. モジュール登録

- FX5U CPU登録



2-3. モジュール構成 – H/W

- マウスでクリック&ドラッグしてFX5-40SSC-G(S)をインストール

The screenshot shows the MELSOFT GX Works3 interface with the 'Module Configuration' window open. The 'Navigation' pane on the left shows the project structure, with 'Module Configuration' highlighted. The main workspace shows a CPU module and a slot for a new module. The 'Element Selection' pane on the right lists various modules, with 'FX5-40SSC-G(S) 4 axes CC-Link IE TSN' selected. A yellow callout box with the text '[クリック&ドラッグ] 1. FX5UCPUが生成されます。 2. FX5-40SSC-G(S)' points to the slot where the module is being installed. A red circle with the number '1' points to the 'Module Configuration' tab in the 'Navigation' pane. A red circle with the number '2' points to the selected module in the 'Element Selection' pane. A dialog box in the bottom left corner contains the following text: 'MELSOFT GX Works3', 'When you finish editing Module Configuration, fix the parameters to reflect to their respective functions.', 'Do not show this dialog again.', 'You are able to change this setting through the Options menu.', and an 'OK' button.

1

2

[クリック&ドラッグ]
1. FX5UCPUが生成されます。
2. FX5-40SSC-G(S)

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

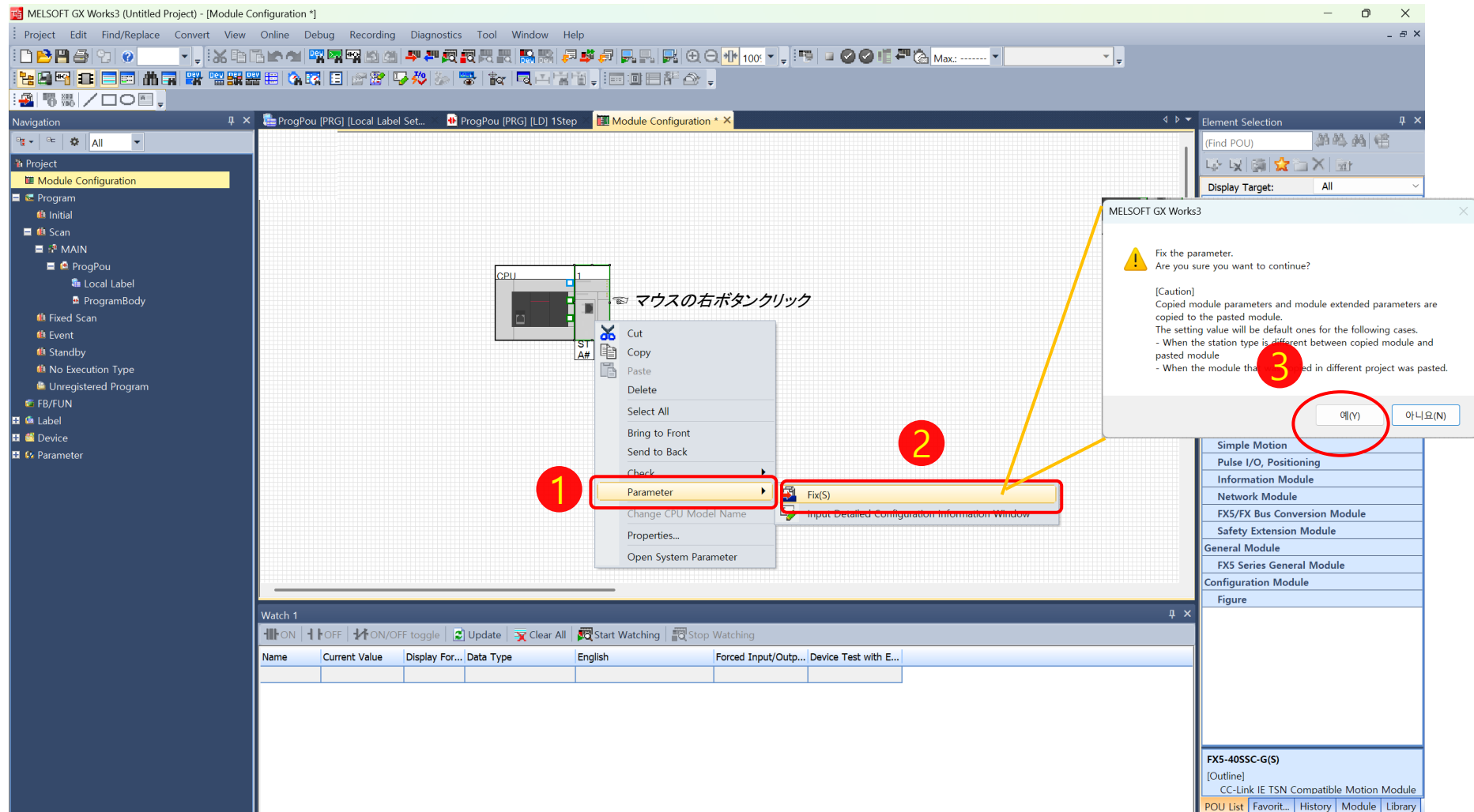
Watch 1

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

FX5-40SSC-G(S)
[Outline]
CC-Link IE TSN Compatible Motion Module
POU List | Favorit... | History | Module | Library

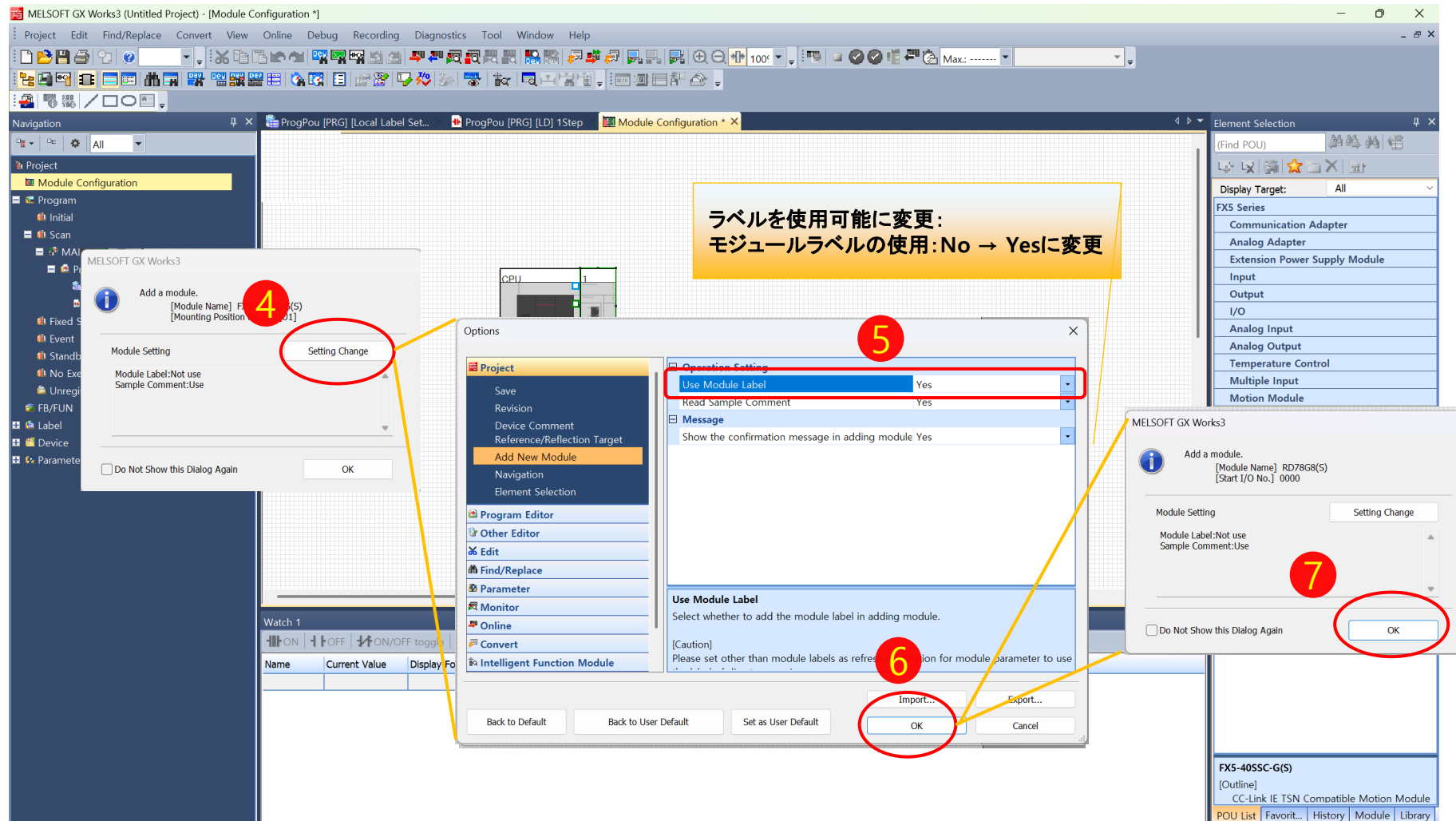
2-3. モジュール構成 – H/W

- マウスの右ボタンをクリックし、Fix(S)を選択してモジュール構成を完了 (1/2)



2-3. モジュール構成 – H/W

- マウスの右ボタンをクリックし、Fix(S)を選択してモジュール構成を完了 (2/2)



2-4. パラメータ / モジュール情報 / 1[U1]:FX5-40SSC-G(S)

- ステーション番号/IPアドレス設定: 例) IP Address → 192.168.3.253

The screenshot shows the MELSOFT GX Works3 interface for configuring a 1[U1]:FX5-40SSC-G(S) module. The configuration is divided into three main sections:

- 1. Project Tree (Left):** The 'Module Information' folder is expanded, and the '1[U1]:FX5-40SSC-G(S)' module is selected.
- 2. Station No./IP Address Setting (Main):** The 'Station No./IP Address Setting' tab is active. The 'Network No.' is set to 1, and the 'IP Address' is set to 192.168.3.253. The 'Subnet Mask' is set to 255.255.255.0.
- 3. Apply Button (Bottom Right):** The 'Apply' button is highlighted, indicating the configuration is being saved.

Network Settings Summary:

- Station Type: Master Station
- Network No.: 1
- IP Address: 192.168.3.253
- Subnet Mask: 255.255.255.0

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)

Watch Window (Bottom): The 'Watch 1' window is visible, showing a table with columns: Name, Current Value, Display For..., Data Type, English, Forced Input/Outp..., and Device Test with E....

2-4. パラメータ / モジュール情報 / 1[U1]:FX5-40SSC-G(S)

● ネットワーク設定

The screenshot displays the MELSOFT GX Works3 interface with the following components and annotations:

- Navigation Pane (Left):** A tree view showing the project structure. The 'Module Information' folder is expanded, and the '1[U1]:FX5-40SSC-G(S)' module is selected. A red circle with the number '1' is placed over this selection.
- Setting Item List (Middle-Left):** A list of configuration items. 'Network Configuration Settings' is highlighted with a red box and a red circle with the number '2'.
- Setting Item (Middle-Right):** The 'Network Configuration Settings' dialog box is open. The 'Detailed Setting' button is highlighted with a red box and a red circle with the number '3'. A red arrow points from this button to the 'CC-Link IE TSN Configuration' dialog box.
- CC-Link IE TSN Configuration (Bottom-Middle):** A dialog box for configuring the CC-Link IE TSN network. It shows a table with columns for No., Model Name, STA#, and Station Type. The STA# is set to 0, and the Station Type is Master Station. A green box highlights the STA# and Station Type fields.
- Module List (Bottom-Right):** A list of modules available for selection. The 'General CC-Link IE TSN Module' is selected.
- Watch Window (Bottom):** A table for monitoring variables. It has columns for Name, Current Value, Display For..., Data Type, English, Forced Input/Outp..., and Device Test with E... The table is currently empty.

Additional annotations include a red line connecting the 'Detailed Setting' button to the 'CC-Link IE TSN Configuration' dialog box, and a red circle with the number '1' around the 'Module Information' folder in the Navigation Pane.

2-4. パラメータ / モジュール情報 / 1[U1]:FX5-40SSC-G(S)

- CC-Link IE TSN モジュールを手動(クリック&ドラッグ)で構成

CC-Link IE TSN Configuration (Mounting Position No.: 1[U1])

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

Connected/Disconnected Module Detection Detailed Display

Mode Setting: Online (Unicast Mode) Assignment Method: Cycle Transmission Time (Min.): 50.00 us Communication Period Interval (Min.): 84.00 us

No.	Model Name	STA#	Station Type	Motion Control Station	RX Setting Points	RY Setting Points	RWr Setting Points	RWw Setting Points	Parameter Automatic Setting	PDO Mapping Setting	IP Address	Subnet Mask
0	Host Station	0	Master Station								192.168.3.253	255.255.255.0
1	Ezi-SERVO-CT-ALL	1	Remote Station							<Detail Setting>	192.168.3.1	255.255.255.0

2

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

1. 192.168.3.1

※ IPアドレス変更後は、電源リセットが必要です。

1

マウスクリック&ドラッグ(繰り返し)

Module List

CC-Link IE TSN Selection Find Module My

- General CC-Link IE TSN Module
- CC-Link IE TSN Module (Mitsubishi Electric)
- 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. Ltd.)
- BLDC Servo Drive
- Closed-loop Step Drive
- Ezi-SERVO-CT Closed-Loop
- Ezi-SERVO-CT-4X Closed-Loop
- Ezi-SERVO-CT-ABS Closed-Loop
- Ezi-SERVO-CT-ALL Closed-Loop
- Open-loop Step Drive
- Speed Control

[参考] Ezi-SERVO CC-Link IE TSN ALL IP Address設定 16進数 ロータリースイッチ

(x16) (x1)

Host Station STA#0

STA#0 Master Station Total STA#1:1 Line/Star

Ezi-SERVO-CT-ALL

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

2-4. パラメータ / モジュール情報 / 1[U1]:FX5-40SSC-G(S)

- CC-Link IE TSN モジュールをモーションコントロールステーションおよび同期選択

CC-Link IE TSN Configuration (Mounting Position No.: 1[U1])

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

Mode Setting: Online (Unicast Mode) Assignment Method:
Cyclic Transmission Time (Min.): 50.00 us Communication Period Interval (Min.): 84.00 us

No.	Model Name	STA#	Station Type	Motion Control Station	RX Setting	RY Setting	RWr Setting	RWw Setting	Parameter Automatic Setting	PDO Mapping Setting	IP Address	Subnet Mask
0	Host Station	0	Master Station								192.168.3.253	255.255.255.0
1	Ezi-SERVO-CT-ALL	1	Remote Station	☒						<Detail Setting>	192.168.3.1	255.255.255.0

1

Motion Control Station - チェック(マウスクリック)

Module List

CC-Link IE TSN Selection Find Module My 4

- General CC-Link IE TSN Module
- CO-Link IE TSN Module (Mitsubishi Electr
- 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
- CO-Link IE TSN Module (FASTECH Co. L
- BLDC Servo Drive
- Closed-loop Step Drive
 - Ezi-SERVO-CT Closed-Loop
 - Ezi-SERVO-CT-4X Closed-Loop
 - Ezi-SERVO-CT-ABS Closed-Loop
 - Ezi-SERVO-CT-ALL Closed-Loop
- Open-loop Step Drive
- Speed Control

[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

2-4. パラメータ / モジュール情報 / 1[U1]:FX5-40SSC-G(S)

- PDOマッピング設定は以下のように自動的に割り当てられ設定されます。

■ TPDO

Index	Sub index	データ Type	内容
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	内容
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. パラメータ / モジュール情報 / 1[U1]:FX5-40SSC-G(S)

- CC-Link IE TSNモジュールをMotion Control StationおよびSynchronous選択

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

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

Mode Setting: Online (Unicast Mode) Assignment Method:

Station No.	Station Name	Station Type	Communication Period Interval (Min.)	Points	Points	R/W Setting	R/W 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-SERVO-CT-ALL	Remote Station				16	16		<Detail Setting>	192.168.3.2	255.255.255.0

クリックすると即時反映

Module List

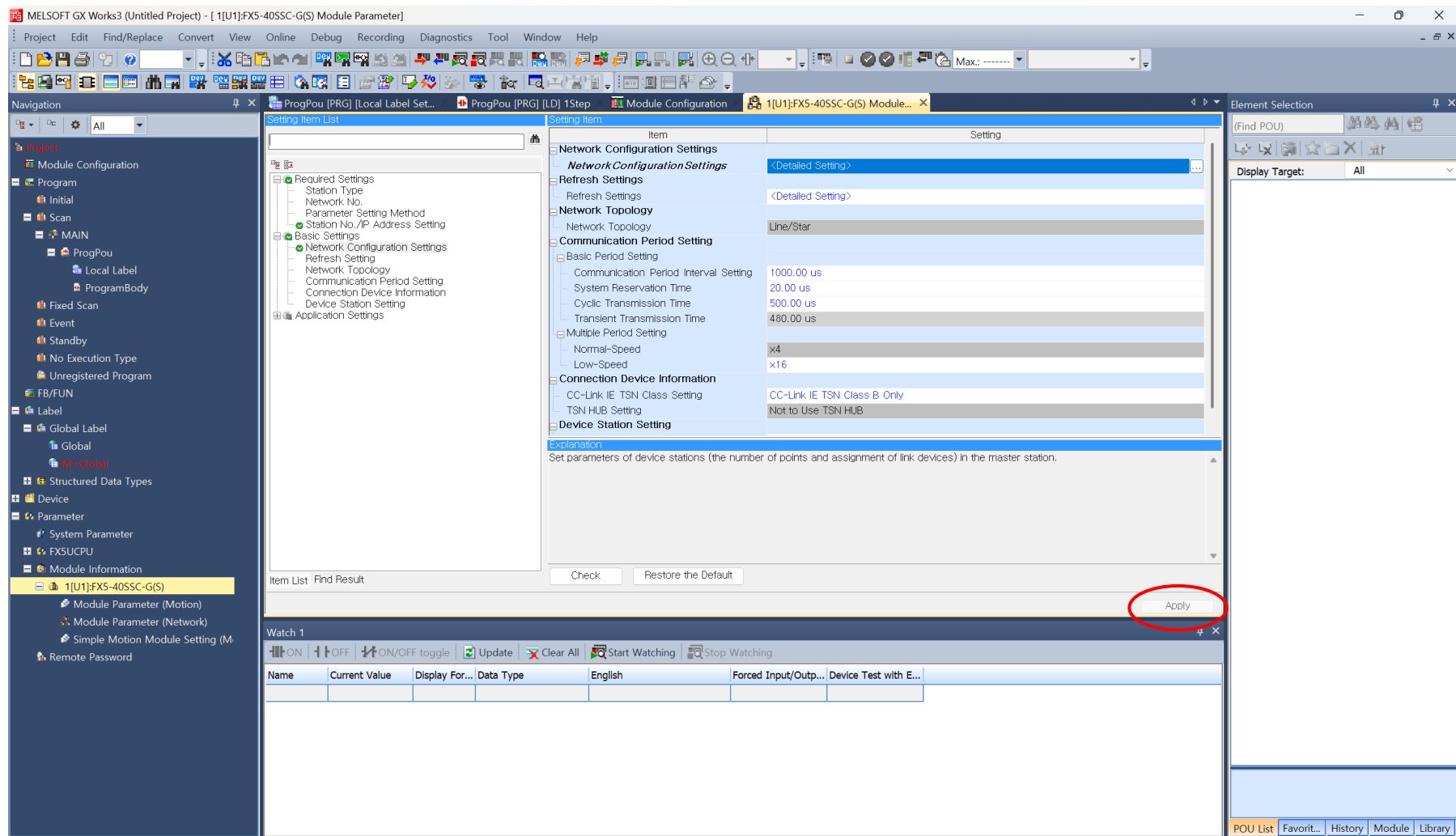
CC-Link IE TSN Selection Find Module My 4

- General CC-Link IE TSN Module
- CO-Link IE TSN Module (Mitsubishi Electr
- Master/Local Module
- Motion Module
- GOT3000 Series
- GOT2000 Series
- General-Purpose AC Servo
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 - Ezi-SERVO-CT-ABS Closed-Loop
 - Ezi-SERVO-CT-ALL Closed-Loop
- Open-loop Step Drive
- Speed Control

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

2-4. パラメータ / モジュール情報 / 1[U1]:FX5-40SSC-G(S)

● ネットワーク構成設定の適用



2-4. パラメータ / モジュール情報 / 1[U1]:FX5-40SSC-G(S)

- シンプルモーションモジュール設定プログラムの実行

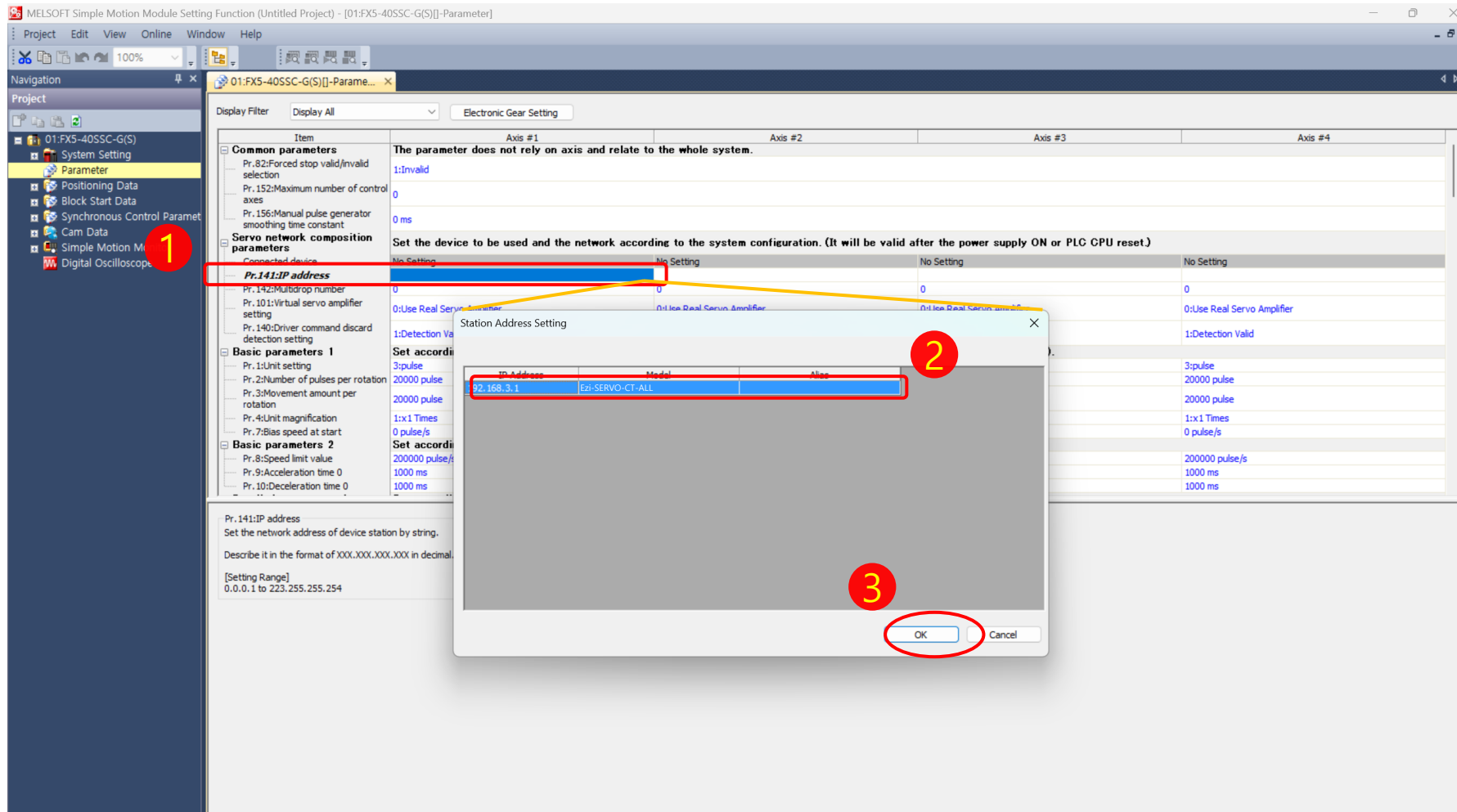
1

The screenshot displays the MELSOFT GX Works3 software interface. The left sidebar shows the project tree with the 'Simple Motion Module Setting (M)' option highlighted under the 'Module Parameter' section. The main window shows the 'Simple Motion Module Setting Function' dialog box. The 'Display Filter' is set to 'Electronic Gear Setting'. The 'Common parameters' section includes 'Pr. 82: Forced stop valid/invalid selection' (set to 1: Invalid) and 'Pr. 152: Maximum number of control axes' (set to 0). The 'Servo network composition parameters' section includes 'Connected device' (No Setting), 'Pr. 141: IP address' (0), 'Pr. 142: Multidrop number' (0), and 'Pr. 101: Virtual servo amplifier address' (0). The 'Basic parameters 1' section includes '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
Common parameters	The parameter does not rely on axis and relate to the whole system.			
Pr. 82: Forced stop valid/invalid selection	1: Invalid			
Pr. 152: Maximum number of control axes	0			
Pr. 156: Manual pulse generator smoothing time constant	0 ms			
Servo network composition parameters	Set the device to be used and the network according to the system configuration. (It will be valid after the power supply ON or PLC CPU reset.)			
Connected device	No Setting	No Setting	No Setting	No Setting
Pr. 141: IP address	0	0	0	0
Pr. 142: Multidrop number	0: Use Real Servo Amplifier	0: Use Real Servo Amplifier	0: Use Real Servo Amplifier	0: Use Real Servo Amplifier
Pr. 101: Virtual servo amplifier address	0: Use Real Servo Amplifier	0: Use Real Servo Amplifier	0: Use Real Servo Amplifier	0: Use Real Servo Amplifier
Basic parameters 1	Set according to the machine and applicable motor when system is started up (It will be valid according to PLC ready signal).			

2-5. シンプルモーションモジュール設定

- パラメータ / サーボネットワーク構成パラメータ / Pr.141:IP Address設定



2-5. シンプルモーションモジュール設定

● パラメータ / 基本パラメータ 1 / Pr.7: 起動時のバイアス速度(500パルス/秒) 設定

MELSOFT Simple Motion Module Setting Function (Untitled Project) - [01:FX5-40SSC-G(S)]-Parameter

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

Display Filter: Display All, Electronic Gear Setting

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

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

Setting Range
0 to 200000 pulse/s

起動時のバイアス速度: 500パルス/秒
※ モータに装着されたエンコーダの仕様に応じて設定を変更できます。

2-5. シンプルモーションモジュール設定

- パラメータ / HPRパラメータ / Pr.46:HPR速度(500パルス/秒)設定

MELSOFT Simple Motion Module Setting Function (Untitled Project) - [01:FX5-40SSC-G(S)]-Parameter

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

Display Filter: Display All | Electronic Gear Setting

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

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

Setting Range
1 to 200000 pulse/s

HPR速度: 500パルス/秒

※ バイアス速度(Pr.7)値よりもHPR速度(Pr.46)値が大きい場合、(1C15H:原点復帰速度エラー)が発生します。

2-5. シンプルモーションモジュール設定

● パラメータ / 基本パラメータ 1 / 1回転あたりのパルス数

The screenshot displays the MELSOFT Simple Motion Module Setting Function (Untitled Project) - [01:FX5-40SSC-G(S)]-Parameter window. The left sidebar shows the project tree with 'Parameter' selected. The main window displays the 'Electronic Gear Setting' dialog for Axis #1. The 'Entry' tab is active, showing the 'Machine Components' dropdown set to 'Others', 'Unit Setting' set to '3:pulse', and 'Movement Amount per Load Rotation (dSL)' set to 10000 [pulse]. The 'Encoder Resolution' is set to 10000 [pulse]. The 'Calculation Result' tab shows the calculated values: Unit Setting (3:pulse), Number of Pulses per Rotation (10000 pulse), Movement Amount per Rotation (10000 pulse), and Unit Magnification (1x1 Times). The 'OK' button is highlighted with a red circle and the number 5.

1. Select the parameter to be set (Pr. 2: Number of pulses per rotation).

2. Set the movement amount per rotation (dSL) to 10,000 pulses.

3. Set the encoder resolution to 10,000 pulses.

4. Click the 'Calculate Electronic Gear' button.

5. Click the 'OK' button to apply the settings.

✓ 負荷回転あたりの移動量(dSL) : 10,000パルス
✓ エンコーダ分解能: 10,000パルス

2-5. シンプルモーションモジュール設定

- パラメータ / HPRパラメータ / Pr.46:HPR速度(500パルス/秒)設定

MELSOFT Simple Motion Module Setting Function (Untitled Project) - [01:FX5-40SSC-G(S)]-Parameter

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

Project: 01:FX5-40SSC-G(S), System Setting, Parameter, Positioning Data, Block Start Data, Synchronous Control Parameter, Cam Data, Simple Motion Monitor, Module Monitor, Axis Monitor, Starting History, Position Value History, Digital Oscilloscope

Display Filter: Display All, Electronic Gear Setting

Item: Common parameters, Servo network composition, Basic parameters 1, Basic parameters 2, Detailed parameters 1

Axis #1: The parameter does not rely on axis and relate to...

Pr.2: Number of pulses per rotation (10000 pulse)

Electronic Gear Setting - Axis #1

Entry: Select the machine components, and enter the machine data to automatically set the basic parameters 1 (unit setting, number of pulses per rotation, movement amount per rotation and unit magnification).

Machine Components: Others

Unit Setting: 3:pulse

Movement Amount per Load Rotation (dSL): 10000 [pulse]

Reduction Ratio (NL/NM): 1 / 1

Calculate reduction ratio by teeth or diameters: Reduction Ratio Setting

Encoder Resolution: 10000 [pulse/rev]

Setting Range: []

When the encoder resolution is 67108864 pulses, the electronic gear (numerator / denominator) of the servo amplifier is rewritten with 16/1. Therefore, set the encoder resolution as 4194304 pulses.

Calculate Electronic Gear

Calculation Result

* 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

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.

Setting Range
1 to 200000000 pulse

2-5. シンプルモーションモジュール設定

● パラメータ / 基本パラメータ 2 / 速度制限値、加速時間 0、減速時間 0

MELSOFT Simple Motion Module Setting Function (Untitled Project) - [01:FX5-40SSC-G(S)]-Parameter

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

Display Filter: Display All | Electronic Gear Setting

Item	Axis #1	Axis #2	Axis #3	Axis #4
Common parameters The parameter does not rely on axis and relate to the whole system.				
Pr.82: Forced stop valid/invalid selection	1: Invalid			
Pr.152: Maximum number of control axes	0			
Pr.156: Manual pulse generator smoothing time constant	0 ms			
Servo network composition parameters Set the device to be used and the network according to the system configuration. (It will be valid after the power supply ON or PLC CPU reset.)				
Connected device	Ezi-SERVO-CT	Ezi-SERVO-CT		
Pr.141: IP address	192.168.3.1	192.168.3.50		
Pr.142: Multidrop number	0	0		
Pr.101: Virtual servo amplifier setting	0: Use Real Servo Amplifier	0: Use Real Servo Amplifier		
Pr.140: Driver command discard detection setting	1: Detection Valid	1: Detection Valid		
Pr.143: Driver communication setting	0: Driver Communication Invalid	0: Driver Communication Invalid		
Basic parameters 1 Set according to the machine and applicable motor when system is started up.				
Pr.1: Unit setting	3: pulse	3: pulse		
Pr.2: Number of pulses per rotation	10000 pulse	20000 pulse		
Pr.3: Movement amount per rotation	10000 pulse	20000 pulse		
Pr.4: Unit magnification	1x1 Times	1x1 Times		
Pr.7: Bias speed at start	500 pulse/s	500 pulse/s		
Basic parameters 2 Set according to the machine and applicable motor when system is started up.				
Pr.8: Speed limit value	500000 pulse/s	200000 pulse/s	200000 pulse/s	200000 pulse/s
Pr.9: Acceleration time 0	200 ms	1000 ms	1000 ms	1000 ms
Pr.10: Deceleration time 0	200 ms	1000 ms	1000 ms	1000 ms
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 amount	0 pulse	0 pulse	0 pulse	0 pulse
Pr.12: Software stroke limit upper limit value	2147483647 pulse	2147483647 pulse	2147483647 pulse	2147483647 pulse
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: Inout signal logic selection : Lower limit	0: Neogative Logic	0: Neogative Logic	0: Neogative Logic	0: Neogative Logic

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

Setting Range
1 to 1000000000 pulse/s

Speed limit value

Acceleration time 0

Deceleration time 0

2-5. シンプルモーションモジュール設定

- パラメータ / 詳細パラメータ 1 / FLS、RLS、DOG信号選択: 入力タイプ: 無効(仮)

設定終了後、ウィンドウを閉じると設定値が反映されます。

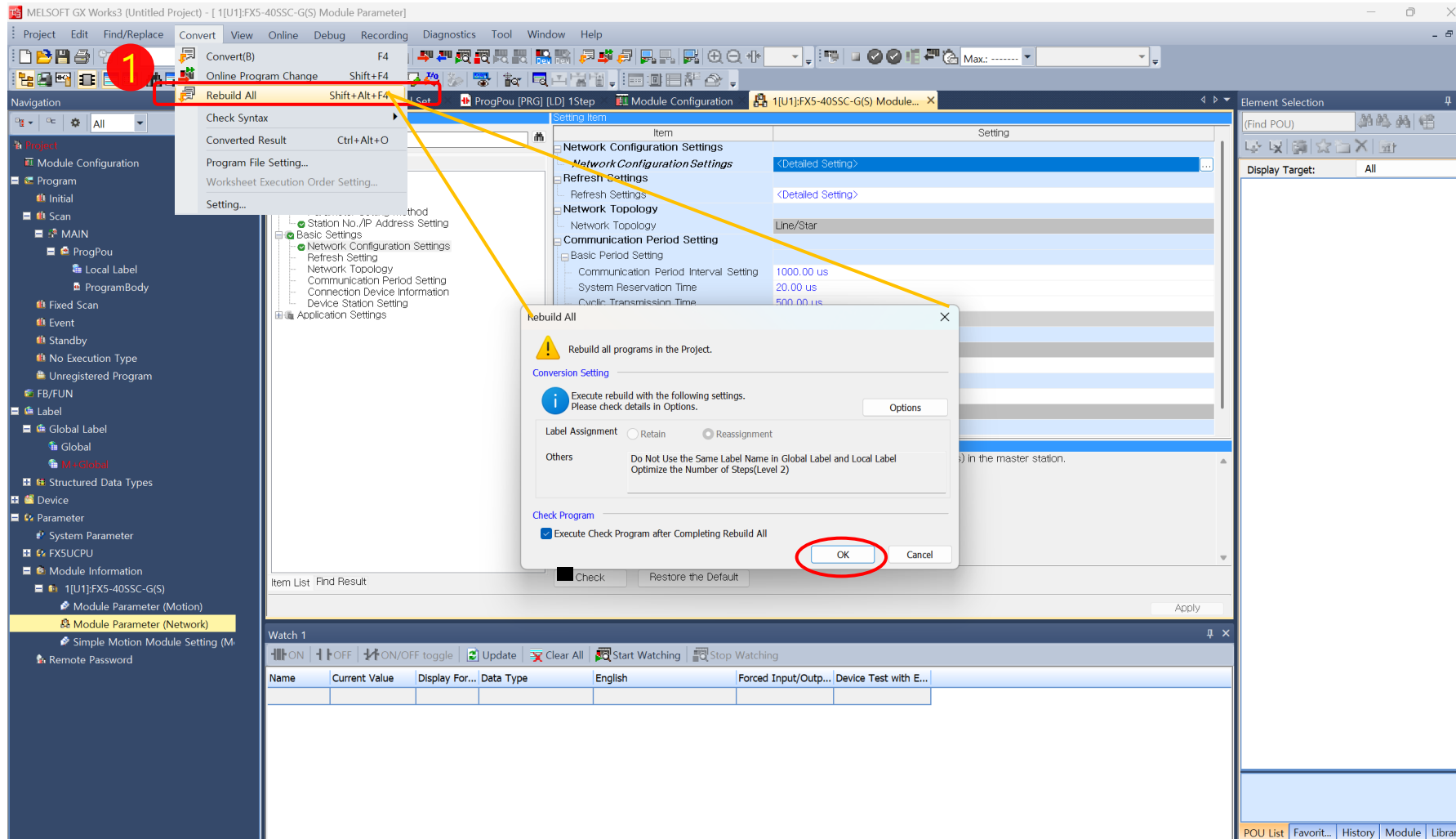
リミットセンサーを接続していない状態でEzi-SERVO動作テストを行うには、Pr.116、Pr.117、Pr.118をすべてInvalidに設定する必要があります。

Item	Axis #1	Axis #2	Axis #3	Axis #4
Pr. 13: Software stroke limit lower limit value	-2147483648 pulse	-2147483648 pulse	-2147483648 pulse	-2147483648 pulse
Pr. 14: Software stroke limit selection	0: Apply Software Stroke Limit on Command Position Value	0: Apply Software Stroke Limit on Command Position Value	0: Apply Software Stroke Limit on Command Position Value	0: Apply Software Stroke Limit on Command Position Value
Pr. 15: Software stroke limit valid/invalid setting	0: Valid	0: Valid	0: Valid	0: Valid
Pr. 16: Command in-position width	100 pulse	100 pulse	100 pulse	100 pulse
Pr. 17: Torque limit setting value	300.0 %	300.0 %	300.0 %	300.0 %
Pr. 18: M-code ON signal output timing	0: WITH Mode	0: WITH Mode	0: WITH Mode	0: WITH Mode
Pr. 19: Speed switching mode	0: Standard Speed Switching Mode	0: Standard Speed Switching Mode	0: Standard Speed Switching Mode	0: Standard Speed Switching Mode
Pr. 20: Interpolation speed designation method	0: Vector Speed	0: Vector Speed	0: Vector Speed	0: Vector Speed
Pr. 21: Command position value during speed control	0: Not Update of Command Position Value	0: Not Update of Command Position Value	0: Not Update of Command Position Value	0: Not Update of Command Position Value
Pr. 22: Input signal logic selection : Lower limit	0: Negative Logic	0: Negative Logic	0: Negative Logic	0: Negative Logic
Pr. 22: Input signal logic selection : Upper limit	0: Negative Logic	0: Negative Logic	0: Negative Logic	0: Negative Logic
Pr. 22: Input signal logic selection : Stop signal	0: Negative Logic	0: Negative Logic	0: Negative Logic	0: Negative Logic
Pr. 22: Input signal logic selection : External command/switching signal	0: Negative Logic	0: Negative Logic	0: Negative Logic	0: Negative Logic
Pr. 22: Input signal logic selection : Proximity dog signal	0: Negative Logic	0: Negative Logic	0: Negative Logic	0: Negative Logic
Pr. 81: Speed-position function selection	0: Speed-position Switching Control (PMC Mode)	0: Speed-position Switching Control (PMC Mode)	0: Speed-position Switching Control (PMC Mode)	0: Speed-position Switching Control (PMC Mode)
Pr. 116: FLS signal selection : Input type	15: Invalid	15: Invalid	1: Servo Amplifier	1: Servo Amplifier
Pr. 117: RLS signal selection : Input type	15: Invalid	15: Invalid	1: Servo Amplifier	1: Servo Amplifier
Pr. 118: DOG signal selection : Input type	15: Invalid	15: Invalid	1: Servo Amplifier	1: Servo Amplifier
Pr. 119: STOP signal selection : Input type	2: Buffer Memory	2: Buffer Memory	2: Buffer Memory	2: Buffer Memory
Detailed parameters 2	Set according to the system configuration when the system is started up (Set as required).	Set according to the system configuration when the system is started up (Set as required).	Set according to the system configuration when the system is started up (Set as required).	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).

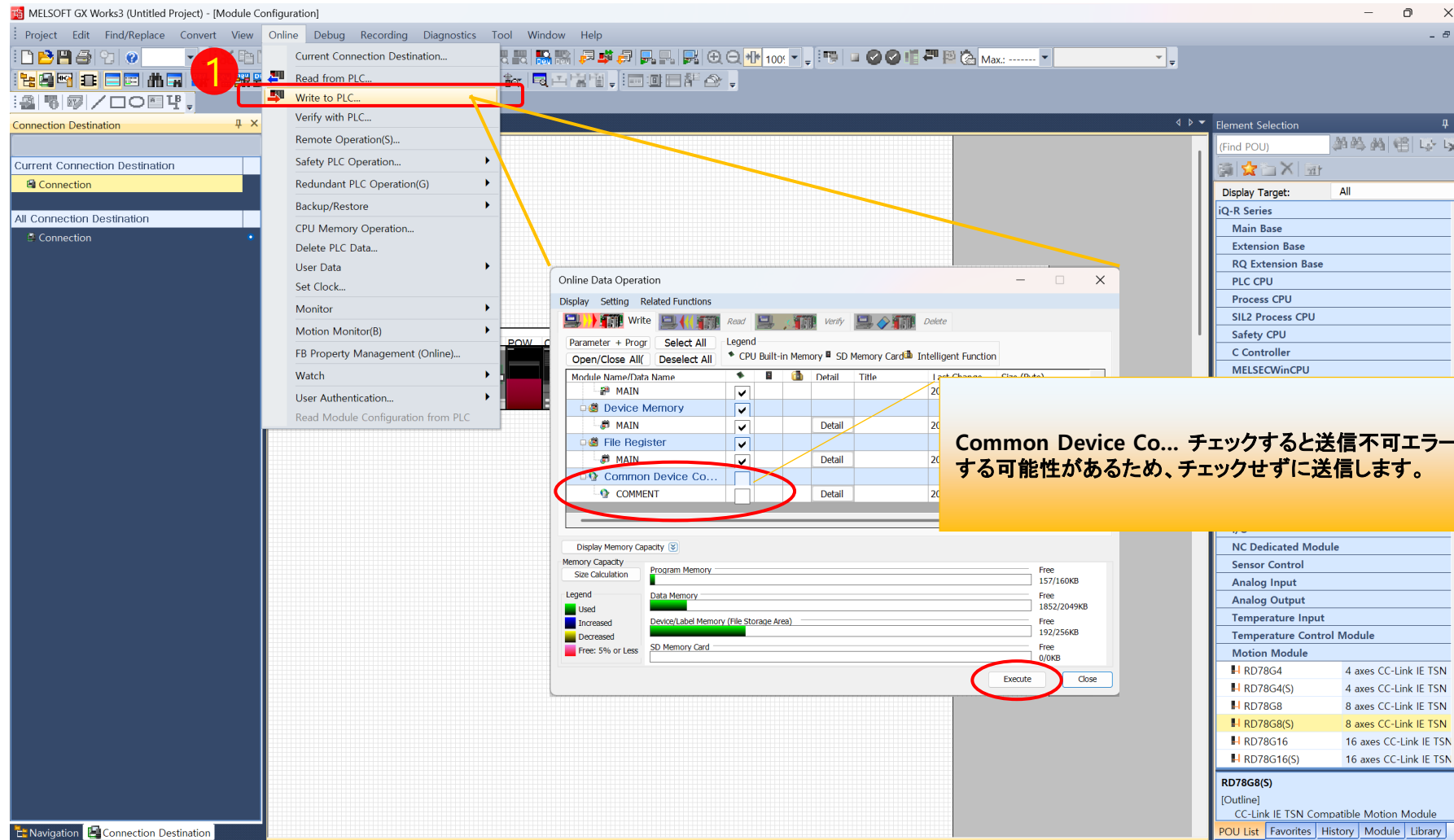
2-6. 変換

- すべて変換 / 再構築



2-7. PLCへの書込み

- オンラインデータ操作



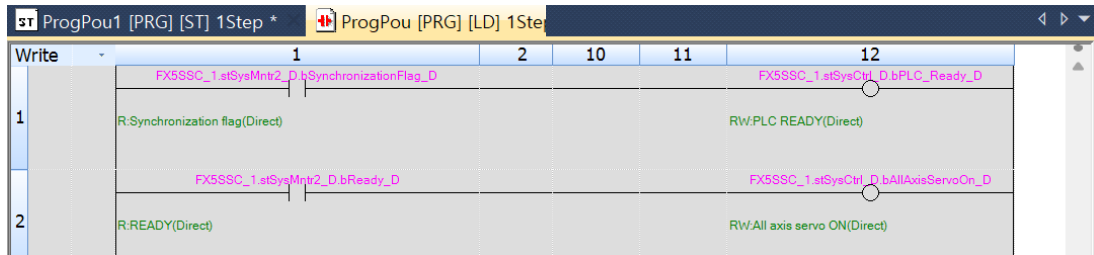
3. 動作確認

3.1 プログラム作成

● PLCモーションモジュール:準備完了／SERVO ON

ラベル(変数)方式

[ラダープログラム]



- ① シーケンスレディ信号 (FX5SSC_1.stSysCtrl_D.bPLC_Ready_D) : ON になると
- ② 同期用フラグ (FX5SSC_1.stSysMntr2_D.bSynchronizationFlag_D) : ON 要求
- ③ 準備完了信号 (FX5SSC_1.stSysMntr2_D.bReady_D) : ON になると
- ④ 全軸サーボ (FX5SSC_1.stSysCtrl_D.bAllAxisSERVO_ON_D) : SERVO ON 要求

ラベル(変数)方式

[STプログラム]

```
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 プログラム作成

● Jog 設定:速度、限界速度、加速時間、減速時間

The screenshot displays the MELSOFT GX Works3 interface for a ladder logic program. The main workspace shows a sequence of steps (1 to 7) with associated logic. Step 1 is labeled 'FXSSSC_1 atbSynch_D bPLC_Ready_D' and includes a comment '(0) RbPLC READY(Direct)'. Step 2 is labeled 'FXSSSC_1 atbSynch_D bReady_D' and includes a comment '(0) RbREADY(Direct)'. Step 3 is labeled 'bSetJogParam' and includes a comment '(12)'. Step 4 is labeled 'FXSSSC_1 atbJogSpeed_D' and includes a comment 'RWJOG speed(Direct)'. Step 5 is labeled 'FXSSSC_1 atbJogSpeedLimit_D' and includes a comment 'RWJOG speed limit value(Direct)'. Step 6 is labeled 'FXSSSC_1 atbJogAccDecTime_D' and includes a comment 'RWJOG acceleration time(Direct)'. Step 7 is labeled 'FXSSSC_1 atbJogDecTime_D' and includes a comment 'RWJOG deceleration time(Direct)'. The program ends with a comment '[END]'. The right-hand pane shows the 'Element Selection' window with a list of modules and functions, including 'FX5-40SSC-G(S)' and various positioning and speed control functions. The bottom status bar indicates the current module is 'M+FXSSSC_JOG_01A' and provides a description in Japanese: 'JOG運転 / インチング運転を行います。' (Perform JOG operation / inching operation).

3.1 プログラム作成

● Jog 動作プログラム: モジュールFB (MFX5SSC_JOG_01A1 クリック&ドラッグ)

MELSOFT GX Works3 C:\Work\카백선가이드\FX5.gx3 - [ProgPou [PRG] [LD] 43Step]

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

Navigation

Write

1 FXSSC_1 at bPLC_Ready_D

2 FXSSC_1 at bPLC_Ready_D

3 FXSSC_1 at bPLC_Ready_D

4 FXSSC_1 at bPLC_Ready_D

5 FXSSC_1 at bPLC_Ready_D

6 FXSSC_1 at bPLC_Ready_D

7 FXSSC_1 at bPLC_Ready_D

FB Instance Name

Local Label (ProgPou)

MFX5SSC_JOG_01A1

Register a FB instance at the last row.

✓ JOG 動作FB生成:OK

Element Selection

(Find POU)

All

Module Label

Module FB

FX5-40SSC-G(S)

M+FX5SSC_SetPositioningData_ Positioning data set

M+FX5SSC_StartPositioning_01A Positioning start FB

M+FX5SSC_JOG_01A JOG/inching operat

M+FX5SSC_MPG_01A Manual pulse gener

M+FX5SSC_ChangeSpeed_01A Speed change FB

M+FX5SSC_ChangeAccDecTime Acc./dec. time SV c

M+FX5SSC_ChangePosition_01A Target position cha

M+FX5SSC_Restart_01A Restart FB

M+FX5SSC_OperateError_01A Error operation FB

M+FX5SSC_InitializeParameter_0 Parameter Initializati

M+FX5SSC_WriteFlash_00A Flash ROM writing f

M+FX5SSC_ChangeTorqueContr Torque control moc

M+FX5SSC_ChangeSpeedContrc Speed control mod

M+FX5SSC_ChangePositionConti Position control mo

M+FX5SSC_ChangeContinuousTr Continuous torque

M+FX5SSC_Sync_01A Starting/ending syn

M+FX5SSC_ChangeSyncEncoder Sync encoder positi

M+FX5SSC_DisableSyncEncoder Sync encoder coun

M+FX5SSC_EnableSyncEncoder_ Sync encoder coun

M+FX5SSC_ResetSyncEncoderEr Sync encoder error

M+FX5SSC_ConnectSyncEncode Sync encoder Conn

M+FX5SSC_MoveCamReference Cam reference posi

M+FX5SSC_ChangeCamPositionl Cam position per c

M+FX5SSC_ChangeMainShaftGe MG Positon per cyc

M+FX5SSC_ChangeAuxiliaryShafl AG position per cyc

M+FX5SSC_MoveCamPositionPe Cam position per c

M+FX5SSC_MakeRotaryCutterCa Cam for rotary cutt

M+FX5SSC_CalcCamCommandP Cam command pos

M+FX5SSC_CalcCamPositionPerl Cam position per c

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 プログラム作成

● Jog 動作プログラム: モジュールFB設定／動作／結果

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

- Module Configuration:** A table at the top right lists modules: K50000, K200, and K200, each associated with a specific function block (FX5SSC_1) and its parameters.
- Ladder Logic:** The main workspace shows a ladder logic diagram with the following steps:
 - Step 1: A normally open contact labeled `bJogForwardReq` is connected to a coil labeled `M+FX5SSC_JOG_01A`.
 - Step 2: A normally open contact labeled `bJogReverseReq` is connected to a coil labeled `M+FX5SSC_JOG_01A`.
 - Step 3: A normally open contact labeled `bJogSpeedReq` is connected to a coil labeled `M+FX5SSC_JOG_01A`.
 - Step 4: A normally open contact labeled `bJogStatus` is connected to a coil labeled `M+FX5SSC_JOG_01A`.
 - Step 5: A normally open contact labeled `bJogOK` is connected to a coil labeled `M+FX5SSC_JOG_01A`.
 - Step 6: A normally open contact labeled `bJogErr` is connected to a coil labeled `M+FX5SSC_JOG_01A`.
- Annotations:** Four yellow callout boxes highlight specific parts of the program:
 - Jog 動作実行指令** (Jog operation execution command) points to the `M+FX5SSC_JOG_01A` coil.
 - Jog Forward指令** (Jog Forward command) points to the `bJogForwardReq` contact.
 - Jog Reverse指令** (Jog Reverse command) points to the `bJogReverseReq` contact.
 - Jog 速度指令** (Jog speed command) points to the `bJogSpeedReq` contact.
- Module FB Selection:** A panel on the right shows the selection of the `M+FX5SSC_JOG_01A` module from the `FX5-40SSC-G(S)` library.

3.2 軸モニタリング

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

FX5-40SSC-G(S)

READY ●

D LINK ●

SD/RD ●

1 [U1]:FX5-40SSC-G(S) - 軸モニター

Axis Monitor

Monitor Type: Axis (Output Axis) Font Size: 9pt Select Monitor Item Select Monitor Axis

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

	Axis #1
Md.20:Command position value	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

Axis No. 1 2 3 4 5 6 7

Md.108:Servo status 1 : Servo ON

Axis No. 1 2 3 4 5 6 7

Md.50:Forced stop input(U0WG4231)

BUSY

Axis No. 1 2 3 4 5 6 7

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(U0WG4000)

Md.133:Operation cycle over flag(U0WG4239)

Md.64:Network error No.(U0WG31504)

Md.132:Operation cycle setting(U0WG4238)

1006h:1.000ms

Md.134:Operation time(U0WG4008)

150 μs

Md.135:Maximum operation time(U0WG4009)

172 μs

Md.19:Number of write accesses to flash ROM(U0WG...

0 times

Md.52:Communication between amplifiers axes search...

Communication between set amplifier...

Md.131:Digital OSC. running flag(U0WG4011)

Stopped

[動作確認: ON時緑色]

- ✓ 同期フラグ(X1) : CPUモジュール - モーションモジュール間接続可能状態
- ✓ PLC Ready(Y0) : モーションモジュール起動指示
- ✓ READY(X0) : モーションモジュール制御可能状態
- ✓ 全軸SERVO ON(Y1) : 全軸SERVO ON指示

3.3 軸動作確認

- Jog 動作 – 設定および移動 (ジョグ動作可能確認 : FX5SSC_1.stnAxMntr_D[0].uServoStatus1_D.1 → TRUE)

プログラム方式(ラダー、ラベル)

✓ bSetJogSpeed,
bSetJogSpeedLimit,
bSetJogAccel,
bSetJogDesel
ON/OFFで設定値を設定

✓ Jog 動作確認
bJogMoveCW : ON → CW回転、OFF → 停止
bJogMoveCCW : ON → CCW回転、OFF → 停止

Instruction	Address	Comment
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)

Watch方式

Watch 1[Watching]

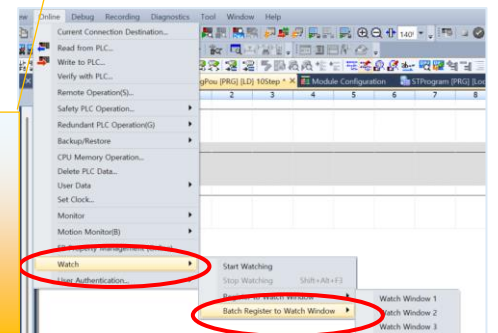
ON OFF ON/OFF toggle Update Clear All

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 動作のためのラベル登録

[動作確認]

- ✓ Jog Speed/SpeedLimit/Accel/Decelには上記のような値でキー入力
- ✓ ジョグ動作確認
...uStartForwardJOG_D : 1 → CW回転, 0 → 停止
...uStartReverseJOG_D : 1 → CCW回転, 0 → 停止



3.3 軸動作確認

● Jog 動作:停止 → 移動

1[U1]:FX5-40SSC-G(S) – 軸モニター

Axis Monit

Monitor Type: Axis (Output Axis) Font Size: 9pt Select Monitor Item Select Monitor Axis

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

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

Module Information List

PLC ready(Y0)

READY(X0)

Synchronization flag(X1)

All axes servo ON(Y1)

Md.108:Servo status 1 : READY ON

Axis No. 1 2 3 4 5 6 7 8

Md.108:Servo status 1 : Servo ON

Axis No. 1 2 3 4 5 6 7 8

Md.50:Forced stop input(U0#G4231)

Axis No. 1 2 3 4 5 6 7 8

Md.31:Status : Error detection

Axis No. 1 2 3 4 5 6 7

Md.31:Status : Axis warning detection

Axis No. 1 2 3 4 5 6 7 8

Md.1:In test mode flag(U0#G4000)

Md.133:Operation cycle over flag(U0#G4239)

Md.64:Network error No.(U0#G31504)

Md.132:Operation cycle setting(U0#G4238)

1006h:1.000ms

Md.134:Operation time(U0#G4008)

149 μs

Md.135:Maximum operation time(U0#G4009)

171 μs

Md.19:Number of write accesses to flash ROM(U0#G4010)

0 times

Md.52:Communication between amplifiers axes se...

Communication between set amplif...

Md.131:Digital OSC. running flag(U0#G4011)

Stopped

1[U1]:FX5-40SSC-G(S) – 軸モニター

Axis Monit

Monitor Type: Axis (Output Axis) Font Size: 9pt Select Monitor Item Select Monitor Axis

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

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

Module Information List

PLC ready(Y0)

READY(X0)

Synchronization flag(X1)

All axes servo ON(Y1)

Md.108:Servo status 1 : READY ON

Axis No. 1 2 3 4 5 6 7 8

Md.108:Servo status 1 : Servo ON

Axis No. 1 2 3 4 5 6 7 8

Md.50:Forced stop input(U0#G4231)

Axis No. 1 2 3 4 5 6 7 8

Md.31:Status : Error detection

Axis No. 1 2 3 4 5 6 7 8

Md.31:Status : Axis warning detection

Axis No. 1 2 3 4 5 6 7 8

Md.1:In test mode flag(U0#G4000)

Md.133:Operation cycle over flag(U0#G4239)

Md.64:Network error No.(U0#G31504)

Md.132:Operation cycle setting(U0#G4238)

1006h:1.000ms

Md.134:Operation time(U0#G4008)

150 μs

Md.135:Maximum operation time(U0#G4009)

171 μs

Md.19:Number of write accesses to flash ROM(U0#G4010)

0 times

Md.52:Communication between amplifiers axes se...

Communication between set amplif...

Md.131:Digital OSC. running flag(U0#G4011)

Stopped

JOG
動作

付録

[付録1] 原点復帰方法

原点復帰方法は、Homing method(6098h)に設定した値に応じて以下のように分類されます。

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



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