

Ezi-SERVO[®] II CC-Link
Closed Loop Stepping System

- User Manual -

※ Before Operation ※

- Thank you for your purchasing the FASTECH's Ezi-SERVO2 CC-Link product.
- Ezi-SERVO2 CC-Link is a product that Ezi-SERVO2 product is directly connected to CC-Link network and can use motion, parameter, PT operation, teaching etc.
- This manual describes handling, maintenance, repairing, diagnosis and troubleshooting of Ezi-SERVO2 CC-Link.
- Before operating Ezi-SERVO2 CC-Link, thoroughly read this manual for safety.
- After reading this manual, please keep this manual near Ezi-SERVO2 CC-Link, so that any user can read the manual whenever needed.

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1. Precautions

1.1 General Precautions

- ◆ Contents of this manual are subjected to change without prior notice for functional improvement, change of specifications or user's better understanding. Thoroughly read the manual provided with the purchased Ezi-SERVO2 CC-Link.
- ◆ When the manual is damaged or lost, please contact with FASTECH's agents or our company at the address on the last page of the manual.
- ◆ Our company is not responsible for a product breakdown due to user's dismantling for the product, and such a breakdown is not guaranteed by the warranty.


1.2 Safety Precaution

- ◆ Before installation, operation and repairing the S-SERVO Plus -R, thoroughly read the manual and fully understand the contents. Before operating the Ezi-SERVO2 CC-Link please fully understand the mechanical characteristics of the product, related safety information and precautions.
- ◆ This manual divides safety precautions into **Attention** and **Warning**.



 Attention	If user does not properly handle the product, the user may seriously or slightly injured and damages may occur in the machine.
 Warning	Improper handling may result in electric shock or other dangerous situations and may result in death or serious injury.

- ◆ Although precaution is only an **Attention**, a serious result could be caused depending on the situation. Please follow safety precautions.



1.3 Product status

 Attention	Check the Product is damaged or parts are missing. Otherwise, the machine may get damaged or the user may get injured.
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1.4 Installation

 <p>Attention</p>	<p>Please carry the Ezi-SERVO2 CC-Link carefully. Otherwise, the product may get damaged or user's foot may get injured by dropping the product.</p> <p>Use non-flammable materials such as metal in the place where the Ezi-SERVO2 CC-Link is to be installed. Otherwise, a fire may occur.</p> <p>When installing several Ezi-SERVO2 CC-Link products in a sealed place, install a cooling fan to keep the ambient temperature of the product as 50°C or lower. Otherwise, a fire or other kinds of accidents may occur due to overheating.</p>
 <p>Warning</p>	<p>The process of installation, Connection, Operation, Checking and Repairing should be done by qualified person. Otherwise, a fire or other kinds of accidents may occur.</p>


1.5 Wiring

 <p>Attention</p>	<p>Keep the rated range of input Voltage for Ezi-SERO2 CC-Link drive. Otherwise, a fire or other kinds of accidents may occur.</p> <p>Cable connection should be following the wiring diagram. Otherwise, a fire or malfunction of machine may occur.</p>
 <p>Warning</p>	<p>Before connecting cables, check if input power is off.. Otherwise, an electric shock or a fire may occur.</p> <p>The case of this Ezi-SERVO2 CC-Link is installed from the ground of the internal circuit by the condenser, please Ground the Ezi-SERVO2 CC-Link. Otherwise, an electric shock or a file may occur and a cause of malfunction of machine.</p>

1.6 Operation & Setting Change

 Attention	<p>If a protection function (Alarm) occurs, firstly remove its cause and then release (Alarm reset) the protection function.</p> <p>If you operate continuously without removing its cause, the machine may get damaged or the user may get injured.</p> <p>Make all input signals to OFF before supply input voltage to Ezi-SERVO2 CC-Lin drive.</p> <p>The machine may get damaged or the user may get injured by motor operation.</p> <p>All parameter values are set by default factory setting value. Change this value after reading this manual thoroughly.</p> <p>Otherwise, the machine may get damaged or other kinds of accidents may occur.</p>
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1.7 Check & Repair

 Warning	<p>Stop to supply power to the main circuit and wait sufficient time before checking or repairing this Ezi-SERVO2 CC-Link.</p> <p>Electricity remaining in the condenser may cause of electric shock.</p> <p>Do not change cabling while power is being supplied.</p> <p>Otherwise, the user may get injured or the product and machine may get damaged.</p> <p>Do not reconstruct the Ezi-SERVO2 CC-Link.</p> <p>Otherwise, an electric shock may occur or the product and machine get damaged. And the reconstructed product cannot get after service.</p>
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Notes on Installation.

- 1) This product has been designed for indoor uses. The ambient temperature of the room should be 0°~ 55°C .
- 2) If the temperature of the case is 50°C or higher, radiate heat outside for cooling down.
- 3) Do not install this product under direct rays or near magnetic or radioactive objects.

- 4) If more than 2 drives are installed in a line, keep the interval of 20mm or more vertically and 50mm or more horizontally at least

2. Specifications of the Product

2.1 Product Overview

Ezi-SERVO2 CC-Link is a product that can drive the step motor of FASTECH in CC-Link network which is high-speed field-network.

By connecting to the network with CC-Link 1.0 Remote Device, it is possible to control through 1 station and 2 station occupation mode, and the allocation area of device memory of host controller can be optimized according to the operation status.

When using station 1 occupation mode, speed or position can be adjusted by jog operation or step-jog operation. User can use the position adjusted by jog operation or step-jog operation, or you can configure the position information input to the remote register (Remote Resister) by position table (PT).

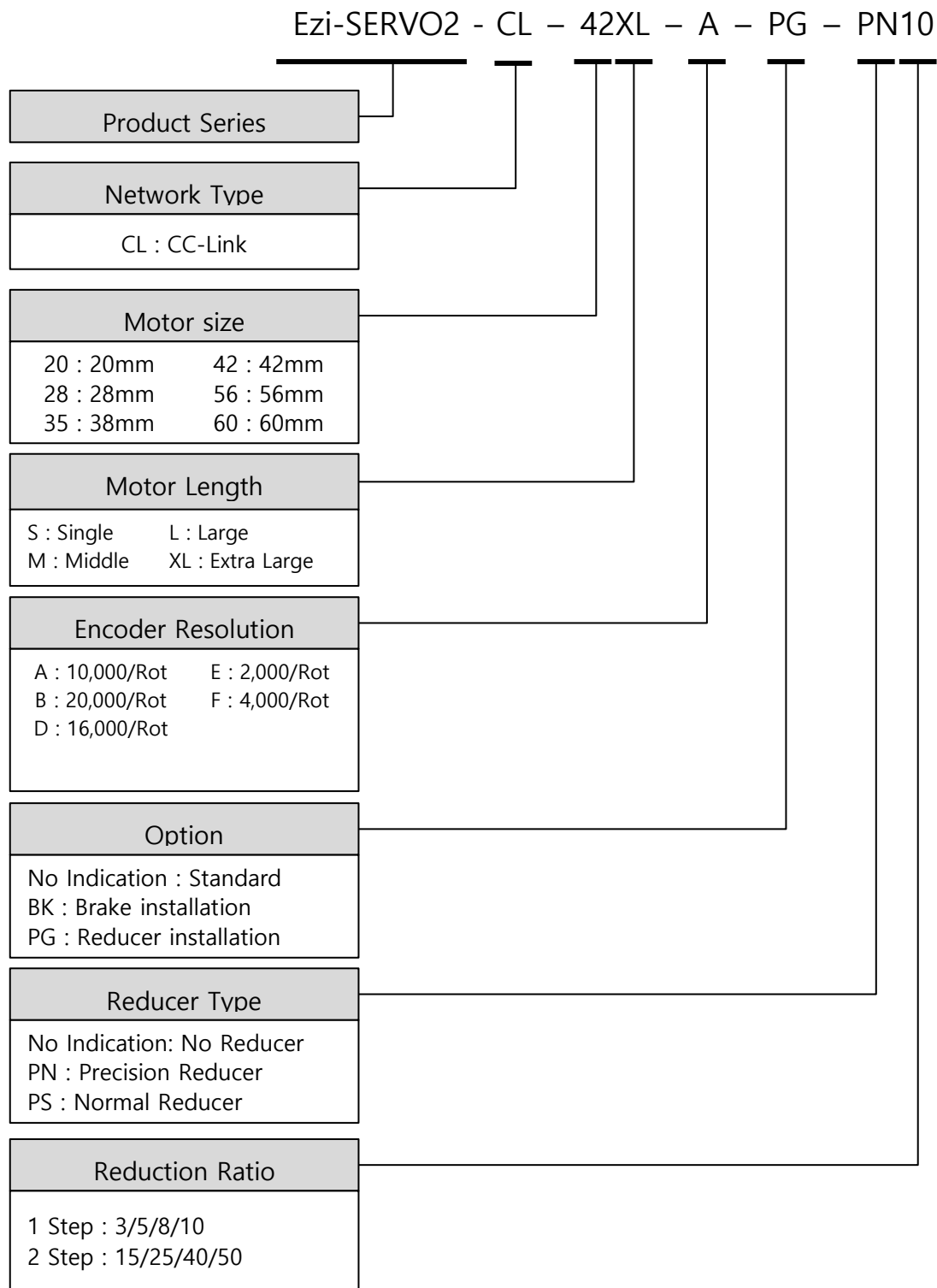
The 2 station occupied mode includes the function of the occupied mode of station 1 and includes the position move command.

2.2 Specifications of the Drive

Network		CC-Link Ver.1
Input Voltage		24VDC ±10%
Control Method		Closed loop control with ARM-based 32-bit MCU
Station Information		Connection to remote device station, 1 ~ 2 Station Occupation
Current Consumption		Drive: Max. 0.5[A], Motor: Max. 4[A]
Operating condition	Ambient Temperature	In Use : 0~55°C In Storage : -27~70°C
	Humidity	In Use : 35~85%RH (Non-Condensing) In Storage : -10~90%RH (Non-condensing)
	Vibration. Resist.	0.5G
Functions	Rotation Speed	0 ~ 3,000 rpm
	Resolution [P/R]	500 ~ 10,000 pulse (Select by Parameter)
	Protection Function	Over current, Over Speed, Position tracking error, Over load, Over temperature, Over regenerated voltage, motor connect error, Encoder connect error, In-position error, ROM error, Position overflow error
	LED Display	Power status, In-Position status, Servo ON status, Alarm status, CC-Link network status
I/O signal	Input Signal	3 dedicated input (Limit+, Limit-, Origin) 7 programmable input (User mapping)
	Output Signal	1 dedicated output (Brake) 6 programmable output (User mapping)

2.3 Configuration of the Product

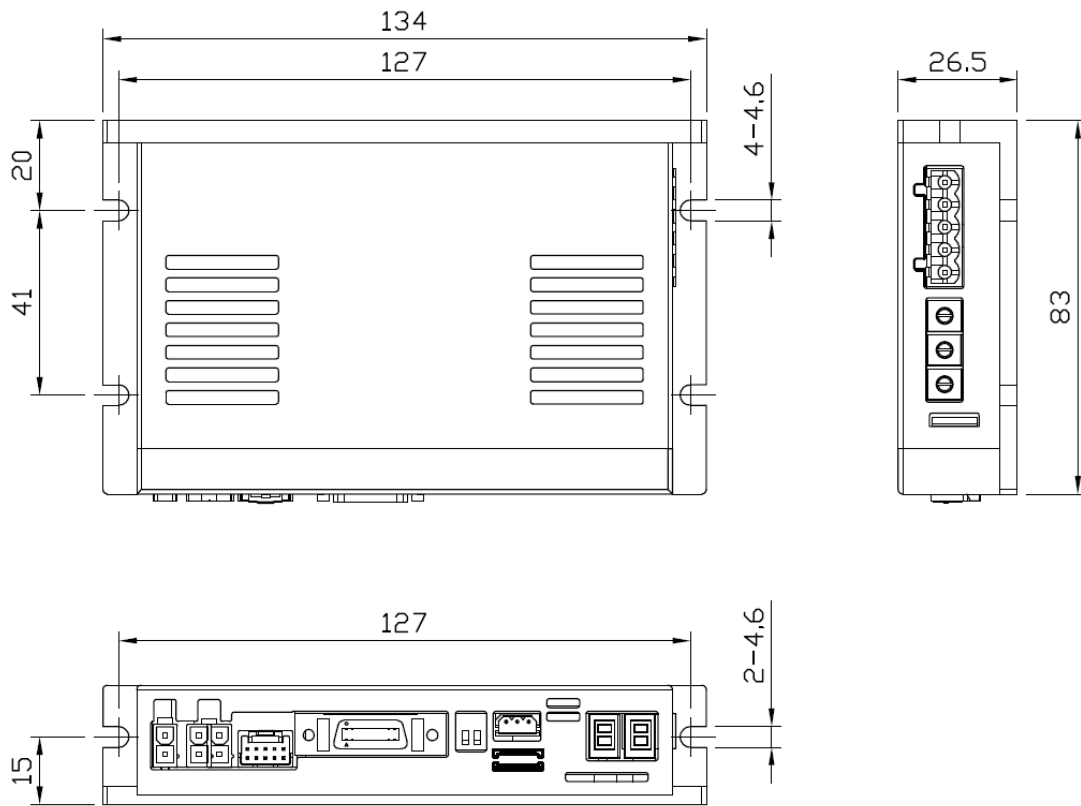
2.3.1 Naming system



2.3.2 Product combination

Unit Name	Motor Name	Drive Name
Ezi-SERVO2-CL-20M-F	EzM2-20M-F	EzS2-CL-20M-F
Ezi-SERVO2-CL-20L-F	EzM2-20L-F	EzS2-CL-20L-F
Ezi-SERVO2-CL-28S-D	EzM2-28S-D	EzS2-CL-28S
Ezi-SERVO2-CL-28M-D	EzM2-28M-D	EzS2-CL-28M
Ezi-SERVO2-CL-28L-D	EzM2-28L-D	EzS2-CL-28L
Ezi-SERVO2-CL-35M-D	EzM2-35M-D	EzS2-CL-35M
Ezi-SERVO2-CL-35L-D	EzM2-35L-D	EzS2-CL-35L
Ezi-SERVO2-CL-42S-A	EzM2-42S-A	EzS2-CL-42S
Ezi-SERVO2-CL-42S-B	EzM2-42S-B	EzS2-CL-42S
Ezi-SERVO2-CL-42M-A	EzM2-42M-A	EzS2-CL-42M
Ezi-SERVO2-CL-42M-B	EzM2-42M-B	EzS2-CL-42M
Ezi-SERVO2-CL-42L-A	EzM2-42L-A	EzS2-CL-42L
Ezi-SERVO2-CL-42L-B	EzM2-42L-B	EzS2-CL-42L
Ezi-SERVO2-CL-42XL-A	EzM2-42XL-A	EzS2-CL-42XL
Ezi-SERVO2-CL-42XL-B	EzM2-42XL-B	EzS2-CL-42XL
Ezi-SERVO2-CL-56S-A	EzM2-56S-A	EzS2-CL-56S
Ezi-SERVO2-CL-56S-B	EzM2-56S-B	EzS2-CL-56S
Ezi-SERVO2-CL-56M-A	EzM2-56M-A	EzS2-CL-56M
Ezi-SERVO2-CL-56M-B	EzM2-56M-B	EzS2-CL-56M
Ezi-SERVO2-CL-56L-A	EzM2-56L-A	EzS2-CL-56L
Ezi-SERVO2-CL-56L-B	EzM2-56L-B	EzS2-CL-56L
Ezi-SERVO2-CL-60S-A	EzM2-60S-A	EzS2-CL-60S
Ezi-SERVO2-CL-60S-B	EzM2-60S-B	EzS2-CL-60S
Ezi-SERVO2-CL-60M-A	EzM2-60M-A	EzS2-CL-60M
Ezi-SERVO2-CL-60M-B	EzM2-60M-B	EzS2-CL-60M
Ezi-SERVO2-CL-60L-A	EzM2-60L-A	EzS2-CL-60L
Ezi-SERVO2-CL-60L-B	EzM2-60L-B	EzS2-CL-60L
Ezi-SERVO2-CL-60L-C	EzM2-60L-C	EzS2-CL-60L

2.4 Dimensions



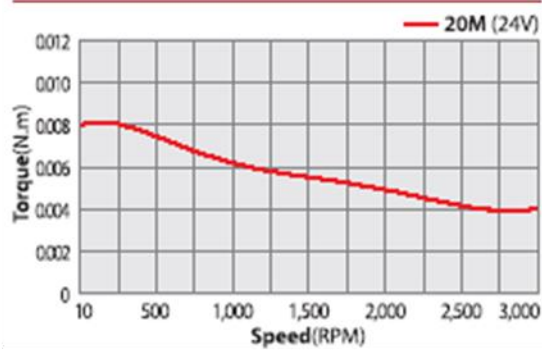
2.5 Specifications of the Motor

2.5.1 Motor Specifications

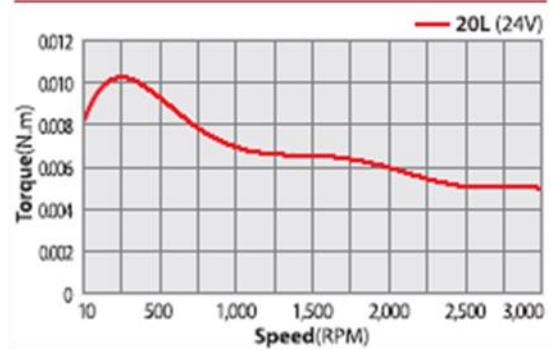
Motor	Current per Phase	Holding Torque	Rotor Inertia	Weight	Length(L)
Unit	A	N·m	$g \cdot cm^2$	g	mm
EzM2-20M	0.5	0.016	2.5	50	28
EzM2-20L	0.5	0.025	3.3	80	38
EzM2-28S	0.95	0.69	9	110	32
EzM2-28M	0.95	0.10	13	140	45
EzM2-28L	0.95	0.12	18	200	50
EzM2-35M	0.6	0.05	8	150	26
EzM2-35L	0.85	0.176	11	260	38
EzM2-42S	1.2	0.32	35	250	34
EzM2-42M	1.2	0.44	54	280	40
EzM2-42L	1.2	0.5	77	350	48
EzM2-42XL	1.2	0.65	114	500	60
EzM2-56S	3	0.64	180	500	46
EzM2-56M	3	1.00	280	720	55
EzM2-56L	3	1.5	520	1150	80
EzM2-60S	4	0.88	240	600	47
EzM2-60M	4	1.28	490	1000	56
EzM2-60L	4	2.4	690	1300	85

2.5.2 Characteristics of the Motor torque

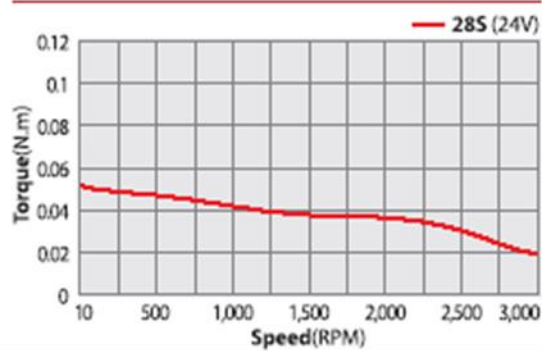
Ezi-SERVO II CC-Link 20M Series



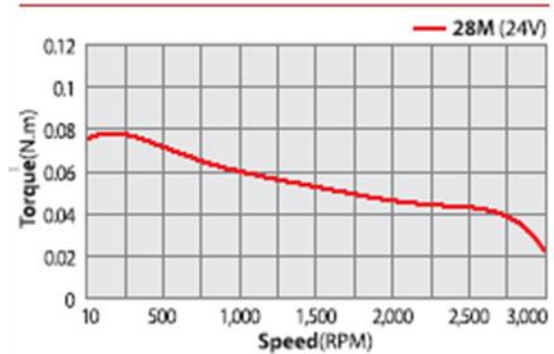
Ezi-SERVO II CC-Link 20L Series



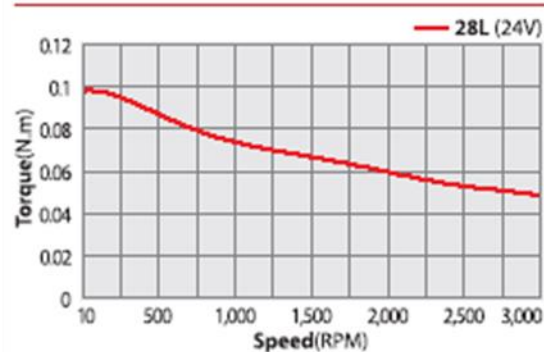
Ezi-SERVO II CC-Link 28S Series



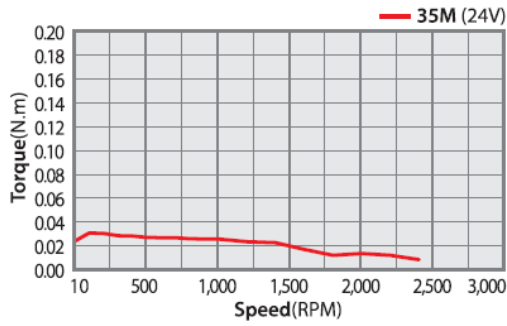
Ezi-SERVO II CC-Link 28M Series



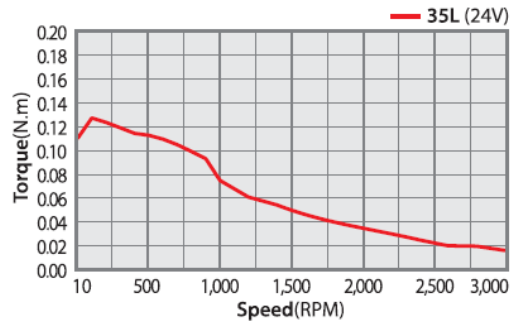
Ezi-SERVO II CC-Link 28L Series



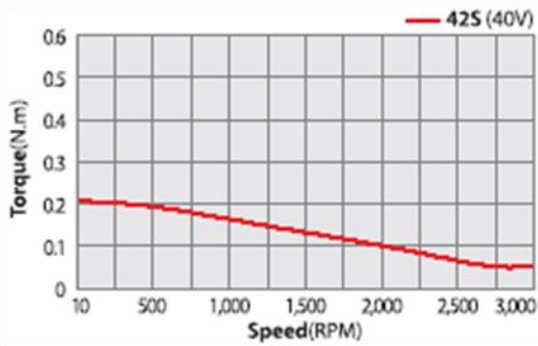
Ezi-SERVO II CC-Link 35M Series



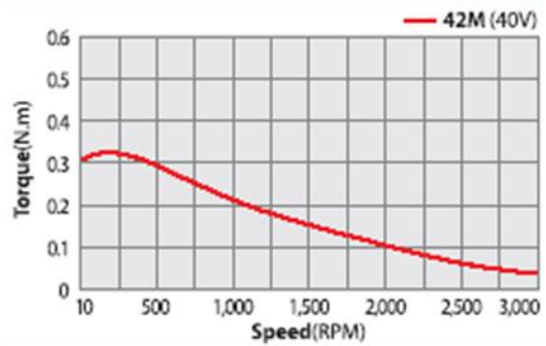
Ezi-SERVO II CC-Link 35L Series



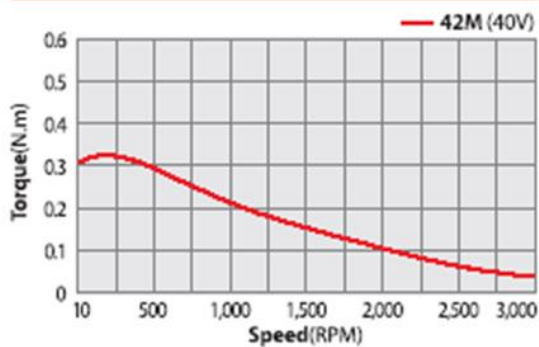
Ezi-SERVO II CC-Link 42S Series



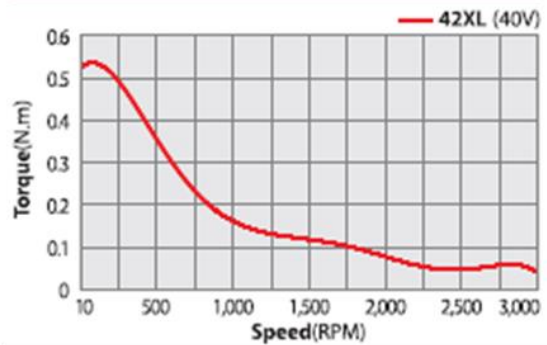
Ezi-SERVO II CC-Link 42M Series



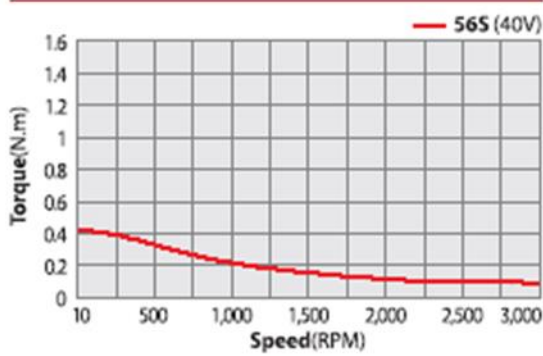
Ezi-SERVO II CC-Link 42M Series



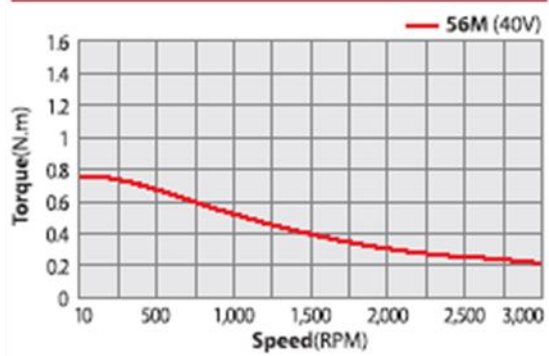
Ezi-SERVO II CC-Link 42XL Series



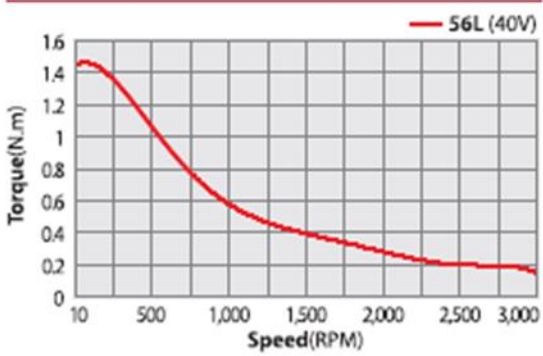
Ezi-SERVO II CC-Link 56S Series



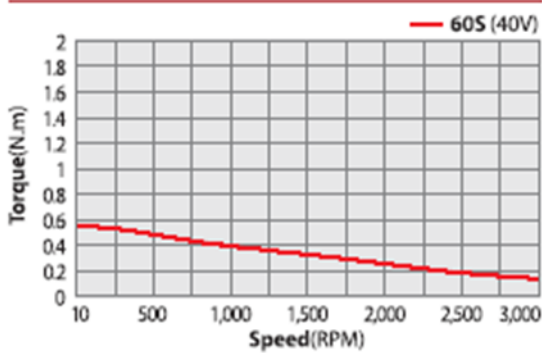
Ezi-SERVO II CC-Link 56M Series



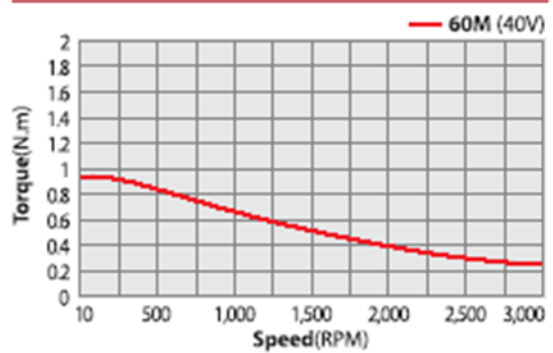
Ezi-SERVO II CC-Link 56L Series



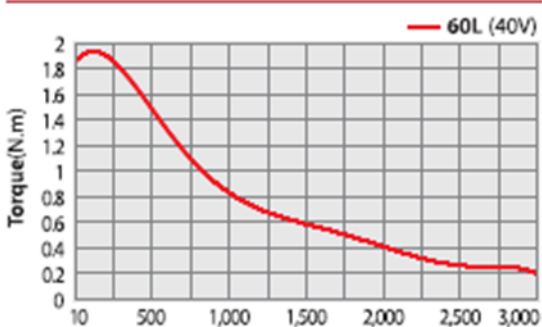
Ezi-SERVO II CC-Link 60S Series



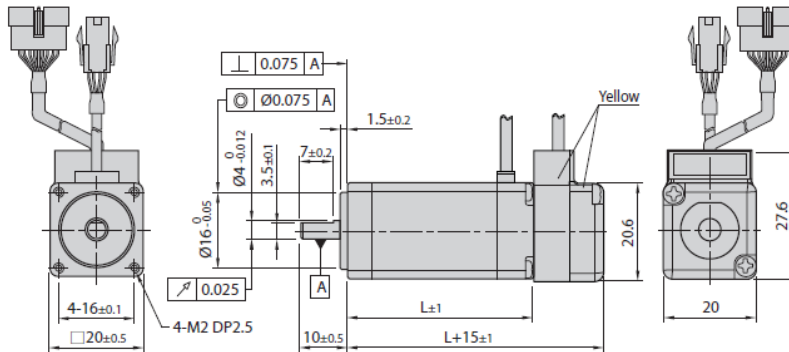
Ezi-SERVO II CC-Link 60M Series



Ezi-SERVO II CC-Link 60L Series

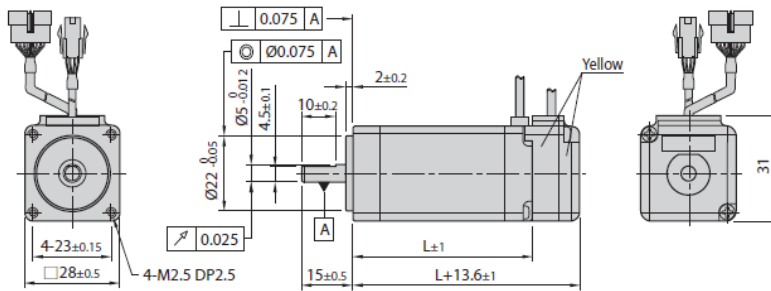


2.5.3 Motor Size



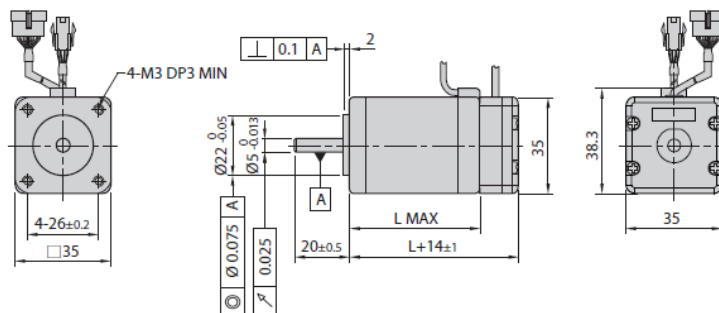
20mm

Model name	Length(L)
EzM2-20M	28
EzM2-20L	38



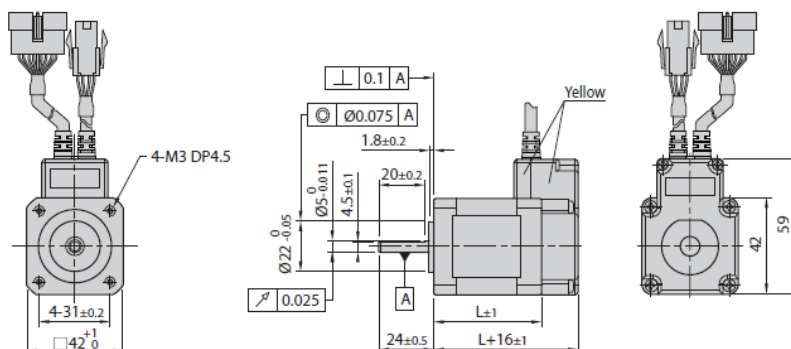
28mm

Model name	Length(L)
EzM2-28S	32
EzM2-28M	45
EzM2-28L	50



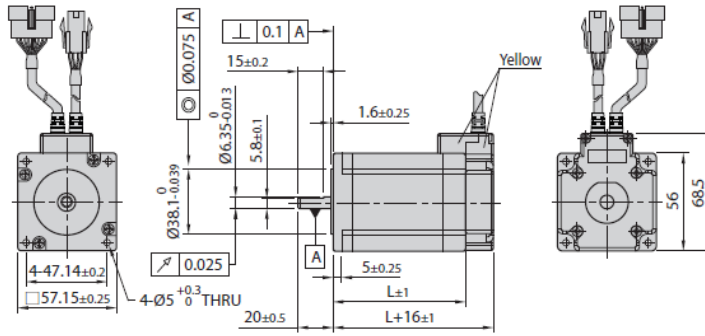
35mm

Model name	Length(L)
EzM2-35M	26
EzM2-35L	38



42mm

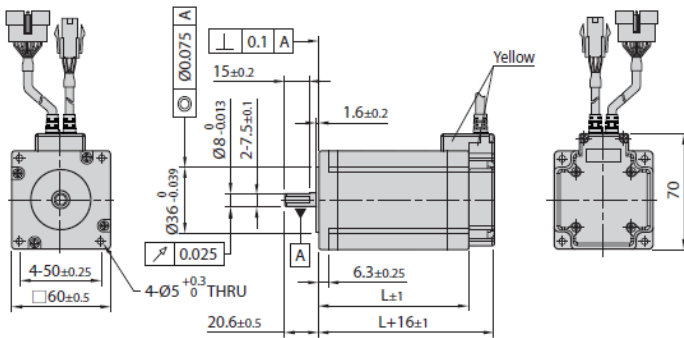
Model name	Length(L)
EzM2-42S	34
EzM2-42M	40
EzM2-42L	48
EzM2-42XL	60



56mm

Model name	Length(L)
EzM2-56S	46
EzM2-56M	55
EzM2-56L	80

※ There are 2 kinds size of front shaft diameter for EzM2-56 series as Ø6.35 and Ø8.0.



60mm

Model name	Length(L)
EzM2-60S	47
EzM2-60M	56
EzM2-60L	85

Refer to "9. Appendix" or catalog in this manual for brake-mounted motors and reducer-mounted motors.

3. Function and Configuration

3.1 CC-Link Overview

CC-Link is an industrial network configured with an RS485 topology. This network is one of the field buses with high-speed / on-time capability and supports communication speeds of up to 10 Mbps. And it is a network that guarantees the regularity of data by supporting the cyclic transmission function for always the same link scan processing.

These features make it possible to process large volumes of data at high speed and enable rapid connection of on-site information to improve productivity. The RS485 topology simplifies installation and maintenance.

Item	Specification
Max. Link point number	Ver 1.1 : Remote I/O (RX,RY) - 2048 Bit, Remote resister (RW _r , RW _w) 512 WORD Ver 2.0 : Remote I/O (RX,RY) - 8192bit, Remote Resister (RW _r , RW _w) 2048 WORD 1) Ezi-SERVO2 CC-Link is CC-Link Ver. 1.1 connection is possible. 2) Even if the CC-Link master card (QJ61BT11N) of the PLC is set to Remote Net 2.0 mode, the station type is can be set to Ver.1.
Max. Point/ 1Station	Remote I/O : 32 points each , Remote resister 8 WORD
Max. occupied station	4 Station occupation (Data volume expansion function, per 1 slave)
Cyclic Transmission Data size	24Byte/1Station
Transmission data size	960Byte (Master->Slave 150Byte/Scan, Slave->Master 34Byte/Scan)
Total slave station number	Max 64Station Depends on occupied the number by 1 slave.
Communication speed and cable extension distance	10Mbps : 100m (Use of optical repeater : 4.3 km) 5Mbps : 160m (Use of optical repeater : 4.48 km) 2.5Mbps : 400m (Use of optical repeater : 5.2 km) 625Kbps : 900m (Use of optical repeater : 6.7 km) 156Kbps : 1200m (Use of optical repeater : 7.6 km) * Ver.1.10 compatible When using CC-Link dedicated cable
Communication Method	Broad Casting Pooling

3.2 Ezi-SERVO2 CC-Link function

3.2.1 CC-Link Network

Ezi-SERVO2 CC-Link is connected to a remote device from CC-Link network, which is a high-speed fieldbus, and can set up to 4 stations for motion control.

	1 Station occupation	2 Station occupation	3 Station occupation ^(1*)	4 Station occupation ^(1*)
Number of modules connectable to the master equipment according to the occupied station	42 Module	32 Module	21 Module	16Module
The allocation amount of the remote device according to the station occupancy (Data Volume)	RX/Ry:32 point RWw/RWr:4 word	RX/Ry:64 point RWw/RWr:8 word	RX/Ry:96 point RWw/RWr:12 word	RX/Ry:128 point RWw/RWr:16 word

^{*1)} 3 and 4 station occupied modes are not supported by Ezi-SERVO2 CC-Link. (It will be supported in the future)

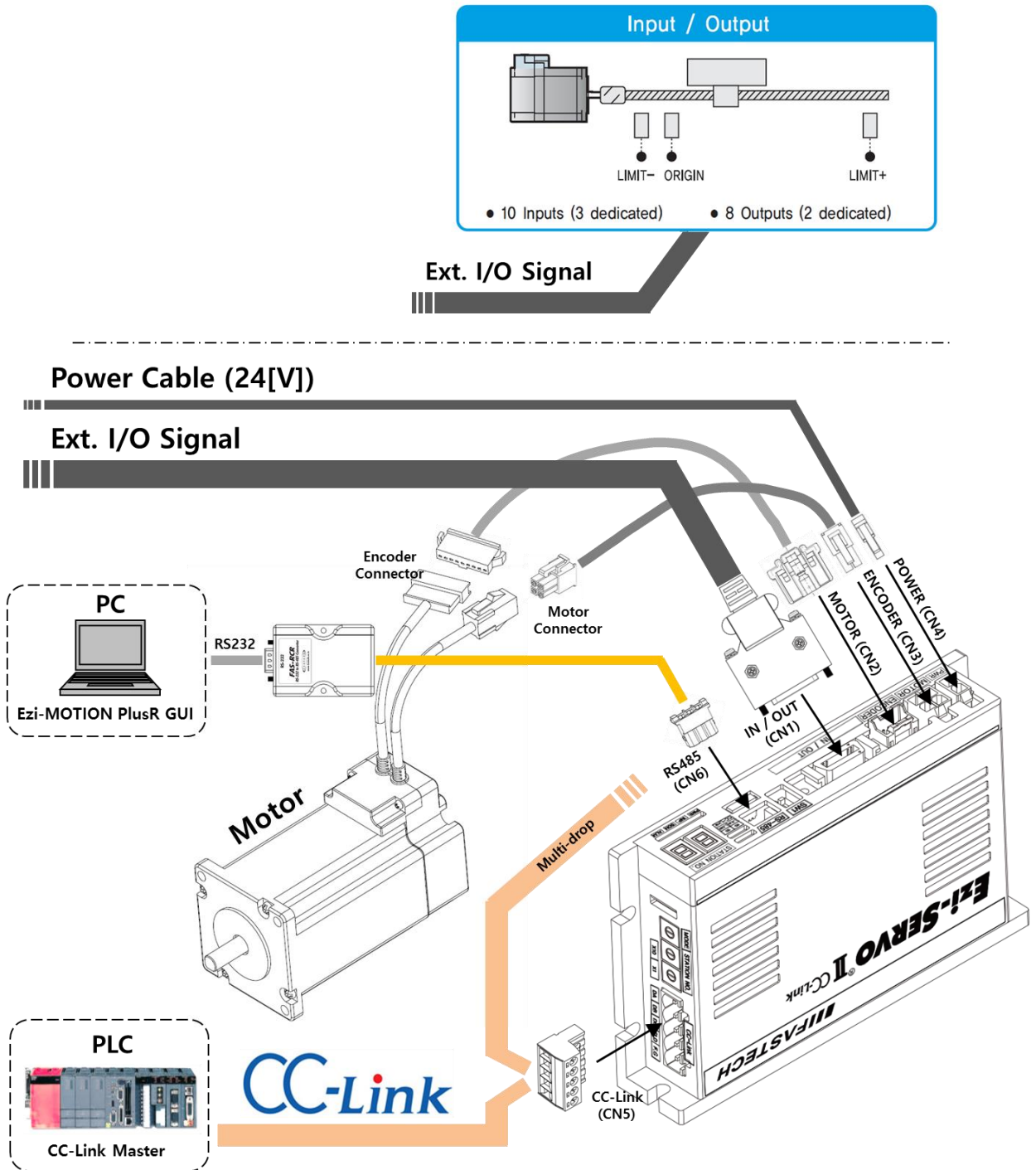
3.2.2 I/O control

- Ezi-SERVO2 CC-Link has seven inputs and six outputs, and each pin can be assigned a function to operate the system. In addition, by incorporating a position controller in the drive and connecting a H / W Limit sensor, which is a sensor signal that can define a limit, mechanical collision can be suppressed during motion control.
- Function Introduction : “4.5.3 Use of External I/O”
- Parameter and Function : “5.5 External I/O Setting”

3.2.3 Ezi-MOTION Plus-R Network

It is possible to connect with RS485 communication using FASTECH's proprietary protocol, and support Ezi-MOTION Plus-R DLL for motion library, parameter access, test operation and status monitoring.

3.3 System Configuration



3.4 CC-Link Remote I/O Device Map

3.4.1 I/O Device Map when 1 Station Occupation

RY	Output Device Name	RX	Input Device Name
RY00	Servo Enable	RX00	Servo Enabled
RY01	/Emergency Stop	RX01	Emergency Stopped
RY02	ALARM RESET	RX02	ALARM Status
RY03	Homing Start	RX03	Homing OK
RY04	JOG +	RX04	MOTION READY
RY05	JOG -	RX05	Jog Response
RY06	Step + Move	RX06	Step Move Response
RY07	Step - Move	RX07	In-Position
RY08	STOP	RX08	MOTIONING
RY09	HOLD	RX09	Hold status
RY0A	Go Zero Position	RX0A	Go Zero Position Resp.
RY0B	PT Start	RX0B	PT Running
RY0C	Single PT Select	RX0C	Single PT Select Resp.
RY0D	-	RX0D	Command Set Resp.
RY0E	Command Set	RX0E	Warning
RY0F	Motion / Setting	RX0F	Motion / Setting Resp.
RY10 ~ RY13	Step Move Position (1~10) BCD Data (Parameter : Multiple of Pn#B030)	RX10 ~ RX13	Step Move Position Resp. (1~10) BCD Data X 10 의 승수(Parameter Value)
RY14 ~ RY17	Monitor code (Motion) PT Command (Teaching)	RX14 ~ RX17	Monitor code(Motion Mode) Data Code (Setting Mode) Response
RY18 ~ RY1B	Command Code	RX18 ~ RX1B	Command Code Resp.
RY1C	Processing Complete Flag	RX1C	Initial Data Processing Request
RY1D	Remote Clear	RX1D	Remote station READY
RY1E	RS485 Approval of use	RX1E	RS485 Port Approved
RY1F		RX1F	RS-485 Port Connected (1 sec)
RWw		RWw	
RWw0 RWw1	Operation speed (Position Move, JOG Move)	RWw0 RWw1	Monitor response Data(Motion) response Data (Setting)
RWw2	PT No. / Parameter Code	RWw2	PT No. / Parameter Code Resp.
RWw3		RWw3	Warning Code

1) Network Connection Setting Bit

- Initial Data Processing Request [RX1C]

Requesting status for processing of initial data by Ezi-SERVO2 CC-Link

- Initial Data Processing Complete Flag [RY1C]

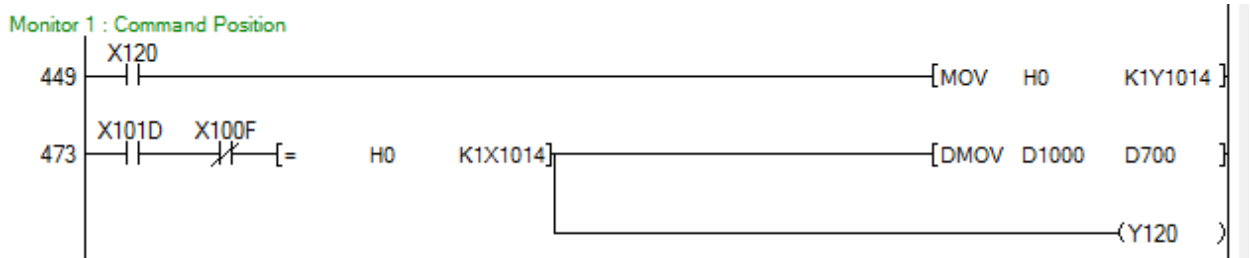
Notify Ezi-SERVO2 CC-Link that initial data has been processed

- Remote station READY [RX1D]

It is status of Ezi-SERVO2 CC-Link completes the initialization operation, the instruction can be executed. All commands must be processed with the "Remote READY" bit enabled.

Example) Command Position Monitoring

- Remote Input Address (RX) : X1000
- Remote Output Address (RY) : Y1000
- Remote Resister Address (RWr) : D1000
- Remote READY bit : X101D



The value of the input device is invalid when "Remote READY" is turned off.

- Remote Clear [RY1D]

Command to release Ezi-SERVO2 CC-Link connection. Remote Ready bit is Off when "Remote Clear" is On.

- RS-485 Port Connect [RY0E]

Allow control command through RS485 communication (It can be executed in Servo Off state)

- RS-485 Port Approved [RX0E]

Control command allow response bit via RS485 communication

- RS-485 Port Connected [RX1F]

When the command is received normally by RS485, keep the ON status for 1 sec.

2) Drive Control command

■ Servo Enable [RY00]

It is the Servo On / Off control bit. This bit must be ON status to drive the motor. Also, it must be kept ON status in a system that performs Servo On / Off operation with external I / O.

■ Emergency Stop [RY01]

It is activated when emergency stop command execution command is Off. Motion commands must be kept ON at all times.

■ ALARM RESET [RY02]

It is the alarm release command, after clearing the cause of the alarm, this bit can be turned on to release the alarm that occurred in the drive.

■ STOP [RY08]

This is motion stop command. it is used to release the current motion profile. In addition, can be performed operation stop while PT is running

■ HOLD [RY09]

This is motion pause command, it pauses the current motion profile. The motion commands that can be used with this command are the jog command and the move command.

3) Motion control Command Bit

When the following motion control command bit is turned on, the motor must be supplied with power so that the motor is ready to be operating (Servo On).

- Homing Start [RY03] : To execute the Homing command
- JOG + [RY04] : +Jog operation command
- JOG - [RY05] : - Jog operation command
- Step + Move [RY06] : + Step move command
- Step - Move [RY07] : - step move command
- Go Zero Position [RY0A] : Move to Zero position
- PT Start [RY0B] : PT Operation

4) Special Control Command Bit

- Single PT Select [RY0B] : Select to Single PT operation
- Command Set [RY0E] : Execution of additional and special commands
 - Used when applying speed override during jog operation
 - Used for parameter access

5) Special control Command Support Bit

- Step Move Position [RY0B] : The position value of the step move command which is a multiple of Magnify of Parameter Pn # B03 Step Move Position
- Motion/Setting [RY0F] : When it is On, it is used in general motion. When it is Off, it is used command code command.
- Command Code [RY18~RY1B] : Command type selection, code number of command executed with Command Set [RY0E] bit On

No	Function	Description
0x0	-	-
0x1	Parameter Read	Parameter request
0x2	Parameter Write	Parameter Change
0x3	Parameter Save	Parameter Storage
0x4	-	-
0x5	-	-
0x6	-	-
0x7	Set User Output	User Out pin Output
0x8	Clear Peak Load	Peak Load Data Initialization Command
0x9	-	-
0xA	Teaching A-POS	Execution of Teaching Command (Encoder position)
0xB	Teaching C-POS	Execution of Teaching Command (Tracking position)
0xC	-	-
0xD	-	-
0xE	Set Position	Change current position to a specific value
0xF	-	-

6) Command Response Bit

- Jog Response [RX05] : Response to Jog command
- Step Move Response [RX06] : Response to Step command
- Go Zero Position Resp. [RX0A] : Response to Go Zero command
- Single PT Select Resp. [RX0C] : Response to Single PT operation command
- Command Set Resp. [RX0D] : Response to Execution of Additional command
- Motion / Setting Resp. [RX0F] : Response to Mode of the current I/O map
- Step Move Position Resp. [RX10~RX13] : Position Response Data of Step Move Command
- Monitor code (Motion Mode) [RX14~RX17] : Monitor code response
- Command Code Resp [RX18~RX1B] : Command code response

7) Monitoring Data Select Bit

- Monitor Code [RY14~RY17] : Request for data information of drive when Motion Mode(Motion/Setting [RY0F] is Off

No	function	Description
0x0	Real Command Position	Pulse information of position tracking value
0x1	Real Actual Position	Pulse information of encoder position value
0x2	Real Position Error	Pulse information of the error between the position tracking value and the encoder position value
0x3	Real Current Velocity	Pulse per Second information of the tracking speed information during driving
0x4	Command Position	Position tracking value
0x5	Actual Position	Encoder position value
0x6	Position Error	Error of position tracking value and encoder position value
0x7	Current Velocity	Tracking speed information during driving
0x8	Unit	Current operating unit
0x9	-	
0xA	-	
0xB	Get I/O Pin Status	Status of I/O
0xC	Get User I/O Status	Status of User Input / Output
0xD	-	
0xE	Axis Status 1	Status information of Drive
0xF	-	

8) Drive Status Information Bit

- Servo Enabled [RX00] : Servo On/Off state
- Emergency Stopped [RX01] : emergency stop state
- ALARM Status [RX02] : alarm stop state
- Homing OK [RX03] : Homing completed state
- MOTION READY [RX04] : Motion command enable state
- In-Position [RX07] : In-Position completed state
- MOTIONING [RX08] : In Motion state
- Hold status [RX09] : Paused state
- PT Running [RX0B] : PT in Operation state
- Warning [RX0E] : Error occurred state

3.4.2 I/O Device Map when 2 Station Occupation

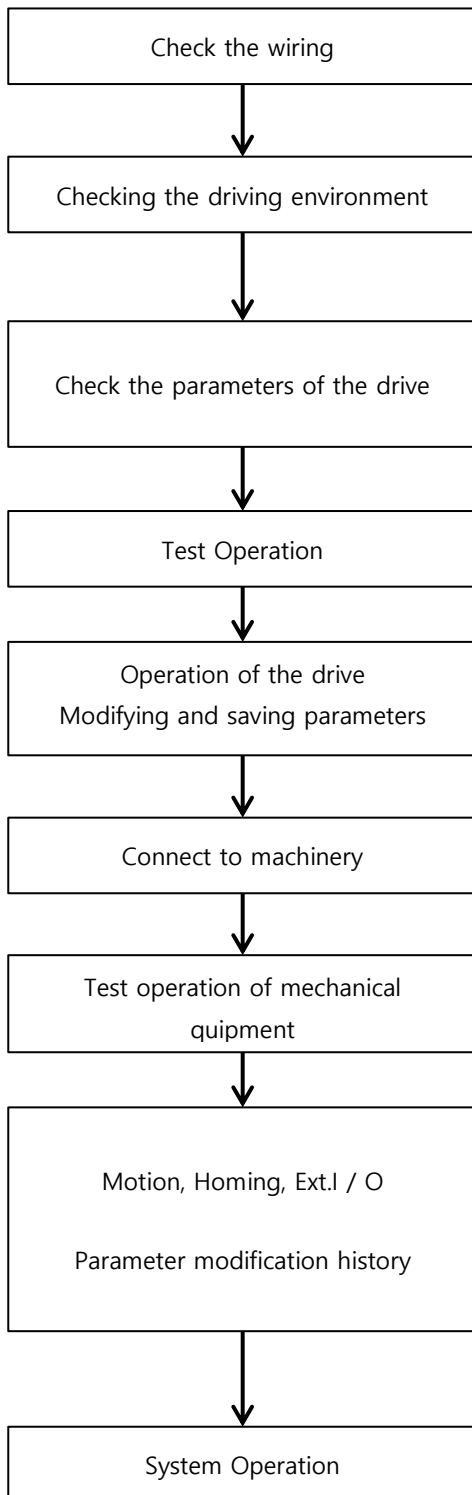
RY	Output Device Name	RX	Input Device Name
RX20		RX20	H/W Limit +
RX21		RX21	H/W Limit -
RX22		RX22	Org Sensor
RX23		RX23	Input Pin 1
RX24		RX24	Input Pin 2
RX25		RX25	Input Pin 3
RX26		RX26	Input Pin 4
RX27		RX27	Input Pin 5
RX28		RX28	Input Pin 6
RX29		RX29	Input Pin 7
RX2A	User Output 1	RX2A	Output Pin 1
RX2B	User Output 2	RX2B	Output Pin 2
RX2C	User Output 3	RX2C	Output Pin 3
RX2D	User Output 4	RX2D	Output Pin 4
RX2E	User Output 5	RX2E	Output Pin 5
RX2F	User Output 6	RX2F	Output Pin 6
RX30	ABS Position Move	RX30	ABS Position Move Resp.
RX31	INC Position Move	RX31	INC Position Move Resp.
RX32		RX32	
RX33		RX33	Motion Accel
RX34	Position Override	RX34	Motion Decel
RX35		RX35	Z Phase
RX36	Position Move Speed Override	RX36	S/W Limit +
RX37		RX37	S/W Limit -
RX38 ~ RX3B	Monitor code (2)	RX38 ~ RX3B	Monitor code (2) Response
RX3C ~ RX3F	Monitor code (3)	RX3C ~ RX3F	Monitor code (3) Response
RWw		RWw	
RWw0 RWw1	Position value (ABS Move, INC Move Pos)	RWw0 RWw1	Monitor response Data(2)
RWw2 RWw3	Accel Time (ABS Move, INC Move Pos) Decel Time (ABS Move, INC Move Pos)	RWw2 RWw3	Monotor response Data(3)

- 1) Motion control command Bit
 - ABS Position Move [RY30] : Execute Absolute Move command
 - INC Position Move [RY31] : Execute Incremental Move command
 - Position Override [RY34] : Perform position override command during position movement
 - Position Move Speed Override [RY34] : Execute speed override command during position movement
- 2) Output Command of User Output pin
 - Output1~6 [RY2A~2F] : Output User Output 1~6
- 3) Status check for Ext. I/O pin
 - H/W Limit + [RX20] : The input status of H/W Limit+ is displayed
 - H/W Limit - [RX21] : The input of H/W Limit – is displayed.
 - Origin Sensor [RX22] : The input status of Origin Sensor is displayed.
 - Input 1~7 [RX23~29] : The input status of Input pin1~7 is displayed.
 - Output 1~6 [RX23~29] : The output status of Output pin 1~6 is displayed.
- 4) Command Response Bit
 - ABS Position Move Resp. [RX30] : The response bit for the absolute positioning command.
 - INC Position Move Resp. [RX31] : The response bit The response bit for the relative position move command
 - Monitor code (2) [RX38~RX3B] : The response bit of monitor code (2)
 - Monitor code (3) [RX3C~RX3F] : The response bot of monitor code(3)
- 5) Drive status information bit
 - Motion Accel. [RX33] : Acceleration status during motion operation
 - Motion Decel. [RX34] : Deceleration state during motion operation
 - Z Phase [RX35] : Encoder Z phase sensor is detected
 - S/W Limit + [RX36] : Current Command Position value exceeds S / W upper limit
 - S/W Limit – [RX37] : Current Command Position value is less than S / W lower limit
- 6) Monitoring data selection bit (also available in Setting Mode)
 - Monitor Code (2) [RY38~RY3B] : Request data information from drive
 - Monitor Code (3) [RY3C~RY3F] : Request data information from drive

4. Operation

4.1 Operation sequence

In the first use, operation start according to this section.



Checking the Power supplied to the drive, motor, encoder, Ext. I / O cable connection with wiring diagram and make sure it is correct.

After power is applied, make sure that the drive and motor are free of dangers, drips and fire hazards.

Use the Ezi-MOTION Plus-R GUI to apply the operating parameters user want to use.

If there is a parameter file that user already has, reload it and set it on the drive.

Before connecting to the machine, run the motor drive test to make sure that the motor rotates correctly.

Save the parameters changed after the test operation to the internal memory of the drive so that there is no data loss even if the power is turned on / off

Connect the drive and the motor to the machine so that they match their axes. (The type of motor applied to the drive must match the type of motor actually connected.)

Test the motor connected to the machine with the master controller.

Once the operation test of the machine has been completed, modify the operating parameters and the homing parameters to suit the operation and record them.

- It is recommended that the drive parameter be set automatically at the initialization setting during the boot process after power supply of the equipment system.

4.2 Check Wiring

Cable wiring should be such that the machine does not interfere with operation.

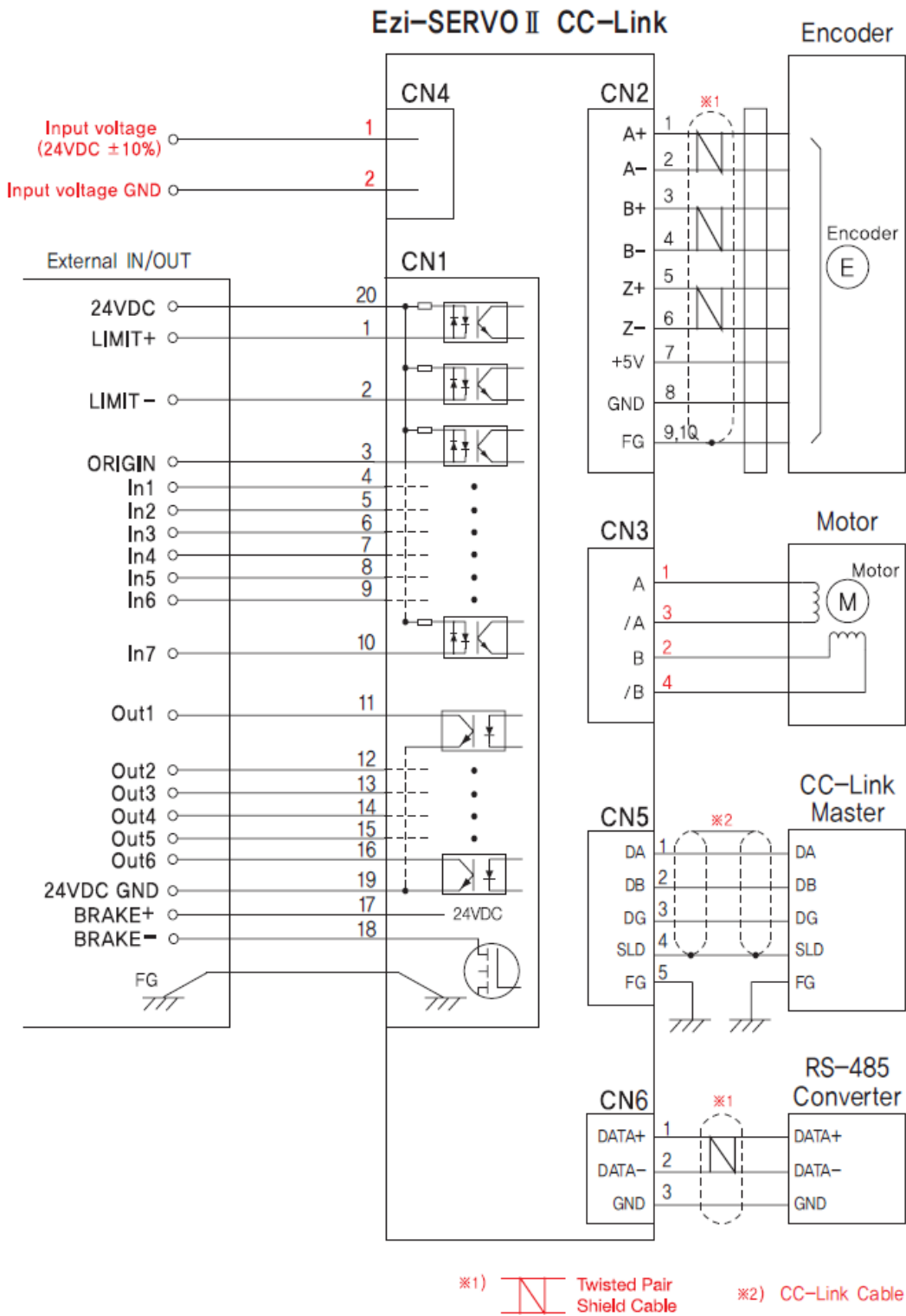


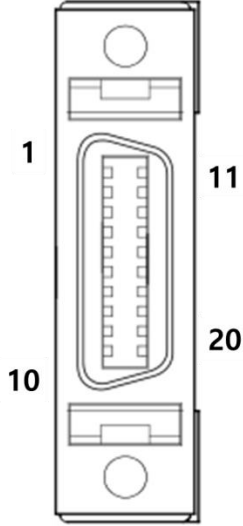
fig 4-1 Wiring of Ezi-SERVO2 CC-Link

4.2.1 Wiring of External I / O Cable [CN1]

Both the drive input and output signals are isolated by photocouplers and the signal status indicates the status of the internal photocoupler [ON: energized] and [OFF: unenergized], not the voltage level of the signal.

External I / O cable connector (CN1)

No	Function	I/O
1	LIMIT+	Input
2	LIMIT-	Input
3	ORIGIN	Input
4	Input 1	Input
5	Input 2	Input
6	Input 3	Input
7	Input 4	Input
8	Input 5	Input
9	Input 6	Input
10	Input 7	Input
11	Output 1	Output
12	Output 2	Output
13	Output 3	Output
14	Output 4	Output
15	Output 5	Output
16	Output 6	Output
17	BRAKE +	Output
18	BRAKE -	Output
19	24GND	Input
20	24VDC	Input



Input / Output
Signal Connector

Drive Connector	
Connector	3M 10226-52A2PL

Cable Connector	
Connector	3M 10120-3000PE
Shell	3M 10320-52F0-008

■ I / O connection cable

Model Name	Length	Remark
CSVN-S-□□□F	□□□	Normal Cable
CSVN-S-□□□M	□□□	Robot Cable

Cable length is 1m, maximum length is 20m.

1) Signal input of H / W limit point and origin

The LIMIT + and LIMIT-sensors are used as a signal to the limit points that limit the movement range of each axis in the clockwise and counterclockwise directions, which is used to prevent mechanical collision. The ORIGIN sensor is used to specify the mechanical origin. This sensor is connected to LIMIT +, LIMIT-, ORIGIN pin of IN / OUT connector.

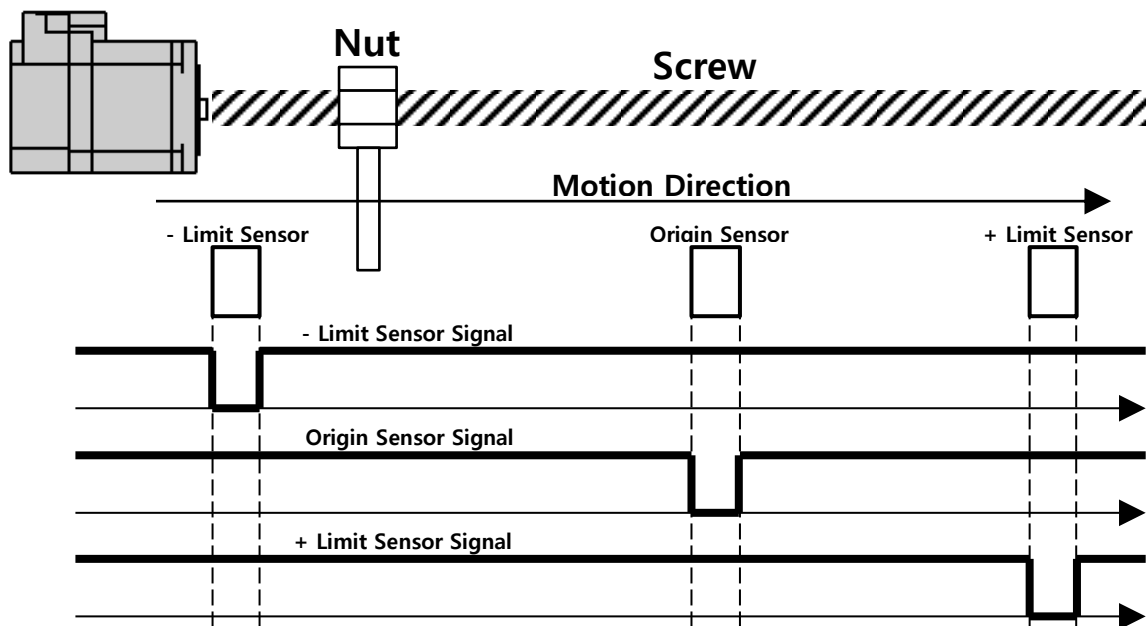


Fig 4-2 Operation of limit sensor and home sensor

2) Brake signal output signal

Brake function is used to prevent rotation of motor in Servo OFF state by using BRAKE + / BRAKE- pin of CN1 I / O connector. 'BRAKE +' is for the + 24V supplied to the outside for driving the brake circuit, and 'BRAKE-' is the output signal for the actual brake control. The control signal is automatically output according to the servo ON / OFF status and alarm occurrence. Use this output function only when the current consumption of the brake is less than 200 [mA] / DC24V.

When the Servo On command is started, the brake will be released so that the motor shaft can operate after the default value of parameter "Pn # B00Bh Brake Delay Time" 200 [msec].

3) Input signal

This product has 7 input points. Prepare the input circuit power supply DC 24V \pm 10% (consumption current about 5mA / circuit) separately.

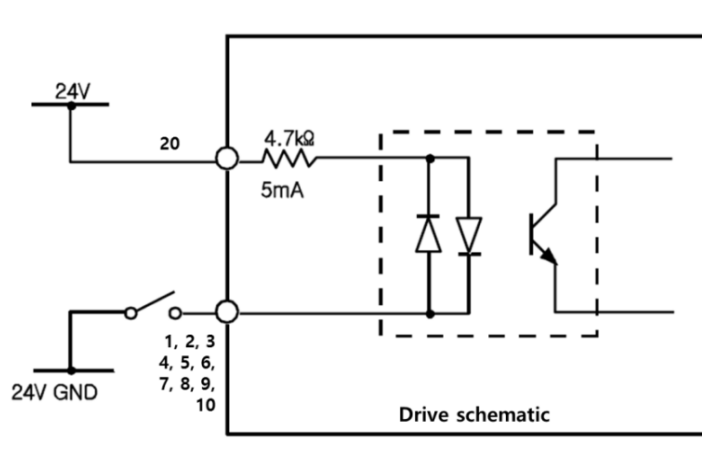


Fig. 4-3 Circuit of Ext. Input

- Connection of NPN type input signal

Connect the '+ 24V external' pin of the drive to + 24V of the host controller as shown below.

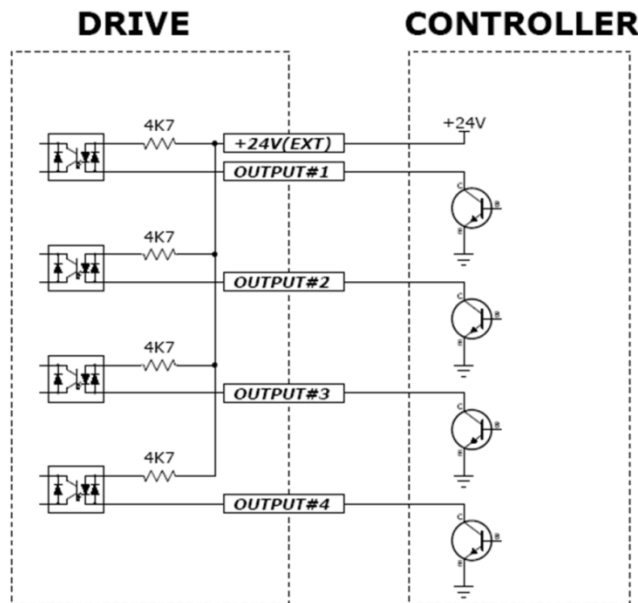
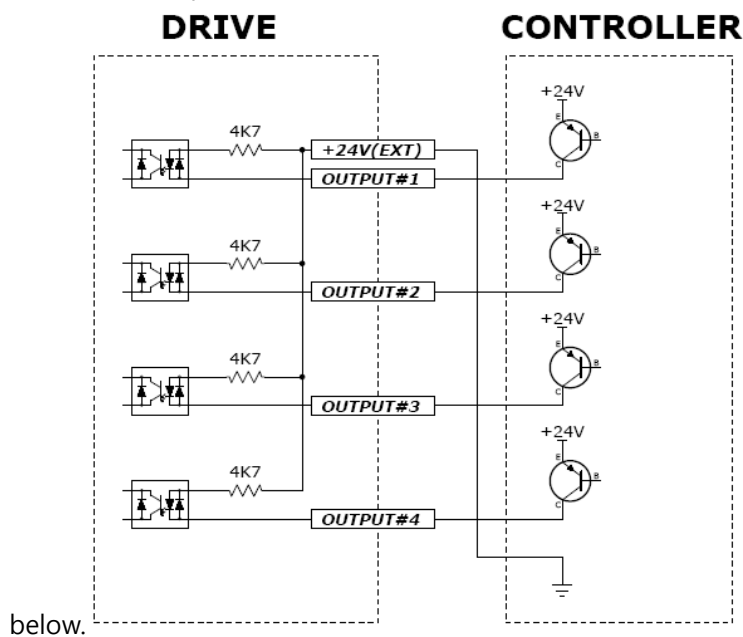


Fig. 4-4 Connection of NPN type input signal

- Connection of PNP type input signal

Connect the '+ 24V external' pin of the drive to the GND of the host controller as shown



below.

Fig. 4-5 Connection of PNP type input signal

4) Output Signal

Prepare the power supply for the output circuit separately. Although it can be used in common with the input circuit power supply, the power supply capacity in this case should be added to the input power capacity and the output power capacity. Applied voltage and power supply capacity of control output terminal are as follows.

: Applied voltage $\leq 30\text{V}$, Energizing current $\leq 15\text{mA}$

This product provides 6 points of output.

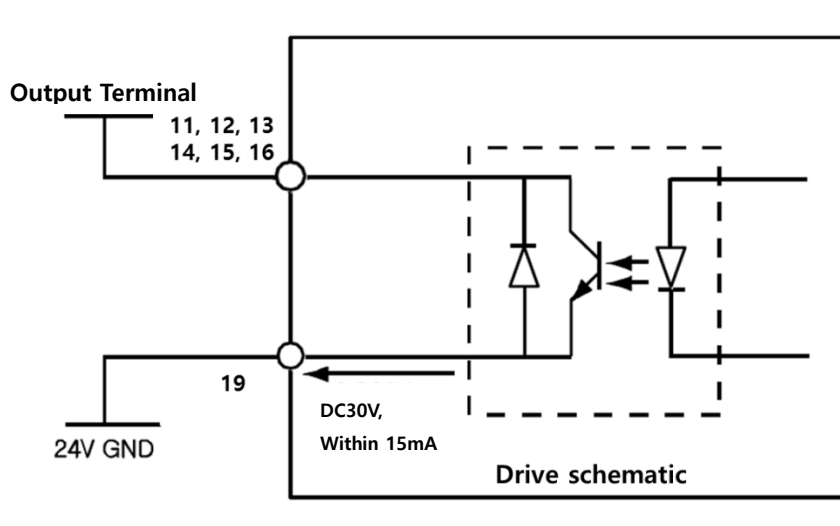


Fig. 4-6 Circuit of Ext. Output




Attention

In order to use I / O signal, DC 24V \pm 10% power must be supplied. If less voltage is applied, the input signal may not be detected. Also, when a large voltage is supplied, the photocoupler circuit inside the drive may be damaged.

4.2.2 Motor cable and encoder cable wiring [CN2] [CN3]

Motor and encoder cables are most likely to interfere with machinery. Be careful not to interfere with the movement path of the machine on other axes when using in multi-axis connected equipment system.

Drive side motor connection terminal (CN2)

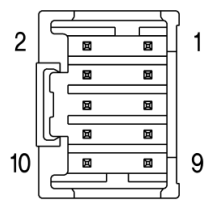
No.	Function							
1	A	 <p>Motor Connector (Connector Type : Molex 5569-04A2)</p> <table border="1"> <thead> <tr> <th colspan="2">Cable Connector</th> </tr> </thead> <tbody> <tr> <td>Terminal</td> <td>MOLEX 5556T</td> </tr> <tr> <td>Housing</td> <td>MOLEX 5557-04R</td> </tr> </tbody> </table>	Cable Connector		Terminal	MOLEX 5556T	Housing	MOLEX 5557-04R
Cable Connector								
Terminal	MOLEX 5556T							
Housing	MOLEX 5557-04R							
2	B							
3	/A							
4	/B							

■ Motor extension cable

Model Name	Length	Remark
CSVO-M-□□□F	□□□	Normal Cable
CSVO-M-□□□M	□□□	Robot Cable

Cable length is 1m, maximum length is 20m.

Encoder connection terminal (CN3)

No.	Function							
1	A +	 <p>Encoder Connector (Connector Type: Molex 55959-1030)</p> <table border="1"> <thead> <tr> <th colspan="2">Cable Connector</th> </tr> </thead> <tbody> <tr> <td>Terminal</td> <td>MOLEX 56134-9000</td> </tr> <tr> <td>Housing</td> <td>MOLEX 51353-1000</td> </tr> </tbody> </table>	Cable Connector		Terminal	MOLEX 56134-9000	Housing	MOLEX 51353-1000
Cable Connector								
Terminal	MOLEX 56134-9000							
Housing	MOLEX 51353-1000							
2	A -							
3	B +							
4	B -							
5	Z +							
6	Z -							
7	5VDC							
8	5V GND							
9	Frame GND							
10	Frame GND							

■ Encoder extension cable

Model Name	Length	Remark
CSVO-E-□□□F	□□□	Normal Cable
CSVO-E-□□□M	□□□	Robot Cable

Cable length is 1m, maximum length is 20m.




Attention

The pin map of the motor connector and the motor connection terminal on the drive side are not directly connected.

4.2.3 Power Wiring [CN4]

Check the supply voltage of the drive and use the SMPS power suitable for the voltage.

Power connection terminal

No.	Function							
1	24VDC ± 10%	<div style="text-align: center;"> <p>2 1</p>  <p>Power Supply Connector (Connector Type : Molex 5569-02A2)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2">Cable Connector</th> </tr> </thead> <tbody> <tr> <td>Terminal</td> <td>MOLEX 5556T</td> </tr> <tr> <td>Housing</td> <td>MOLEX 5557-02R</td> </tr> </tbody> </table> </div>	Cable Connector		Terminal	MOLEX 5556T	Housing	MOLEX 5557-02R
Cable Connector								
Terminal	MOLEX 5556T							
Housing	MOLEX 5557-02R							
2	GND							

■ Power Cable

Model Name	Length	Remark
CSVO-P-□□□F	□□□	Normal Cable
CSVO-P-□□□M	□□□	Robot Cable

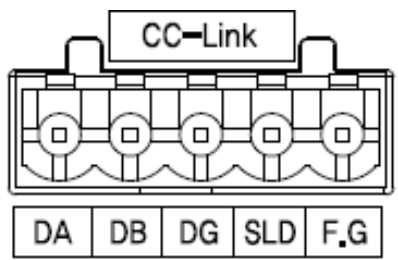
Cable length is 1m, maximum length is 20m.

4.2.4 CC-Link Cable wiring [CN5]

The CC-Link connector is used as a detachable connector. The function of each pin must be connected equally to enable normal network connection.

CC-Link terminal

No.	Function
1	DA
2	DB
3	DG
4	SLD
5	FRAME GND



CC-Link Connector

Cable Connector	
Pin Strip / Terminal Block	AK950-5P

■ CC-Link Network Cable

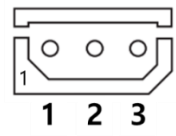
* CC-Link network cable is not handled by us.

4.2.5 RS-485 Cable wiring [CN6]

Ezi-SERVO2 CC-Link can be monitored by RS-485 communication.

RS-485 Terminal

No.	Function
1	DATA+
2	DATA-
3	GND



RS-485 Connector

Cable Connector	
Housing	MOLEX 5264-03
Terminal	MOLEX 5263PBT

- RS-485 Cable

Model Name	Length	Remark
CGNR-RT-□□□F	□□□	Normal Cable

Cable length is 1m, maximum length is 20m.

- FAS-RCR (RS-232C to RS-485 Converter)



Item	Standard
Communication Speed	Max. 115.2 kbps
Communication Distance	RS-232C : Max. 15m RS-485 : Max. 1.2km
Connector	RS-232C : DB9 Female RS-485 : RJ-45
Size	50 x 75 x 23mm
Weight	38g
Power	RS-232C own power (DC5~24V External power available)

- RS-232C Cable

Model Name	Length	Remark
CGNR-C-002F	2	Normal Cable
CGNR-C-003F	3	
CGNR-C-005F	5	

4.3 Maneuver

4.3.1 Power On/Off Method

1) Power On

If the drive is powered separately, proceed as follows:

- ① Release the Servo On command from the host controller to make Servo Off.
 - If a large number of drives are powered on and the Servo On command is executed, the power supply may be damaged.
 - If the motion command is set to be executed, the motor can be started simultaneously with Servo On.
- ② When using external I / O, Ext. Turn off the power to the I / O.
 - If Servo On or Motion command is inputted as an external input signal, the motor can be started simultaneously with power supply.

2) Power Off

Please pay attention to the following points for the stability of the equipment system and the circuit protection of the drive..

- ① Disconnect the power by instructing the drive to cancel the Servo On state.
 - The operation of the brake will operate below a certain voltage, so it will not operate immediately when the power is turned off. Therefore Servo Off command must be executed to turn off the power and then the power must be cut off.
- ② If the motor is running, turn off the power after stopping the operation.
 - If the power is turned off during operation, mechanical shock due to inertia may occur.
- ③ After the power supply of the drive is turned off, do not forcibly rotate the motor.
 - Forced rotation of the motor may generate regenerative voltage, which may damage the drive.

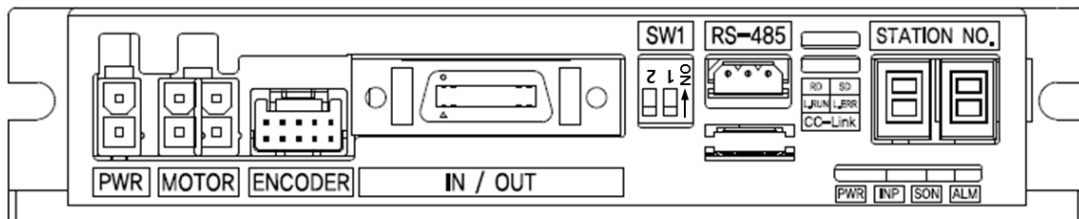
4.3.2 Operation Stop

The drive stops the operation of the motor under the following conditions.

- 1) STOP Command (Slow Stop: Stop with deceleration value included in motion profile)
- 2) E-STOP command (Emergency stop: Forced Stop)
- 3) Servo On release command (Servo Off: power off the motor and keep it in the free run state)
- 4) Alarm occurrence
- 5) Input the H/W Limit signal
- 6) The limit of S / W limit is reached.
- 7) Disconnect the network (can be changed by parameter setting)

4.3.3 CC-Link Station Occupying Setting

Ezi-SERVO2 CC-Link can be used by setting station 1 and station 2 to occupied mode with SW1 switch.



Station Occupation Switch Setting [SW1]		Operating characteristic
2	1	
0	0	1 Station Occupied Mode
0	1	2 Station Occupied Mode

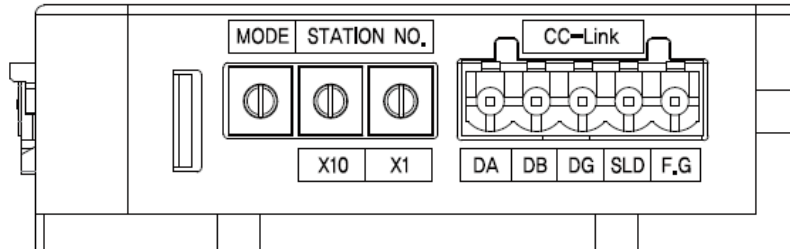
Relationship between the number of occupied stations and the number of connected modules

Station occupied No.	1 Station Occupied	2 Station Occupied	4 Station Occupied	4 Station Occupied
Number of modules connected to each remote device station by master	42	32	21	16

*When the number of connected remote device stations are equals the number occupied

4.3.4 Setting the Drive Identification Number

This product changes the CC-Link network station number setting to "STATION NO." Rotary switch. The User must set the station number and reboot the drive.



Attention

In the CC-Link network, the station number cannot be 0.
: Available station number 1 ~ 63

Ezi-SERVO2 CC-Link is a remote device that can be connected to up to 42 units when it is set to station 1 occupied mode.

4.3.5 Network Mode Setting

The communication speed of Ezi-SERVO2 CC-Link is changed with "MODE" rotary switch. The communication speed setting of the CC-Link network must be the same as the communication speed of the CC-Link master. After changing the CC-Link communication speed, be sure to re-boot the drive.

MODE	CC-Link Baud-Rate
0	156 kbps
1	625 kbps
2	2.5 Mbps
3	5 Mbps
4	10 Mbps
5...9	Not used

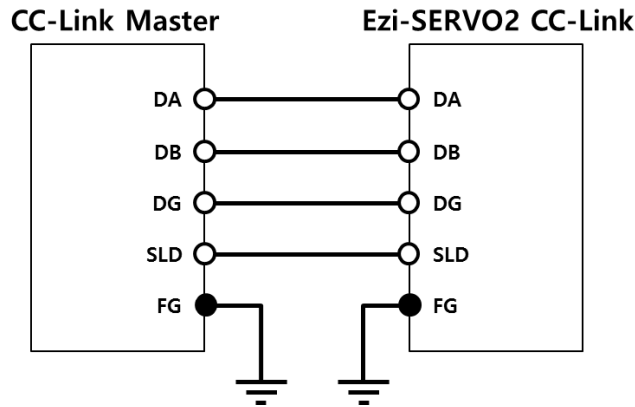


Attention

Depending on the set communication speed, the total extension distance of the system will be different. Refer to the CC-Link master user manual for specifications.

4.3.6 Network cable connection

The pin map of the CC-Link network cable is the same as that of all CC-Link remote devices.




CC-Link network cable		Pin map of CC-Link connector									
		<p>1. DA 3. DG 5. FG 2. DB 4. SLD</p> <p>* The FG (5.) Pin is an enclosure ground pin and may not be included in the CC-Link cable.</p>									
<table border="1"> <thead> <tr> <th>Core wire type</th> <th>Data name</th> </tr> </thead> <tbody> <tr> <td>Blue</td> <td>DA</td> </tr> <tr> <td>white</td> <td>DB</td> </tr> <tr> <td>Yellow</td> <td>DG</td> </tr> <tr> <td>Drain wire or Braided shield</td> <td>SLD</td> </tr> </tbody> </table>	Core wire type		Data name	Blue	DA	white	DB	Yellow	DG	Drain wire or Braided shield	SLD
Core wire type	Data name										
Blue	DA										
white	DB										
Yellow	DG										
Drain wire or Braided shield	SLD										

<p>주의</p>	<p>Ezi-SERVO2 CC-Link follows to the CC-Link network protocol. Refer to "Open Field Network CC-Link Catalog" for details on setting the value of termination resistance according to the length of the network cable and how to wiring the network cable.</p>
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4.3.7 Connection with CC-Link master PLC

When user want to set the CC-Link network parameters by opening the CC-Link card setting window in GX-Works or GX-Developer, user can set CC-Link network parameters in the module field of CC-Link card (QJ61BT11N) to which Ezi-SERVO2 CC- Mode to Remote Net (Ver.2 Mode) *. (* Can be mixed with CC-Link Ver.1 in this mode)

Ezi-SERVO2 CC-Link must be assigned as a remote device when setting start I / O and start register, and station information. Also, set the Number of Occupied Stations as same as the information of the station occupancy switch SW1.




 Attention	<p>Ezi-SERVO2 CC-Link is compatible with CC-Link Ver.2.0. When using a remote I / O device to be used as CC-Link Ver.1, set CC-Link Ver.2 in the CC-Link network parameter setting and set the station type of the corresponding remote I / O in station information (Station Type) to "Ver.1 Remote I / O Station".</p>
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4.3.8 Access to Windows GUI program or RS-485

Ezi-SERVO2 CC-Link supports motion library (Ezi-MOTION PlusR DLL) manufactured by Ezi-Motion PlusR protocol through separate RS485 port. Therefore, it is possible to connect with Ezi-MOTION PlusR GUI program which is the GUI program of Ezi-MOTION PlusR product family. (This program can be downloaded from the website of www.fastech.co.kr)

In the provided Windows GUI program, Ezi-SERVO2 CC-Link Parameter setting and position table information can be modified and basic motion test can be performed.

When controlling Ezi-SERVO2 CC-Link via separate RS485 port, Ezi-SERVO2 CC-Link must release CC-Link network or release CC-Link master control authority

 Attention	<p>Ezi-SERVO2 CC-Link is compatible with Ezi-MOTION Plus-R GUI Ver.6.40.11.XX or higher.</p>
 Attention	<p>The parameter code (2 bytes) for access to the remote device area of the CC-Link network via the host controller and the parameter code (1 byte) for the Ezi-MOTION Plus-R Protocol parameter access command are not mixed.</p>
 Attention	<p>When connected to CC-Link master when RS-485 is connected, it is not possible to change the motion control and parameter, and only the current status flag information and parameter value can be checked.</p>

4.3.9 Test Operation

Before connecting the motor to the machine and before starting the system operation, check that the machine operates normally by operating the motor.

- 1) Test operation with CC-Link master
 - ① Setting CC-Link Network Parameter of Master
 - ② Check the status LED of the drive and check that it is normal
 - ③ Execute monitoring data of Start I / O Address
 - ④ Change the master I / O device data to the I / O Device Mapping value for the corresponding command of Ezi-SERVO2 CC-Link and execute test operation

- 2) Test operation with Ezi-MOTION PlusR GUI program
 - ① Block communication with the CC-Link master or disconnect the cable
 - ② Connection with RS-485 port of drive through PC and RS-485 converter
 - ③ Run Ezi-MOTION PlusR GUI program to test

4.3.10 Parameter Access

Parameter of Ezi-SERVO2 CC-Link can be changed by command to access CC-Link remote device and window-based Ezi-MOTION Plus-R GUI program.

Parameter Classification	Parameter Start Address	Description	Write condition
Operating	0xA000	Drive information and network operation parameters	Servo Off
Drive control	0xB000	Parameter for drive control for 1 axis	Servo Off
Motion control	0xB100	Parameter of motion profile	Servo On
Homing control	0xB200	Parameter of homing profile	Servo On
Ext. I/O control	0xE000	Assigned information and level control of external I / O	Servo Off
Position Table	0x9000	Items in the position table	Servo On

4.3.11 Position Table Setting

The items of the position table are accessed by the parameter number of the CC-Link I / O Map. Parameter number is WORD unit, upper byte is PT item, lower byte is PT number.

High	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
Device Address	Position Table Item No.								Position Table No.							

Ex) PT No. When the target position value of 14 is changed, the upper device value becomes 0x810E

The items in the position table are as follows. Refer to the "Ezi-SERVO Plus-R Position Table Function" in the User's Manual.

Remote PT Item No.	Setting Item	Description	Unit	Lower Limit	Upper Limit
80h	Command (Type of command)	Specifies the type of motion to be executed.	-	0	10
81h	Position (Movement amount)	Position / movement amount is set by pulse.	pulse	-134,217,728	+134,217,727
82h	Low Speed (Low speed motion speed)	Set the number of pulses according to the type of motion.	pps	1	500,000
83h	High Speed (High speed motion speed)	Set the number of pulses according to the type of motion.	pps	1	2,500,000
84h	ACC time (Acceleration time)	Sets the acceleration time at the start of motion in msec.	msec	1	9,999
85h	DEC time (Deceleration time)	Sets the deceleration time at the end of motion in msec.	Msec	1	9,999
86h	Wait time (Waiting Time)	When the PT number item to jump is set, the waiting time until the next position operation is started is set in units of msec. If JP Table No is set to 'blank' and Continuous Action is checked, this item will be ignored.	msec	0	60,000

Remote PT Item No.	Setting Item	Description	Unit	Lower Limit	Upper Limit
87h	Continuous action (Continuous operation yes / no)	When set to 'check' (1), the current position is linked to the next position operation.	-	0	1
88h	JP Table No. (Jump position No.)	After the position operation is completed, the position operation of the jump PT is executed automatically.	-	0	255
8Ch	Loop Count (Loop count)	After execution of the number of times of setting the position (loop count), jump to a separate correspondence number (jump position number after loop) different from "jump position number".	-	0	100
8Dh	Loop Jump Table No.		-	0	255
	(Jump position number after loop)		-	10,000	10,255
8Fh	Loop Counter Clear (Loop clear)	Clears the loop counts of the position number for the set number.	-	0	255
90h	Check In-position (Motion completion recognition type)	When positioning is completed (In-position), it is recognized as stop.	-	0	1
93h	Push Ratio (The ratio of the motor's power)	Sets the ratio of applied force by each motor during push motion.	%	20	90
94h	Push Speed (Speed during force control)	Set the operation speed value to be applied in push motion. (Up to 200 [rpm])	pps	1	33,333
95h	Push Position (Target absolute position value during force control)	Sets absolute target position value to be applied in push motion.	pulse	-134,217,728	+134,217,727
96h	Push Mode (Pulse Count) (Set mode and pulse number for force control)	Select Stop mode (0) and Non-Stop mode (1 ~ 10000).	-	0	10,000

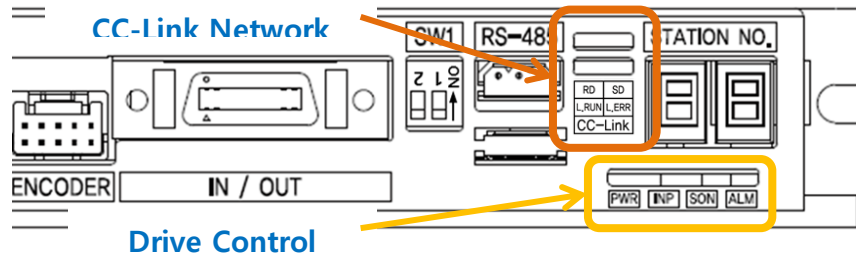


Attention

The function of the position table is the same as that of Ezi-SERVO Plus-R. However, please note that it does not support the function of outputting to the external output among the position table functions.

4.4 Drive status Display

The status display of the drive is composed of four CC-Link network status LEDs and four Ezi-SERVO2 CC-Link drive control status LEDs.



4.4.1 7-Segment for station number display

1) Station number display

When the drive is normally connected to the CC-Link network, the 7-segment displays the station number with the status lighting.

When the drive is powered up, the network identification number will flash if it is not connected to the CC-Link network. At this time, if the network connection is normalized, the blinking ID number will stay on.

2) Station number change

During system operation, CC-Link station number FND flashes by setting the rotary switch.

3) ERROR value display

When an error occurs in the controller of the drive (Fault status), the Error value is displayed in the 7-Segment instead of the CC-Link station number. The Error value is displayed in the form of 'E-000' every 3 characters in 7-Segment. Characters are switched every second.

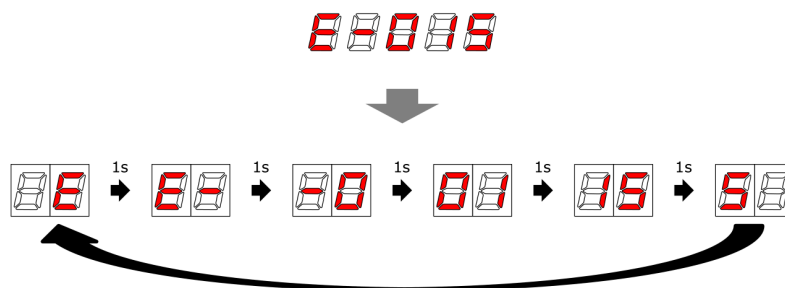


Fig. 4-7. Error value display (Ex: E-015)

The first digit of the Error value indicates the status value of the CC-Link Error, the second digit and the third digit indicates the drive's alarm status.

■ CC-Link Network Status 7-Segment Display Information

ERROR Display	Description
E-0□□.	CC-Link network In normal state
E-1□□.	CC-Link station number switch setting is incorrect
E-2□□.	CC-Link Mode switch setting is incorrect
E-3□□.	CC-Link station number switch setting is changed
E-4□□.	CC-Link Mode switch setting is changed
E-5□□.	CRC error occurs in CC-Link communication
E-6□□.	Timeout occurs during communication with master
E-7□□.	Communication with master is disconnected
E-8□□.	CC-Link processor error 1
E-9□□.	CC-Link processor error 2
E-A□□.	Data link error
E-B□□.	Remote I/O error
E-C□□.	Remote resister error

■ Drive control status 7-Segment display information

ERROR Display	Description
E-□00.	Drive in normal state
E-□01.	The current through power devices in inverter exceeds the limit value *1
E-□02.	Motor speed excess 3300[rpm]
E-□03.	If the position error in the position command is excess than the given value *2
E-□04.	The motor is continuously operated more than 5 seconds under a load exceeding the max. torque
E-□05.	Temperature of inside of the drive exceed 85°C
E-□06.	Back EMF of motor exceeds limit value *3
E-□07.	When there is a problem with the connection between the drive and the motor
E-□08.	When there is a problem with the connection between the drive and the encoder
E-□09.	When the supply power to the motor is below the lower limit value *4
E-□0A.	When position error (1 or more) occurs more than 3 seconds after completion of operation
E-□0b.	When an error occurs in the drive system (Watch Dog Timer)
E-□0C.	When error occurs in parameter storage device(ROM)
E-□0F.	If the position error value after position command completion is larger than the given value *5
E-□bF.	Data error in internal EEPROM

*1 Detection current: 4.5A, *2 Parameter 'Pos Tracking Limit [No.24]' Set value [pulse],

*3 Limit value: 70V, *5 Parameter 'Pos Error Overflow Limit[No.28]' Set value[pulse]

4.4.2 CC-Link status display LED

LED Display	Operation status	Function	Action
L RUN (녹색)	Off	Power OFF	Checking the power status
		No network connection	Checking the status of network cable and Master controller connection
	On	Normal operation	CC-Link network connection is normal status
L ERROR (적색)	Off	Normal operation	No error occurred
	On	Critical error	Communication process fails
	Flashing	Communication error	Error occurred in the CC-Link network Check the 7-Segment display information and process it
	Random flashing	CRC error, Network cable error	There is a contact error of the network connector or noise in the cable line. To check the terminating resistor attachment status, network wiring, and grounding status with frame

4.4.3 Drive status display LED

indication	Color	Function	On/Off Condition
PWR	Green	Power Input Indication	LED is turned On when Power On
INP	Yellow	Complete Positioning Motion	Lights On when position error reaches within preset pulse selected by rotary switch
SON	Orange	Motor Enable status Indication	Enable : Light On, Disable: Light Off
ALM	Red	Alarm Indication	Repeated blinking when protection function is activated (counting the number of LED flashes shows the function of the activated protection function)

4.5 Type of operation command

Type of motion command	Additional explanation
Homing	Execute the Homing command - Homing Sensor - Limit Sensor - Z-Phase Signal - Mechanical limit detection
JOG Operation	Depending on the input state,
JOG Speed Override	Change of motor rotation speed during JOG operation
Step Move	Move as much as user setting
Zero position Move	Move to set Drive Zero Position in Drive
Position Table Operation	Motion profile stored in position table
Position Table Single Operation	Only one motion profile stored in the position table
Absolut Position Move	Moving the target position to the tracked position information
Incremental Position Move	Moves the target position to the addition or subtraction position at the current position
Absolut Position Override	Moving the target position during operation to new tracked position information
Incremental Position Override	Move by change the target position during operation to the added or subtracted position at the current position
Position Move Speed Override	Speed change during position movement

Ezi-SERVO2 CC-Link has a limited data memory map due to the network characteristic. Therefore, extended command can be executed by setting the station 1 occupied mode and the 2 station occupied mode.

User can execute a command by assigning a specific command to an external input signal.

4.5.1 1 Station occupied mode

- Homing movement: Mechanical origin is designated by homing method saved as parameter
- JOG Operation : Moves to the limit by the entered speed value
- JOG Speed Override : Move to the limit point by change the initial input speed value during JOG operation
- Step Movement : Only when the command signal is held, it is additionally moved as much input position, and it is stopped when the command signal is interrupted during the movement.
- Zero Position Movement : Move to Zero position
- Position Table Operation : Execute operation with motion profile stored in drive

4.5.2 2 Station occupied mode

- Absolut Position Move : Move to entered position value
- Absolut Position Override Move : Change target position value during absolute position movement
- Incremental Position Move : Additional move by the entered position value
- Incremental Position Override Move : Change additional movement value during incremental position movement
- Position Move Speed Override) : Change moving speed value during position movement

4.5.3 Use of External I/O

Ezi-SERVO2 CC-Link can be used by assigning each function to 7 inputs. This input information can be assigned redundantly.

Mapping information value [info]		Function	Motion
[HEX]	[DEC]		
0x00	0	None	No operation
0x01	1	User Input 1	User Input 1
0x02	2	User Input 2	User Input 2
0x03	3	User Input 3	User Input 3
0x04	4	User Input 4	User Input 4
0x05	5	User Input 5	User Input 5
0x06	6	User Input 6	User Input 6
0x07	7	User Input 7	User Input 7
0x10	16	E-STOP	Emergency stop command
0x11	17	Servo Enable	Servo On/Off
0x12	18	Alarm Reset	Release the alarm of drive
0x13	19	S-STOP	Decelerate to stop operation
0x14	20	Home Search	Star homing
0x15	21	Clear Position	Set current position to "0"
0x16	22	JOG +	Forward jog operation
0x17	23	JOG -	Reverse Jog operation
0x18	24	STEP +	Forward step movement
0x19	25	STEP -	Reverse step movement
0x1A	26	Go Zero Position	Return to Zero position
0x1B	27	Pause	Motion Pause
0x1C	28	Teaching	Teaching command
0x20	32	PT A0	Position Table No. - Set to 8-bit value from 0 ~ 255 Attention: Ezi-SERVO2 CC-Link input signals can be assigned up to 7, please pay attention to the assignment of PT number.
0x21	33	PT A1	
0x22	34	PT A2	
0x23	35	PT A3	
0x24	36	PT A4	
0x25	37	PT A5	
0x26	38	PT A6	
0x27	39	PT A7	
0x28	40	PT Start	Position Table Start
0x29	41	Single PT Select	Selecting single operation mode of Position Table

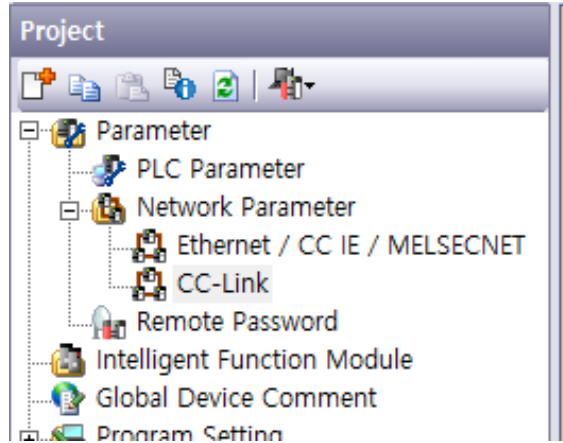
Ezi-SERVO2 CC-Link can be used by assigning each function to 6 inputs. This output information can be duplicated.

Mapping information value [info]		Function	Motion
[HEX]	[DEC]		
0x00	0	None	
0x01	1	User Output 1	User Output 1
0x02	2	User Output 2	User Output 2
0x03	3	User Output 3	User Output 3
0x04	4	User Output 4	User Output 4
0x05	5	User Output 5	User Output 5
0x10	16	Motioning	In Motion
0x11	17	Servo Ready	Servo On/Off status
0x12	18	In-Position	In-position Completed state
0x13	19	Alarm	Alarm stop status
0x14	20	Motion Ready	Motion command enabled state
0x15	21	Accel / Decel	During motion operation, acceleration / deceleration state
0x16	22	Motion Direction	Operation direction of motor (OFF: + direction, ON: - direction)
0x18	24	END	Position Table Stop
0x19	25	HOMING	Homing
0x1A	26	Homing OK	Homing Completed
0x1B	27	Warning	Error occurred

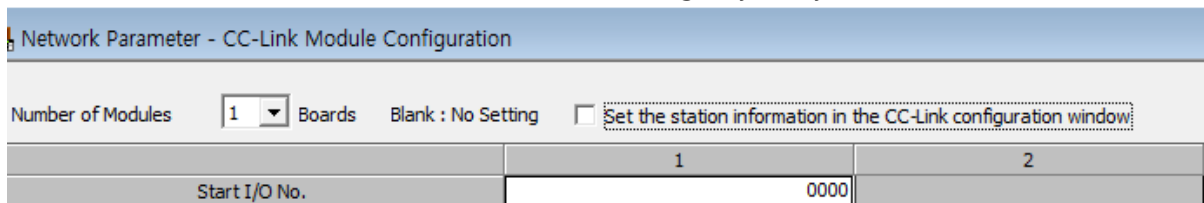
4.6 CC-Link Parameter Setting

This manual is written based on GX Works 2.

- ① Ezi-SERVO2 CC-Link can be connected with CC-Link Ver.1. To connect to the master controller, double-click [Parameter] - [Network Parameter] - [CC-Link] in the PLC program project.



- ② In the CC-Link Module Configuration window, set the number of modules (CC-Link module) and the value of Start I / O according to your system environment..



- ③ If user system is using CC-Link Ver.1, set it to Remote Net (Ver.1 Mode)..

Type	Master Station	▼	▼
Master Station Data Link Type	PLC Parameter Auto Start	▼	▼
Mode	Remote Net(Ver. 1 Mode)	▼	▼

However, if user system uses CC-Link Ver.2, set it to Remote Net (Ver.2 Mode).

Type	Master Station	▼	▼
Master Station Data Link Type	PLC Parameter Auto Start	▼	▼
Mode	Remote Net(Ver. 2 Mode)	▼	▼

- ④ Enter the number of devices to be connected to the CC-Link network. (1 in this manual)



- ⑤ Set the CC-Link remote device start address

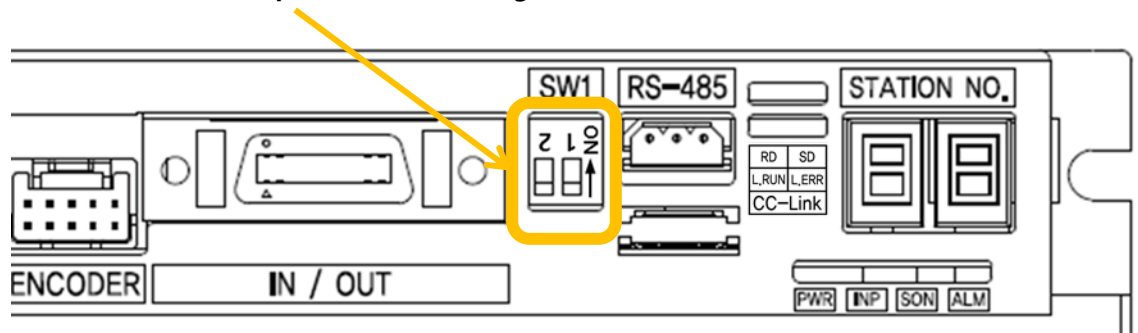
Remote input(RX)	X1000	
Remote output(RY)	Y1000	
Remote register(RWr)	D1000	
Remote register(RWw)	D2000	

The remote device set in this manual

- Remote Input Address (RX) : X1000
- Remote Output Address (RY) : Y1000
- Remote Resister Address (RWr) : D1000
- Remote Resister Address (RWw) : D2000

- ⑥ Set the switch value of SW1 on the front side of Ezi-SERVO2 CC-Link of the station number to be occupied according to the system condition..

Number of Occupied Station Setting Switch



Switch information

SW1.2	SW1.1	Occupied station number
OFF	OFF	1
OFF	ON	2
ON	OFF	3 (No function)
ON	ON	4 (No function)

- ⑦ Set device information connected to CC-Link network..

Station Information Setting	Station Information	
-----------------------------	---------------------	--

- ⑧ If the CC-Link network is Ver.1, Station Type is set to Remote Device Station.

CC-Link Station Information Module 1

Station No.	Station Type	Expanded Cyclic Setting	Number of Occupied Stations	Remote Station Points	Reserve/Invalid Station Select
1/ 1	Remote Device Station	Single	Occupied Station 1	32Points	No Setting
	No Setting				
	Remote I/O Station				
	Remote Device Station				
	Intelligent Device Station				

- ⑨ If the network of CC-Link is Ver.2, station type should be set as Ver.1 Remote Device Station.

CC-Link Station Information Module 1

Station No.	Station Type	Expanded Cyclic Setting	Number of Occupied Stations	Remote Station Points	Reserve/Invalid Station Select
1/ 1	Ver. 1 Remote Device Station	Single	Occupied Stations 2	64Points	No Setting
	No Setting				
	Ver. 1 Remote I/O Station				
	Ver. 1 Remote Device Station				
	Ver. 1 Intelligent Device Station				
	Ver. 2 Remote Device Station				
	Ver. 2 Intelligent Device Station				

- ⑩ The setting of the number of occupied stations must be set according to the user system and set the same as the switch setting information of SW1 on the front side of Ezi-SERVO2 CC-Link.

CC-Link Station Information Module 1

Station No.	Station Type	Expanded Cyclic Setting	Number of Occupied Stations	Remote Station Points	Reserve/Invalid Station Select
1/ 1	Ver. 1 Remote Device Station	Single	Occupied Stations 2	64Points	No Setting
	No Setting				
	Occupied Station 1				
	Occupied Stations 2				
	Occupied Stations 3				
	Occupied Stations 4				

- ⑪ If several connected stations are connected and the occupied station is also different, the station numbers are arranged as follows. At this time, the CC-Link station number should be set to the value declared here.

CC-Link Station Information Module 1

Station No.	Station Type	Expanded Cyclic Setting	Number of Occupied Stations	Remote Station Points	Reserve/Invalid Station Select
1/ 1	Ver. 1 Remote Device Station	Single	Occupied Stations 2	64Points	No Setting
2/ 3	Ver. 1 Remote Device Station	Single	Occupied Station 1	32Points	No Setting
3/ 4	Ver. 1 Remote Device Station	Single	Occupied Stations 2	64Points	No Setting
4/ 6	Ver. 1 Remote Device Station	Single	Occupied Stations 2	64Points	No Setting
5/ 8	Ver. 1 Remote Device Station	Single	Occupied Station 1	32Points	No Setting

⑫ This manual is written with set up as follows..

Network Parameter - CC-Link Module Configuration		
Number of Modules	<input type="text" value="1"/> Boards	Blank : No Setting <input type="checkbox"/> <input type="text" value="Set the station information in the CC-Link configuration window"/>
	1	2
Start I/O No.	<input type="text" value="0000"/>	
Operation Setting	Operation Setting	
Type	Master Station	
Master Station Data Link Type	PLC Parameter Auto Start	
Mode	Remote Net(Ver. 2 Mode)	
Total Module Connected	<input type="text" value="1"/>	
Remote input(RX)	<input type="text" value="X1000"/>	
Remote output(RY)	<input type="text" value="Y1000"/>	
Remote register(RWr)	<input type="text" value="D1000"/>	
Remote register(RWw)	<input type="text" value="D2000"/>	
Ver. 2 Remote input(RX)		
Ver. 2 Remote output(RY)		
Ver. 2 Remote register(RWr)		
Ver. 2 Remote register(RWw)		
Special relay(SB)	<input type="text" value="SB0"/>	
Special register(SW)	<input type="text" value="SW0"/>	
Retry Count	<input type="text" value="3"/>	
Automatic Reconnection Station Count	<input type="text" value="1"/>	
Standby Master Station No.		
PLC Down Select	Stop	
Scan Mode Setting	Asynchronous	
Delay Time Setting	<input type="text" value="0"/>	
Station Information Setting	Station Information	
Remote Device Station Initial Setting	Initial Setting	
Interrupt Settings	Interrupt Settings	

4.7 Confirmation of handshake

4.7.1 Activating the Drive

Ezi-SERVO2 CC-Link requests initial data processing when power is turned on. This can be checked by turning on the "Initial Data Processing Request [RY1C]" bit of the remote device.

Ezi-SERVO2 CC-Link's "Remote station Ready [RX1D]" is ON when the status of "Initial Data Processing Request [RX1C]" is checked in the upper part and "Initial Data Processing Complete [RY1C]" is checked in the upper part and "Initial Data Processing Complete [RY1C]" "RX1C is ON, then Initial Data Processing Request" turns OFF, and the drive becomes active

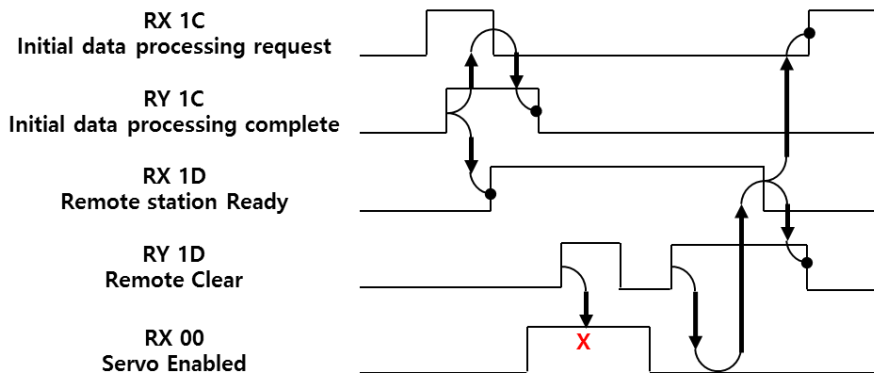
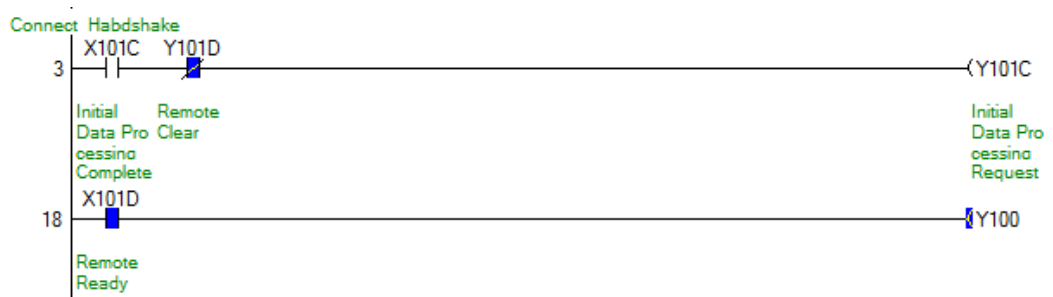



Fig. 4-8 Confirmation of handshake

The drive can be released with the "Remote Clear [RYD]" set to release the active state. However, to disable the drive, it must be in Servo Off mode. When the remote device output RY00 is turned on or the external input command is Servo On, stop the motion and make the Servo Off state.

4.7.2 Handshake Method

When the start address of Remote Device I / O of CC-Link Data is Y1000, X1000



 Attention	<p>Please note that the data when the Remote station Ready bit (RY1D) is not ON is invalid.</p>
---	---

4.8 RS485 Control Authority

In case of FA field control, access to other interface except main control device is required. Ezi-SERVO2 CC-Link supports Ezi-MOTION Plus-R Protocol with RS485 port, so it can be used as a program for motion command and parameter setting of existing Ezi-MOTION PlusR product family.

4.8.1 Approval of Control Authority

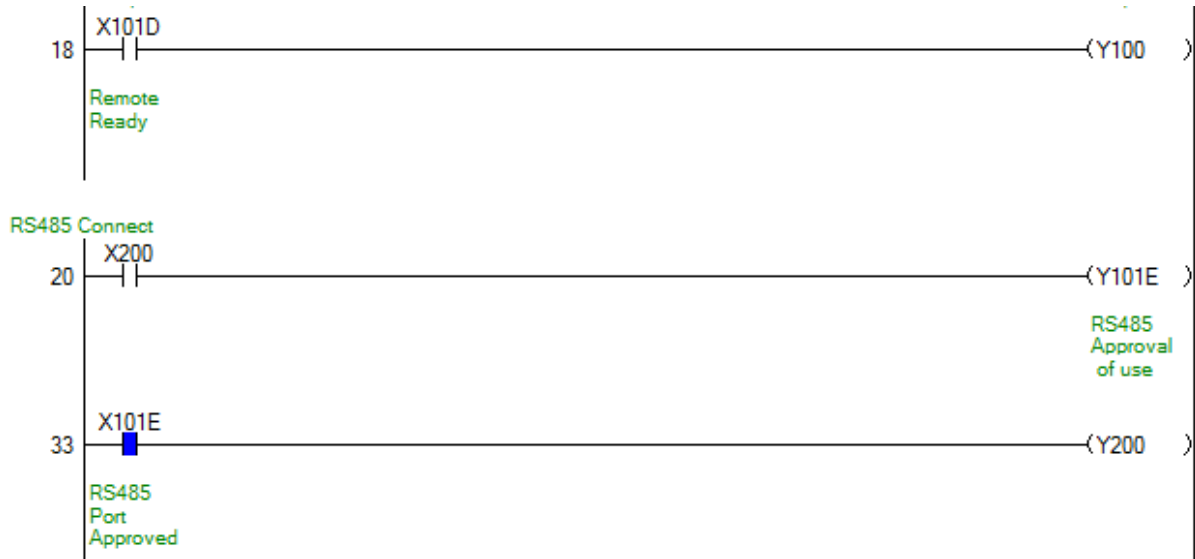
Ezi-SERVO2 CC-Link is an RS485 port that enables basic status monitoring and parameter request commands. These commands can only process commands that are read-only. If you want to modify parameter or motion control to RS485 communication, you can obtain control authority as follows.

- ① Exit from the CC-Link network by turning off the power of the master controller or disconnecting the CC-Link cable from the drive.
 - Execute all supported commands
- ② Turn on "RS485 Approval of use [RY1E]" to acquire control authority
 - No authority for Servo On / Off control
- ③ Disable drive (set "Remote station Ready [RX1D]" to Off)
 - Execute all supported commands

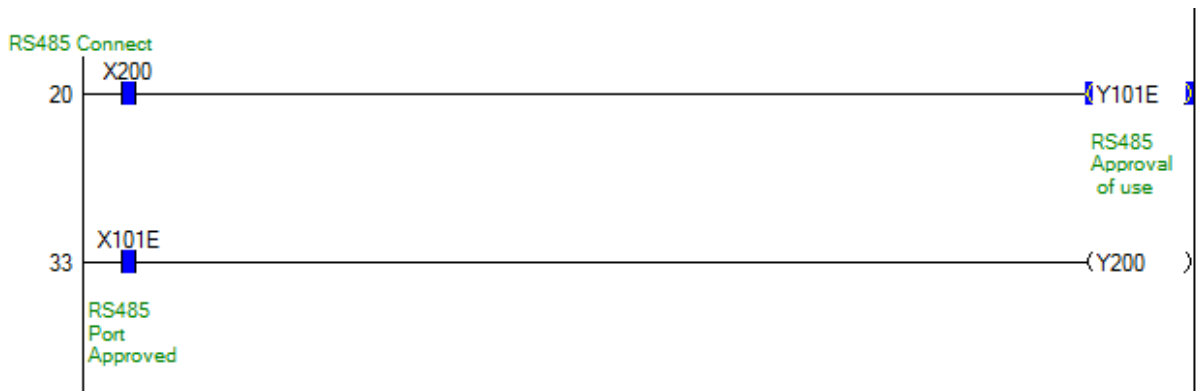
4.8.2 Approval of Control authority check and RS485 communication status

The control authority for RS485 communication is approved when "[RX1E] RS485 Port Approved" is ON. The conditions under which this device turns ON are as follows.

- ① When "Remote station Ready [RX1D]" is off state



- ② When "[RY1E] RS485 Approval of use" is On state



4.8.3 RS485 communication connection flag

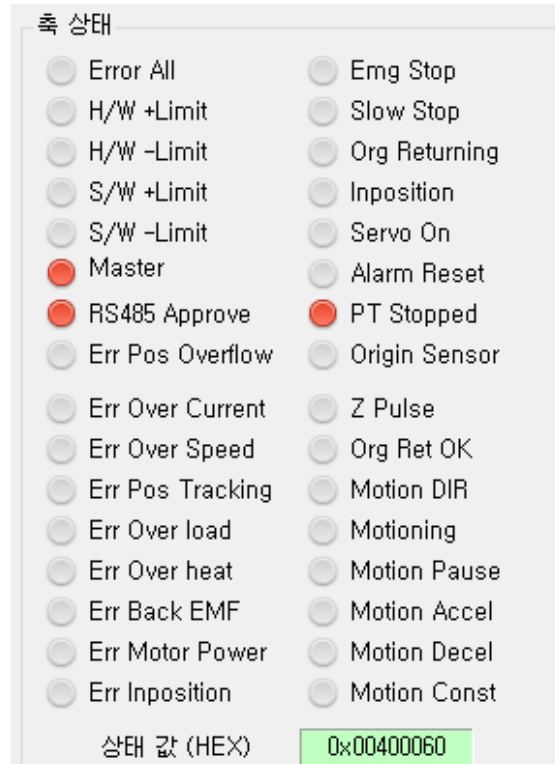
The master controller can check whether the command is being received by RS485. At this time, the Ezi-MOTION PlusR protocol will stay on for 1 second from the point of the normal processed command.



4.8.4 Status bits in Ezi-MOTION PlusR GUI

Ezi-SERVO2 CC-Link can check the following status information by executing FZ_GetAxisStatus () command which is Ezi-MOTION PlusR Protocol.

The User can check the flag when the connection of the master controller is checked and the flag indicating whether or not control is available through RS485.



- Master bit : When the host controller is detected
- RS485 Approve bit : When user has RS485 control authority

4.9 Servo On/Off and Alarm Reset

1) Servo On/Off function

If the Servo ON / OFF signal is turned OFF, the drive will stop supplying current to the motor and the motor will be in the free run state. In this state, the position of the rotation axis of the motor can be adjusted manually. When signal is ON, the drive supplies current to the motor and maintenance torque is maintained. Since the process procedure for Servo On is required, execute the motion command about 2 seconds later when operating the motor

Remote Device

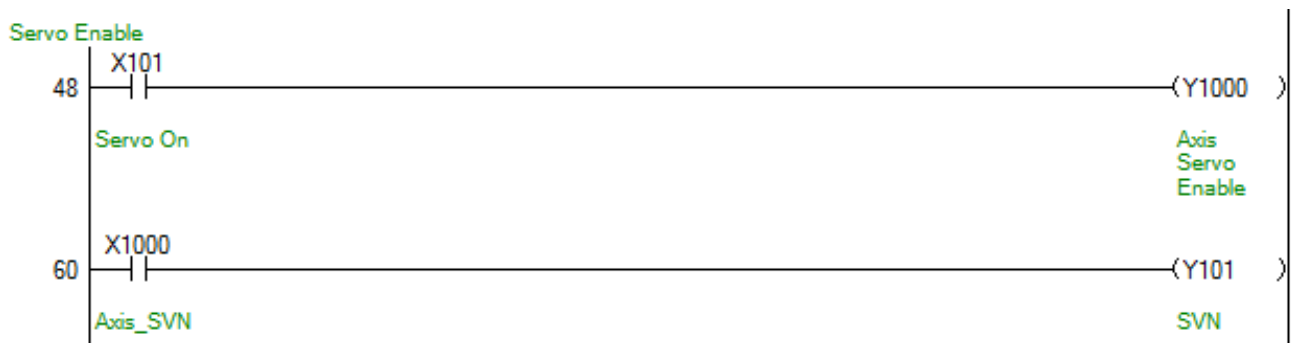
- Remote Input Address (RX) : X1000
- Remote Output Address (RY) : Y1000
- Remote Resister Address (RWr) : D1000
- Remote Resister Address (RWw) : D2000


Mapping information

Motion Name	Function PLC->Drive	Remote Device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
Servo Enable	Output	Y1000	SERVO ON	17	0x11
Servo Enabled	Input	X1000	SERVO READY	17	0x11

Device comment

- User Servo On Command : X101
- User Servo On Status : Y101



 Attention	In order to control Servo On / Off command to external input by assigning Servo On command to external input pin, Servo On bit of CC-Link I / O map should also be On.
---	--

2) Alarm factor and Alarm Reset

When the drive cannot be operated by the internal protection circuit, the protection function of the drive is activated and the alarm is output. The confirmation of the alarm can be confirmed by the 7-segment display of "4.4 Drive Status Display" or by the number of flashes of the alarm status LED

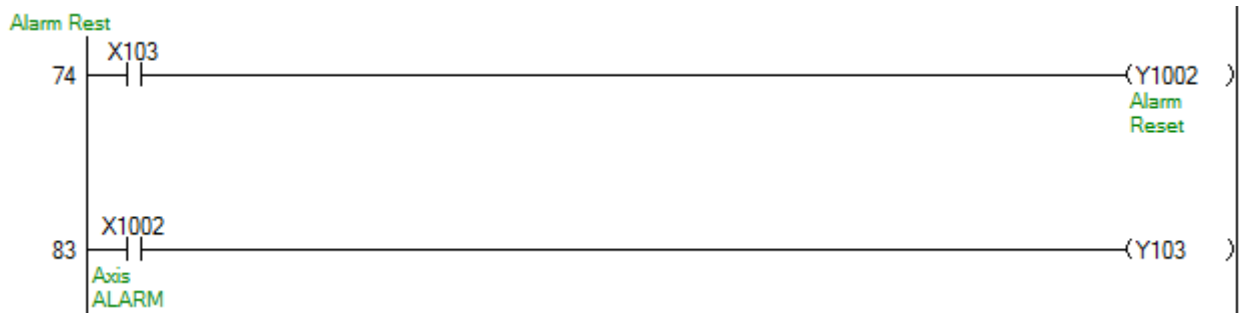
When an alarm occurs, the system can be rebooted or released by an alarm reset command. At this time, it is necessary to clear the cause of alarm and then reset it.

Mapping information

Motion Name	Function PLC->Drive	Remote Device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
Alarm Reset	Output	Y1002	Alarm Reset	18	0x12
Axis Alarm	Input	X1002	ALARM	18	0x13

Device comment

- User Alarm Reset Command : X103
- User Axis Alarm Status : Y103



3) Operation of Servo On / Off and Alarm

If an alarm occurs in the drive while the motor is running, the motor will stop and automatically turn off. When the alarm release command is executed, the motor maintains the pre-run state. In order to restart it, the Servo On command must be executed. The operation is as follows, and the Alarm Reset command must maintain a signal of 2 cycles or 10 [msec] or more.

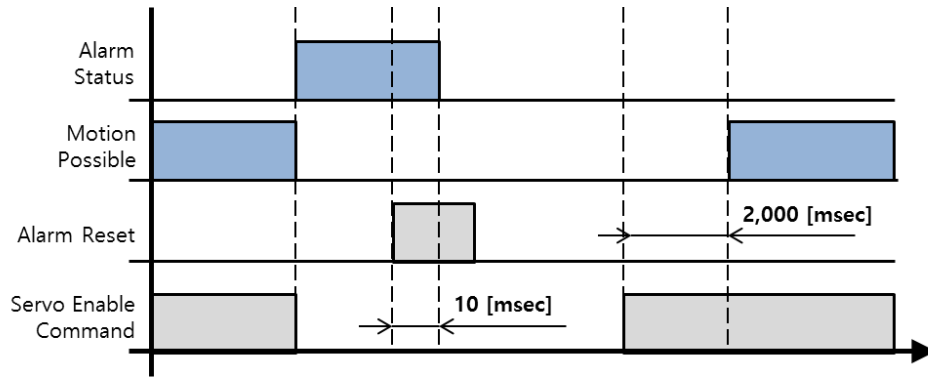


Fig. 4-9. Operation of Servo On/Off and Alarm

4.10 E-STOP (Emergency Stop)

The E-STOP command is an emergency stop command that immediately stops without deceleration. In CC-Link I / O-Map, it operates by low command. When input by external input, it operates according to level setting value.

Mapping information

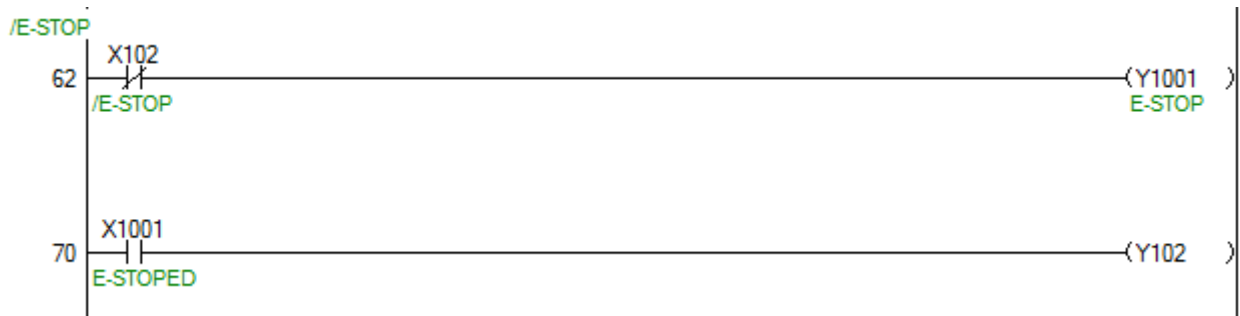
Motion Name	Function PLC->Drive	Remote Device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
Emergency Stop	Output	Y1001	E-STOP	18	0x10
Emergency Stopped	Input	X1001	-	-	-

Used Parameter

Parameter No.		Parameter Name
GUI No.	Parameter Code	
0	A011	E-STOP Method

Device comment

- User E-STOP Command : X102
- User Motioning Status : Y102



If the E-STOP command is maintained, no motion command is executed. The operation of the E-STOP command can be changed according to the parameter **Pn # A011h E-STOP Method** when the command is executed.

1) Servo On maintained [Pn#A011h = 0]

If the parameter value is set to '0', the motion during E-STOP command will stop suddenly without deceleration and Servo On will be maintained.

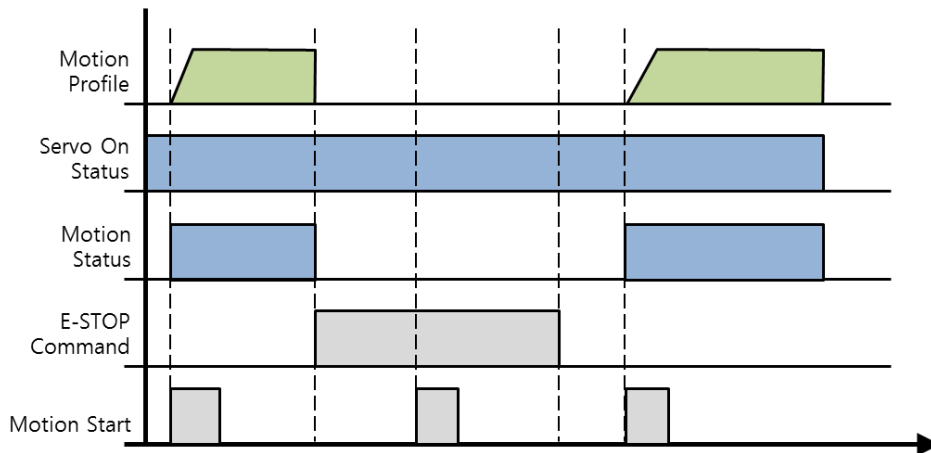


Fig. 4-10. E-STOP Only

2) Execution of Servo Off [Pn#A011h = 1]

If user set the parameter value to '1' to enable Servo Off, the motion in motion will stop suddenly without deceleration and Servo Off will be enabled.

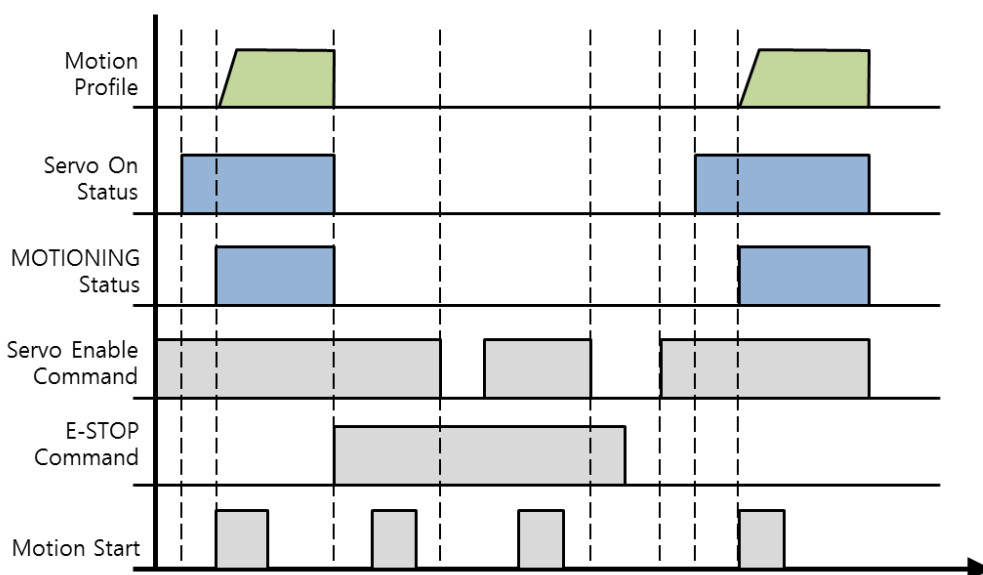


Fig. 4-11. When set to Servo Off operation mode

4.11 S-STOP (Slow Stop)

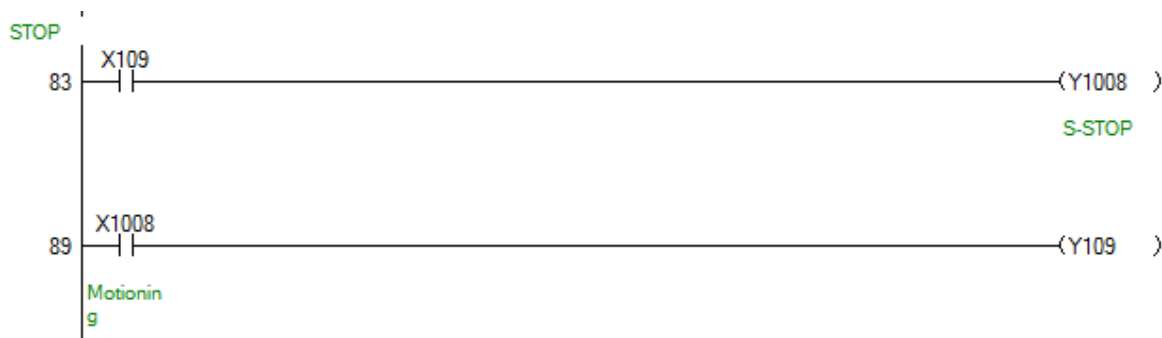
The S-STOP instruction is a general stop instruction that stops the motion profile under the deceleration condition. In CC-Link I / O-Map, it operates by High command. When input by external input, it operates according to the level setting value.

Mapping information

Motion Name	Function PLC->Drive	Remote Device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
S-Stop	Output	Y1008	S-STOP	19	0x13
Motioning	Input	X1008	Motioning	16	0x10

Device comment

- User STOP Command : X109
- User Motioning Status : Y109



If the S-STOP instruction is maintained, no motion command is executed.

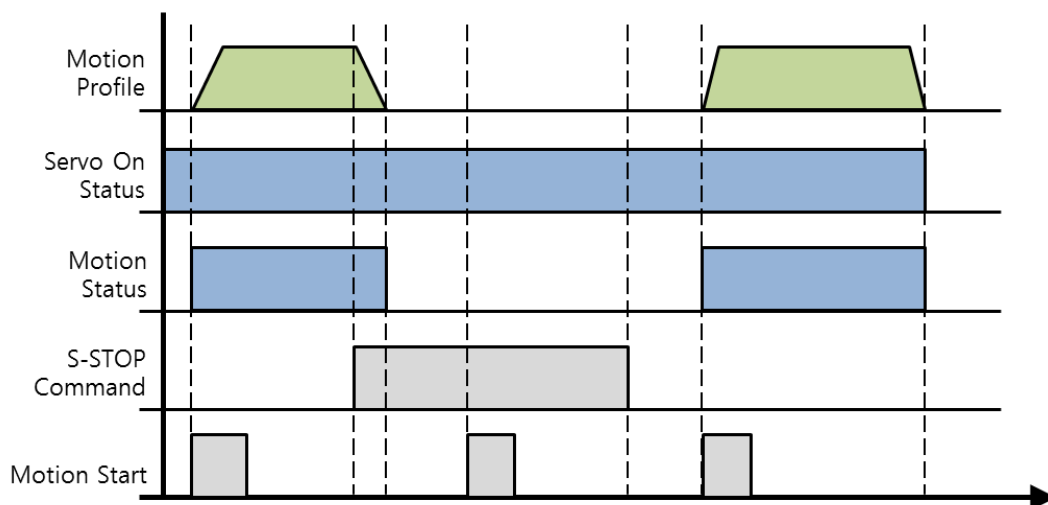


Fig. 4-12. Motion of S-STOP

4.12 Homing Start

Homing start is a command to specify a mechanical origin. To execute the homing start command, search the origin according to the value of parameter "Pn # B200h Homing Method". When this command is executed, Motion Ready is off. Motion Ready is On when the origin move command is canceled or home search is completed.

Mapping information

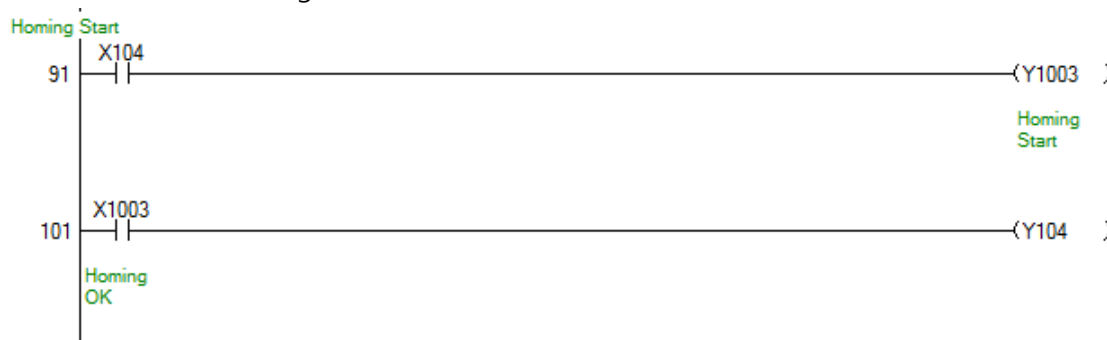
Motion Name	Function PLC->Drive	Remote Device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
Homing Start	Output	Y1008	Home Search	20	0x14
HOME Search OK	Input	X1008	Homing OK	26	0x1A
MOTION READY	Input	X1004	Motion Ready	20	0x14

Used Parameter

Parameter No.		Parameter Name
GUI No.	Parameter Code	
32	B200	Homing Method
33	B201	Homing Speed
34	B202	Homing Search Speed
35	B203	Homing Acc Dec Time
36	B204	Homing Direction
37	B205	Homing Offset
38	B206	Homing Position Set
39	B207	Org Torque Ratio
40	E000	Limit Sensor Logic
41	E001	Org Sensor Logic

Device comment

- User STOP Command : X109
- User Motioning Status : Y109



When returning to the home position, the status flag can be checked as shown in Fig. 4-13.

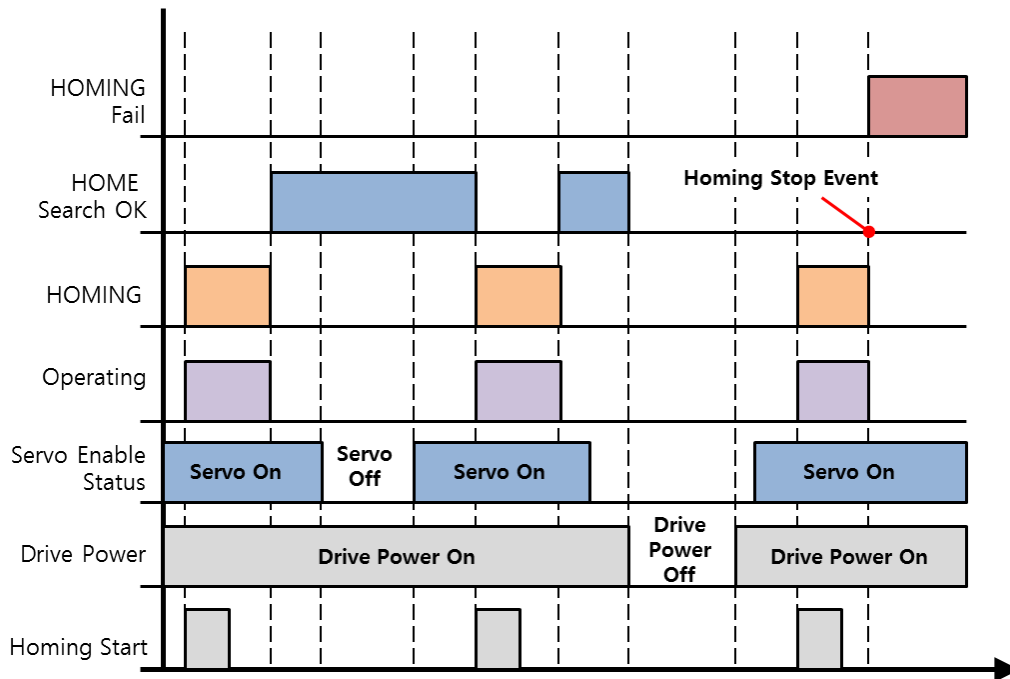




Fig. 4-14. State flag of home move command

When homing start command is issued, HOMING, which is the process of operating the drive according to the origin method of Pn # B200, is executed. When home search is completed during this operation, Home Search OK flag turns on.

A flag indicating that home movement has been completed. The Home Search OK flag remains ON even when the servo is off. However, when a new home return command is executed or the drive is re-booted, the Home Search OK flag turns OFF

 Attention	<p>Homing Fail state in which origin movement stops when Servo Off, Stop command, H / W Limit signal which is unnecessary for origin method is detected during home position movement.</p>
 Attention	<p>Homing Search Fail is not a status flag on the drive.</p> <p>The homing start failure condition is that the homing flag is ON by executing Homing start command, and Homing flag is OFF when Home Search OK is not ON.</p>

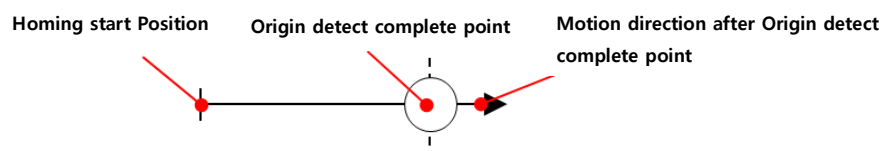
The input signals used to find the origin are Origin, Limit +, Limit-Sensor and Z-Phase signal which is the index pulse of the encoder. This uses signals differently according to the Homing Method (Pn # B200h) parameter.

Pn#B200h : Homing Method

Method Number.	Method Type
0x00	Origin profile of 오류! 참조 원본을 찾을 수 없습니다.
0x01	Origin profile of Homing Profile of "Z-Origin"
0x02	Origin profile of Homing Profile of "Reverse Side Origin"
0x03	Origin profile of Homing Profile of "Reverse Side Z-Origin"
0x04	Origin profile of Homing Profile of "Limit Origin"
0x05	Origin profile of Homing Profile of "Z Limit Origin"
0x06	Homing Profile of "Z Phase"
0x07	Origin profile of Homing Profile of "Torque Origin"
0x08	Origin profile of Homing Profile of "Torque Origin"
0x09	Set Origin

※ Setting of homing method

- To execute home return, parameter "Pn # B200: Org Method" must be set.
- The arrows in the figure indicate the direction of movement after the detection of home position is completed.
- In the figure, ○ is the origin detection position.
- The number in ○ indicates the position of the sensor dog or the example number according to Org Dir.
- In Z-pulse homing method, Z-pulse homing is repeated twice at a speed of 10 [pps] (fixed speed) after completion of low homing of Parameter Homing Search Speed (Pn # B202h) Complete the return. (This method is for accurate Z-pulse Zero point return.)



Attention

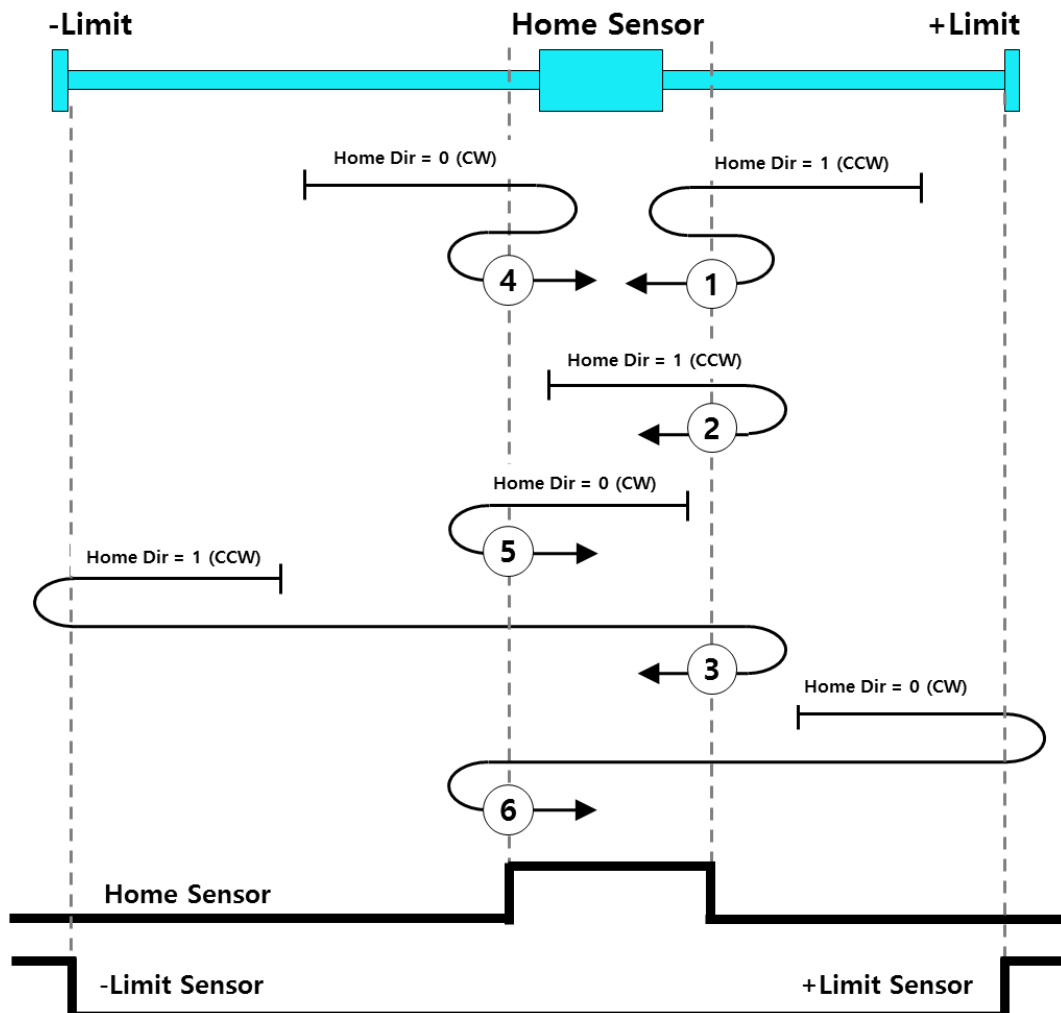
When the H / W Limit input is done, the home position is moved by the Z-phase method or Torque Org method, the homing command is canceled.

4.12.1 Homing Method : Origin (0x00)

The origin return method by the origin sensor is the method in which the origin is detected when the sensor dog is approached to the home sensor.

Homing operation ①, ③, ④, ⑥ is when sensor dog is between Origin and Limit sensor. At this time, if the Limit sensor is detected earlier than the origin sensor as in the home return operation ③ and ⑥, it moves in the direction opposite to the limit and detects the origin sensor and is designated as origin. If the opposite limit sensor is detected by moving in the direction opposite to the limit, Homing will fail, so check whether the home sensor is operating.

Homing operation ②, ⑤, is when the sensor dog exists in the origin sensor, moves in the direction opposite to the homing direction and designates the proximity position of the sensor as origin.

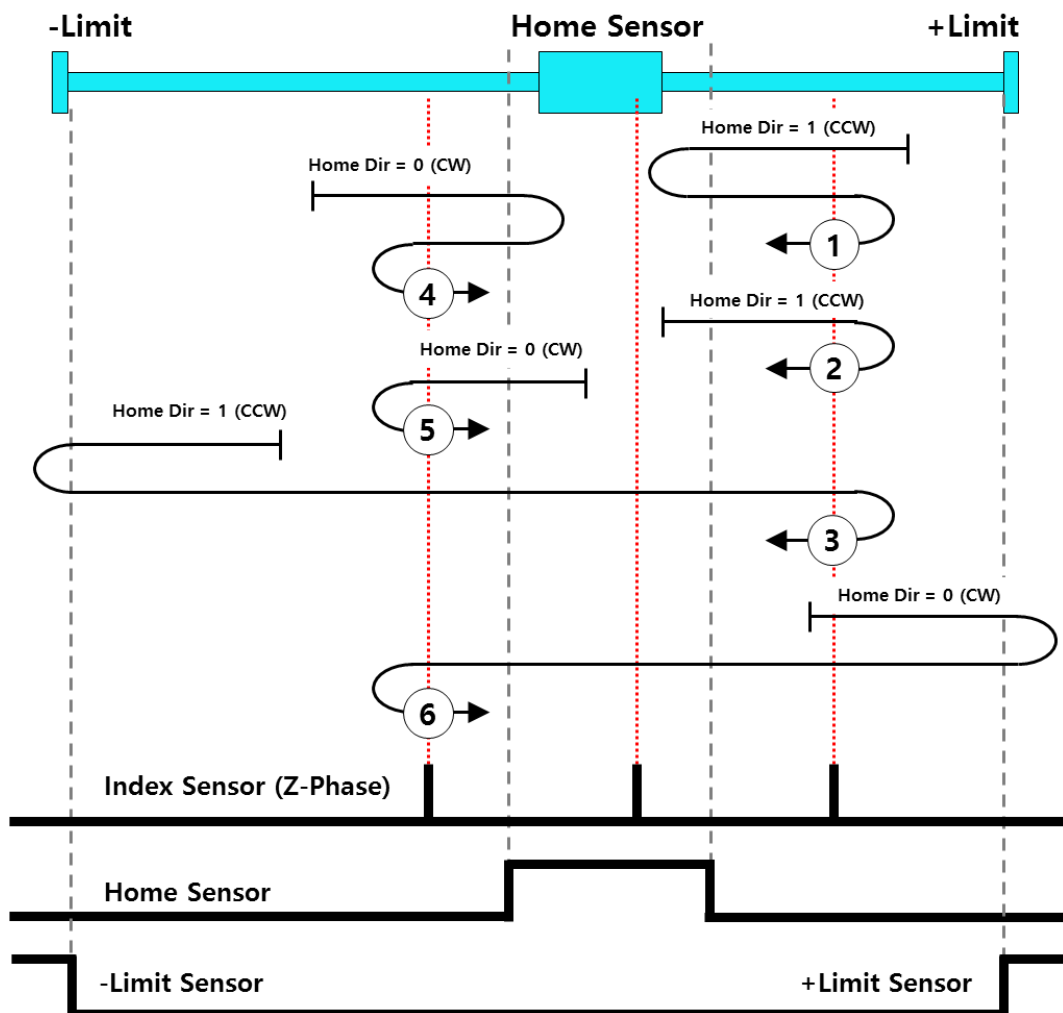



4.12.2 Homing Method : Z Origin (0x01)

The homing method by Z phase input signal after home sensor detection is to designate the home position where the Z phase input signal of encoder detected after execution of home sensor return method is detected

The homing operation ①, ③, ④, ⑥ is when the sensor dog is between the origin and limit sensor. It operates as same as homing method by home sensor until home sensor is detected. At this time, all Z-phase input signals before the home sensor is detected are ignored and the first Z-phase input signal after the home sensor is detected is designated as origin

Homing operation ②, ⑤, is the case where the sensor dog exists in the origin sensor, moves in the direction opposite to homing direction, and the first Z-phase input signal after completely deviating from the input range of the origin sensor is set as origin specified



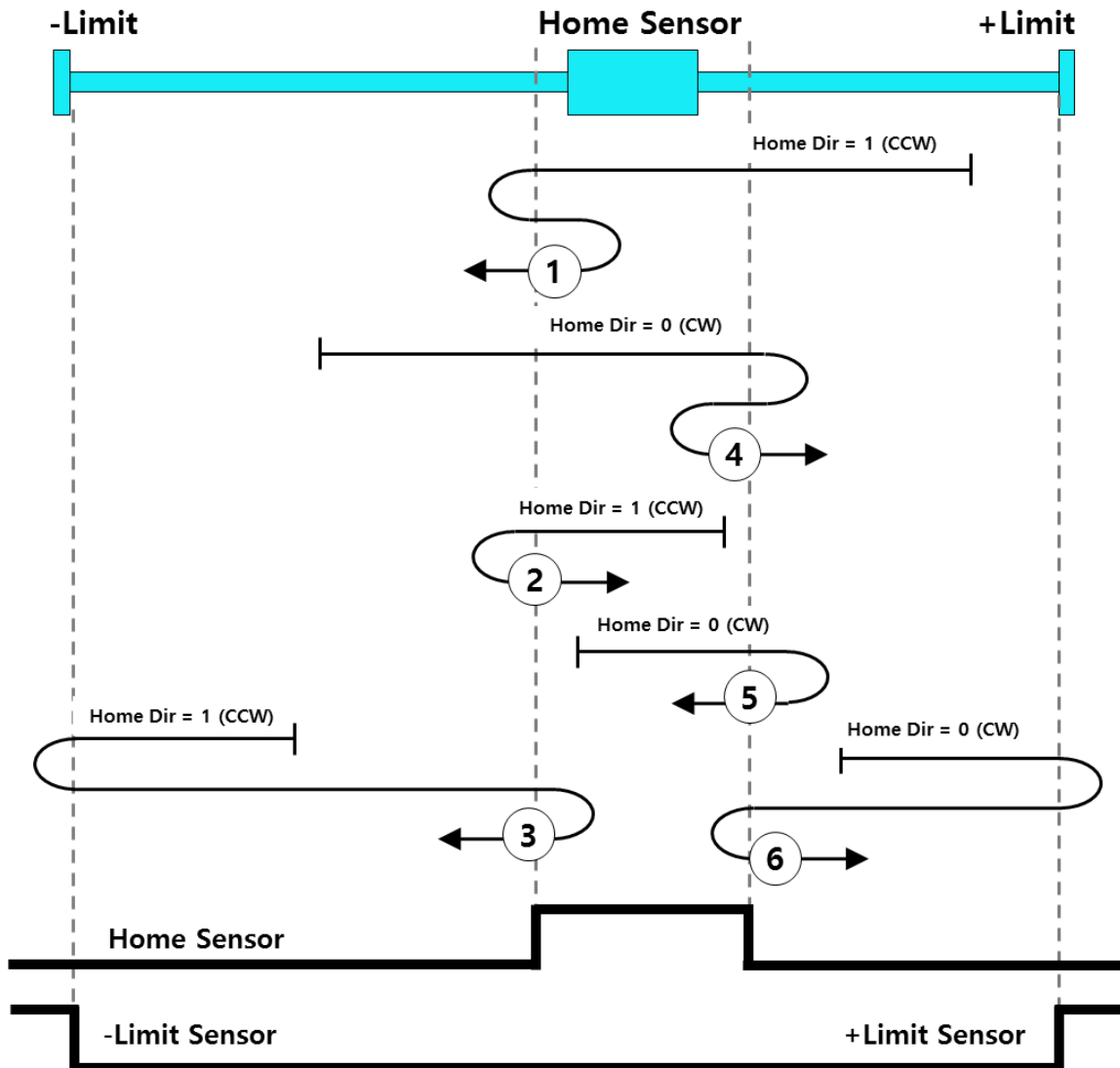
 Attention	If the H / W Limit input occurs when moving the home position in the Z-Phase mode, the Homing command is canceled.
---	--

4.12.3 Homing Method : Reverse Side Origin (0x02)

The homing method to the point opposite the origin sensor is a method in which the origin point is designated as the point where the sensor detection state is released through the origin sensor detected during home movement.

The homing operation ①, ③, ④, ⑥ is when sensor dog is between Origin and Limit sensor. At this time, if the Limit sensor is detected earlier than the origin sensor as in the home return operation ③ and ⑥, it moves in the direction opposite to the limit and detects the origin sensor and is designated as origin. If the opposite limit sensor is detected by moving in the direction opposite to the limit, origin return will fail, so check whether the home sensor is operating.

Homing operation ②, ⑤, is when the sensor dog exists in the origin sensor, moves in the direction opposite to the homing direction and designates the proximity position of the sensor as origin.

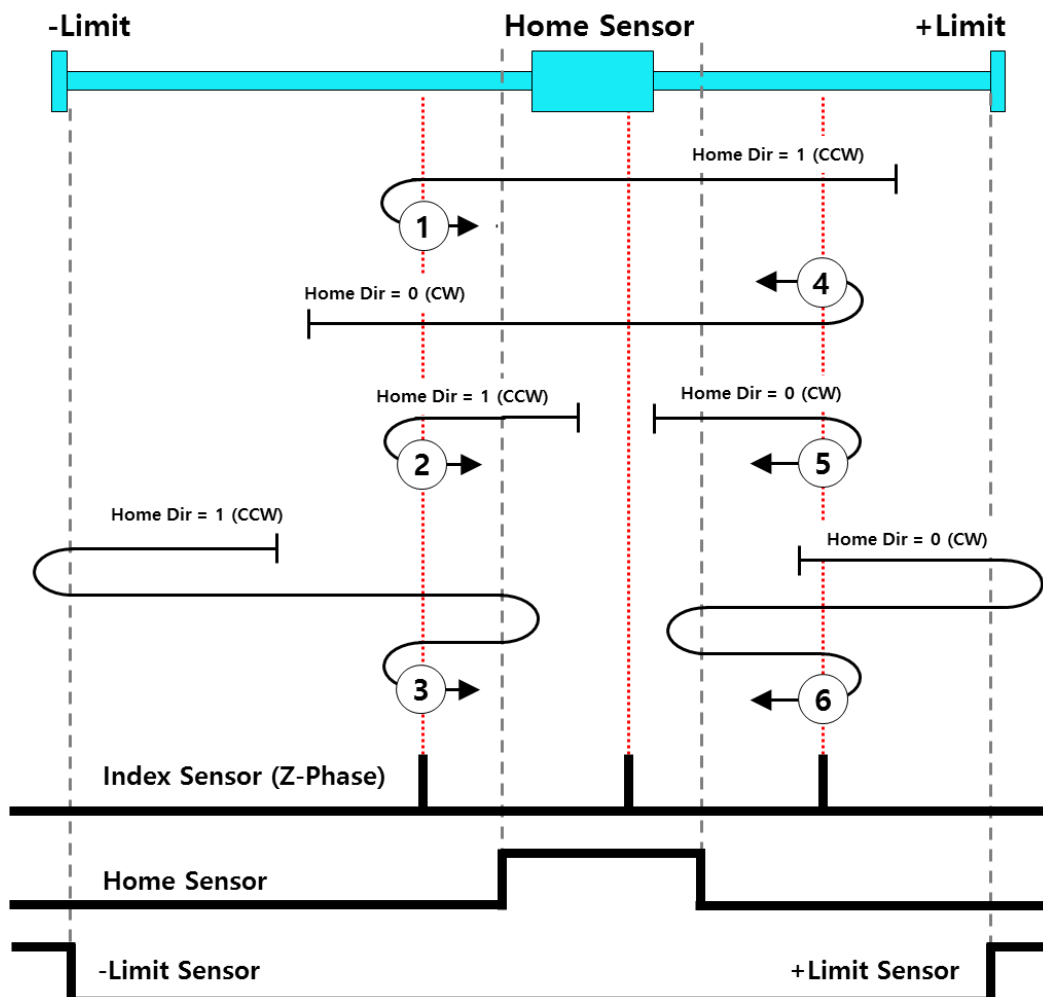


4.12.4 Homing Method : Reverse Side Z-Origin (0x03)

The homing method to the Z phase input signal after detection of the opposite side of the home sensor is to designate the home position where the Z phase input signal of the encoder detected after execution of the return method against the home sensor is detected.

The homing operation ①, ③, ④, ⑥ is when the sensor dog is between the origin and limit sensor. It operates as same as homing method by home sensor until home sensor is detected. At this time, all Z phase input signals before the home sensor is detected are ignored, and the first Z phase input signal after the home sensor is detected is designated as origin.

Homing operation ②, ⑤, is the case where the sensor dog exists in the origin sensor, moves in the direction opposite to homing direction, and the first Z-phase input signal after completely deviating from the input range of the origin sensor is set as origin specified



Attention

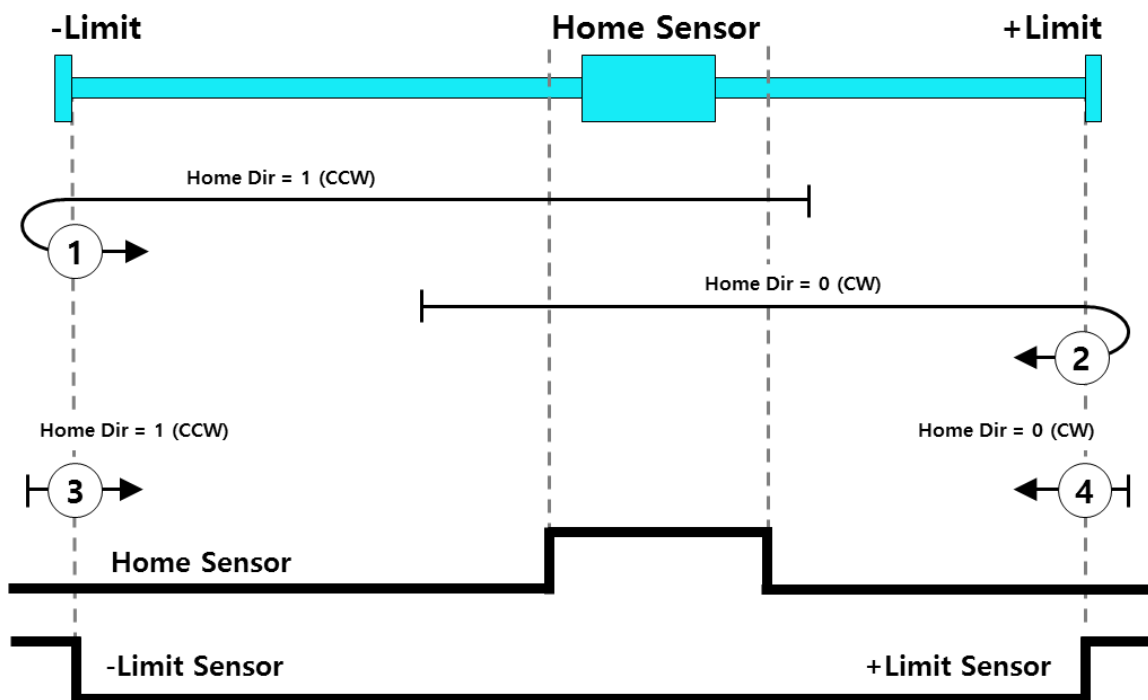
If the H / W Limit input occurs when moving the home position in the Z-Phase mode, the Homing command is canceled.

4.12.5 Homing Method : Limit Origin (0x04)

The homing method based on the limit input signal specifies the position where the limit sensor is detected as the home position.

Homing operation ① and ② are within the operating range, and specify the origin where the Limit input signal in origin direction is detected. Even if the input signal of the origin sensor or the limit input signal in the opposite direction is detected before the Limit input signal in the direction of origin is detected, it is ignored and the origin where the Limit input signal in the origin direction is detected is the origin.

The homing operation ③ and ④ are the origin when the Limit input signal in origin direction is detected and the limit input section is completely deviated from the origin.

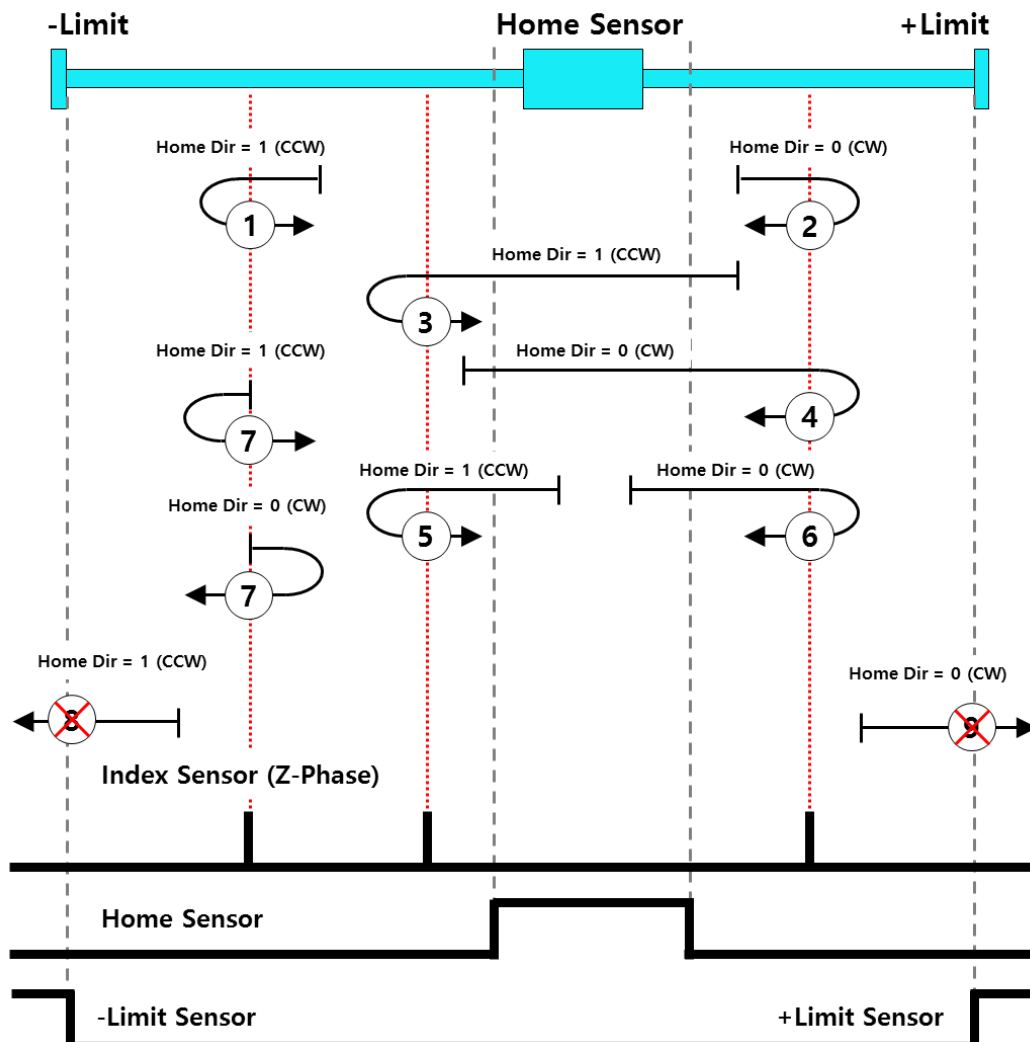


4.12.7 Homing Method : Z-Phase (0x06)

Z-phase input method is to return Z-phase signal, which is detected once by 1 [pulse] per rotation of encoder, as origin point.

Homing operation ①, ②, ③, ④ is to move the origin of Z-phase signal to the home position for the first time. At this time, Even if the home position signal is detected as in steps (3) and (4), it is ignored and the first detected Z phase signal is designated as the home position. However, if the limit signal is detected before the Z phase is detected as in steps (8) and (9), the home return operation is canceled.

Homing operation ⑦ is a condition that Z phase is detected. When Homing command is executed in this state, 1 [pulse] is moved in the direction of origin and then it returns to Z phase position again and homing designation is completed.



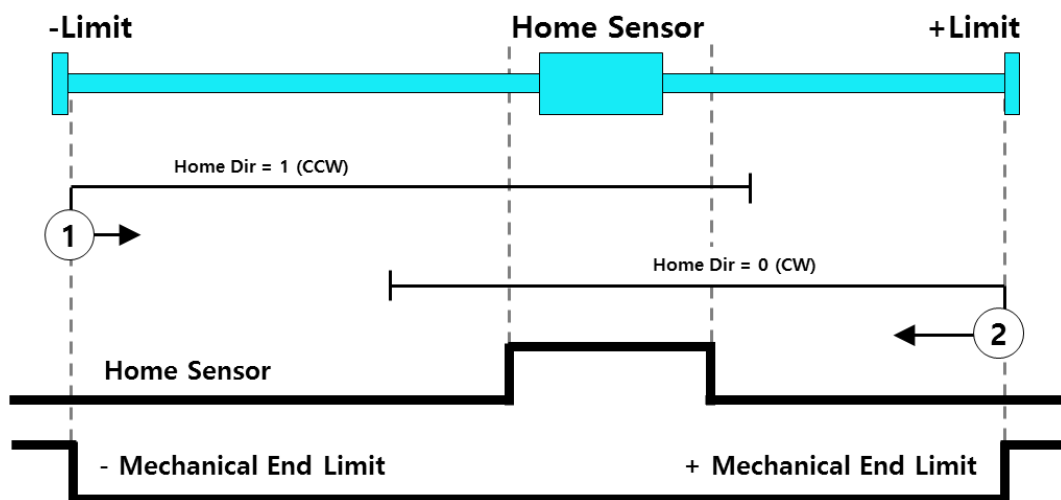
Attention

If the H / W Limit input occur when moving the home position in the Z-Phase mode, the Homing command is canceled.

4.12.8 Homing Method : Torque Origin (0x07)

The torque origin command is a command that originates at the point where a physical load is detected at the mechanical end point in a system without the H / W Limit signal.

Homing operation ① and ② are motions in which the motor moves in the origin direction and the mechanical end point is designated as the origin. The operation at this time is to detect the load amount of the motor and detect the mechanical end point when the abnormality occurs in the setting value of Org Torque Ratio (Pn # B207h). Therefore, before executing the torque origin command, it should be set to a value that is more than the basic load condition of the mechanical equipment.



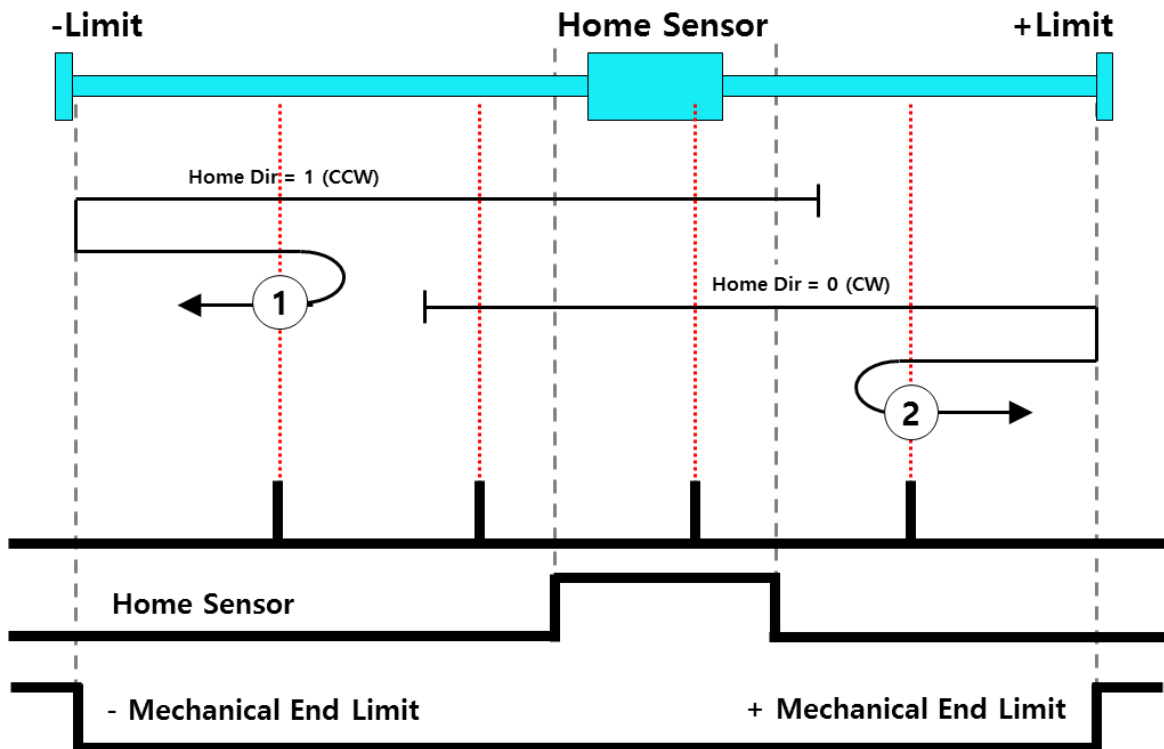
Attention

If the H / W Limit input is entered when moving the origin by the Torque Org method, the homing command is canceled.

4.12.9 Homing Method : Torque Origin Z-Phase (0x08)

Homing method based on Z phase input signal after torque origin is a command executed by concurrent execution of home return and Z-phase home return method by detecting the point where physical load is detected at mechanical end point.

Homing operation ① and ② are movement in the direction of origin and detect the mechanical end point and are performed in the opposite direction by Z-phase homing method.



Attention

If the H / W Limit input is entered when moving the origin by the Torque Org method, the Homing command is canceled.

4.12.10 Homing Method : Set Origin (0x09)

The origin setting command sets the current encoder position to the mechanical origin.

Origin sensor, H / W Limit signal and Z-phase signal are ignored when origin setting command. Also, when executing this command, it must be in Servo On state.



Attention

The Set Origin method sets the current position information to 0 in the same way as the Clear Position command, but in the Set Origin method, it can check that the Home OK flag is set to On.

4.13 Jog Operation

4.13.1 Jog Operation

Jog operation is a motion command that moves to the limit point while the command is maintained. Motion Ready is off when this command is executed.

Mapping information

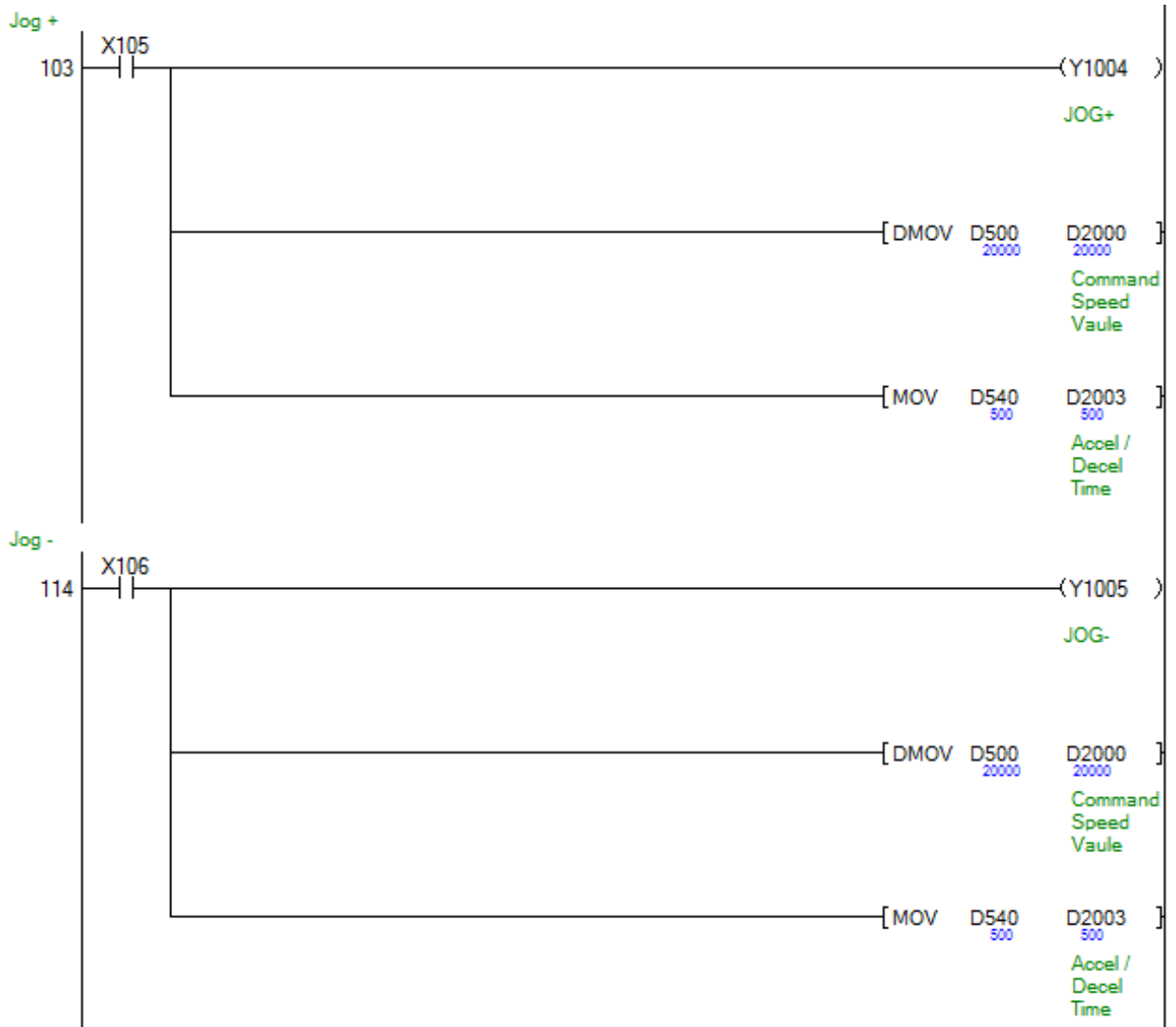
Motion Name	Function PLC->Drive	Remote device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
JOG +	Output	Y1004	JOGP	22	0x16
JOG -	Output	X1005	JOGN	23	0x17
MOTION READY	Input	X1004	Motion Ready	20	0x14
Move Speed	Output	D2000	Pn#B105 Jog Speed		
Acc/Dec Time	Output	D2003	Pn#B107 Jog Acc/ Dec Time		

Used Parameter

Parameter No.		Parameter Name
GUI No.	Parameter Code	
0	A011	E-STOP Method
2	B000	Pulse Per Resolution
3	B001	S/W +Limit Value
4	B002	S/W -Limit Value
5	B003	S/W Limit Stop Method
6	B004	H/W Limit Stop Method
9	B007	Position Tracking Limit
8	B008	Motion Dir
12	B00A	Pos. Error Overflow Limit
28	B104	Speed Override
29	B105	Jog Speed
30	B106	Jog Start Speed
31	B107	Jog Acc/ Dec Time

Device comment

- User JOG+ Command : X105
- User JOG- Command : X106
- User operation speed : D500
- User Acc/Dec time: D540



If the acceleration / deceleration time value assigned to the remote device is not within the range of 1 ~ 9,999 when executing the jog operation command, the acceleration / deceleration time of the motion profile of the jog command becomes the value of Pn # B107 Jog Acc Dec Time.

If the command is canceled during jog operation, it stops at S-STOP from the point at which it is released. This command can be used on systems that require continuous movement.

- 1) Command maintenance : Normal movement

While the jog operation command is maintained, the motion moves to the limit point.

- 2) Command cancel during movement : Move stop

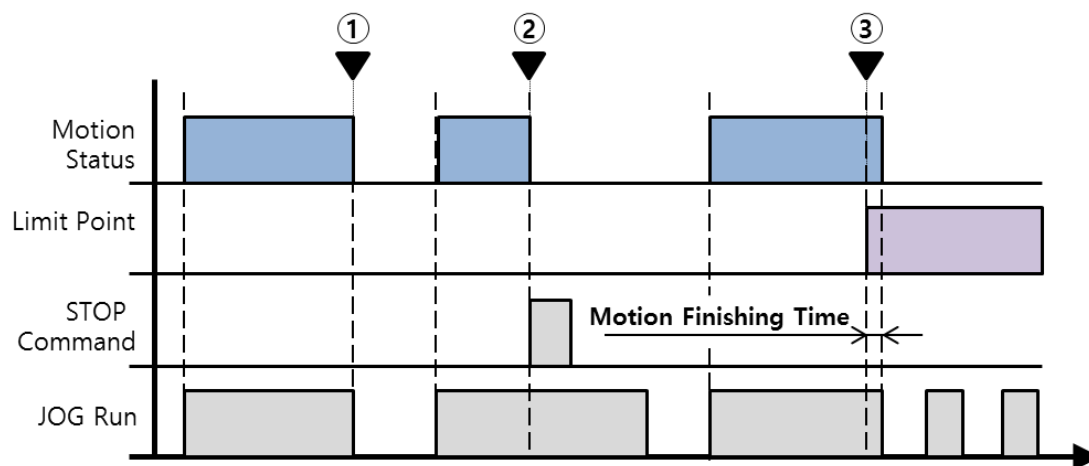
If the command is canceled during jog operation, it will stop at the point of ①

- 3) Stop while moving Command : Cancel command

During jog operation, S-STOP or E-STOP is executed at the time when the stop command is input.

- 4) Limit reached during movement : not moveable

When the limit is reached during the motion, it will stop according to the stopping method for the limit.



The limits of jog operation are H / W limit signal and S / W limit value. When the limit is reached, it stops at E-STOP or S-STOP condition by Parameter Pn # B003 S / W Limit Method and Pn # B004 H / W Limit Method.



Attention

What happens when the motor is running at high speed

- If user set to stop by E-STOP, alarm may occur
- When stopping at S-STOP, exceeding the limit, mechanical collision possible

4.13.2 Speed override for jog operation

Jog speed override is a command to execute the speed change command during jog operation. When the speed override command is executed, the movement speed profile is changed and moved in the initially started motion profile.

4.14 Step Move

A step move is a command that moves as much as entered position value while the command is maintained. If the instruction is canceled during step movement, it is stopped at S-STOP from the point at which it is released. This command can be used in positioning for teaching.

Mapping information

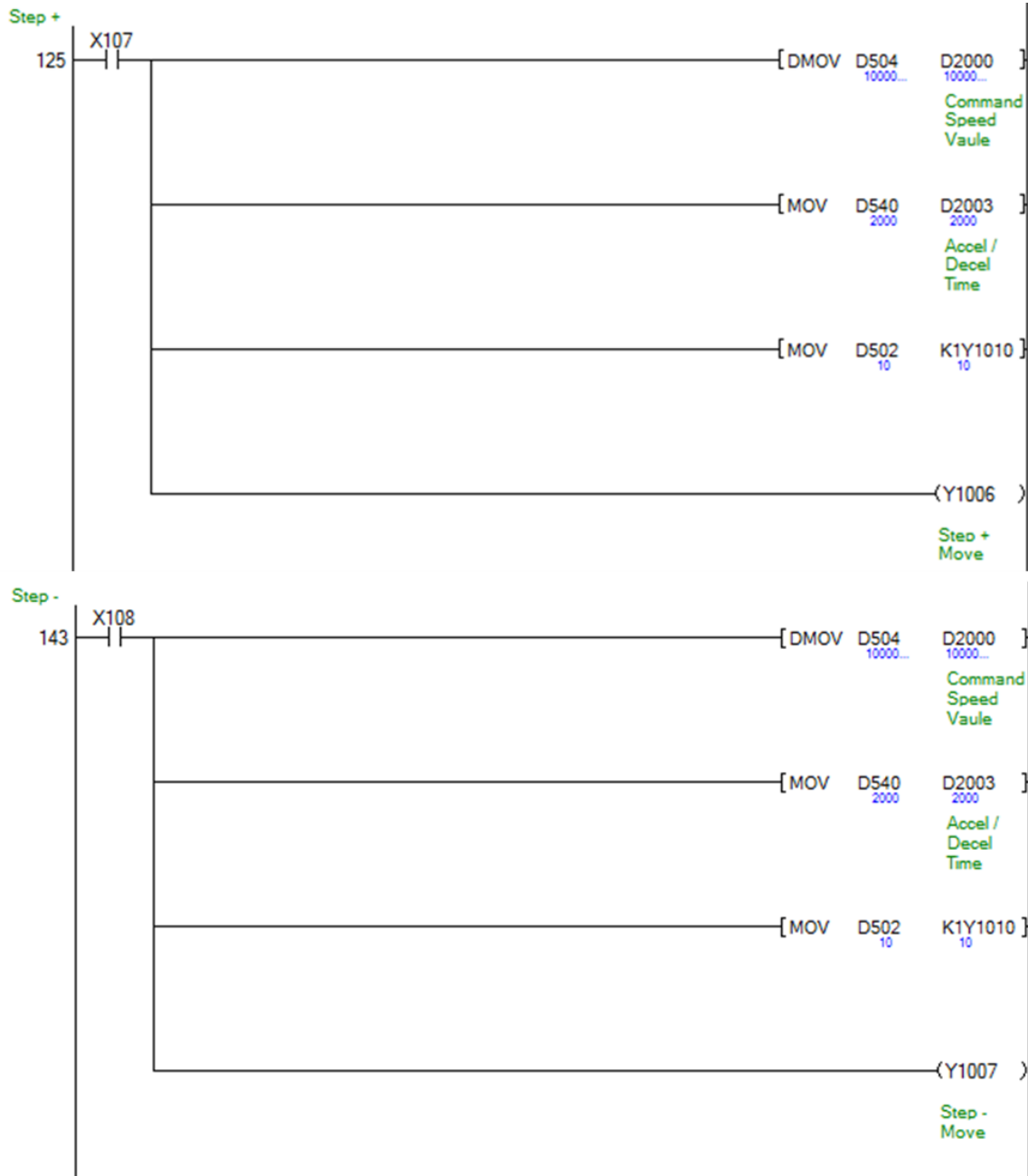
Motion Name	Function PLC->Drive	Remote device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
STEP +	Output	Y1004	JOGP	22	0x16
STEP -	Output	X1005	JOBN	23	0x17
MOTION READY	Input	X1004	Motion Ready	20	0x14
Move Speed	Output	D2000	Pn#B105 Jog Speed		
Acc/Dec Time	Output	D2003	Pn#B107 Jog Acc Dec Time		

Used Parameter

Parameter No.		Parameter Name
GUI No.	Parameter Code	
0	A011	E-STOP Method
2	B000	Pulse Per Resolution
3	B001	S/W +Limit Value
4	B002	S/W -Limit Value
5	B003	S/W Limit Stop Method
6	B004	H/W Limit Stop Method
9	B007	Position Tracking Limit
8	B008	Motion Dir
12	B00A	Pos. Error Overflow Limit
23	B030	Step Move Position Magnify
28	B104	Speed Override
29	B105	Jog Speed
30	B106	Jog Start Speed
31	B107	Jog Acc Dec Time

Device comment

- User Step + Move Command : X107
- User Step - Move Command : X108
- User operation Speed : D504
- User Acc/Dec Time : D540
- Step Movement Distance : D502



- 1) Command maintenance : Normal movement

While the step move command is maintained, the motion reaches the target position ①.

- 2) Command cancel during movement: Stop movement.

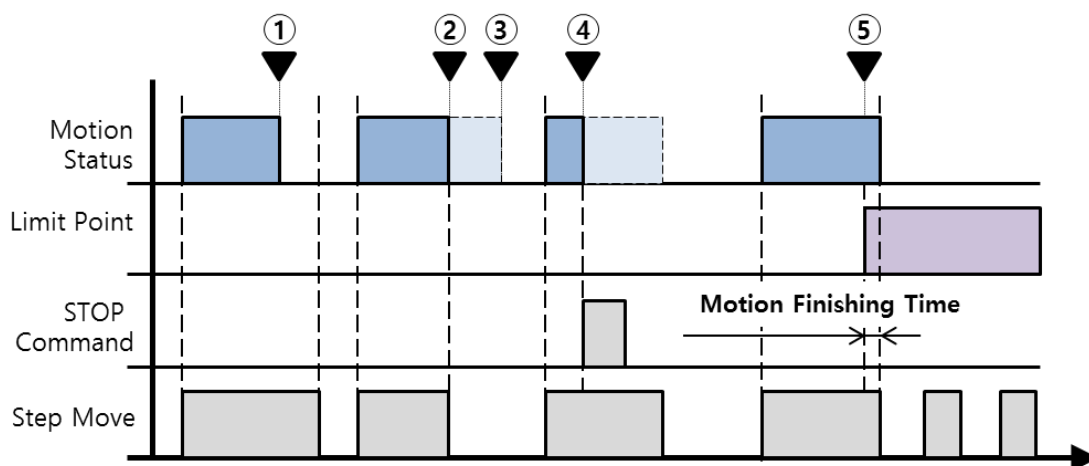
If the command is released during the step movement, the target position ③ is not reached and stops at the position ②.

- 3) Stop while moving Command: Cancel command

Execute S-STOP or E-STOP at ④ when the stop command is input during step movement

- 4) Limit reached during movement: not moveable

When the limit of motion is reached, it stops according to the stop method for the limit

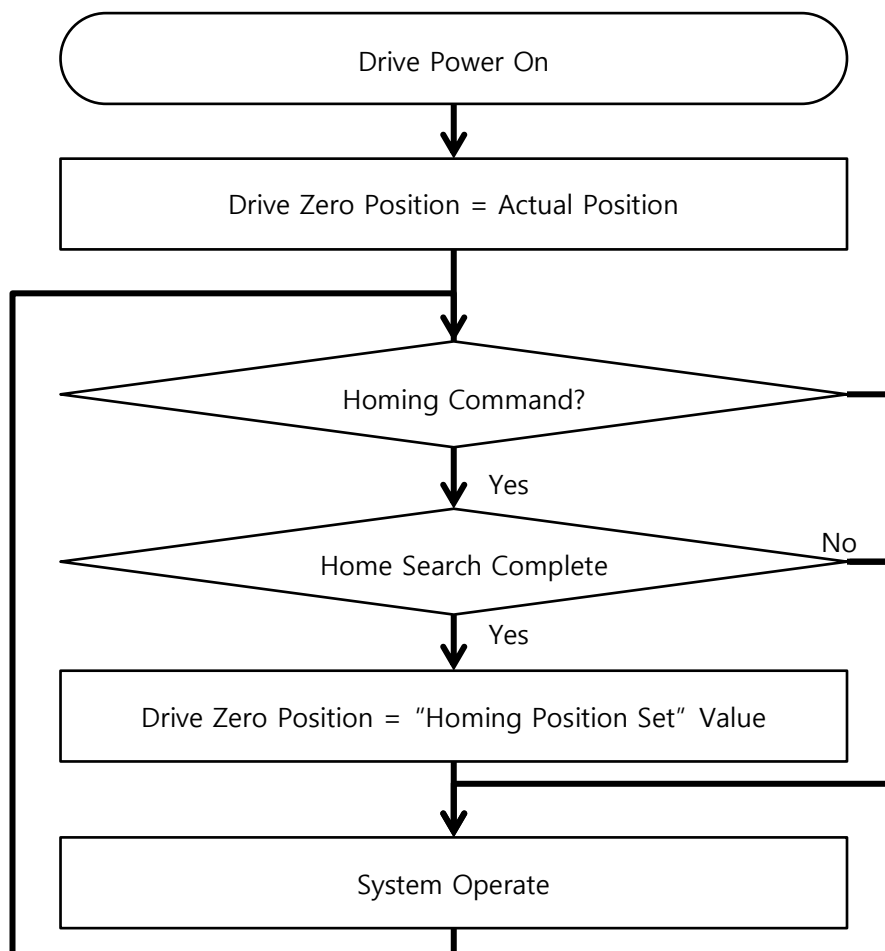


Limitations of step movement include H / W limit signal and S / W limit value. When the limit is reached, it stops at E-STOP or S-STOP condition by Parameter Pn # B003 S / W Limit Method and Pn # B004 H / W Limit Method.

4.15 Zero Position Move

Zero position movement is a position move command that moves to the drive zero position in the drive.

The point at which the drive is designated as the zero point is the initial encoder position (Incremental Encoder 0 [pulse]) at the point when power is supplied to the drive as the zero point of the drive. Homing Position Set (Pn # B206h), which is a Homing Parameter, becomes the drive's zero point (Drive Zero Position) when it completes normally after executing homing command. However, if homing command is executed again after homing has been completed, if homing command is canceled, it becomes homing position set value at homing. The processing of the zero point position of the drive is as follows. Also, even if you change the Homing Position Set value with the parameter setting, the zero point position of the drive will not be changed until homing is executed.



Mapping information

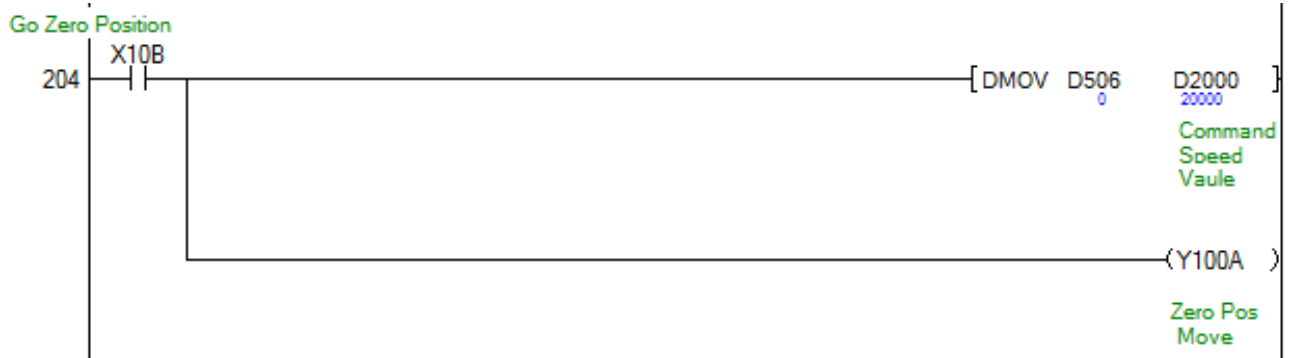
Motion Name	Function PLC->Drive	Remote device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
STEP +	Output	Y1004	JOGP	22	0x16
STEP -	Output	X1005	JOGN	23	0x17
MOTION READY	Input	X1004	Motion Ready	20	0x14
Move Speed	Output	D2000	Pn#B105 Jog Speed		
Acc/Dec Time	Output	D2003	Pn#B107 Jog Acc Dec Time		

Used Parameter

Parameter No.		Parameter Name
GUI No.	Parameter Code	
9	B007	Position Tracking Limit
8	B008	Motion Dir
11	B009	Limit Sensor Dir
12	B00A	Pos. Error Overflow Limit
28	B104	Speed Override
29	B105	Jog Speed
30	B106	Jog Start Speed
31	B107	Jog Acc Dec Time

Device comment

- Zero Position Move command : X10B
- User Operation Speed : D506
- User Acc/Dec Time: D540



- 1) Power input to the drive: Not return to Zero position

At the point of power on of the drive, the zero point position of the drive is designated as the encoder's current position value (Actual Position).

- 2) Return to home position: Home position return not executed after drive power

If you move the zero point at ② before the zero point return, it moves to the zero point position set in 1)..

Homing parameter When the value of "Homing Position Set (Pn # B206h)" is changed ③, the information of zero position set in 1) is not changed

- 3) After completion of home return: completion of mechanical origin

The zero point position is designated by the value of homing parameter "Homing Position Set (Pn # B206h)" from the point of ⑤ when zero point return command is executed at the point of ④ and homing is completed.

Homing position set (Pn # B206h) "is changed at the point of ⑥ after homing, the specified zero point position is not changed at the point of ⑤.

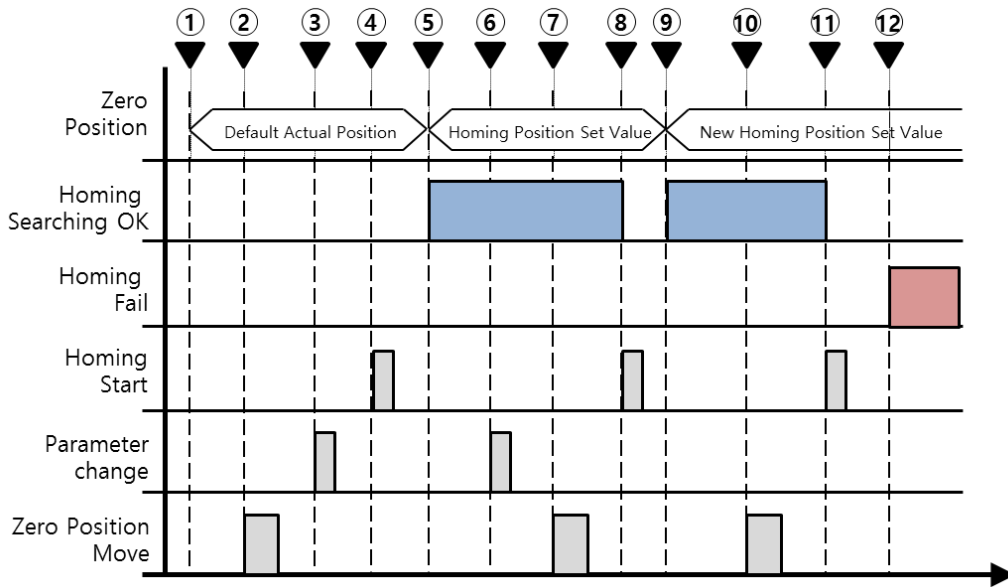
Homing parameter Even if homing is executed without changing the value of "Homing Position Set (Pn # B206h)", the current parameter value is designated as zero

- 4) Completion of 2nd homing command: Zero position is designated, Homing is completed with changed homing profile

Homing position setting (Pn # B206h) "is changed to the zero point position when the home position return is executed again.



- 5) Homing command failure: Zero point position is specified and the executed homing command fails

In case ⑫ in which home return has failed, the zero position specified in 4) is not changed. If the origin return command does not complete homing, the specified value is retained at the time of drive boot.



4.16 Position Move

Position move is the profile information determined at the time of command, and moves to the target position. The profile information required at the time of command requires information on the target position, start speed, travel speed, acceleration time, and deceleration time. With this profile information, absolute positioning and relative positioning commands are performed.

 <p>Attention</p>	<p>The position move command is supported in 2 or more station occupied mode.</p> <p>SW1.1 must be turned ON to change to 2 station occupied mode.</p>	
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4.16.1 Absolute Position Move

Absolute position movement is a command to move from the current position to the command position. The parameters used at this time are different from those used for jog operation

Mapping information

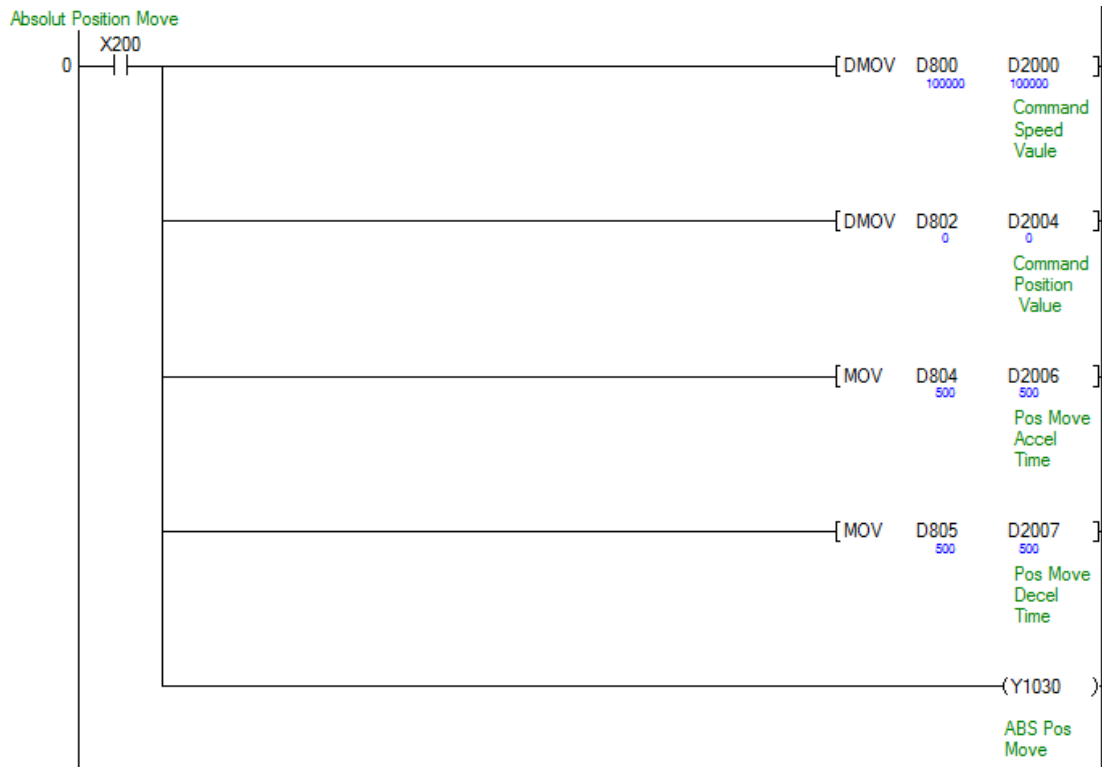
Motion Name	Function PLC->Drive	Remote device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
ABS Position Move	Output	Y1030	-	-	-
MOTION READY	Input	X1004	Motion Ready	20	0x14
Move Speed	Output	D2000	-	-	-
Move Position	Output	D2004	-	-	-
Acceleration time	Output	D2006	-	-	-
Deceleration time	Output	D2007	-	-	-

Used main Parameter

Parameter No.		Parameter Name
GUI No.	Parameter Code	
0	A011	E-STOP Method
2	B000	Pulse Per Resolution
3	B001	S/W +Limit Value
4	B002	S/W -Limit Value
5	B003	S/W Limit Stop Method
6	B004	H/W Limit Stop Method
9	B007	Position Tracking Limit
8	B008	Motion Dir
12	B00A	Pos. Error Overflow Limit
24	B100	Axis Max Speed
25	B101	Axis Start Speed
26	B102	Axis Accel Time
27	B103	Axis Decel Time
28	B104	Speed Override

Device comment

- Absolute position move command start : X200
- Operation Speed : D800
- Target Position : D802
- Acceleration time : D804
- Deceleration Time : D805



4.16.2 Incremental Position Move

Incremental position movement is a command that moves the current position by the command position. The parameters used at this time are parameters that are different from those used for jog operation.

Mapping information

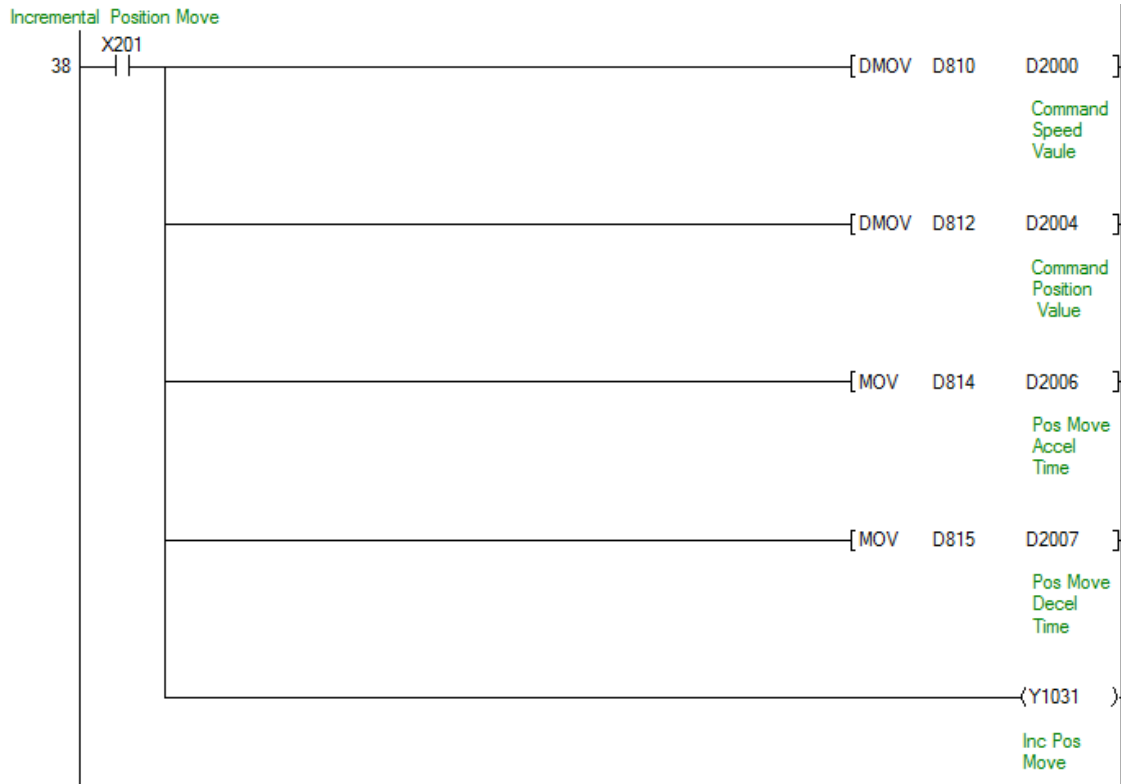
Motion Name	Function PLC->Drive	Remote device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
Inc Position Move	Output	Y1031	-	-	-
MOTION READY	Input	X1004	Motion Ready	20	0x14
Move Speed	Output	D2000	-	-	-
Move Position	Output	D2004	-	-	-
Acceleration time	Output	D2006	-	-	-
Deceleration time	Output	D2007	-	-	-

Used main Parameter

Parameter No.		Parameter Name
GUI No.	Parameter Code	
0	A011	E-STOP Method
2	B000	Pulse Per Resolution
3	B001	S/W +Limit Value
4	B002	S/W -Limit Value
5	B003	S/W Limit Stop Method
6	B004	H/W Limit Stop Method
9	B007	Position Tracking Limit
8	B008	Motion Dir
12	B00A	Pos. Error Overflow Limit
24	B100	Axis Max Speed
25	B101	Axis Start Speed
26	B102	Axis Accel Time
27	B103	Axis Decel Time
28	B104	Speed Override

Device comment

- Incremental position move command : X201
- Operation Speed : D810
- Target Position : D812
- Acceleration Time: D814
- Deceleration Time : D815



The position move command is a command to move to the target position even if the command is released at the time when the position movement is started. When the stop command is executed and the limit is reached during the position movement, the position movement is stopped.

1) Command execution: Normal command

The motion starts at ①, which is the point at which the position move command is executed, and reaches the target position even if the command is released before reaching the target position ②.

2) Repeated command execution while moving: Ignore command

Move to the target position started in ③ even if the position move command is executed and the position move command is executed at the time when the position move is not completed as in ④.

3) Command maintenance: Move to normal position

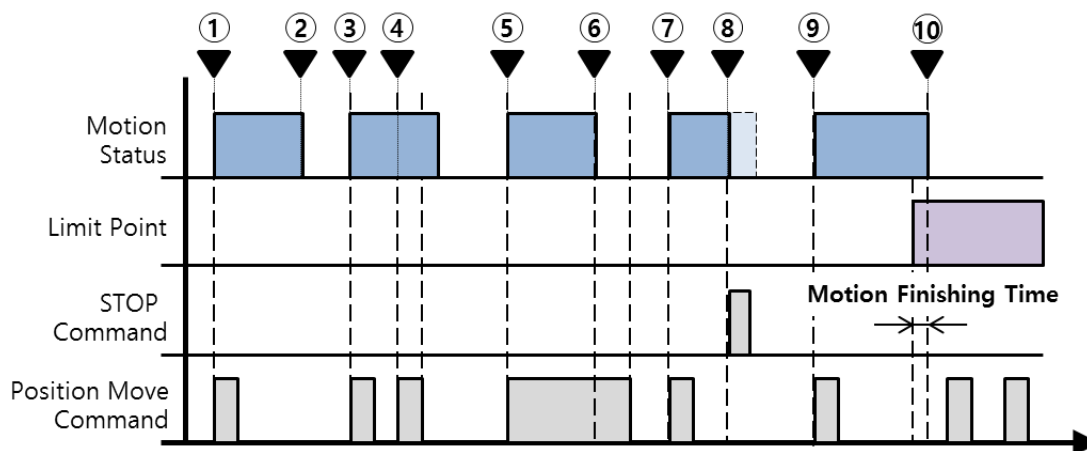
Even if the position move command is kept longer than the position ⑥ at which the position move command is completed, the target position executed at the point of ⑤ is maintained.

4) Stop command while moving: Command cancel

S-STOP or E-STOP is executed at ⑧ when the stop command is input. At this time, motion profile input from ⑦ point is canceled

5) Limit reached during movement: Can not move

When the motion at the point ⑨ at which the command is executed reaches the limit in progress, the motion stops at the point ⑩ because it stops according to the stopping method for the limit point.



4.16.3 Override Command

There is "Position Override" to change the target position when moving the position, and "Velocity Override" command to change the current running speed.

The override function of the position move command continues the motion by changing only the position information, which is the change condition, or the speed information in the motion profile in which the motion starts. For the motion characteristics of this, refer to “오류! 참조 원본을 찾을 수 없습니다.”

Mapping information

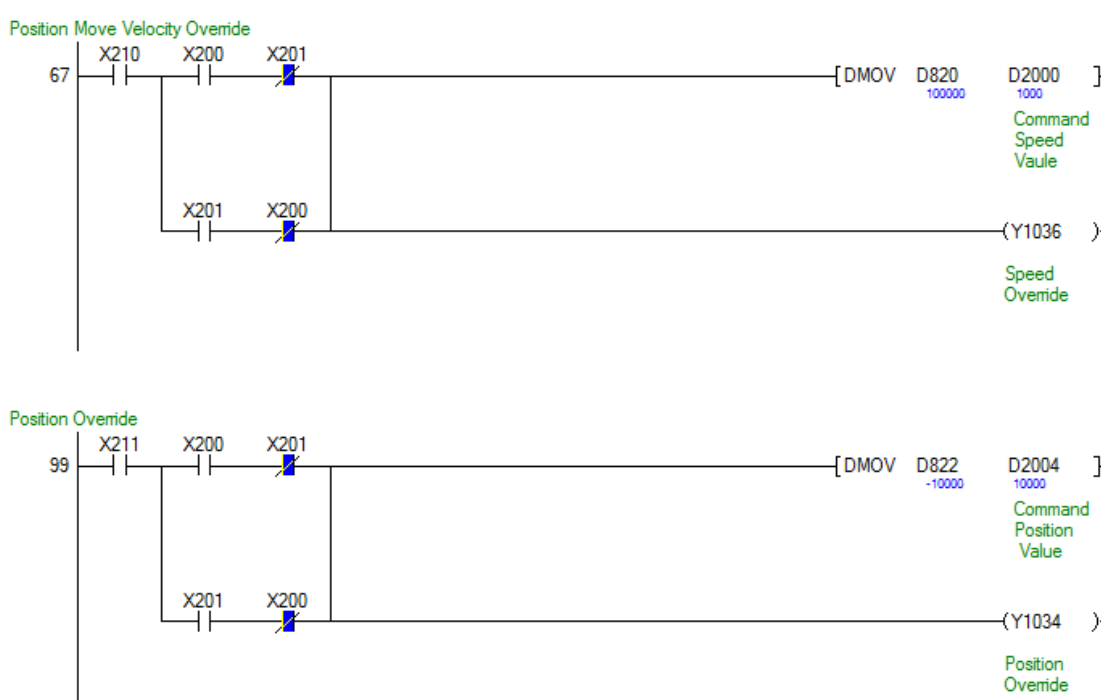
Motion Name	Function PLC->Drive	Remote device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
Abs Position Move	Output	Y1030	-	-	-
Inc Position Move	Output	Y1031	-	-	-
MOTION READY	Input	X1004	Motion Ready	20	0x14
Move Seed	Output	D2000	-	-	-
Move Position	Output	D2004	-	-	-

Used main Parameter

Parameter No.		Parameter Name
GUI No.	Parameter Code	
0	A011	E-STOP Method
2	B000	Pulse Per Resolution
3	B001	S/W +Limit Value
4	B002	S/W -Limit Value
5	B003	S/W Limit Stop Method
6	B004	H/W Limit Stop Method
9	B007	Position Tracking Limit
8	B008	Motion Dir
12	B00A	Pos. Error Overflow Limit
24	B100	Axis Max Speed
25	B101	Axis Start Speed
26	B102	Axis Accel Time
27	B103	Axis Decel Time
28	B104	Speed Override

Device comment

- Absolute position move command t : X200
- Incremental position move command : X201
- Command to apply speed to change : X210
- Command to apply position to change : X211
- Operation speed to change : D820
- Target position to change : D822



Attention

Position override operation after speed override is disabled.
 Speed override operation after position override is disabled

4.17 Position Table Operation

Position Table (Position Table : PT below) operation is the operation in which the defined commands and the motion profiles of the commands are organized into tables and the commands are executed by calling them.

PT Command No.	PT Command Name	Function Description	Detailed description of motion profile
0	Abs Move low speed.	The value of the position term is the absolute position value. - Teaching function available. - Continuous operation function available.	오류! 참조 원본을 찾을 수 없습니다. Motion of Position Move Command
1	Abs Move high speed.		
2	Abs Move high speed with deceleration.		
3	Abs Move with acceleration and deceleration.		
4	Inc Move low speed.	If the value of the position term is the incremental position value - Teaching function is disabled. - Continuous operation function available.	6.3.1 Movement of Position Move Command
5	Inc Move high speed		
6	Inc Move high speed with deceleration.		
7	Inc Move with acceleration and deceleration.		
8	Move to Origin	Homing command is executed according to the currently set parameter value.	7. Homing Profile
9	Clear Position	Reset the 'command position' and 'actual position' values to '0' at the current position.	-
10	Push Abs Move	Push motion function to absolute coordinate system.	-
11	Stop	This command is used to stop the push motion operation.	6.1 Operation of Stop Command

Mapping information

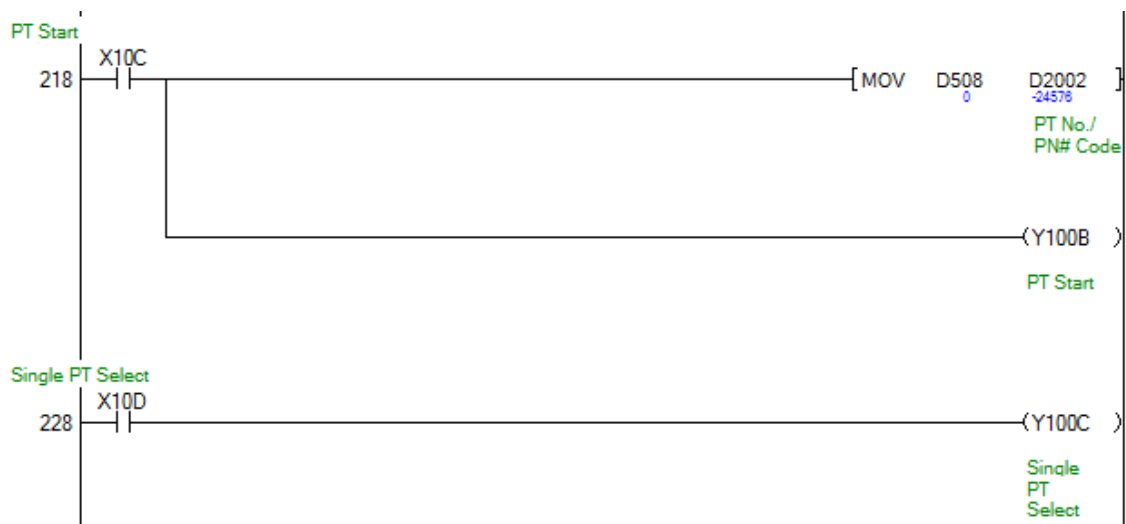
Motion Name	Function PLC->Drive	Remote device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
PT Start	Output	Y100B	PT Start	40	0x28
MOTION READY	Input	X1004	Motion Ready	20	0x14
Move Speed	Output	D2000	-	-	-
Move Position	Output	D2004	-	-	-

Used main Parameter

The parameter list can be checked in "5.6 Position Table Parameter".

Device comment

- Position Table operation start: X10C
- Select Single mode : X10D
- Position Table No. : D508



4.17.1 Normal PT Operation

After the normal PT operation completes the operation for the selected PT number, the jump table number (Item No. 88H) "is the command to be executed subsequently. If the jump table number is set to '-1', PT operation will be finished after PT operation is completed.

1) Command execution: Normal command

PT No. 13 selected in ①, which is the time when general PT operation command is executed, is executed. Since the jump PT number is specified as PT14 in PT13 started in ①, when PT13 is completed, PT14 is executed. Then, it continues to operate with the jump PT number of PT14.

2) Execute PT command during operation: Ignore command

If PT13 is run command while PT14 is running at the point of ② during PT operation, the PT command started from ① point is continuously executed.

3) Command maintenance: Normal execution

The PT operation command is a rising edge operation. Even if the PT operation command is maintained until the PT operation is terminated, the PT operation command executed is not repeated.

4) Change PT number: Ignore command

Even if the PT number is changed to 15 at the time of ③ of PT operation, it does not jump to PT15 and it is executed by PT27 which is the jump PT number of PT15.

5) Stop command during PT operation: Cancel command

S-STOP or E-STOP is executed at ④ when the stop command is input during operation. At this time, PT operation started from ① is stopped, PT operation of PT27 is canceled and PT operation is ended.

6) Do not jump PT to the table: 1 time table operation

If the jump table number is -1 (0xFF) in PT27 which is jumped after execution of PT 15, PT operation is terminated at ⑦, which is the time of normal operation of PT 27 of PT 27

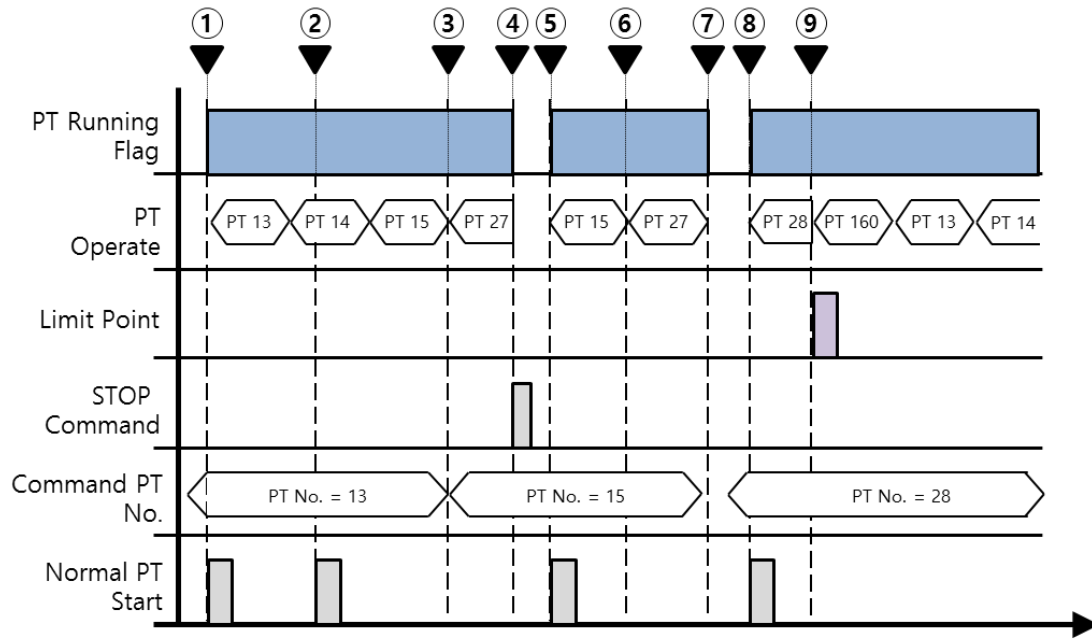
7) Limit point reached during PT operation: Not movable

In case of reaching the limit point during PT operation, the corresponding PT28 which is in operation at ⑧ point is canceled and PT160 which is the jump number of PT28 is executed.

8) Command of PT item is Homing command: Homing command operation

If the limit at point ⑨ is S / W Limit, the condition of S / W Limit is ignored.

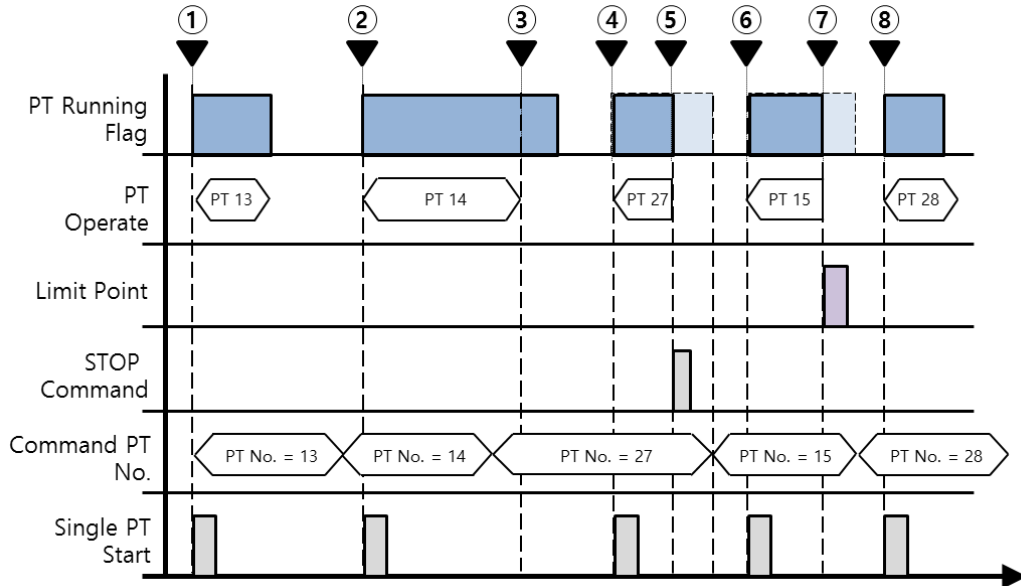
If the limit at point ⑨ is H / W Limit, it corresponds to Limit signal during homing.



PT No.	...	Jump Table No.	...
...
13	...	14	...
14	...	15	...
15	...	27	...
...
27	...	-1	...
28	...	160	...
...
160	...	13	...

4.17.2 Single PT Operation

Single PT operation is a command to execute the selected PT number alone. Even if there is a table jump item in the selected PT number, if the selected PT operation is completed, the PT operation state is ended.



PT No.	...	Jump Table No.	...
...
13	...	14	...
14	...	15	...
15	...	27	...
...
27	...	-1	...
28	...	160	...
...
160	...	13	...

1) Command execution: Normal command

PT No. 13 selected in ①, which is the point at which the single PT run command is executed, is executed. Even if the jump PT number is designated as PT14 in PT13 started from ①, PT operation is ended

2) Execute PT command during operation: Ignore command

Even if a new command is input during single PT operation, the single PT operation command is executed normally.

3) Command maintenance: Normal execution

The PT operation command is a rising edge operation. Even if the PT operation command is maintained until the PT operation is terminated, the PT operation command executed is not repeated.

4) Change PT number: Ignore command

Even if the PT number is changed to 27 in the ③ of the single PT operation, the PT does not jump to the PT27, and the PT operation is finished when the PT14 in operation is completed.

5) Stop command during PT operation: Cancel command

If S-STOP or E-STOP is executed at ⑤ when the stop command is input during operation, single PT operation started from ④ is stopped and PT operation is terminated.

6) Limit point reached during PT operation: Not movable

In case of reaching the limit point during single PT operation, corresponding PT28 in operation is canceled and PT operation is terminated. At this time, operation is possible only when the PT operation command entered at ⑧ point is in the opposite direction of the limit point.

7) Command of PT item is Homing command: Homing command operation

If the limit at point ⑦ is S / W limit, the condition of S / W limit is ignored.

If the limit at point ⑦ is H / W Limit, it corresponds to limit signal during homing.

4.18 Controller Status Information

Status information of Ezi-SERVO2 CC-Link can be checked by real-time data monitoring and status bit through remote receiving device

4.18.1 Command Response Checking

The command response is a status flag that, when the host controller issues a command to the remote station, confirms that it has processed and completed the command

Command response in 2 station occupied mode

Remote input [RX]	Flag Name	Description
RX05	Jog Response	Turns ON when a jog command is executed.
RX06	Step Move Response	Turns ON when step move command is executed.
RX07	In-Position	It turns ON when it is in the state close to the positioning completion range.
RX08	MOTIONING	It turns ON when it is in the following operation state. - Control to drive the motor to the destination position - A state that receives a homing command and processes it - Position table operation is running
RX0A	Go Zero Position Resp.	It turns On when the zero point move command is executed.
RX0B	PT Running	When the position table operation is being executed, it turns On.
RX0C	Single PT Select Resp.	User tries to run position table operation in stand-alone mode.
RX0D	Command Set Resp.	It turns ON when an additional instruction is executed.
RX0F	Motion / Setting Resp.	This command indicates whether the status of the current I / O Map is motion command processing status or setting mode.
RX10 ~ RX13	Step Move Position Resp.	The magnification value of the commanded step travel distance is displayed as 4-bit data.
RX14 ~ RX17	Monitor/Data Code Resp.	The value of the monitor code and data code that is commanded is displayed as 4-bit data.
RX18 ~ RX1B	Command Code Resp.	The value of the command code that is commanded is displayed as 4-bit data.

Command response in 2 station occupied mode

Remote input [RX]	Flag Name	Description
RX30	ABS Position Move Resp.	Turns ON when the absolute position command is executed.
RX31	INC Position Move Resp.	Turns ON when incremental position move command is executed.
RX38 ~ RX3B	Monitor Code (2) Resp.	The value of the monitor code and data code that is commanded is displayed as 4-bit data.
RX3C ~ RX3F	Monitor Code (3) Resp.	The value of the monitor code and data code that is commanded is displayed as 4-bit data.

4.18.2 Axis Status Checking

A flag that checking the current operation status of the drive, It can check the availability of commands for the following actions.

Axis status flag in 1 station occupied mode

Remote input [RX]	Flag Name	Description
RX00	Enabled	The motor is in Servo On state and can be driven.
RX01	Emergency Stopped	Emergency stop command is executed by remote device or external input.
RX02	ALARM Status	An alarm has occurred in the drive.
RX03	Homing OK	Return to origin is completed normally by home return command.
RX04	MOTION READY	Motion command is available. When this bit is OFF, the motion command cannot be executed.
RX07	In-Position	When it is within positioning completion range, it turns On.
RX08	MOTIONING	Turns on when the current motion is running
RX09	Hold status	The operation of the motor is paused.
RX0B	PT Running	Position table operation is running.
RX0E	Warning	The currently executed command is invalid, or the drive has failed.

Axis status flag in 2 station occupied mode

Remote input [RX]	Flag Name	Description
RX33	Motion Accel	It turns ON when motion is accelerating.
RX34	Motion Decel	It turns ON when motion is decelerating.
RX36	S/W Limit +	It turns ON when the software limit of the plus is exceeded.
RX37	S/W Limit -	It turns ON when the software limit of minus is exceeded.

4.18.3 Current Status Data Checking

The status information in the data format such as position information, speed, and parameter data is received and confirmed by the remote register.

Ezi-SERVO2 CC-Link has 1 monitoring area in 1 station occupied mode and 2 monitoring areas in 2 station occupied mode, so user can simultaneously check 3 data simultaneously.

Remote receive register

Remote receive register [RWr]	Data Type	Description
RWr0	DWORD	In the motion control mode, data is received in response to the monitoring codes of the remote transmitting devices RX14 to RX13. In the setting control mode, the data value which is confirmed when reading and writing the parameter is received.
RWr4	DWORD	Regardless of the motion control mode and setting control mode, data is received in response to the monitoring codes of the remote transmitting devices RX38 to RX3B.
RWr6	DWORD	Regardless of the motion control mode and setting control mode, data is received in response to the monitoring codes of the remote transmitting devices RX3C to RX3F.

At this time, the received data is confirmed by DWORD type data, but in some conditions, upper WORD and lower WORD are used in combination.

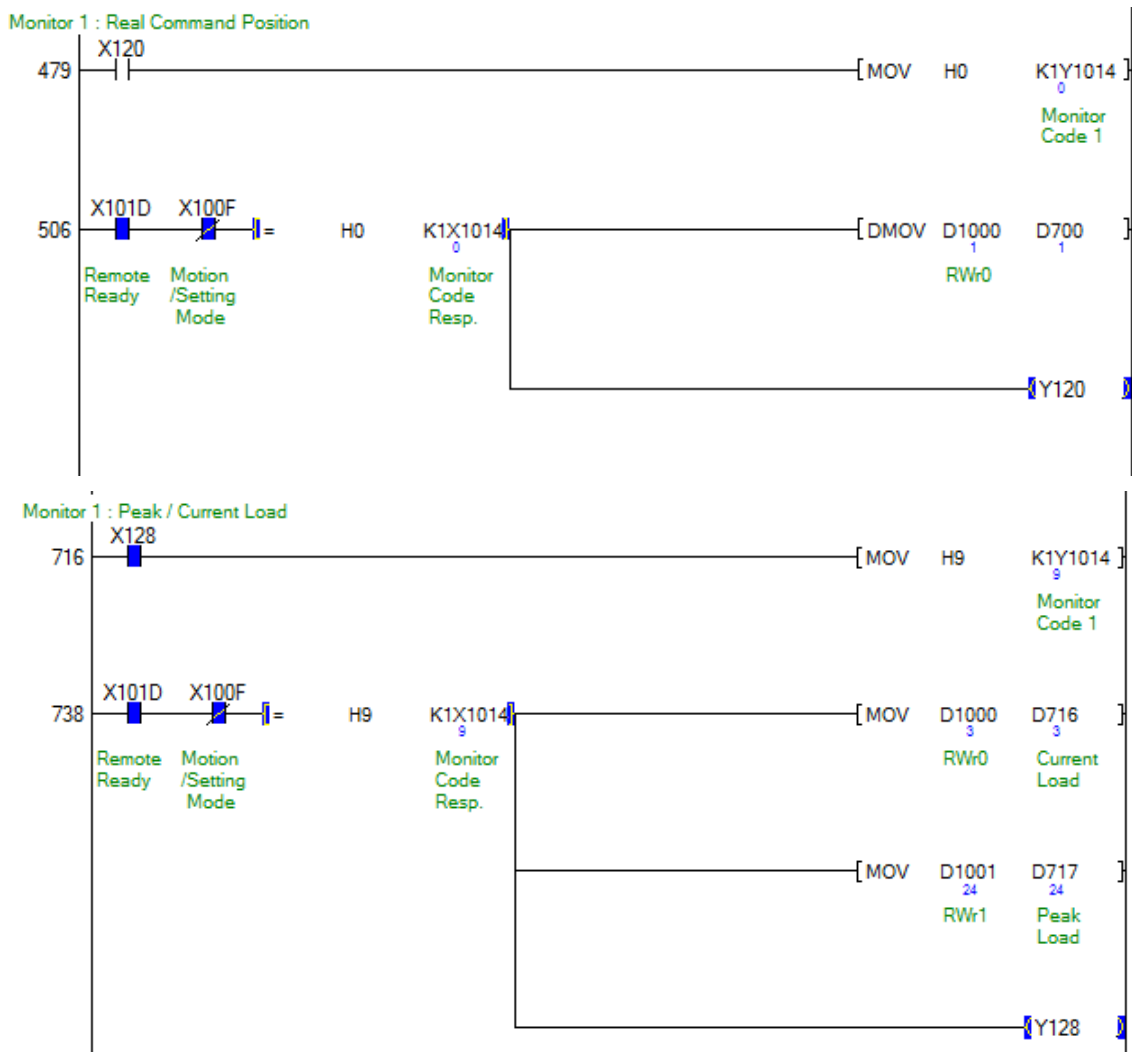
Monitoring Code

Code		Data Name	Description
[DEC]	[HEX]		
00	0x0	Real Command Position	Receives a value in [Pulse] units. This information does not apply to the reduction ratio parameter (Pn # B2022h, B2023h).
01	0x1	Real Actual Position	
02	0x2	Real Position Error	
03	0x3	Real Current Velocity	
04	0x4	Command Position	The value to be displayed changes according to the condition of the Parameter [Pn # B020h] Mechanism Type Select. This information is received with the reduction ratio parameter (Pn # B2022h, B2023h).
05	0x5	Actual Position	
06	0x6	Position Error	
07	0x7	Current Velocity	
08	0x8	-	-
09	0x9	Peak / Current Load	Displays load of motor in Servo On state - Upper WORD : Peak Load - Lower WORD : Current Load
10	0xA	Current	Displays the amount of motor RMS current in the drive
11	0xB	Get I/O Pin Status	Check status of I / O pin of input & output
12	0xC	Get User I/O Status	Check status value of user setting I / O
13	0xD	-	-
14	0xE	Axis Status 1	Drive status information
15	0xF	Setting Mode	When the I / O Map is in Setting Mode, the command response code of monitoring code (1) is output as 1111 [b].

* When a monitoring code not defined above is used, the remote register input value becomes '0'.

Device comment

- Real Command Position request : X120
- Peak / Current Load request : X128
- Real Command Position receipt notification : Y120
- Peak / Current Load receipt notification : Y128
- Real Command Data : D700
- Current Load Data : D716
- Peak Load Data : D717



Drive Status Information

Code		Data Name	Description
BIT	[HEX]		
0	0x00000001	Error Servo ALARM	Alarm occurs on drive
1	0x00000002	H/W + Limit	Detect H/W + Limit sensor
2	0x00000004	H/W - Limit	Detect H/W - Limit sensor
3	0x00000008	S/W + Limit	Current position exceeds S / W + Limit range
4	0x00000010	S/W - Limit	Current position exceeds S / W - Limit range
5	0x00000020	Master Connection	When the master controller is detected
6	0x00000040	RS485 Approve	Control authority approved through RS485
7	0x00000080	Error Position Over Flow	When the motor in the Servo ON state is stopped, the 'Pos Error' value is set to "[Pn # B00A] Pos. Error Overflow Limit" is exceeded
8	0x00000100	Error Current	The current through power devices in inverter exceeds the limit value
9	0x00000200	Error Over Speed	Motor speed excess 3300[rpm]
10	0x00000400	Error Position Tracking	Position error during motion exceeds "[Pn # B007h] Position Tracking Limit"
11	0x00000800	Error Over Load	An alarm occurs when a load exceeding the maximum torque of the motor is applied for more than 5 seconds or more than 10 rotations of the motor
12	0x00001000	Error Over Heat	An alarm whose drive internal temperature exceeds 85 ° C
13	0x00002000	Error Back EMF	Alarm with motor back EMF voltage exceeding 70V
14	0x00004000	Error Motor Power	Motor voltage error alarm
15	0x00008000	Error In-Position	Alarms exceeding "[Pn # B006h] In-position Value" during positioning
16	0x00010000	E-Stopped	When the emergency stop command is executed
17	0x00020000	S-Stopped	In the state where the normal stop command is executed and stopped during motion
18	0x00040000	Origin Returning	Origin return state
19	0x00080000	In-Position	When positioning, close to "[Pn # B006h] In-position Value" range
20	0x00100000	Servo On	Motor is Servo On state
21	0x00200000	Alarm Reset	Alarm release command is being executed
22	0x00400000	PT Stopped	Status of position table operation is terminated
23	0x00800000	Origin Sensor	When home sensor is detected
24	0x01000000	Z-Pulse Sensor	Z phase sensor is detected
25	0x02000000	Origin Return Ok	Origin return completed state
26	0x04000000	Motion Direction	Motor running direction (0: + direction, 1: - direction)
27	0x08000000	Motioning	Motion in progress
28	0x10000000	Motion Pause	Paused
29	0x20000000	Motion Accel.	The state of motion being accelerated in motion progress
30	0x40000000	Motion Decel.	The state of motion being decelerated in motion progress

31	0x80000000	Motion Const.	The state of motion being constant in motion progress
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* The above table is the same data that can be obtained by FAS_GetAxisStatus command of Ezi-MOTION PlusR Protocol.

4.18.4 External I / O Status Checking

When data is requested as the previous status data checking method, external I / O status information can be obtained as follows

Status value of I / O pin

DWORD		Data Name	Description
BIT	[HEX]		
0	0x00000001	Input Pin 1	Input state of pin 4 of CN1 connector terminal
1	0x00000002	Input Pin 2	Input state of pin 5 of CN1 connector terminal
2	0x00000004	Input Pin 3	Input state of pin 6 of CN1 connector terminal
3	0x00000008	Input Pin 4	Input state of pin 7 of CN1 connector terminal
4	0x00000010	Input Pin 5	Input state of pin 8 of CN1 connector terminal
5	0x00000020	Input Pin 6	Input state of pin 9 of CN1 connector terminal
6	0x00000040	Input Pin 7	Input state of pin 10 of CN1 connector terminal
7	0x00000080	-	
8	0x00000100	H/W + Limit	Detect H/W + Limit sensor
9	0x00000200	H/W - Limit	Detect H/W - Limit sensor
10	0x00000400	Origin Sensor	Home sensor is detected
11	0x00000800	Z-Pulse Sensor	Z phase sensor is detected
12	0x00001000	-	
13	0x00002000	-	
14	0x00004000	S/W + Limit	Current position exceeds S / W + Limit range
15	0x00008000	S/W - Limit	Current position exceeds S / W - Limit range
16	0x00010000	Output Pin 1	Output state of pin 11 of CN1 connector terminal
17	0x00020000	Output Pin 2	Output state of pin 12 of CN1 connector terminal
18	0x00040000	Output Pin 3	Output state of pin 13 of CN1 connector terminal
19	0x00080000	Output Pin 4	Output state of pin 14 of CN1 connector terminal
20	0x00100000	Output Pin 5	Output state of pin 15 of CN1 connector terminal
21	0x00200000	Output Pin 6	Output state of pin 16 of CN1 connector terminal
22	0x00400000	-	

* The information in the above table is confirmed by the remote receiving devices RX20 to RX2F in the 2 station occupied mode. Therefore, when requesting this information in the 2 station occupancy mode, you will be asked for information in duplicate.

Status information of user setting I / O

Code		Data Name	Description
BIT	[HEX]		
0	0x00000001	User Input 1 Map	The state of user input 1 assigned to the drive
1	0x00000002	User Input 2 Map	The state of user input 2 assigned to the drive
2	0x00000004	User Input 3 Map	The state of user input 3 assigned to the drive
3	0x00000008	User Input 4 Map	The state of user input 4 assigned to the drive
4	0x00000010	User Input 5 Map	The state of user input 5 assigned to the drive
5	0x00000020	User Input 6 Map	The state of user input 6 assigned to the drive
6	0x00000040	User Input 7 Map	The state of user input 7 assigned to the drive
-	-	-	-
16	0x00010000	User Output 1 Map	Status of user output 1 assigned to the drive
17	0x00020000	User Output 2 Map	Status of user output 2 assigned to the drive
18	0x00040000	User Output 3 Map	Status of user output 3 assigned to the drive
19	0x00080000	User Output 4 Map	Status of user output 4 assigned to the drive
20	0x00100000	User Output 5 Map	Status of user output 5 assigned to the drive
21	0x00200000	-	

* The above table is information for processing the external I / O signals of the drive in the host controller

4.18.5 User Output

Ezi-SERVO2 CC-Link can set up to 6 output signals at user's discretion. The mapping setting of this pin output can be set to "**Parameter**" for the user output signal setting.

4.18.6 Motor Current [mA]

The amount of current in the motor is the value indicating the effective value (RMS) of the motor's A and B phases. It cannot be displayed higher than the specifications of the applied motor.

4.18.7 Current Load [%]

The amount of load checked by monitoring is calculated from the amount of position change detected by the encoder position feed-back information used in the current closed-loop processing of the motor and the information detected when controlling the step angle of the stepping motor is. Therefore, the load is not measured in the Servo Off state in which current is not applied to the motor.

An overload alarm will occur if the load is held above 100 [%] for more than 5 seconds while the motor is stopped or driven

This information can be used for inspection of the equipment system, and the relative load can be evaluated by comparing the load at the time of initial installation and the load at the time of inspection. And because it is linked with the parameter "[Pn # B00Ch] Run Current", even if it is the same equipment system, if this parameter is changed, the load amount to be verified will be checked differently from the previous information.



Attention

When an alarm occurs in the drive, the current amount of the motor and the load amount of the drive are kept at the state value just before the alarm is generated in order to track it.

4.18.8 Peak Load [%]

Peak load is the maximum load after drive power up. To clear this value, parameter request can be made by changing RY0F of I / O-Map to '1' and changing it to "Command Code = 8".

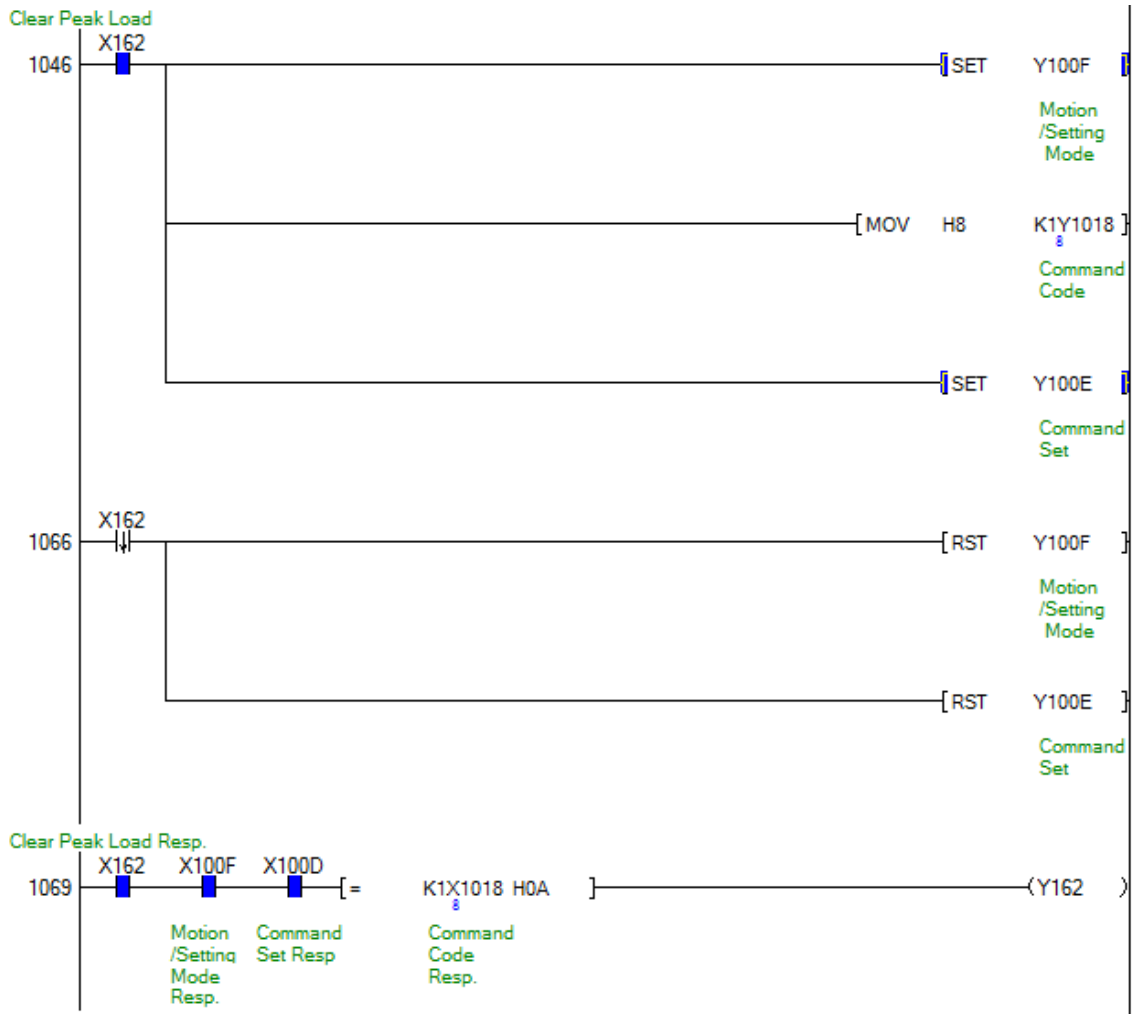
Mapping information

Motion Name	Function PLC->Drive	Remote device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
Command Set	Output	Y100E	-	-	-
Motion / Setting	Output	Y100F			
Command Code 0	Output	Y1018	-	-	-
Command Code 1	Output	Y1019	-	-	-
Command Code 2	Output	Y101A	-	-	-
Command Code 3	Output	Y101B	-	-	-
Command Set Resp.	Input	X100D	-	-	-
Motion / Setting Resp.	Input	X100F			

Command Code Resp. 0	Input	X1018			
Command Code Resp. 1	Input	X1019			
Command Code Resp. 2	Input	X101A			
Command Code Resp. 3	Input	X101B			

Device comment

- Parameter Request Command : X110
- Parameter Code : D510
- Normal execution flag of Parameter request command : Y110
- Requested Parameter: D600



Attention

If the processing of Y100F and Y100E is used as a coil, other setting command and redundant coil may not be executed. Therefore, Y100F and Y100E are treated as bit set instructions, and at step "1066" instructions are added to clear the falling differential of instruction execution.

4.19 Parameter Access

As a parameter access method, there is a method to access each parameter coat by calling RS485 and remote device of host controller. The code number of the parameter can be checked in "5Parameter List".

The current position command is a command that specifies the current motor position as the input value. When this command is executed, the current position tracking value (Command Position) and encoder position value (Actual Position) are changed to the value to be changed

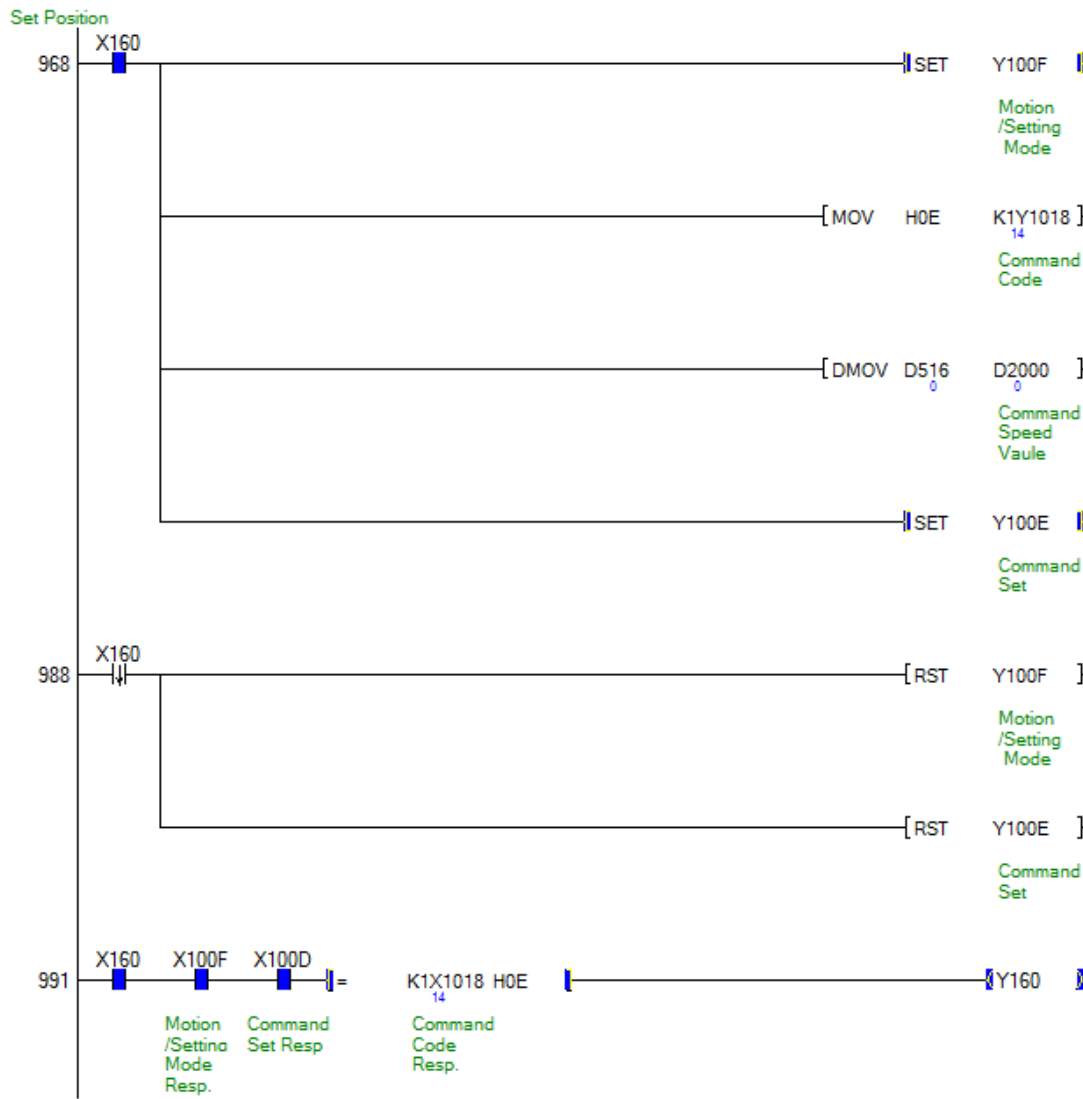
The current position command can be the same as the "Position Set" of the home return method, but the home position return command cannot be executed in Servo Off state, but the current position command can be executed. However, the Origin Return OK flag cannot be turned On with the current positioning command.


Mapping information

Motion Name	Function PLC->Drive	Remote device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
Command Set	Output	Y100E	-	-	-
Motion / Setting	Output	Y100F			
Command Code 0	Output	Y1018	-	-	-
Command Code 1	Output	Y1019	-	-	-
Command Code 2	Output	Y101A	-	-	-
Command Code 3	Output	Y101B	-	-	-
Command Set Resp.	Input	X100D	-	-	-
Motion / Setting Resp.	Input	X100F			
Command Code Resp. 0	Input	X1018			
Command Code Resp. 1	Input	X1019			
Command Code Resp. 2	Input	X101A			
Command Code Resp. 3	Input	X101B			

Device comment

- Parameter Request Command : X110
- Parameter Code : D510
- Normal execution flag of Parameter request command : Y110
- Requested Parameter: D600



 Attention	<p>The parameter code (2 bytes) for accesses to the remote device area of the CC-Link network through the master controller and the parameter code (1 byte) for the Ezi-MOTION Plus-R Protocol parameter access command are not mixed.</p>
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4.19.1 Parameter Request

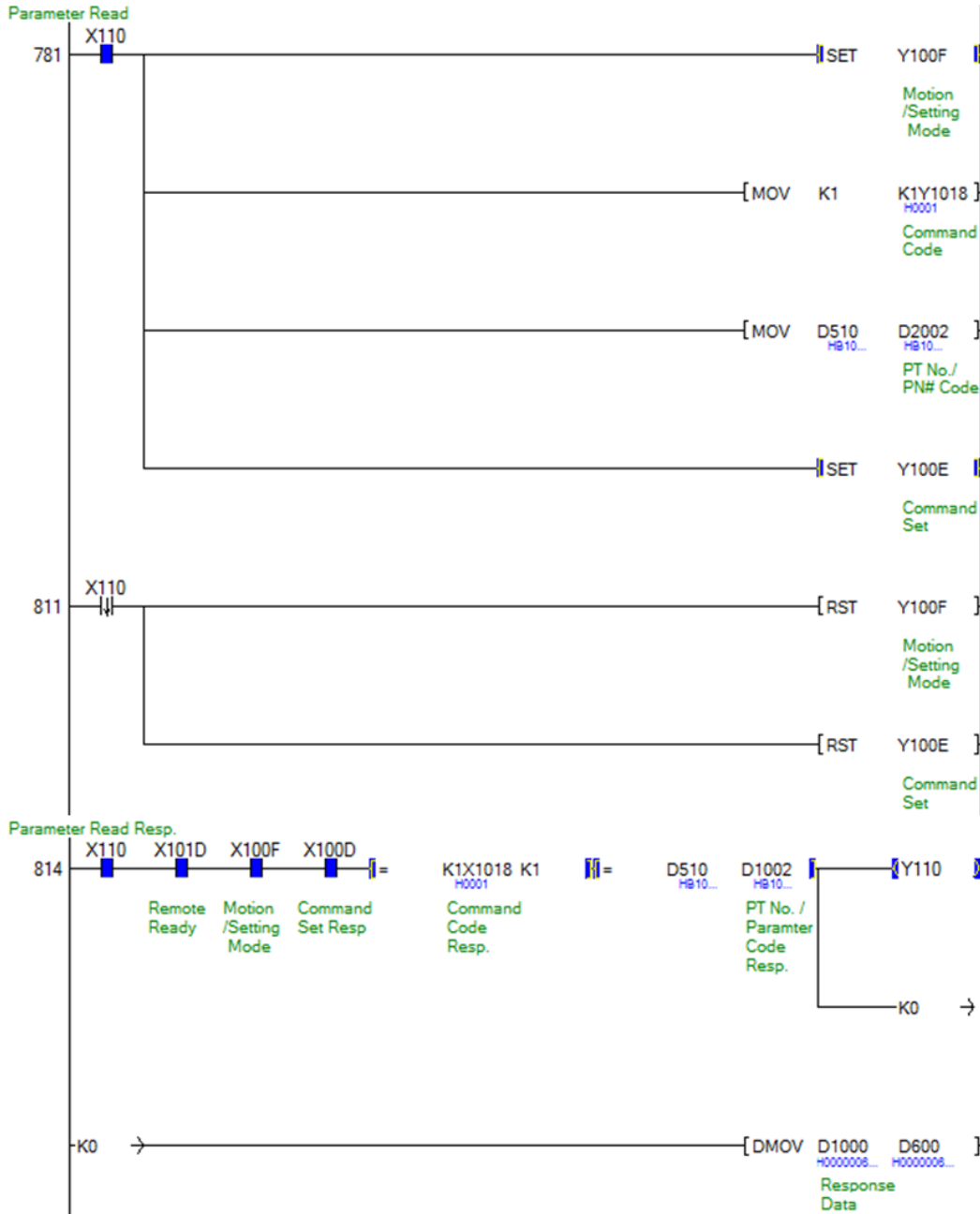
To check the parameter data through the CC-Link host controller, parameter request can be made by changing RY0F of I / O-Map to '1' and changing to "Command Code = 1". The requested data is checked as DWORD data in the remote register receiving areas RWr0 to RWr1.

Mapping information

Motion Name	Function PLC->Drive	Remote device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
Command Set	Output	Y100E	-	-	-
Motion / Setting	Output	Y100F			
Command Code 0	Output	Y1018	-	-	-
Command Code 1	Output	Y1019	-	-	-
Command Code 2	Output	Y101A	-	-	-
Command Code 3	Output	Y101B	-	-	-
Command Set Resp.	Input	X100D	-	-	-
Motion / Setting Resp.	Input	X100F			
Command Code Resp. 0	Input	X1018			
Command Code Resp. 1	Input	X1019			
Command Code Resp. 2	Input	X101A			
Command Code Resp. 3	Input	X101B			
Parameter Code	Output	D2002	-		
Parameter Code Resp.	Input	D1002	-		
Response Data	Input	D1000	-		

Device comment

- Parameter Request Command : X110
- Parameter Code Value : D510
- Normal execution flag of Parameter request command : Y110
- Requested Parameter Value : D600



Attention

If the processing of Y100F and Y100E is used as a coil, other setting command and redundant coil may not be executed. Therefore, Y100F and Y100E are treated as bit set instructions, and at step "811" instructions are added to clear the falling differential of instruction execution.

4.19.2 Parameter Change

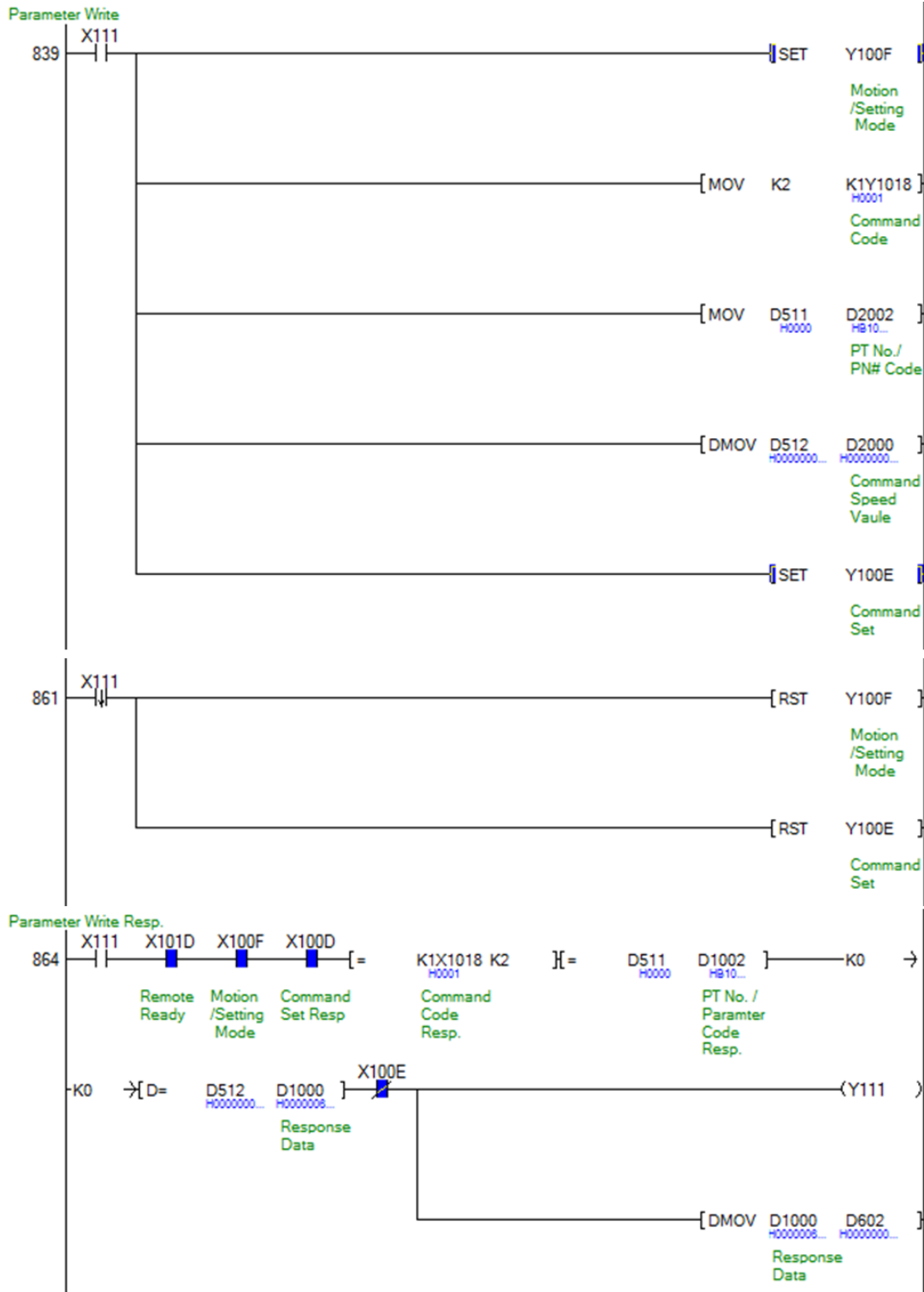
To modify the parameter data, set RY0F to '1' and change the setting mode Command Code = 2. When parameter change command is executed normally, it responds with changed parameter value.

Mapping information

Motion Name	Function PLC->Drive	Remote device Mapping	Ext. I/O using condition		
			Mapping Name	[DEC]	[HEX]
Command Set	Output	Y100E	-	-	-
Motion / Setting	Output	Y100F			
Command Code 0	Output	Y1018	-	-	-
Command Code 1	Output	Y1019	-	-	-
Command Code 2	Output	Y101A	-	-	-
Command Code 3	Output	Y101B	-	-	-
Command Set Resp.	Input	X100D	-	-	-
Motion / Setting Resp.	Input	X100F			
Command Code Resp. 0	Input	X1018			
Command Code Resp. 1	Input	X1019			
Command Code Resp. 2	Input	X101A			
Command Code Resp. 3	Input	X101B			
Parameter Code	Output	D2002	-		
Parameter Code Resp.	Input	D1002	-		
Response Data	Input	D1000	-		

Device comment

- Parameter Request Command : X111
- Parameter Code Value : D511
- Parameter Value to change : D512
- Normal execution flag of Parameter request command : Y111
- Changed Parameter Value : D602



Attention

If the processing of Y100F and Y100E is used as a coil, other setting command and redundant coil may not be executed. Therefore, Y100F and Y100E are treated as bit set instructions, and step "861" has been added to clear the falling instruction differential of instruction execution

4.19.3 Parameter Storage

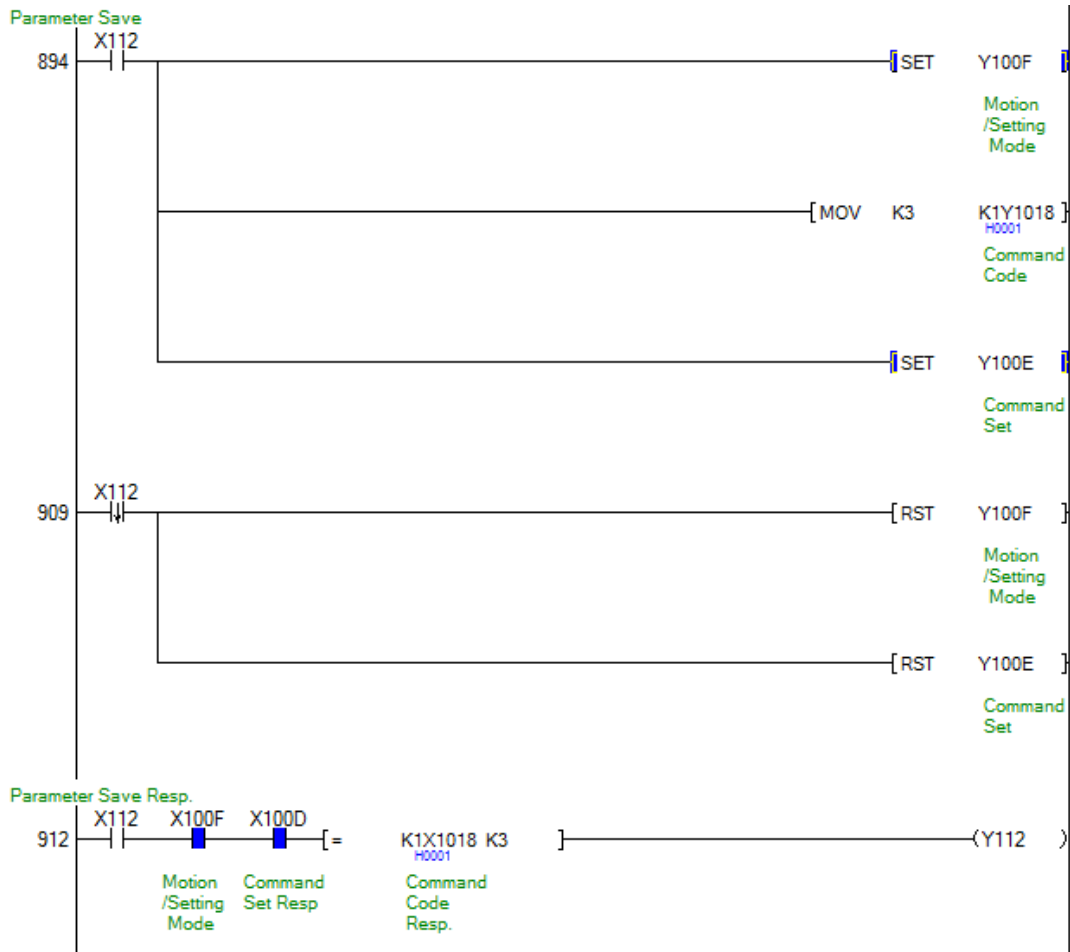
To save the data after changing the parameter data of the drive, you must execute the Save Parameter command. This can be commanded with "Command Code = 3" in setting mode by setting RY0F to '1'.

Mapping information

Motion Name	Function PLC->Drive	Remote Device Mapping	Ext. I/O		
			Mapping Name	[DEC]	[HEX]
Command Set	Output	Y100E	-	-	-
Motion / Setting	Output	Y100F			
Command Code 0	Output	Y1018	-	-	-
Command Code 1	Output	Y1019	-	-	-
Command Code 2	Output	Y101A	-	-	-
Command Code 3	Output	Y101B	-	-	-
Command Set Resp.	Input	X100D	-	-	-
Motion / Setting Resp.	Input	X100F			
Command Code Resp. 0	Input	X1018			
Command Code Resp. 1	Input	X1019			
Command Code Resp. 2	Input	X101A			
Command Code Resp. 3	Input	X101B			

Device Comment

- Parameter : X112
- Parameter normal execution flag of request command : Y112



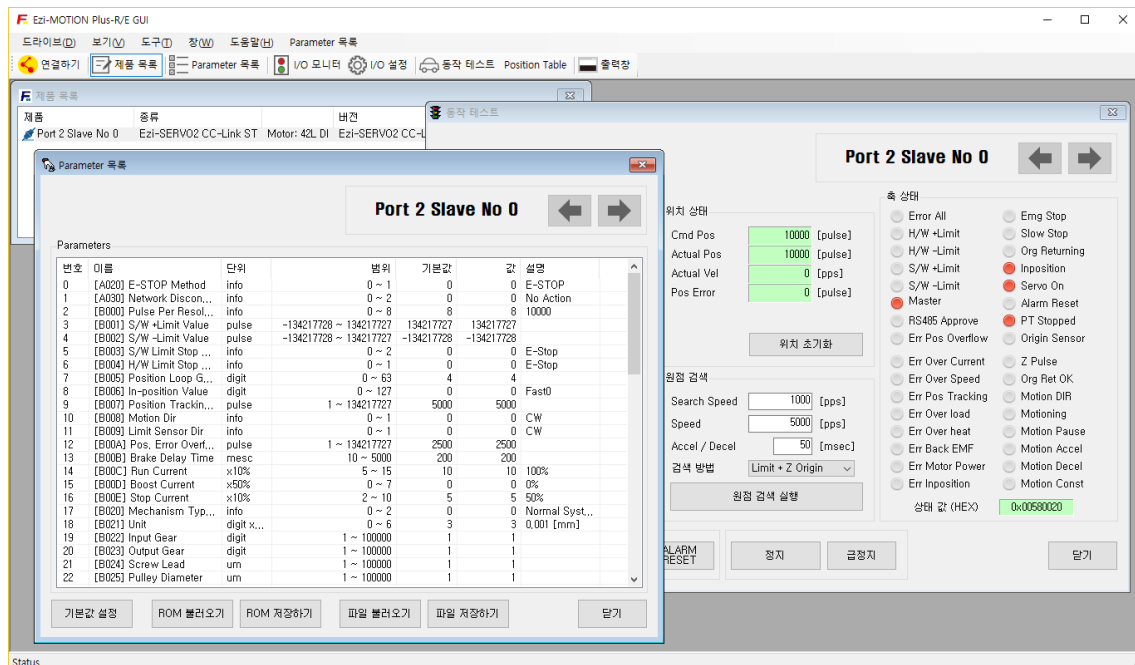
Attention

If the processing of Y100F and Y100E is used as a coil, other setting command and redundant coil may not be executed. Therefore, Y100F and Y100E are processed as bit set instructions, and instructions are added at step "909" to clear the falling differential of instruction execution.

4.19.4 Access to Ezi-MOTION Plus-R GUI program

The window GUI program of Ezi-SERVO2 CC-Link can be downloaded from the FASTECH website (www.fastech.co.kr)

In the provided Windows GUI program, it is possible to check the data of the parameter easily, but the change and save command of data cannot be arbitrarily modified because of permission setting. When changing and saving the parameters, proceed to the CC-Link network forcible exit and execute the authority release command to the host controller. <Refer to 4.8 RS485 control authority>



Attention

Ezi-SERVO2 CC-Link is compatible with Ezi-MOTION Plus-R GUI Ver.6.40.11.XX or higher.

4.20 Teaching command

Teaching in the robot system is a task in which the user directly identifies the movement path and the target point. This has the advantage that it is easy for users to process commands and manage their locations

Ezi-SERVO2 CC-Link Motion profile information saved as teaching command is saved in Position Table. Therefore, you must complete the teaching and execute the parameter save command. The motion profiles stored here are as follows.

Items Saved by Teaching

Item	Data Access	Applied Data	Data Size
Motion Type	Constant	Normal Absolut Position Move	-
Acceleration time	Parameter	[Pn#B102] Axis Accel Time	WORD
Deceleration time	Parameter	[Pn#B103] Axis Decel Time	WORD
Start Speed	Parameter	[Pn#B101] Axis Start Speed	DWORD
Move Speed	User Input	RWw0	DWORD
Target Position	Status Information	Command Code = A : Command Position Command Code = B : Actual Position	DWORD
Jump PT No.	Constant	No Jump (-1)	-
Waiting Time	Constant	No Delay (0 [msec])	-

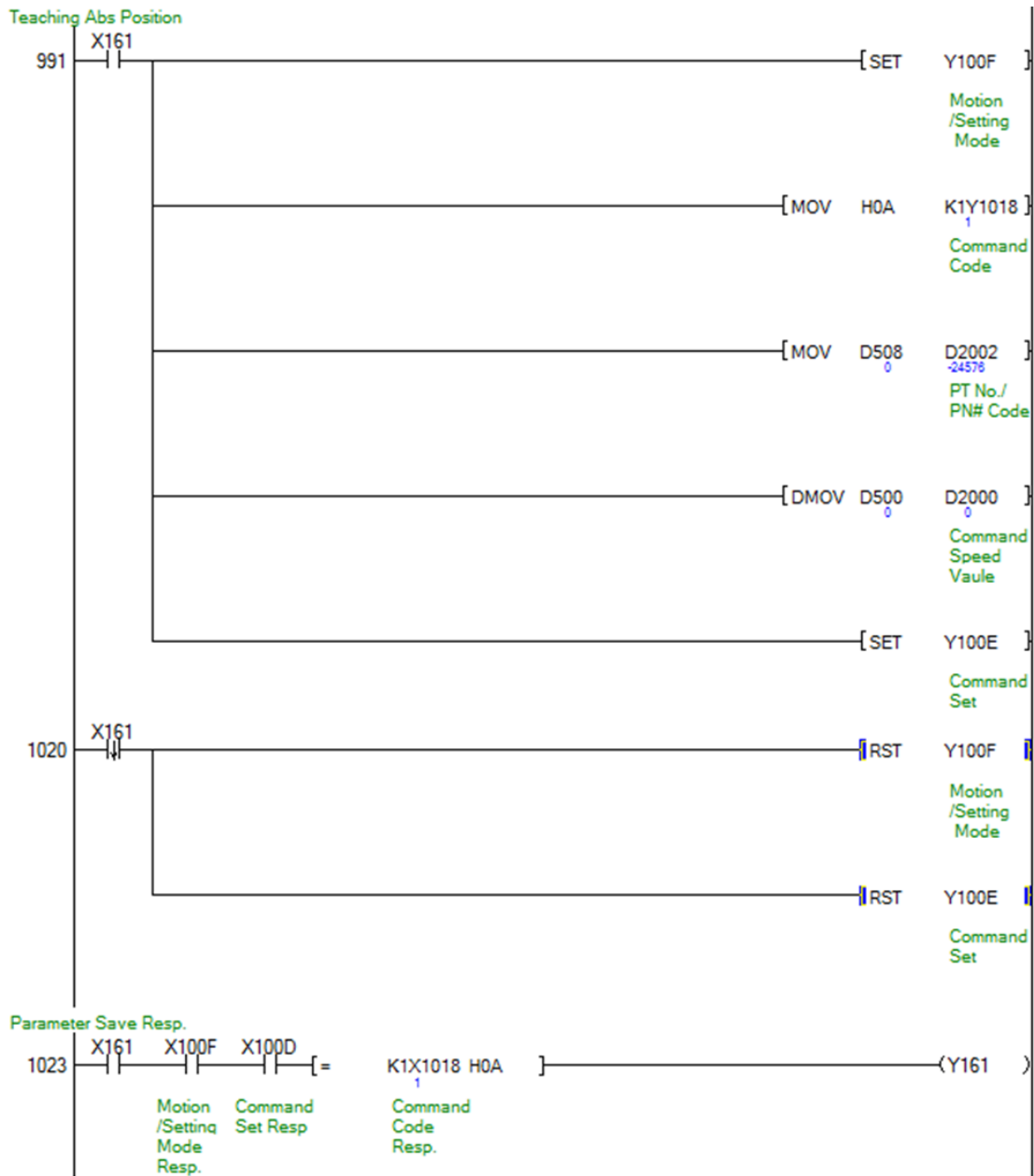
The teaching command is executed in the setting mode in which RY0F is set to '1'. If the command code is '0xA', the teaching is Absolute Position Teaching to teach the encoder position value. '0x0B' is used to teach the current position follower value Command Position as position information

Mapping information


Motion Name	Function PLC->Drive	Remote Device Mapping	Ext. I/O		
			Mapping Name	[DEC]	[HEX]
Command Set	Output	Y100E	-	-	-
Motion / Setting	Output	Y100F			
Command Code 0	Output	Y1018	-	-	-
Command Code 1	Output	Y1019	-	-	-
Command Code 2	Output	Y101A	-	-	-
Command Code 3	Output	Y101B	-	-	-
Command Set Resp.	Input	X100D	-	-	-
Motion / Setting Resp.	Input	X100F			
Command Code Resp. 0	Input	X1018			
Command Code Resp. 1	Input	X1019			
Command Code Resp. 2	Input	X101A			
Command Code Resp. 3	Input	X101B			
Parameter Code	Output	D2002	-		
Parameter Code Resp.	Input	D1002	-		
Response Data	Input	D1000	-		

Device comment

- Execute Absolute Position Teaching : X151
- PT number to Teaching : D508
- Speed Value to Teaching: D500
- Teaching Complete Flag : Y111



* In the above example, Absolute Position Teaching is performed by inputting 4-bit Data "0xA" to the remote device output "Y1018". At this, if 4-bit 0xB is input to the remote device output "Y1018", Command Position Teaching is executed.

 Attention	<p>If the processing of Y100F and Y100E is used as a coil, other setting command and redundant coil may not be executed. Therefore, Y100F and Y100E have been processed by bit set instruction, and step "1020" has been added to clear the falling instruction differential of instruction execution.</p>
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4.21 Set Current Position

The current position command is a command that specifies the current motor position as the input value. When this command is executed, the current position tracking value (Command Position) and encoder position value (Actual Position) are changed to the value to be changed

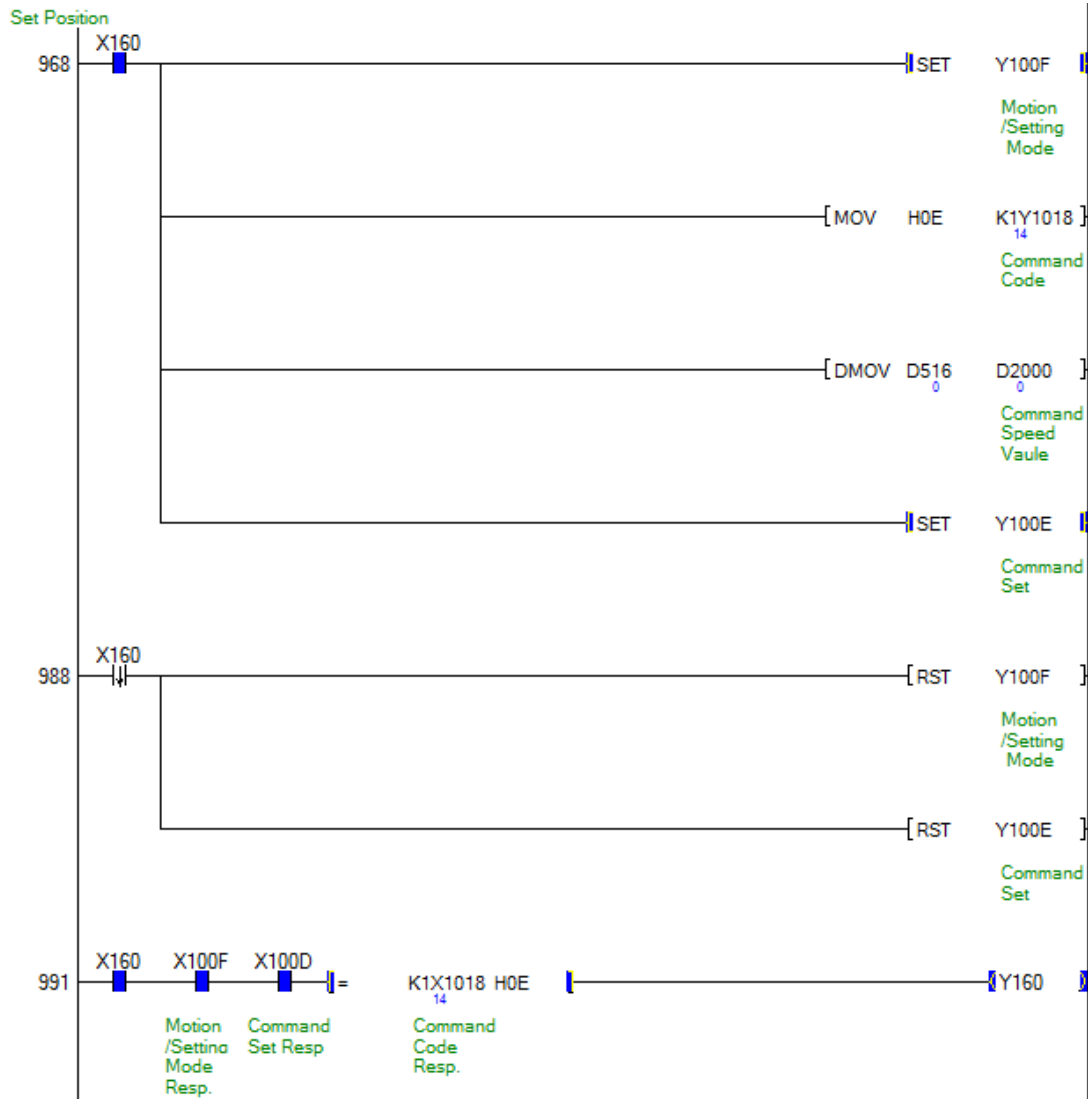
The current position command can be the same as the "Position Set" of the homing method, but the origin return command cannot be executed in Servo Off state, but the current position command can be executed. However, the origin is not reset even when the current positioning command is executed. In addition, the target position of the zero movement command becomes the designated position after returning to origin.

Mapping information

Motion Name	Function PLC->Drive	Remote Device Mapping	Ext. I/O		
			Mapping Name	[DEC]	[HEX]
Command Set	Output	Y100E	-	-	-
Motion / Setting	Output	Y100F			
Command Code 0	Output	Y1018	-	-	-
Command Code 1	Output	Y1019	-	-	-
Command Code 2	Output	Y101A	-	-	-
Command Code 3	Output	Y101B	-	-	-
Command Set Resp.	Input	X100D	-	-	-
Motion / Setting Resp.	Input	X100F			
Command Code Resp. 0	Input	X1018			
Command Code Resp. 1	Input	X1019			
Command Code Resp. 2	Input	X101A			
Command Code Resp. 3	Input	X101B			

Device comment

- Parameter request command : X110
- Parameter Code : D510
- Normal execution flag of Parameter request command: Y110
- Requested Parameter: D600



5. Parameter List

Parameter of Ezi-SERVO2 CC-Link can be changed by command to access CC-Link remote device and window-based Ezi-MOTION Plus-R GUI program.

Parameter Classification	Parameter Start Address	Description	Write Condition
Operating	0xA000	Drive information and network operation parameters	Servo Off
Drive Control	0xB000	Parameter for drive control	Servo Off
Motion control	0xB100	Parameter of motion profile	Servo On
Origin Control	0xB200	Parameter of homing profile	Servo On
Ext. I/O Control	0xE000	Assignment information and level control of external I / O	Servo Off
Position Table	0x9000	Items in the position table	Servo On

5.1 Operating Parameter

Drive information and network operation parameters.

Pn#No.	GUI No.	Parameter Name	Description	Access	Unit	Minimum	Maximum	Default
Pn#A000h	-	Drive F/W Revision Info	Revision number of drive firmware	R	[digit]	-	-	-
Pn#A001h	-	Drive F/W Version Info	Drive firmware version	R	[digit]	-	-	-
Pn#A002h	-	Drive H/W Version Info	Drive hardware version	R	[digit]	-	-	-
Pn#A003h	-	Drive Version Info	Drive version	R	[digit]	-	-	-
Pn#A005h	-	Motor Type Info	Motor type number	R	[digit]	-	-	-
Pn#A008h	-	CC-Link Occupied Stations Info	Occupancy status of CC-Link network	R	[Info]	1	4	-
Pn#A009h	-	CC-Link Mode Switch Info	CC-Link Mode Switch Information	R	[digit]	-	-	-
Pn#A00Ah	-	CC-Link ID Info	CC-Link ID number	R	[digit]	-	-	-
Pn#A010h	-	Ezi-MOTION Plus-R ID	RS485 communication network ID	R/W	[digit]	0	15	0
Pn#A011h	-	Ezi-MOTION Plus-R Baud-Rate	RS485 communication speed	R	[digit]	-	-	112500
Pn#A020h	0	E-STOP Method	Operating condition at emergency stop	R/W	[digit]	0	1	0
Pn#A030h	1	Network Disconnection	Operation condition when CC-Link network is disconnected	R/W	[digit]	0	3	0

5.1.1 Drive F/W Revision Info [Pn#A000]

This parameter is the firmware version of the drive and is the version information for the fix

5.1.2 Drive F/W Version Info [Pn#A001]

This parameter is the firmware version of the drive and is the major version information

5.1.3 Drive H/W Version Info [Pn#A002]

This parameter is the hardware version of the drive. It is the version information about the hardware specification.

5.1.4 Drive Major Version Info [Pn#A003]

This parameter is the main version information of the drive

5.1.5 Motor Type Info [Pn#A005]

The code representing the motor type. Depending on the motor applied to each drive, the motor number to be checked is different.

Parameter Value [info]	Motor Type	Parameter Value [info]	Motor Type
130	20M	120	56S
129	20L	132	56M
128	28S	117	56L
127	28M	146	60S
126	28L	147	60M
125	42S	148	60L
124	42M		
123	42L		
122	42XL		

5.1.6 CC-Link Occupied Stations Info [Pn#A008]

Shows the station occupied by the CC-Link network applied by the setting of switch SW1 occupying the drive.

Parameter Value [info]	Operating characteristic
1	1 station occupied mode
2	2 station occupied mode
3	3 station occupied mode
4	4 station occupied mode

5.1.7 CC-Link Mode Switch Info [Pn#A009]

Indicates the value applied by setting the mode switch SW2 of the drive. CC-Link communication setting speed is as follows

Parameter Value [info]	CC-Link Communication Speed [bps]
0	156K
1	625K
2	2.5M
3	5M
4	10M

5.1.8 CC-Link ID Info [Pn#A00A]

Station No. setting switch of the drive CC-Link station number set by SW3 (X10) and SW4 (X1). It is displayed as set value of switch set at boot. If user wants to apply the changed ID after booting, re-boot the drive.



Attention

When the CC-Link mode and CC-Link ID are changed while a normal connection with the CC-Link network has been made, error messages "E-400" and "E-300" are output from the display FND of the drive.

5.1.9 Ezi-MOTION Plus-R ID [Pn#A010]

The ID number for Ezi-MOTOIN Plus-R protocol is based on RS485. It can be set from 0 to 15

5.1.10 Ezi-MOTION Plus-R Baud-Rate [Pn#A011]

Communication speed of Ezi-MOTOIN Plus-R protocol is based on RS485. The default value is '4' which is fixed at 115,200 [bps]

Parameter Value [info]	RS485 Communication Speed[bps]
0	9,600
1	19,200
2	38,400
3	57,600
4	115,200 (* Fixed value)
5	230,400
6	460,800
7	921,600

5.1.11 E-STOP Method [Pn#A020]

Selects the drive operation condition when the E-STOP instruction is executed

Parameter Value [info]	Operating characteristic
0	E-STOP Only
1	Automatic Servo OFF after E-STOP

5.1.12 Network Disconnection [Pn#A030]

Select the drive operation condition when the CC-Link network is disconnected.

Parameter Value [info]	Operating characteristic
0	Stay current status
1	Execute E-STOP
2	Execute Servo OFF
3	Execute S-STOP

5.2 System Control Parameter

Drive control parameters are parameters that configure the environment when motor is connected to mechanical equipment. This parameter can be changed in the Servo Off state

Pn#No.	GUI No.	Parameter Name	Description	Access	Unit	Minimum	Maximum	Default
Pn#B000h	2	Pulse Per Resolution	Pulse resolution for one revolution of the drive	R/W	[info]	0	8	8
Pn#B001h	3	S/W +Limit Value	Forward S / W Limit Points	R/W	[pulse]	-134,217,728	+134,217,727	+134,217,727
Pn#B002h	4	S/W -Limit Value	Reverse S / W limit point	R/W	[pulse]	-134,217,728	+134,217,727	-134,217,728
Pn#B003h	5	S/W Limit Stop Method	S / W Limit Stop method	R/W	[info]	0	2	0
Pn#B004h	6	H/W Limit Stop Method	H / W sensor input stop method	R/W	[info]	0	1	0
Pn#B005h	7	Position Loop Gain	Adjustment of motor response according to load	R/W	[digit]	0	63	4
Pn#B006h	8	In-position Value	Positioning complete range	R/W	[digit]	0	127	3
Pn#B007h	9	Position Tracking Limit	Condition of position tracking alarm	R/W	[pulse]	1	+134,217,727	5,000
Pn#B008h	10	Motion Dir	Motion direction setting	R/W	[info]	0	1	0
Pn#B009h	11	Limit Sensor Dir	Direction of the limit signal setting	R/W	[info]	0	1	0
Pn#B00Ah	12	Pos. Error Overflow Limit	Position error overflow alarm condition	R/W	[pulse]	1	+134,217,727	2500
Pn#B00Bh	13	Brake Delay Time	Brake delay value	R/W	[msec]	10	5,000	200

Pn#No.	GUI No.	Parameter Name	Description	Access	Unit	Minimum	Maximum	Default
Pn#B00Ch	14	Run Current	The ratio of the current flowing through the motor	R/W	X10[%]	5	15	10
Pn#B00Dh	15	Boost Current	Current ratio of motor used when motor is accelerated	R/W	X50[%]	0	7	0
Pn#B00Eh	16	Stop Current	Current ratio used by motor at stop	R/W	X10[%]	2	10	5
Pn#B020h	17	Mechanism Type Select	Type of machine equipment	R/W	[info]	0	3	0
Pn#B021h	18	Unit	Unit Information of machinery equipment	R/W	10 ⁻ⁿ [digit]	0	6	3
Pn#B022h	19	Input Gear	Input gears of mechanical equipment	R/W	[digit]	1	10,000	1
Pn#B023h	20	Output Gear	Output gear of mechanical equipment	R/W	[digit]	1	10,000	1
Pn#B024h	21	Screw Lead	Lead information of screw of machine equipment	R/W	[μm]	1	10,000	1
Pn#B025h	22	Pulley Diameter	Pulley diameter of mechanical equipment	R/W	[μm]	1	10,000	1
Pn#B030h	23	Step Move Position Magnify	Position magnification of step movement command	R/W	[digit]	1	25,000,000	1,000

*The GUI No. is Parameter No. displayed in the parameter list window of Ezi-MOTION PlusR-R GUI.

5.2.1 Pulse Per Resolution [Pn#B000h]

It means the number of pulses per motor rotation. This value can be changed in Servo OFF state.

Parameter Value [info]	Number of pulses per revolution [ppr]
0	500
1	1,000
2	1,600
3	2,000
4	3,600
5	5,000
6	6,400
7	7,200
8	10,000

5.2.2 S/W Limit \pm Value [Pn#B001h], [Pn#B002h]

Set the maximum input limit value that can move in plus direction to 28bits when using the move command (absolute move, incremental move, Jog). Since it is treated as the actual position value (Command Position, Actual Position), it is applied as the value that executed Set Position and Clear Position command.

5.2.3 S/W Limit Stop Method [Pn#B003h]

Set the motor stop method by the Parameter S / W limit value.

Parameter Value [info]	Operating characteristic
0	Execute E-STOP
1	Execute S-STOP
2	Not applied S/W Limit

5.2.4 H/W Limit Stop Method [Pn#B004h]

Set the motor stop method by the Parameter H / W limit value.

Parameter Value [info]	Operating characteristic
0	Execute E-STOP
1	Execute S-STOP

5.2.5 Position Loop Gain [Pn#B005h]

This function is used to adjustment for attached to the motor according to the load after motor stop. This is a relative value, not an actual value used inside the drive. For example, changing this value from 3 to 6 does not mean doubling the response time.

If the value of this parameter is small, the operation of stopping the motor becomes sensitive, the motor takes less time to stop, and if the value is large, the operation of stopping the motor becomes insensitive and the motor takes more time to stop.

The setting method is as follows.

- 1) Set the value to '0'.
- 2) Increase the value until the motor response stabilized.
- 3) Accurately adjust the current setting value by increasing or decreasing 1 or 2 steps.

Value	Time constant of Integral part	Proportional Gain	Value	Time constant of Integral part	Proportional Gain	Value	Time constant of Integral part	Proportional Gain
0	1	1	22	3	7	44	6	5
1	1	2	23	3	2	45	6	6
2	1	3	24	4	1	46	6	7
3	1	4	25	4	2	47	6	8
4	1	5	26	4	3	48	7	1
5	1	6	27	4	4	49	7	2
6	1	7	28	4	5	50	7	3
7	1	2	29	4	6	51	7	4
8	2	1	30	4	7	52	7	5
9	2	2	31	4	8	53	7	6
10	2	3	32	5	1	54	7	7
11	2	4	33	5	2	55	7	2
12	2	5	34	5	3	56	8	1
13	2	6	35	5	4	57	8	2
14	2	7	36	5	5	58	8	3
15	2	8	37	5	6	59	8	4
16	3	1	38	5	7	60	8	5
17	3	2	39	5	2	61	8	6
18	3	3	40	6	1	62	8	7
19	3	4	41	6	2	63	8	8
20	3	5	42	6	3			
21	3	6	43	6	4			

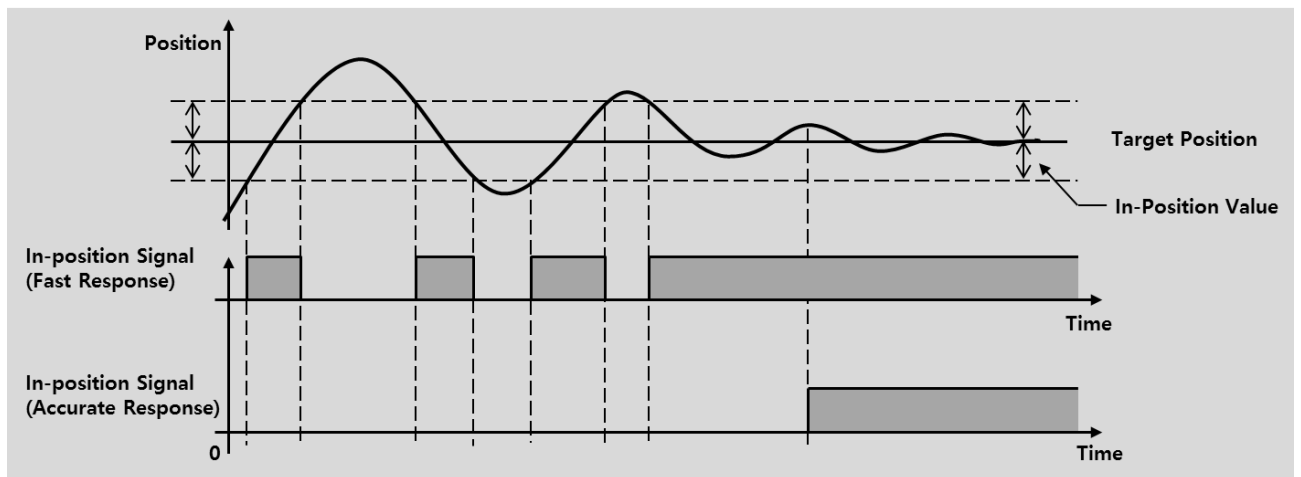
5.2.6 In-position Value [Pn#B006h]

Set the output condition of the positioning complete signal. When the position deviation from the target position is within the set 'In-Position Value' after the position command pulse ends, the positioning completion signal is output.

The position deviation that can output In-Position is 0 ~ 63. The setting values according to the control mode are as follows. The position deviation range according to each mode is 0 ~ 63.

- 1) Fast Response Mode : 0~63
- 2) Accurate Response Mode : 64~127

Fast Response and Accurate Response control methods are as follows



5.2.7 Position Tracking Limit [Pn#B007h]

This function protects the motor and the drive. If the 'Position Error' value becomes larger than this value while the motor is in operation, an alarm is generated to cut off the current supply to the motor and Servo Off

5.2.8 Motion Direction [Pn#B008h]

Set the direction of motor rotation when operating by position command.

Parameter Value [info]	Operating characteristic
0	Move in CW direction
1	Move in CCW direction

5.2.9 Limit Sensor Direction [Pn#B009h]

This function sets the direction of the limit signal to stop during operation up to the limit point. In a typical system, set the same as Parameter Motion Direction (Pn # B008h).

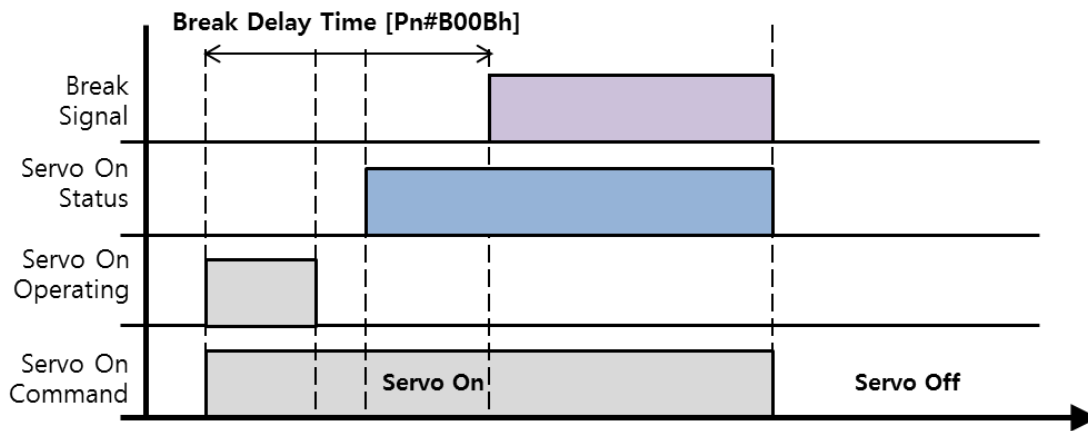
Parameter Value [info]	Operating characteristic
0	Stop by limit + signal when moving in CW direction
1	Stop by limit - signal when moving in CW direction

5.2.10 Pos. Error Overflow Limit [Pn#B00Ah]

This function protects the motor and the drive. If the 'Position Error' value becomes larger than this value when Servo On status, the alarm is generated and the current supply to the motor is cut off and Servo OFF.

5.2.11 Brake Delay Time [Pn#B00Bh]

User can set the brake operation time according to Servo ON command



5.2.12 Run, Boost, Stop Current [Pn#B00Ch], [Pn#B00Dh], [Pn#B00Eh]

Ezi-SERVO2 CC-Link can minimize the heat generation by adjusting the motor current consumption variably according to the driving load condition of machine equipment. The Run Current and Stop Current can adjust the maximum and minimum values of the drive current and stop current of the motor according to the load during operation. Boost Current is a current control parameter to improve the mobility.

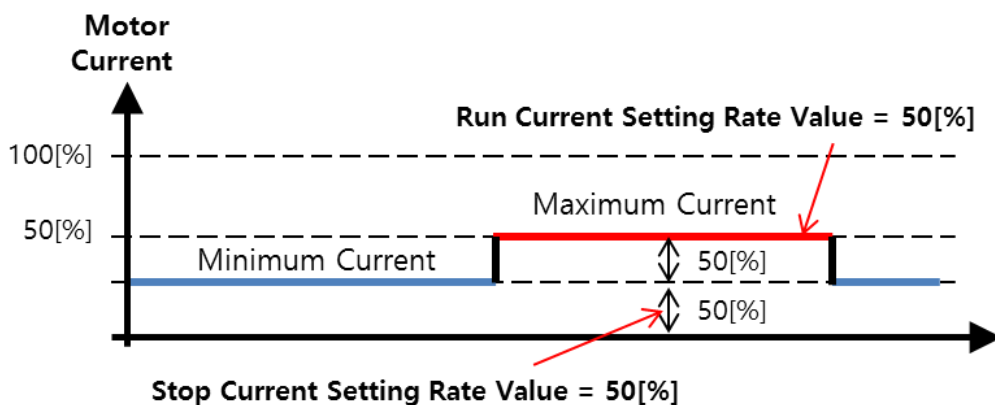
- Run Current [Pn#B00Ch]

It is the current value that flows to the motor during drive operation and is set based on the rated current of the motor. This value is related to the torque that the motor is running. If this value is high, the torque during operation will increase. Therefore, when the value of this parameter is adjusted, it is possible to set the maximum drive torque of the motor in the range of 50 [%] ~ 150 [%] and the maximum current in 4 [A] in 10 [%] units.

Parameter Value X10[%]	Minimum	Maximum	Default
5~15	50[%]	150[%]	100[%]

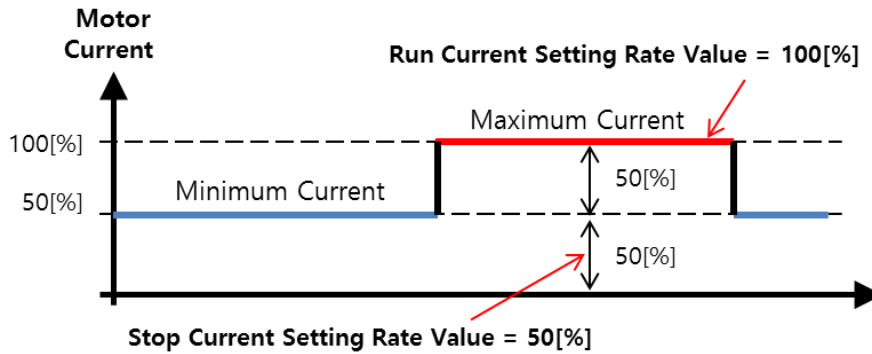
- 1) In case of the Run Current is set to 50 [%] (Pn # B00Ch = 5)

When using a motor whose rated current is 1 [A], the maximum current value for which the motor is used during operation is 0.5A. At this time, if Stop Current is 50%, it will operate from 0.25 [A] to 0.5 [A] for 1 [A] motor.



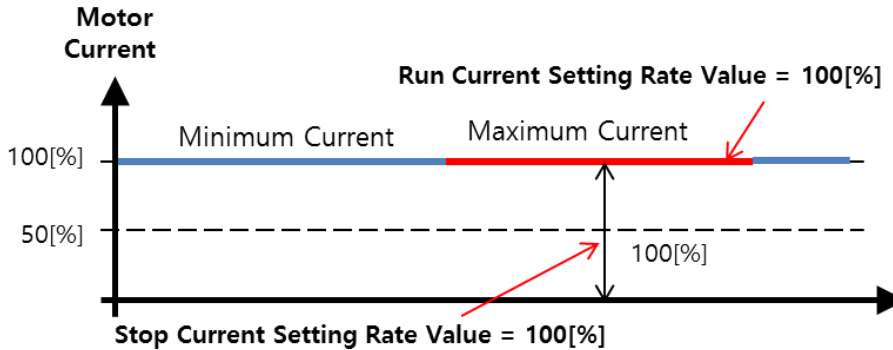
- 2) In case of the Run Current is set to 100 [%] (Pn # B00Ch = 10)

When using a motor with a rated current of 1.0 [A], the maximum current value at which the motor is used during operation is 1.0 [A]. At this time, if Stop Current is 50 [%], the minimum current of motor according to load is operated from 0.5 [A] to 1.0 [A] which is 50 [%] of Run Current.



- 3) In case of Pn # B00Ch and Pn # B00Eh are set to '10' (Run Current and Stop Current are 100 [%])

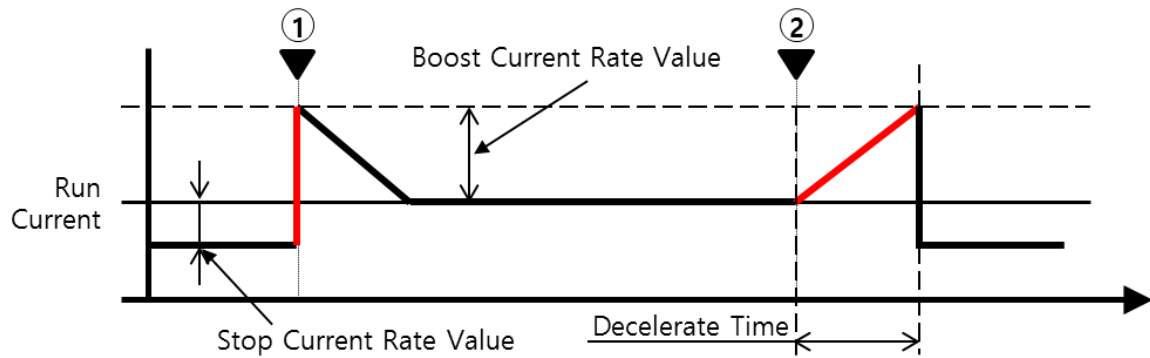
When the motor with rated current of 1.0 [A] is used and the Run Current and Stop Current are set to 100 [%], the motor's minimum current will be 1.0 [A] Regardless of the load, the Run Current is maintained at 1.0 [A] with 100 [%].



- Boost Current [Pn#B00Dh]

Boost Current is a parameter to increase the starting torque by temporarily supplying the driving current to the set value for a limited period when starting from the stop state. The motor accelerates to Boost Current at ①. After the acceleration is completed, the current decreases to run below the Run Current. At ②, the decelerating point, it decelerates to Boost Current. This parameter can be used to improve acceleration / deceleration performance.

Parameter Value X50[%]	Minimum	Maximum	Default
0~5	0[%]	350[%]	0[%]



- Stop Current [Pn#B00Eh]

It describes the stop current (the minimum current value that flows through the motor) that is automatically set after 0.1 second after the motor stops running. The current used at this time is the current for holding the motor. This parameter is used to reduce heat when the motor is stopped for a long time. The current set by the Stop Current Parameter is not proportional to the rated current as specified in the motor specification, but is proportional to the set Parameter Run Current value.

Parameter Value X10[%]	Minimum	Maximum	Default
2~10	20[%]	100[%]	50[%]

For example, if the run current of the motor with rated current of 1 [A] is set to 150 [%], the maximum motor current becomes 1.5 [A], and if the stop current is set to 50 [%] 0.75 [A].



Attention

- 1) If the value of Run Current is high, the temperature of the motor's heat may rise.
- 2) The maximum setting value of the Run Current (150%) is limited to 4 [A]. Therefore, motors (56mm, 60mm) whose motor rated current exceeds 2.7 [A] will not increase by the set value even if the set value is raised.
- 3) Therefore, use it only when the torque value during running is insufficient.
- 4) As same as Run Current, the control current is limited to 4 [A]. Motors (56 angles, 60 angles) whose rated current value exceeds 2.7 [A] will not increase by the set value even if the set value is raised.

5.2.13 Mechanism Type Select [Pn#B020h]

This is a parameter that makes the motor start to match the value of command, status information, setting value, etc., with the feed amount of the machine, depending on the type of machine. Depending on the mechanism, the calculation method for the transfer amount of the mechanical equipment is different. Therefore, it is calculated when the drive is booted according to the mechanism type and applied to the system.

Parameter Value [info]	System	Valid Parameter
0	Normal System	Pulse Per Resolution [Pn#B000h] Input Gear [Pn#B022h] Output Gear [Pn#B023h]
1	Ball Screw System (Lead Screw)	Pulse Per Resolution [Pn#B000h] Setting Unit : Unit [Pn#B021h] Drive axis gear information: Input Gear [Pn#B022h] Wave axis Gear Information: Output Gear [Pn#B023h] Lead screw information: Screw Lead [Pn#B024h]
2	Belt & Pulley System (Conveyor System)	Pulse Per Resolution [Pn#B000h] Setting Unit : Unit [Pn#B021h] Drive axis gear information: Input Gear [Pn#B022h] Wave axis Gear Information: Output Gear [Pn#B023h] Pulley Information : Pulley Diameter [Pn#B025h]
3	Rotary Index Table	Pulse Per Resolution [Pn#B000h] Setting Unit : Unit [Pn#B021h] Drive axis gear information: Input Gear [Pn#B022h] Wave axis Gear Information: Output Gear [Pn#B023h]

5.2.14 Unit [Pn#B021h]

Specify the unit when the pulse information of the motor is converted into the feed amount information

Parameter Value [digit]	Contents
X10 ⁻ⁿ [digit]	<p>In the default 1.000 [mm] increments, the higher the multiplier, the lower the decimal place</p> <ul style="list-style-type: none"> ● When Value = 1, 0.100 [mm] ● When Value = 3, 0.001[mm] ● When Value = 6, 0.001[μm]

5.2.15 Reduction ratio (Input Gear [Pn#B022h], Output Gear [Pn#B023h])

When gearing with motors and machinery, set gear reduction ratio during power transmission

EX 1) When the reduction ratio is 1:30, the input gear is set to 1, and the output gear is set to 30

EX 2) When the reduction ratio is 1: 14.7, the input gear is set to 10, and the output gear is set to 147

EX 3) When the diameter of the pulley directly connected to the motor is 46.3 [mm], and the diameter of the pulley connected to the mechanical equipment is 120 [mm], the input gear is set to 463 and the output gear is set to 1200

5.2.16 Screw Lead [Pn#B024h]

Set the screw when the machine type is linear screw type. At this time, the input unit is μm


EX 1) When the ball screw lead is 2.5 [mm], it is set to 2,500

EX 2) When the ball screw lead is 2.5 [inch], 2.5 [inch] is multiplied by 25,400, and 2.5 "× 25, 400 μm = 63,500 which converts the inch unit into μm unit

5.2.17 Pulley Diameter [Pn#B025h]

Set the pulley diameter in μm when the type of the machine is a conveyor type consisting of pulleys.

EX 1) When the diameter of the pulley is 34.7 mm, it is set to 34,700

 <p>Attention</p>	<p>If parameter Pn # B020h to Pn # B025h is set and applied to the system, it is calculated and applied by referring to Parameter Pulse Per Resolution [Pn # B000h], which indicates the number of pulses per motor rotation. Be careful when setting parameters.</p> <p>To apply this parameter to the system, save the parameter and re-boot.</p>
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5.2.18 Step Move Position Magnify [Pn#B030h]

This parameter is used for step movement of Ezi-SERVO2 CC-Link. When the step movement command is executed, the value of 1 to 15 is input and the magnification of this value is stored in the parameter. If the step movement value is set to '7' and the step movement command is executed, this parameter is multiplied by the step movement value 7 to move the position.

5.3 Motion control Parameter

Motion control parameters are parameters that make up the motion profile. Pulse Per Revolution [Pn # B000h], which is a parameter indicating the number of pulses per rotation, is used as a reference. This parameter can also be changed to Servo On status.

Pn#No.	Parameter Name	Description	Access	Unit	Minimum	Maximum	Default
Pn#B100h	Axis Max Speed	Motor driving maximum speed	R/W	[pps]	1	2,500,000	500,000
Pn#B101h	Axis Start Speed	Position start speed	R/W	[pps]	1	350,000	1
Pn#B102h	Axis Accel Time	Position Move Acceleration Time	R/W	[msec]	1	9,999	100
Pn#B103h	Axis Decel Time	Position Move Deceleration Time	R/W	[info]	1	9,999	100
Pn#B104h	Speed Override	Input speed override	R/W	[%]	1	500	100
Pn#B105h	Jog Speed	Ext. Jog input speed	R/W	[pps]	1	2,500,000	5,000
Pn#B106h	Jog Start Speed	Jog start speed	R/W	[pps]	1	350,000	1
Pn#B107h	Jog Acc Dec Time	Jog Acc/Dec Time	R/W	[msec]	1	9,999	100

5.3.1 Axis Max Speed [Pn#B000h]

Specify the maximum speed that can be operated during the position movement command so that it will not be operated at a speed higher than this value in any case. Set the value in [pps] unit. The upper limit value range must be changed according to the Pulse Per Resolution value.

5.3.2 Axis Start Speed [Pn#B001h]

Set the operation start speed value at the position movement command.

5.3.3 Axis Accel/ Decel Time [Pn#B002h], [Pn#B003h]

Set the acceleration section time value in [msec] unit at the start of operation in position movement command. The applicable range is limited by Axis Speed.

EX 1) Axis Start Speed=1 [pps], Move Speed=500,000 [pps] : 1~9,999 [msec]

EX 2) Axis Start Speed=1 [pps], Move Speed=400,000 [pps] : 1~1,430 [msec]

EX 3) Axis Start Speed=1 [pps], Move Speed=10,000 [pps] : 1~350 [msec]

5.3.4 Speed Override [Pn#B004h]

The operation speed changes according to the ratio value specified at the currently specified 'Move Speed' at the position movement command.

EX 1) If the current Move Speed is 10,000 and the Speed Override is 200 [%], the actual motion speed is 20,000.

5.3.5 Jog Speed [Pn#B005h]

It is the motor rotation speed value when Jog operation command assigned as external input is executed. The unit to be set is [pps].

5.3.6 Jog Start Speed [Pn#B006h]

It is operation start speed value when Jog operation command assigned as external input is executed.

5.3.7 Jog Accel/Decel Time [Pn#B007h]

It is time value of acceleration section and deceleration section during Jog operation.

5.4 Homing Parameter

The homing parameter is used to specify the mechanical origin.

Pn#No.	GUI No.	Parameter Name	Description	Access	Unit	Minimum	Maximum	Default
Pn#B200h	32	Homing Method	Setting of homing command type	R/W	[info]	0	7	0
Pn#B201h	33	Homing Speed	Speed value to the point where the origin is detected	R/W	[pps]	1	500,000	5,000
Pn#B202h	34	Homing Search Speed	Speed value for redetection at the point where the origin is detected	R/W	[msec]	1	500,000	1,000
Pn#B203h	35	Homing Acc Dec Time	ACC/Dec time during homing operation	R/W	[msec]	1	9,999	50
Pn#B204h	36	Homing Dir	Homing direction	R/W	[info]	0	1	0
Pn#B205h	37	Homing Offset	Move value after homing	R/W	[pulse]	- 134,217,728	+134,217,727	0
Pn#B206h	38	Homing Position Set	Position setting value after completion of homing	R/W	[pulse]	- 134,217,728	+134,217,727	0
Pn#B207h	39	Org Torque Ratio	Load detection value of Torque Origin	R/W	[%]	10	90	50

5.4.1 Homing Method [Pn#B200h]

Homing Method Parameter is a parameter to select homing method. The homing method is as follows.

Method Number.	Method Type
0x00	오류! 참조 원본을 찾을 수 없습니다.
0x01	Homing Profile of "Z-Origin"
0x02	Origin profile of "Reverse Side Origin"
0x03	Origin profile of "Reverse Side Z-Origin"
0x04	Origin profile of "Limit Origin"
0x05	Origin profile of "Z Limit Origin"
0x06	Homing Profile of "Z Phase"
0x07	Origin profile of "Torque Origin"
0x08	Origin profile of "Torque Origin"
0x09	Set Origin

5.4.2 Homing Speed [Pn#B201h]

It is the operation speed value that moves to the origin detecting point at homing command.

5.4.3 Homing Search Speed [Pn#B202h]

It is the low speed operation speed value for returning to the zero point accuracy after reaching the origin detecting point at homing command

5.4.4 Homing Accel/Decel Time [Pn#B203h]

It is time of acceleration and deceleration sections of operation start /end part in homing command.

5.4.5 Homing Dir [Pn#B204h]

Sets the rotation direction of the motor when homing operation.

Parameter Value [info]	Operating characteristic
0	Move in CW direction
1	Move in CCW direction

5.4.6 Homing Offset [Pn#B205h]

After returning to home position, it moves further by the position of this set value, stops after it, and completes homing operation. When this command is completed, it is assigned to the value stored in the Homing Position Set [Pn # B206h] parameter.

5.4.7 Homing Position Set [Pn#B206h]

After homing is completed, it is assigned to the value stored in this parameter..

5.4.8 Org Torque Ratio [Pn#B207h]

Sets the maximum torque ratio value to detect as a physical limit. when returning to origin by torque origin method.

5.5 External I/O Setting

User can set the input / output signal assignment and signal level of CN1 of the drive as an external input / output setting parameter.

Pn#No.	GUI No.	Parameter Name	Data Size	Description
Pn#E000h	40	Limit Sensor Logic	1 [bit]	Set the level of H / W Limit signal
Pn#E001h	41	Org Sensor Logic	1 [bit]	Sets the signal level of origin sensor
Pn#E011h	42	Input 1 Mapping	1 [bit]	Set operation command of input signal
Pn#E012h	43	Input 2 Mapping	1 [bit]	
Pn#E013h	44	Input 3 Mapping	1 [bit]	
Pn#E014h	45	Input 4 Mapping	1 [bit]	
Pn#E015h	46	Input 5 Mapping	1 [bit]	
Pn#E016h	47	Input 6 Mapping	1 [bit]	
Pn#E017h	48	Input 7 Mapping	1 [bit]	
Pn#E021h	49	Output 1 Mapping	1 [bit]	Set operation command of output signal
Pn#E022h	50	Output 2 Mapping	1 [bit]	
Pn#E023h	51	Output 3 Mapping	1 [bit]	
Pn#E024h	52	Output 4 Mapping	1 [bit]	
Pn#E025h	53	Output 5 Mapping	1 [bit]	
Pn#E026h	54	Output 6 Mapping	1 [bit]	
Pn#E030h	-	DWORD Input Level	1 [WORD]	Set the input level in combination.
Pn#E031h	55	Input 1 Level	1 [bit]	Sets the level of the input signal in bits.
Pn#E032h	56	Input 2 Level	1 [bit]	
Pn#E033h	57	Input 3 Level	1 [bit]	
Pn#E034h	58	Input 4 Level	1 [bit]	
Pn#E035h	59	Input 5 Level	1 [bit]	
Pn#E036h	60	Input 6 Level	1 [bit]	
Pn#E037h	61	Input 7 Level	1 [bit]	
Pn#E040h	-	DWORD Output Level	1 [WORD]	Set the output level in combination.
Pn#E041h	62	Output 1 Level	1 [bit]	Sets the output signal level in bits.
Pn#E042h	63	Output 2 Level	1 [bit]	
Pn#E043h	64	Output 3 Level	1 [bit]	
Pn#E044h	65	Output 4 Level	1 [bit]	
Pn#E045h	66	Output 5 Level	1 [bit]	
Pn#E046h	67	Output 6 Level	1 [bit]	

5.5.1 Setting Level of H / W Limit Signal and Origin Signal

H / W \pm Limit signal is assigned to 1 and 2, and the origin signal is assigned to 3 of CN1. Then, user can set the level of the input signal. At this time, the levels of H / W + Limit signal and H / W -limit signal are simultaneously changed to Parameter Limit Sensor Logic [Pn # E000h].



Attention

The level of the H / W Limit signal is the same. Therefore, when one limit sensor is A contact, another limit sensor must be used as A contact type.

5.5.2 Input signal Setting

The signal input to CN1 can give meaning to each input. The input signal to the drive can be assigned as follows.

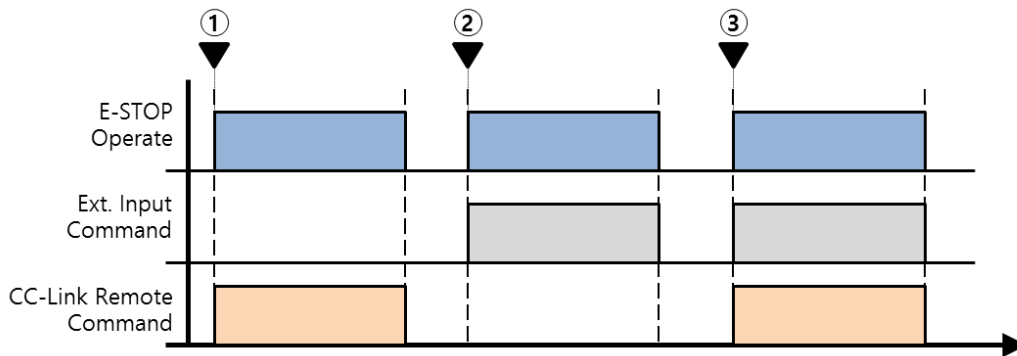
Parameter Value [info]		Function	Parameter Value [info]		Function	CC-Link Remote Command	Parameter Value [info]		Function	CC-Link Remote Command
[DEC]	[HEX]		[DEC]	[HEX]			[DEC]	[HEX]		
0	0x00	No Function	16	0x10	E-STOP	permit	32	0x20	PT A0	Separate command
1	0x01	User Input 1	17	0x11	Servo Enable	Allow simultaneous	33	0x21	PT A1	
2	0x02	User Input 2	18	0x12	Alarm Reset	Allowed	34	0x22	PT A2	
3	0x03	User Input 3	19	0x13	S-STOP	Allowed	35	0x23	PT A3	
4	0x04	User Input 4	20	0x14	Home Search	Not allowed	36	0x24	PT A4	
5	0x05	User Input 5	21	0x15	Clear Position	Allowed	37	0x25	PT A5	
6	0x06	User Input 6	22	0x16	JOG +	Not allowed	38	0x26	PT A6	
7	0x07	User Input 7	23	0x17	JOG -	Not allowed	39	0x27	PT A7	
			24	0x18	STEP +	Not allowed	40	0x28	PT Start	Not allowed
			25	0x19	STEP -	Not allowed	41	0x29	Single PT	Not allowed
			26	0x1A	Go Zero Position	Not allowed				
			27	0x1B	Pause	Not allowed				
			28	0x1C	Teaching	Not allowed				

1) User Input 1~7 : 0x01 ~ 0x07

The User Input is not operate as a function of the drive with actual input signal and can be used as an input signal to be processed by the master controller,

2) E-STOP : 0x10

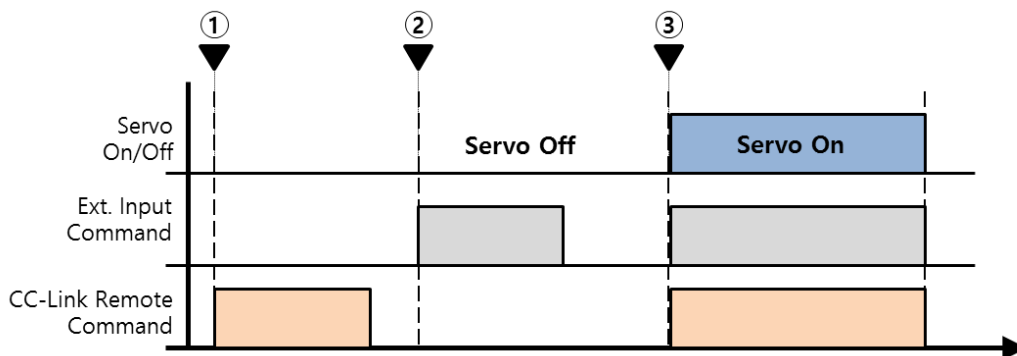
As an input signal to execute the emergency stop command, when this signal is input, no motion command is executed. When E-STOP command is executed by remote command of CC-Link, E-STOP function is executed even if external input signal is not input as ①. Also, E-STOP function is executed even if only external input signal is input as shown in ②. Even if both methods are executed simultaneously, E-STOP function is executed as shown in ③.



『 Refer to : [E-STOP \(Emergency Stop\)](#) 』

1) Servo Enable : 0x11

As an input signal to execute the Servo On command, Servo On / Off is executed according to this signal. If the Servo Enable command is assigned to the external input signal, Servo On does not work even if a CC-Link remote command exists as shown in <1>. Also, even if the Servo On command is executed with external input as shown in ②, the drive does not execute Servo On operation. If the CC-Link remote command and external input command exist as shown in ③, execute the Servo On motion



『 Refer to : [Servo On/Off 와 Alarm Reset](#) 』

3) Alarm Reset : 0x12

When the alarm is generated by the protection function of the drive, there is an alarm reset command as a method for releasing the alarm state without rebooting the drive after eliminating the cause. It can be assigned to external input signal and can be processed simultaneously with CC-Link remote command.

4) S-STOP : 0x13

When the motor is running, it is used to execute the stop command with deceleration information. It can be assigned to an external input signal and processed simultaneously with the CC-Link remote command.

5) Home Search : 0x14

Homing command is executed when setting mechanical origin of mechanical equipment. When this command is assigned to an external input signal, it cannot be executed by CC-Link remote command.

6) Clear Position : 0x15

This command is used to specify the current position as '0'. When this command is assigned to an external input signal, it cannot be executed by CC-Link remote command

7) JOG +, JOG - : 0x16, 0x17

This command is used to execute a motion command that moves to the limit point while the command is being held. When this command is assigned to an external input signal, it cannot be executed by CC-Link remote command.

8) Step Move +, Step - : 0x18, 0x19

When a step move command is used that is moved by the input position value while the command is being maintained, it cannot be executed by the CC-Link remote command.

9) Go Zero Position : 0x1A

The Move to Zero command, which is a command to move to the position where the homing command has been executed, cannot be executed in the CC-Link remote command when it is assigned to an external input signal

10) Pause : 0x1B

The Pause command that pauses during operation cannot be executed by the CC-Link remote command when it is assigned to an external input signal.

5.5.3 Output Signal Setting

The status information of the drive can be output with CN1. The output signal can give meaning to each output. The input signal to the drive can be assigned as follows.

Parameter Value [info]	Function	Parameter Value [info]	Function
0x00	No function	0x10	Motioning
0x01	User Output 1	0x11	Servo Ready
0x02	User Output 2	0x12	In-Position
0x03	User Output 3	0x13	Alarm
0x04	User Output 4	0x14	-
0x05	User Output 5	0x15	Accel/Decel
0x06	User Output 6	0x16	Motion Direction
		0x17	ACK
		0x18	END
		0x19	Homing
		0x1A	Homing Ok
		0x1B	Warning

- 1) User Output 1~7 : 0x01 ~ 0x06

The user output is output by the master controller by the output command. This signal is independent of the drive's status information

- 2) Motioning : 0x10

Output when the motor is running.

- 3) In-Position : 0x11

Output the positioning completion status.

- 4) Alarm : 0x12

To Output the alarm status.

- 5) Accel/Decel : 0x15

To indicate the acceleration / deceleration status during operation.

- 6) Motion Direction : 0x16

To indicate the direction of operation.

7) ACK : 0x17

To indicates in PT operation.

8) END : 0x18

To indicate that PT operation is completed.

9) Homing : 0x19

To indicates that the current motion is in the homing state

10) Homing OK : 0x1A

To indicates that homing has been completed.

11) Warning : 0x1B

To indicates the error status for the command.

5.6 Position Table Parameter

The items of the position table are accessed by the parameter number of CC-Link I / O Map. Parameter number is WORD unit, upper byte is PT item, lower byte is PT number.

High	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
Device Address	Position Table Item No.								Position Table No.							

Ex) When the target position value of PT No. 14 is changed, the upper device value is 0x810E.

The items in the position table are as follows. Refer to the "Ezi-SERVO Plus-R Position Table Function" in the User's Manual for the operation of the corresponding command.

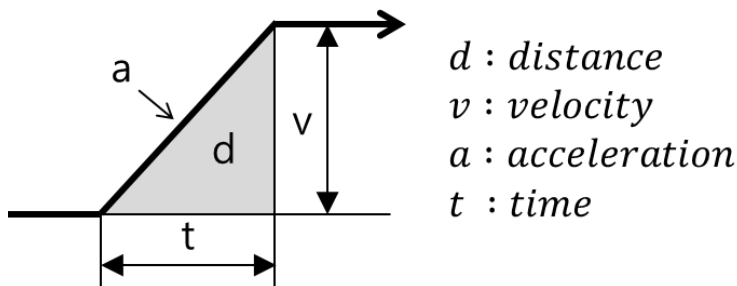
Remote PT Item No	Setting Item	Description	Unit	Lower	Upper
80h	Command (Command type)	Specifies the type of motion action to be executed.	-	0	10
81h	Position (Movement amount)	Position / movement amount is set by pulse.	pulse	-134,217,728	+134,217,727
82h	Low Speed (Low-speed operation speed)	Set the number of pulses according to the type of motion operation.	pps	1	500,000
83h	High Speed (High-speed operation speed)	Set the number of pulses according to the type of motion operation.	pps	1	2,500,000
84h	ACC time (Acceleration time)	Sets the acceleration time at the start of motion operation in msec.	ms	1	9,999
85h	DEC time (Deceleration time)	Set the deceleration time at the end of motion operation in msec.	ms	1	9,999
86h	Wait time (waiting time)	When the PT number item is set to be jumped, the waiting time until the next position operation starts is set in units of msec. If JP Table No is set to 'blank' and Continuous Action is checked, this item will be ignored.	ms	0	60,000

Remote PT Item No	Setting Item	Description	Unit	Lower	Upper
87h	Continuous action (Continuous operation enabled / disabled)	'If set to check '(1), it will link the current position with the next position action.	-	0	1
88h	JP Table No. (Jump position number)	After the position operation ends, the position operation of the jump PT is executed automatically.	-	0	255
8Ch	Loop Count (Loop count)	After execution of the number of times of setting the position (number of loops), jump to a separate correspondence number (jump position number after loop) different from "jump position number".	-	0	100
8Dh	Loop Jump Table No.		-	0	255
	(Jump position number after loop)	-	10,000	10,255	
8Fh	Loop Counter Clear (Loop clear)	Clears the number of loops of the position number for the set number.	-	0	255
90h	Check In-position (Motion completion recognition type)	When positioning is completed (In-position), it is recognized as stop.	-	0	1
93h	Push Ratio (Force ratio of motor)	Sets the ratio of force per motor applied during push motion.	%	20	90
94h	Push Speed (Speed during force control)	Set the operation speed value to be applied in push motion. (Up to 200 [rpm])	pps	1	33333 *1
95h	Push Position (Target absolute position value at the time of force control)	Sets absolute target position value to be applied in push motion.	pulse	-134,217,728	+134,217,727
96h	Push Mode (Pulse Count) (Mode and pulse number setting for force control)	Select Stop mode (0) and Non-Stop mode (1 ~ 10,000).	-	0	10,000

6. Motion Profile

The motion profile is the control path for the motor to drive to the target position. It is common for a trapezoidal speed profile to generate information to control speed and position so that the motor follows it.

The components of the motion profile consist of moving distance, speed, time, and acceleration / deceleration information.



In the above profile, the moving distance (S) is the area of the profile, the velocity (v) is the height of the profile, time (t) is the progress, and acceleration / deceleration (a) can be expressed as a slope.

The information of the elements of the motion profile is organized into the following formulas.

Movement distance in motion profile without acceleration / deceleration information:

$$d = v \times t \times \frac{1}{2} \quad \text{Formula (1)}$$

Moving distance in motion profile without time information :

$$d = (v)^2 \times \frac{1}{2} \cdot a \quad \text{Formulas (2)}$$

Move distance in a motion profile without velocity information:

$$d = a \times (t)^2 \times \frac{1}{2} \quad \text{Formular (3)}$$

Acc/ deceleration information in a motion profile without position information :

$$a = v/t \quad \text{Formular (4)}$$

Acc / deceleration information in a motion profile without time information :

$$a = v^2/2 \cdot d \quad \text{Formular (5)}$$

Acc / deceleration information in a motion profile without velocity information :

$$a = 2 \cdot d/t^2 \quad \text{Formular (6)}$$

Time information in a motion profile without location information:

$$t = v/a \quad \text{Formular (7)}$$

Time information in motion profile without acc / deceleration information:

$$t = 2 \cdot d / v \quad \text{Formular (8)}$$

Time information in a motion profile without rate information:

$$t = v \cdot (2 \cdot d / a) \quad \text{Formular (9)}$$

Speed information in a motion profile without location information:

$$v = a \times t \quad \text{Formular (10)}$$

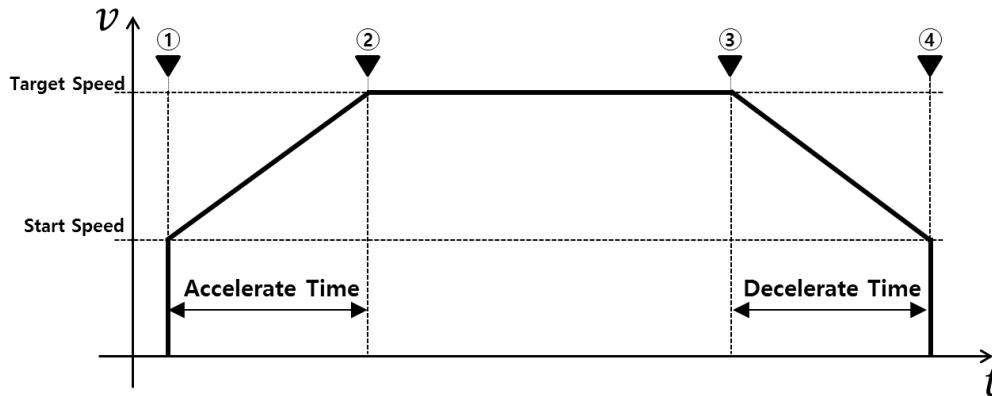
Speed information in motion profile without acc/ deceleration information :

$$v = 2 \cdot d / t \quad \text{Formular (11)}$$

Speed information in a motion profile without time information:

$$v = v \cdot (2 \cdot a \times d) \quad \text{Formular (12)}$$

The basic motion profile of Ezi-SERVO2 CC-Link is as follows.



Increase the speed from ① to ② as Target Speed to start motion with Start Speed information in motion operation. The time information for this process is the Accelerate Timing. Then, it decelerates to the start speed during decelerate time at the point ③ before reaching the target position ④ and then stops. If the start speed is equal to the target speed, the acceleration / deceleration time becomes 0 [msec], and a rectangular motion profile is created.

In the motion profile, the target speed is used as the commanded value. Here, the input speed command value is changed and applied according to the ratio value of Parameter Speed Override [Pn # B104h]. The items and parameters used in the motion profile in accordance with the jog operation and position movement command are as follows.

Parameter Type	Jog Operation	Position Move
Start Speed	Pn#B106h	Pn#B101h
Acceleration time	Pn#B107h	Pn#B102h
Deceleration time		Pn#B103h
Target Speed	Command Value	Command Value
Target Positon	Move to Limit point	Command Value
Velocity Override	Pn#B104h	



Attention

The starting speed of a typical motion profile starts at 1 [pps]. The picture of the motion profile expressed in the explanation is expressed with relatively high start speed for easy understanding.

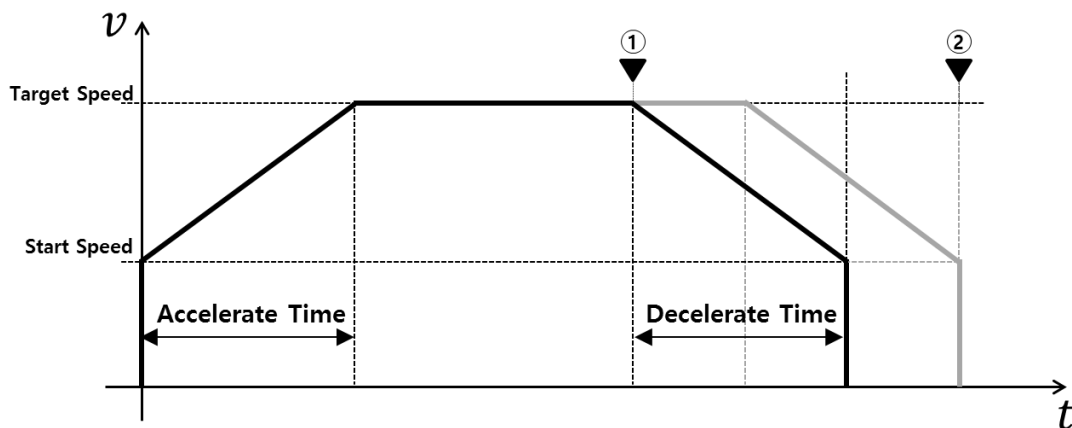
The elements of the motion profile of the motion applied during PT operation operate with the values entered in the PT item.

6.1 Operation of Stop Command

Stop commands include S-STOP and E-STOP commands. S-STOP is a command that stops with deceleration information, and E-STOP command is a command that stops immediately without deceleration information.

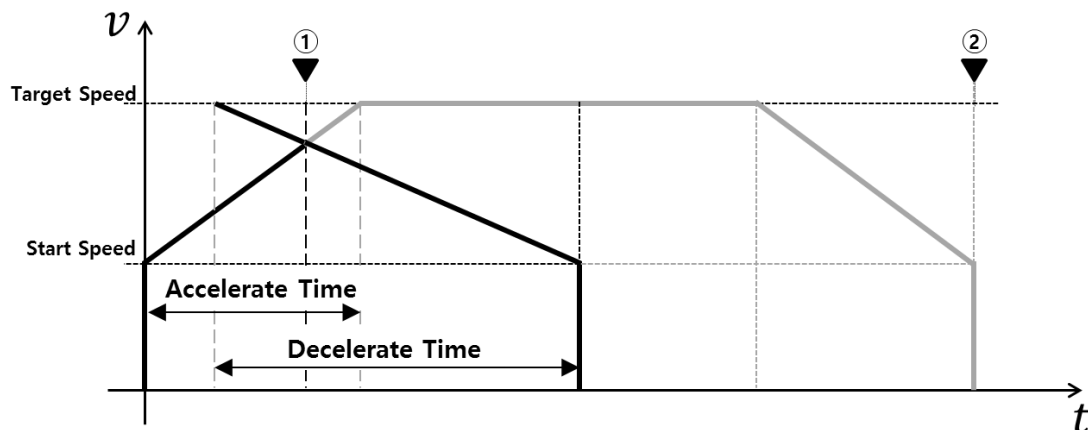
6.1.1 Operation of S-STOP during Constant Speed Operation

The S-STOP command stops at the motion profile deceleration information when the S-STOP instruction is executed at the point of ① before reaching ② in the motion profile started to reach ② position.



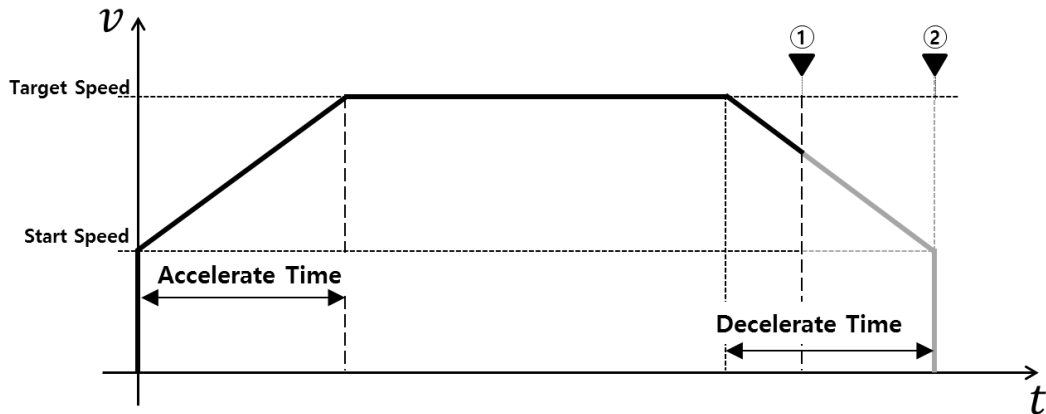
6.1.2 Operation of S-STOP during acceleration operation

If S-STOP command is executed while motion is started and acceleration is being performed, the motion in acceleration is stopped and decelerated at the point of ①, where the stop instruction is executed as follows.



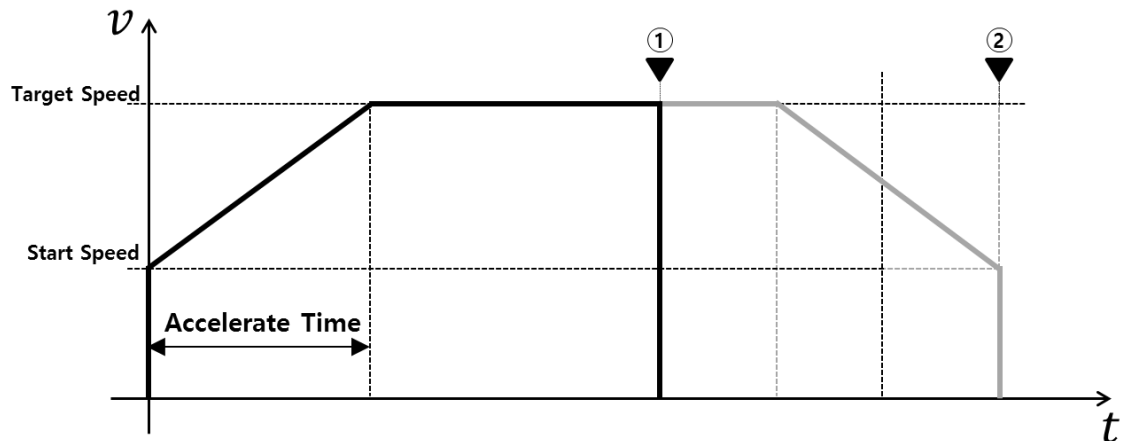
6.1.3 Operation of S-STOP during deceleration operation

When the S-STOP command is executed at the point of deceleration during motion operation, the motion is terminated at the point of ② while maintaining the deceleration state.



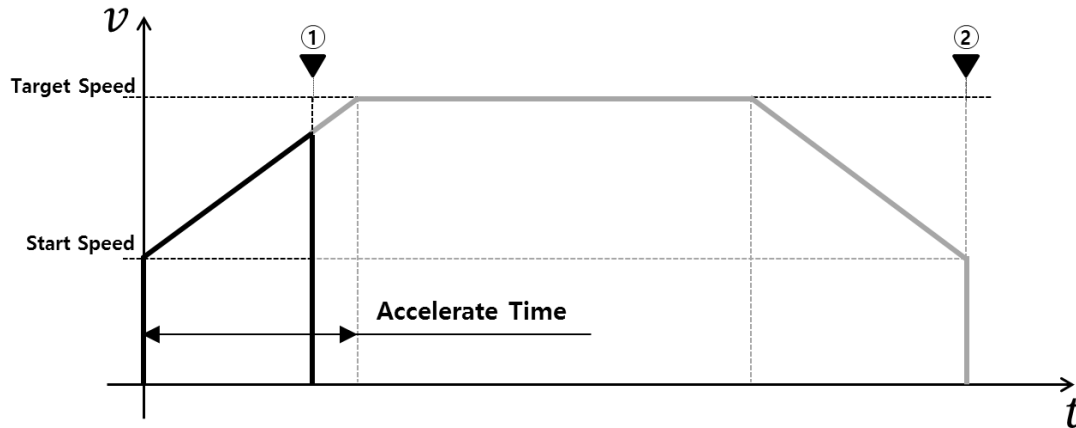
6.1.4 Operation of E-STOP during constant speed operation

The E-STOP command stops immediately when the E-STOP instruction is executed at the point of ① before reaching ② in the motion profile started to reach ② position.



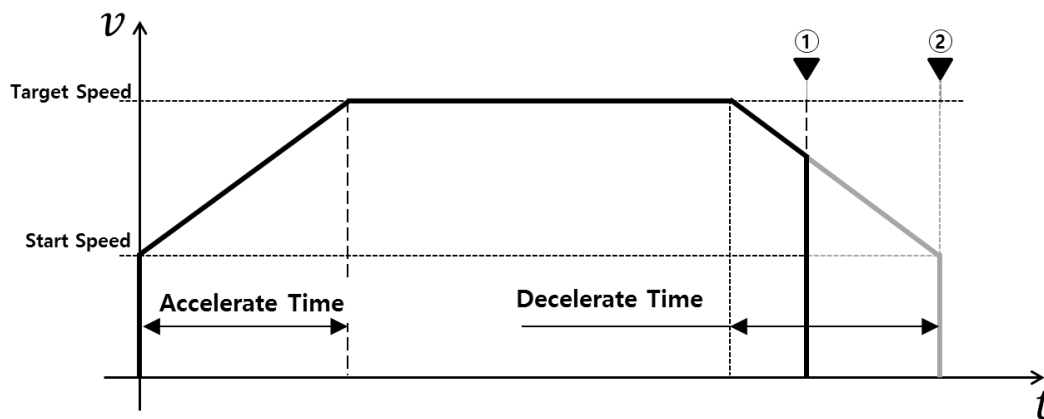
6.1.5 Operation of E-STOP during acceleration operation

If the E-STOP command is executed while the motion is being started and accelerated, the motion in acceleration is stopped and the motion is terminated immediately at the point of ①, when E-STOP instruction is executed as follows.



6.1.6 Operation of E-STOP during deceleration operation

When E-STOP command is executed at the point of deceleration during motion operation, motion is ended immediately in decelerating state.



6.2 Motion Profile of Jog Operation

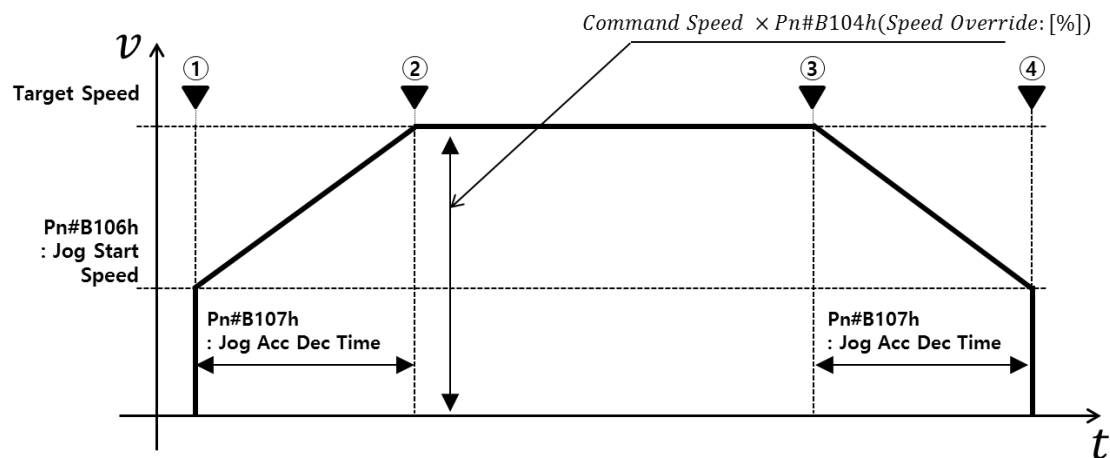
Jog operation is a command to continue operation to the limit point while the command is maintained.

6.2.1 Jog operation command motion

The motion profile of jog operation calculates the motion profile with the following information at the start of command ①.

- 1) Start Speed : Jog Start Speed [Pn#B106h]
- 2) Accel / Deceleration time : Jog Acc Dec Time [Pn#B107h]
- 3) Target Speed : Command Speed X Speed Override[%](
- 4) Target Position : Command Position

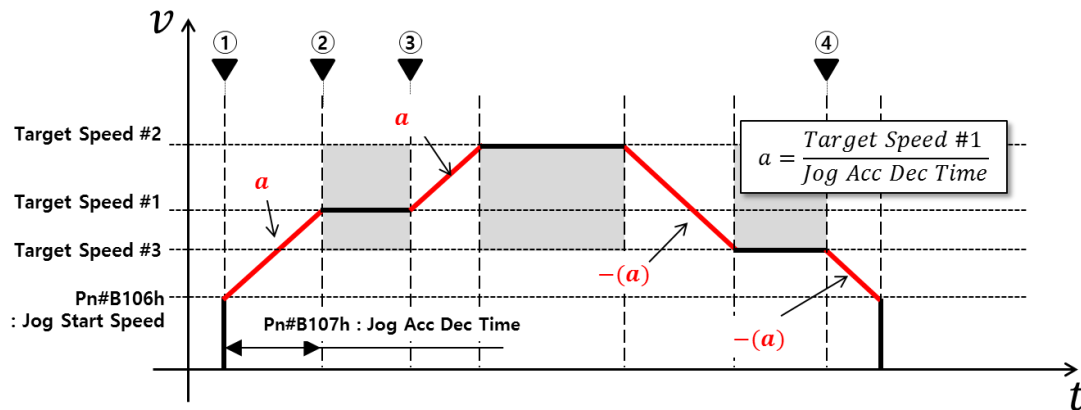
When the command is started, start the operation from the start speed to start the acceleration, and end the motion by decelerating from the point ③ at which the target position is decelerated to the start speed ④.



6.2.2 Velocity Override for Jog Operation

Jog operation continues to run the motor while the command is being maintained. At this time, in order to change the driving speed, it is possible to execute through the Velocity Override command.

The motion profile at velocity override command in jog operation is as follows.



Jog operation started from point ① starts with information of parameter Jog Acc Dec Time [Pn # B107h] and executes constant speed operation from point ② to target speed # 1. Then, the speed is changed to the newly entered target speed # 2 at the time of the execution of the override command to increase the jog speed. At this time, the acceleration information whose speed changes is accelerated to the acceleration information 'a' started at the point ① and reaches the target speed # 2. Also, in the command for decelerating the speed, it is decelerated to the negative value of the acceleration information 'a' started at the point ①.



Attention

When the Velocity override command is executed, it must be executed when the motion state is constant.
If Velocity override is executing when acceleration or deceleration is being executed, the shape of the motion profile can be changed.

6.3 Motion profile of position movement

The motion profile of the position move command is applied in step move, zero move, absolute move, relative move command.

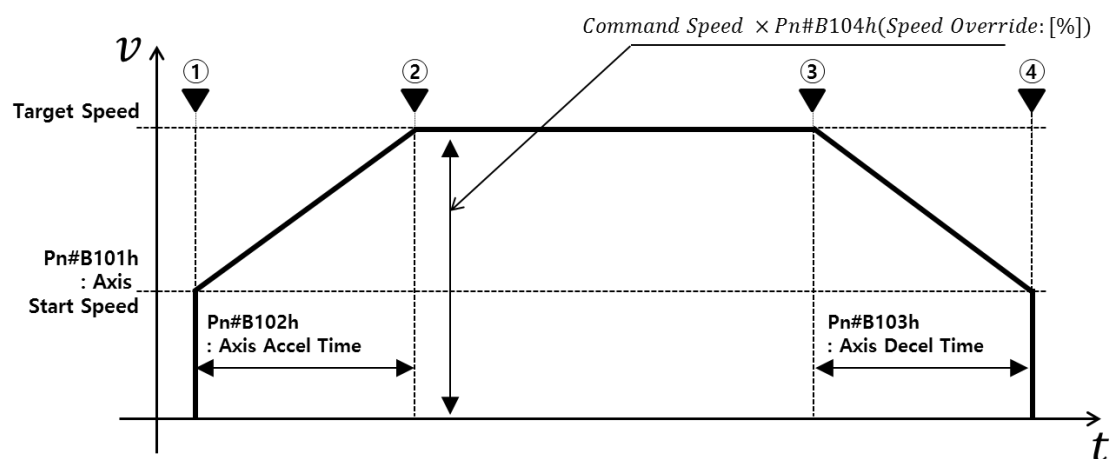
The step movement operates using the motion profile acting as the incremental position movement, and the zero movement command operates using the motion profile of the absolute position movement command.

6.3.1 Motion of Position Move Command

The motion profile of the move command calculates the motion profile with the following information at the start of command ①.

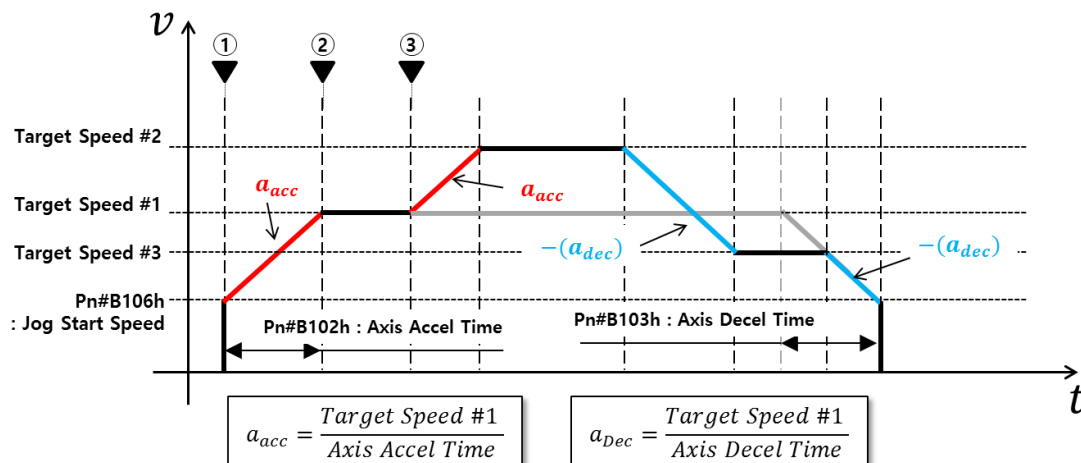
- 5) Start Speed : Axis Start Speed [Pn#B101h]
- 6) Acceleration time : Axis Accel Time [Pn#B102h]
- 7) Deceleration time : Axis Decel Time [Pn#B103h]
- 8) Target Speed : Command Speed X Speed Override[%]
- 9) Target Position : Command Position

When the command is started, start the operation from the start speed to start the acceleration, and end the motion by decelerating from the point ③ at which the target position is decelerated to the start speed ④.



6.3.2 Velocity Override of Position Move

The Velocity override of position move is a command to change the moving speed in the position moving state. The motion profile at speed override command during position move is as follows.



The position move motion started from the point ① starts with the information of Parameter Axis Accel Time [Pn # B102h] and executes the constant speed operation from the point ② to the target speed # 1. The speed is changed to the newly entered target speed # 2 at the time of the execution of the override command to increase the position move speed. At this time, the acceleration information for changing the speed is accelerated to the acceleration information 'a_{acc}' started at the point ① and reaches the target speed # 2. Also, in the command to decrease the speed, the deceleration information 'a_{dec}' used in the motion profile started at the point ① is decelerated.



Attention

When the Velocity override command is executed, it must be executed when the motion state is constant.

If velocity override is executing when acceleration or deceleration is being executed, the shape of the motion profile can be change.

6.3.3 Absolute Position Override

Absolute Position Override is a command to change the target position during absolute position move. The point where the absolute position override command is valid when the position movement is executed with the motion profile started first and is running at constant speed after acceleration.



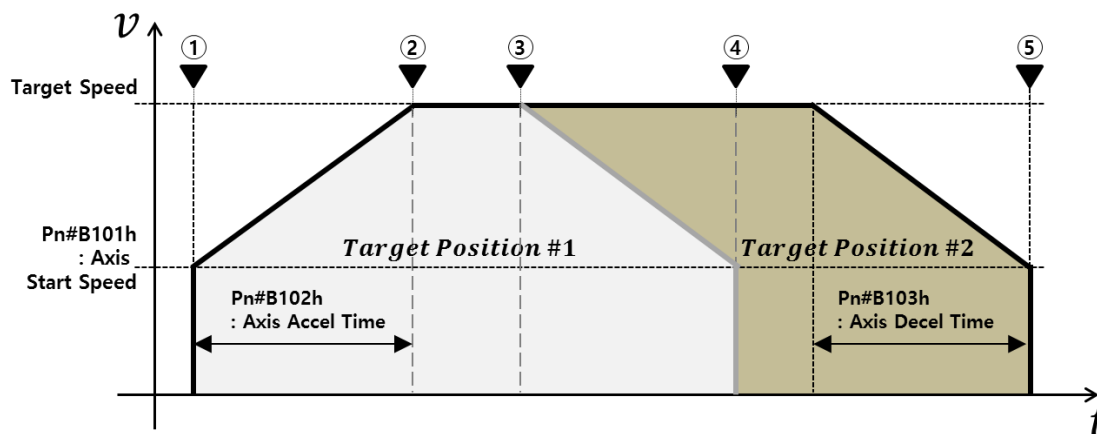
Attention

When the position override command is executed, it must be executed when the motion state is constant.

If the position override is executed while accelerating or decelerating, the shape of the motion profile can be changed.

- 1) Change the position to a value larger than the current position

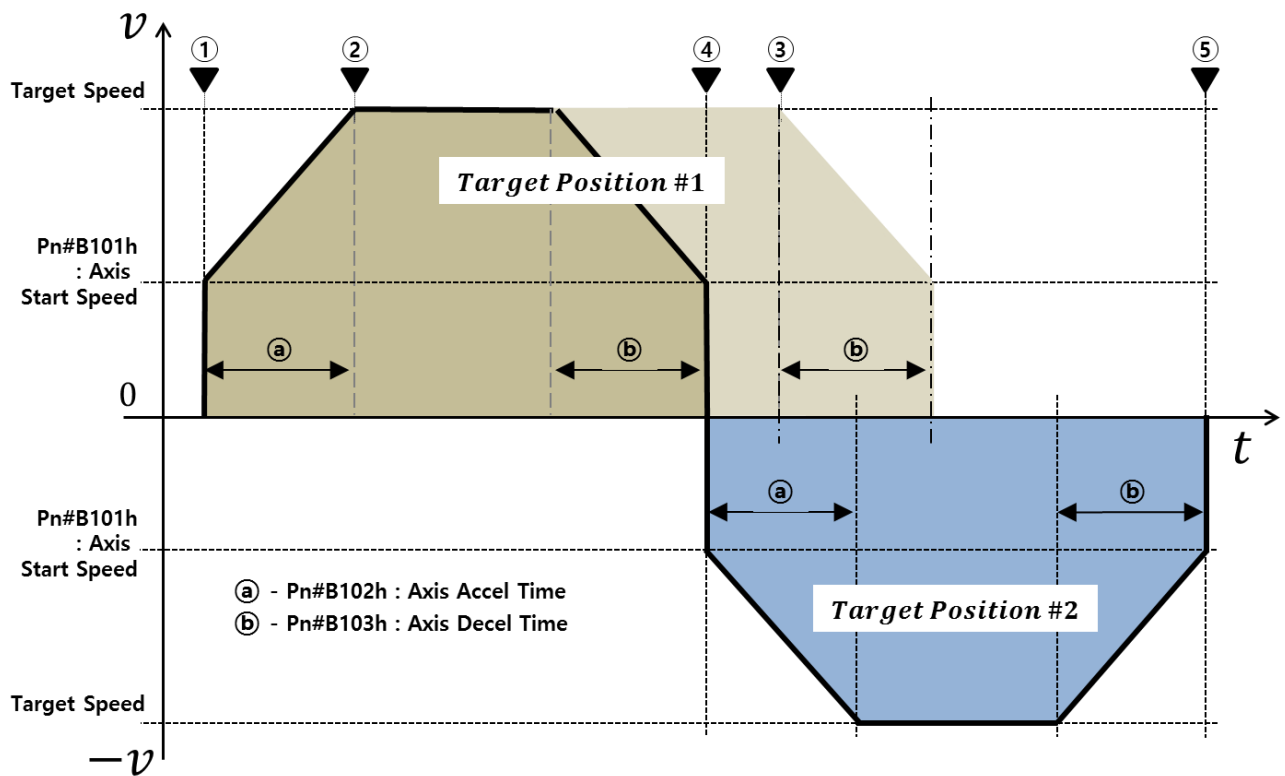
When the absolute position override command is executed between points 2 and 3 and set to a value larger than the current operating position, motion ends at ⑤ reaching target position # 2, not ④ reaching target position # 1.



- 2) Change the position to a value smaller than the current position value


When the absolute position override command is executed between the time point ② and ③ while the motion profile moving to the target position # 1 started at the time point ① is being executed, the movement is made to the target position # 1 when the new position # 2 is smaller than the current position. Motion will be decelerated and stopped. Move from the stop point ④ to the new target position # 2 by executing motion profile.

The motion based on this condition is executed with the motion profile moving to the target position # 2 by maintained the information of the acceleration time, deceleration time, and target speed of the profile moving to the target position # 1 started at the point ①.



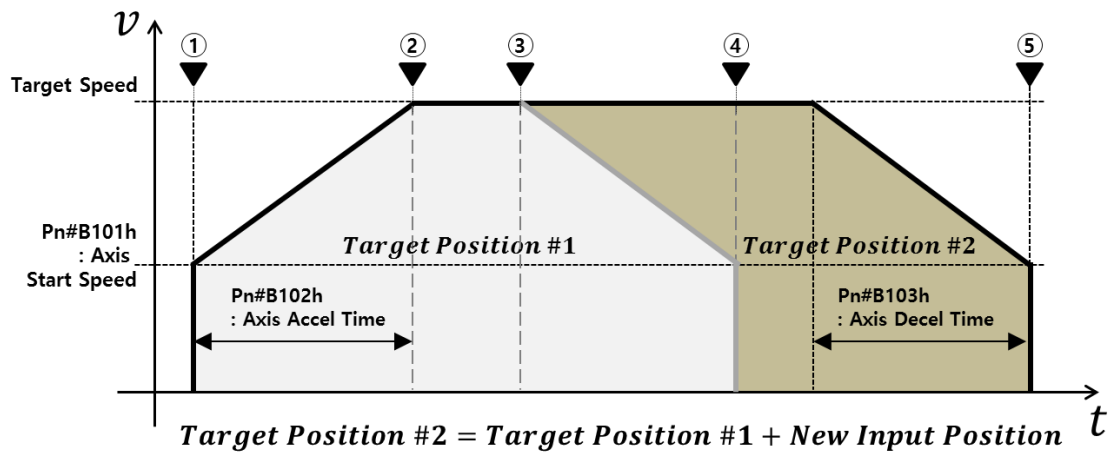
6.3.4 Incremental Position Override

Incremental Position Override is a command to change the target position during incremental position move. The point where the incremental position override command is valid when the position move to the first started motion profile has been completed and is running at constant speed.

 Attention	<p>When the position override command is executed, it must be executed when the motion state is constant.</p> <p>If the position override is executed while accelerating or decelerating, the shape of the motion profile can be changed.</p>
---	---

- 1) Change the position to a value larger than the current position

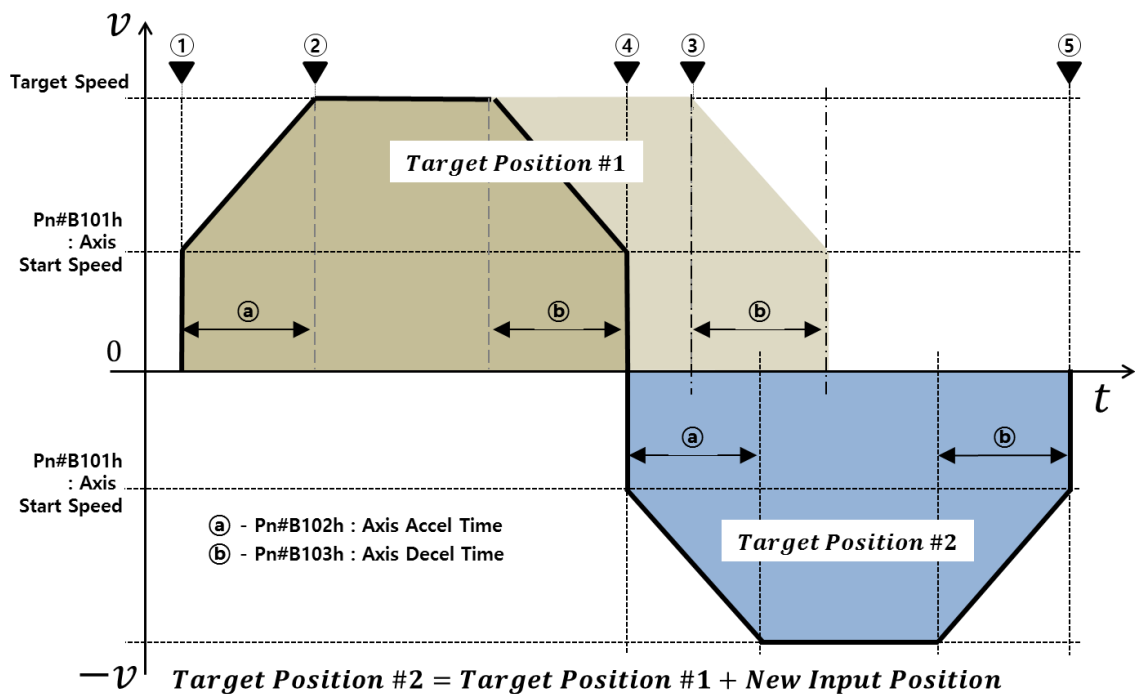
When the incremental position override command is executed between the point ② and ③, the profile is created when the sum of the target position # 1 and the input override position value is larger than the target position being operated.



2) Change the position to a value smaller than the current position value

When the incremental position override command is executed between the points ② and ③ and the sum of the target position # 1 and the input override position value is smaller than the target position, the motion to move to the target position # 1 is decelerated to stop. Then, at the point ④, the motion profile reaching the target position # 2 is generated as follows and moves to the target position # 2 after acceleration in the opposite direction.

The motion based on this condition is executed with the motion profile moving to the target position # 2 by keeping the information of the acceleration time, deceleration time, and target speed of the profile moving to the target position # 1 started at the point ①.



7. Homing Profile

The Homing Profile is a motion profile according to the homing method. However, unlike the motion profile at the time of position move, the start speed of the motion profile at the homing is fixed at 1 [pps]. In the state that the origin is searched with precise position, the home position is precisely searched by the motion without acceleration / deceleration applied as the Homing search speed.

The parameters used in the homing command are operated by the following parameters. The parameters used at this time are applied to the homing profile.

Pn#No.	Parameter Name	Description
Pn#B004h	H/W Limit Stop Method	H / W sensor input stop method
Pn#B200h	Homing Method	Setting of homing command type
Pn#B201h	Homing Speed	Speed value to the point where the origin is detected
Pn#B202h	Homing Search Speed	Speed value for redetection at the point where the origin is detected
Pn#B203h	Homing Acc Dec Time	Acc/Deceleration time during homing operation
Pn#B204h	Homing Dir	Homing direction
Pn#B205h	Homing Offset	Move value after homing
Pn#B206h	Homing Position Set	Position setting value after completion of homing
Pn#B207h	Org Torque Ratio	Load detection value of Torque origin method

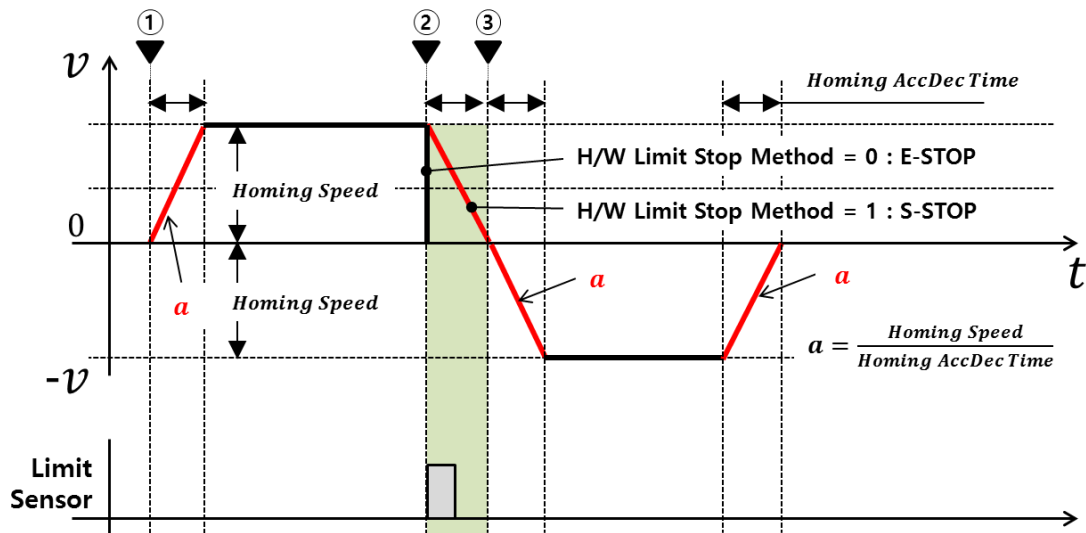
Pn#B200h : Homing Method



Method Number.	Method Type
0x00	오류! 참조 원본을 찾을 수 없습니다.
0x01	Homing Profile of "Z-Origin"
0x02	Origin profile of "Reverse Side Origin"
0x03	Origin profile of "Reverse Side Z-Origin"
0x04	Origin profile of "Limit Origin"
0x05	Origin profile of "Z Limit Origin"
0x06	Homing Profile of "Z Phase"
0x07	Origin profile of "Torque Origin"
0x08	Origin profile of "Torque Origin"

0x09	Set Origin
------	------------

※ When the H / W limit sensor is detected to be dirtier than the home position during homing

When the H / W limit sensor in the movement direction is detected at homing, the homing direction is changed. Also, according to the value of Parameter H / W Limit Stop Method [Pn # B004h], emergency stop as in ② of the color area in the following figure, or deceleration stop as in ③ is executed. After that, it is moved in the opposite direction of origin to perform homing



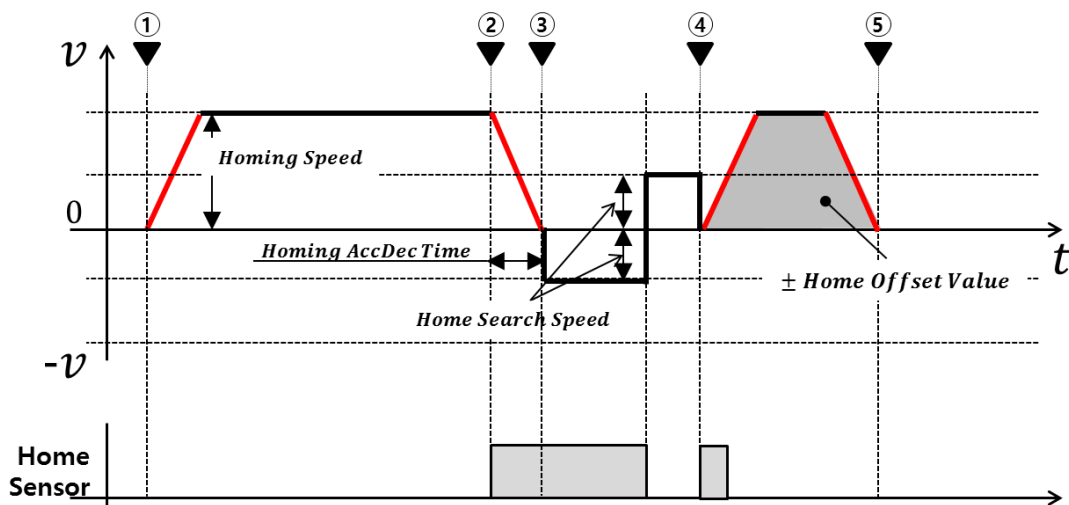
 Attention	Limit Origin of the homing method does not move in the opposite direction of origin.
 Attention	<p>If the deceleration time is long due to the value of Parameter Homing Acc Dec Time [Pn # B203h] in the process of decelerating operation by detection of H / W limit or origin sensor during homing, it may collide with the mechanism.</p> <p>In addition, when you release the sensor, motion will continue to search for the sensor. In this case, increase the sensing range of the sensor or set the value of Parameter Homing Acc Dec Time [Pn # B203h] to a low value so that the acceleration / deceleration time is relatively short.</p>

7.1 Homing profile of "Origin"

The Homing method by the origin sensor is the method in which the origin detected when the sensor dog is approached to the home sensor. The operation in this way is as follows.

◆ Operation of the homing profile

- ① Move until the home sensor is detected after Acceleration with Parameter Homing Acc Dec Time [Pn # B203h] and Home Search Speed [Pn # B202h]
- ② After detection of the sensor, deceleration to the parameter Homing Acc Dec Time [Pn # B203h]
- ③ Without Acceleration / Deceleration operation, it execute the operation to search the origin sensor precisely at the speed of Parameter Home Search Speed [Pn # B202h]
- ④ When the Z-phase signal is precisely searched, move to the value of Parameter Homing Offset [Pn # B205h] to end the homing operation
- ⑤ When homing is completed, set the current position to the value of Parameter Homing Position Set [Pn # B206h]

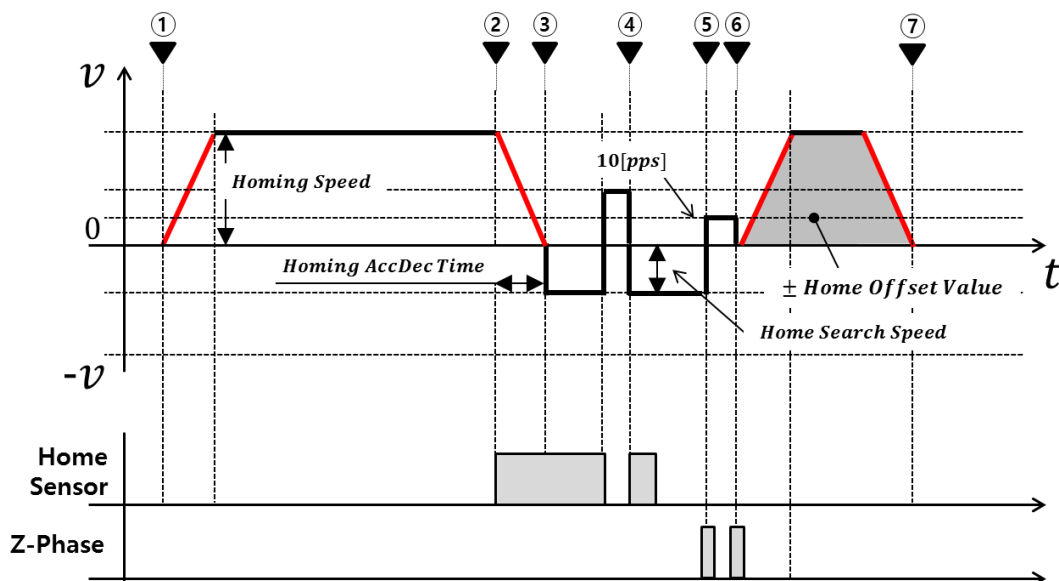


7.2 Homing Profile of "Z-Origin"

The homing method by Z phase input signal after home sensor detection is to designate the point where the Z phase input signal of the encoder is sensed as origin after executing the return method by home sensor. The operation in this way is as follows.

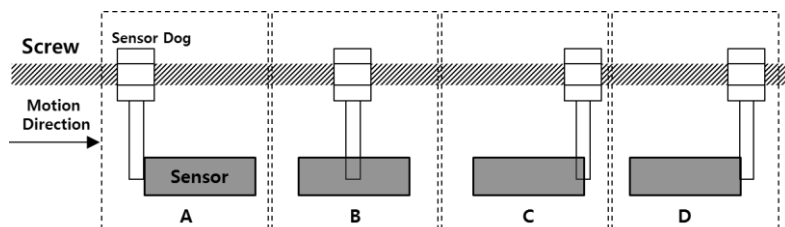
◆ Operation of the homing profile

- ① Move until the home sensor is detected after Acceleration with Parameter Homing Acc Dec Time [Pn # B203h] and Home Search Speed [Pn # B202h]
- ② After detection of the sensor, deceleration to the parameter Homing Acc Dec Time [Pn # B203h]
- ③ Without Acceleration / Deceleration operation, it execute the operation to precisely detect the origin sensor at the speed of Parameter Home Search Speed [Pn # B202h].
- ④ When the sensor has been precisely searched, proceed to detect the Z phase signal at the speed of Parameter Home Search Speed [Pn # B202h]
- ⑤ When a Z-phase signal is detected, a precision sensing operation is executed. If the Z phase is get out due to speed of the parameter Home Search Speed [Pn # B202h] is high, additionally execute the precise detection of the Z phase at 10 [pps]
- ⑥ When the Z-phase signal is precisely searched, move to the value of Parameter Homing Offset [Pn # B205h] to end the homing operation
- ⑦ When homing is completed, set the current position to the value of Parameter Homing Position Set [Pn # B206h]



7.3 Homing Profile of "Reverse Side Origin"

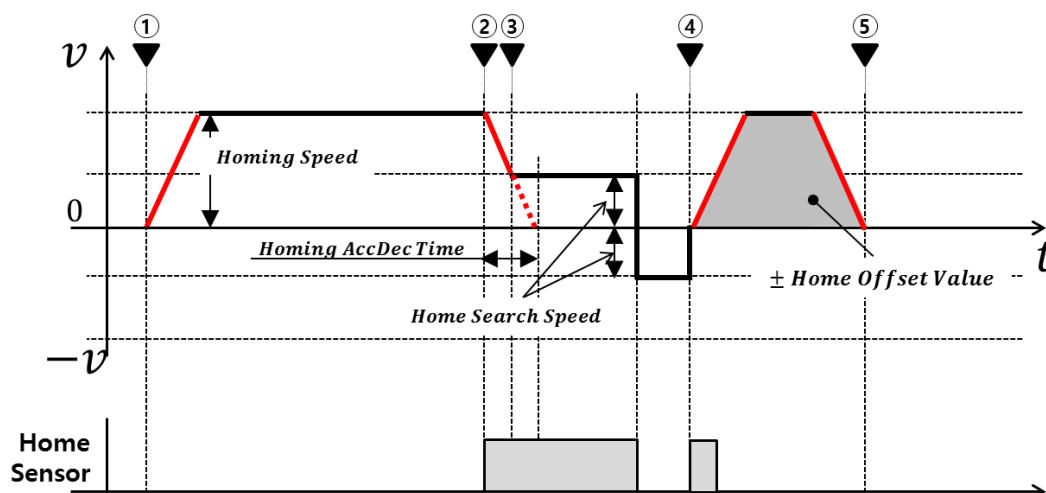
The homing method based on the detection of the opposite point of the home sensor is to designate the origin detected by the home sensor when the dog passes the origin sensor. The operation in this way is as follows.



The "Reverse Side Origin" method is passing the sensor like Snap B, even though it is close to the sensor in Snap A. And even if the snap C is made, the homing is not completed, it is set as the origin point opposite point of to the sensor entry which is the point where the sensor is completely passed as in snap D.

Operation of the Homing profile

- ① Move until the home sensor is detected after Acceleration with Parameter Homing Acc Dec Time [Pn # B203h] and Home Search Speed [Pn # B202h]
- ② After detection of the sensor, decelerates to the parameter Home Search Speed with Parameter Homing Acc Dec Time [Pn # B203h]
- ③ It execute searching for the opposite point of origin sensor with Parameter Home search speed [Pn # B202h]
- ④ When the Z-phase signal is precisely searched, move to the value of Parameter Homing Offset [Pn # B205h] to end the homing operation
- ⑤ When Homing is completed, set the current position to the value of Parameter Homing Position Set [Pn # B206h]

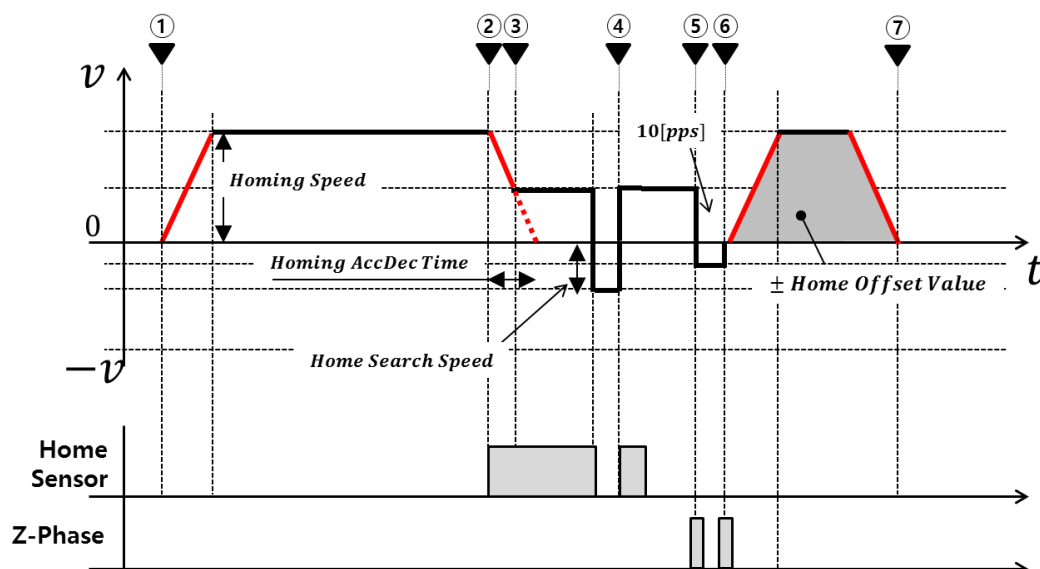


7.4 Homing Profile of "Reverse Side Z-Origin"

Reverse Side Z-Origin is a method of Homing to the passing point of the home sensor and then detecting the Z-phase input signal to specify the home position. This operation is the same as when "Z Phase Origin" is executed after "Reverse Side Origin".

Operation of the Homing profile

- ① Move until the home sensor is detected after Acceleration with Parameter Homing Acc Dec Time [Pn # B203h] and Home Search Speed [Pn # B202h]
- ② After detection of the sensor, decelerates to the parameter Home Search Speed with Parameter Homing Acc Dec Time [Pn # B203h]
- ③ It is executed to search the pass point of the home sensor precisely with Parameter Home search speed [Pn # B202h]
- ④ When the sensor has been precisely searched, proceed to detect the Z phase signal at the speed of Parameter Home Search Speed [Pn # B202h]
- ⑤ When a Z-phase signal is detected, a precision sensing operation is executed. If the Z phase is get out due to speed of the parameter Home Search Speed [Pn # B202h] is high, additionally execute the precise detection of the Z phase at 10 [pps]
- ⑥ When the Z-phase signal is precisely searched, move to the value of Parameter Homing Offset [Pn # B205h] to end the homing operation
- ⑦ When homing is completed, set the current position to the value of Parameter Homing Position Set [Pn # B206h]

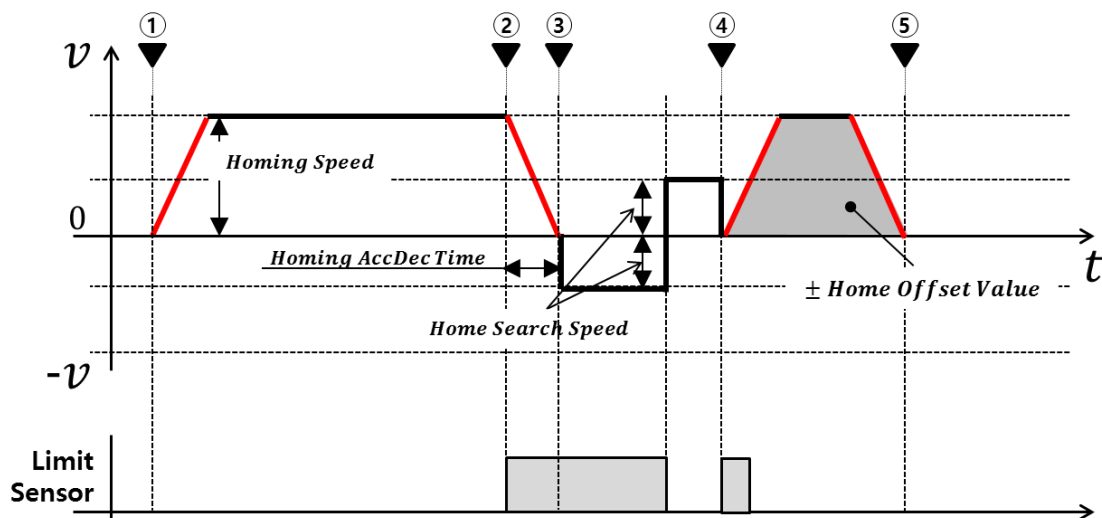


7.5 Homing Profile of "Limit Origin"

The homing method based on the limit input signal specifies the position where the limit sensor is detected as the home position. The operation in this way is as follows.

◆ Operation of Homing profile

- ① Move until the home sensor is detected after Acceleration with Parameter Homing Acc Dec Time [Pn # B203h] and Home Search Speed [Pn # B202h]
- ② After detection of the sensor, deceleration to the parameter Homing Acc Dec Time [Pn # B203h]
- ③ Without acceleration / deceleration operation it executes the operation to precisely detect H / W limit sensor at the speed of Parameter Home Search Speed [Pn # B202h]
- ④ When the Z-phase signal is precisely searched, move to the value of Parameter Homing Offset [Pn # B205h] to end the homing operation
- ⑤ When homing is completed, set the current position to the value of Parameter Homing Position Set [Pn # B206h]

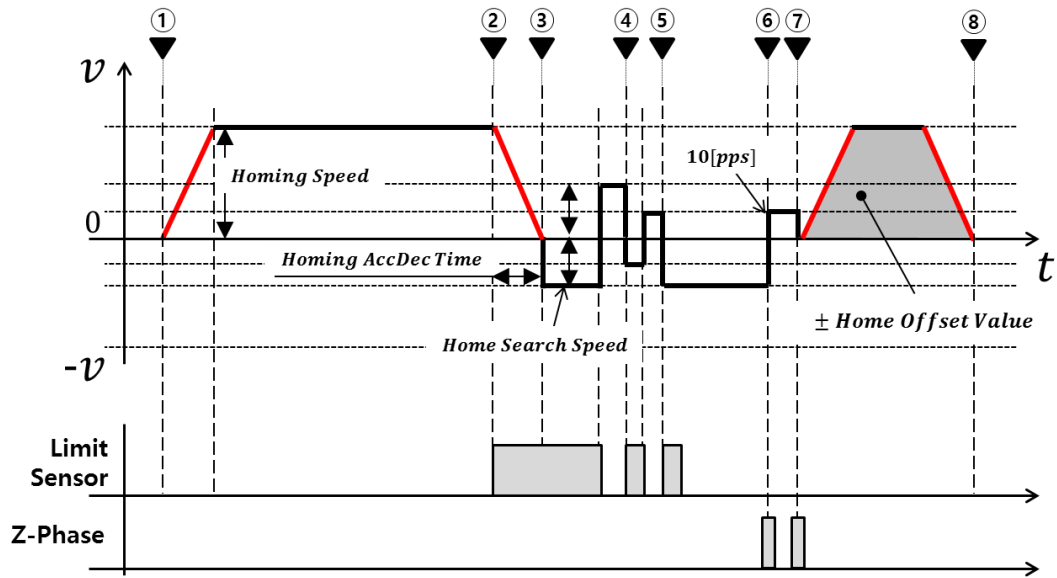


7.6 Homing Profile of "Z Limit Origin"

The "Z Limit Origin" method uses the position where the Z phase input signal of the encoder is detected as the origin after Homing by the limit input signal. The operation in this way is as follows

◆ Operation of Homing profile

- ① Move until the home sensor is detected after Acceleration with Parameter Homing Acc Dec Time [Pn # B203h] and Home Search Speed [Pn # B202h]
- ② After detection of the sensor, deceleration to the parameter Homing Acc Dec Time [Pn # B203h]
- ③ Without acceleration / deceleration operation it executes the operation to precisely detect H / W limit sensor at the speed of Parameter Home Search Speed [Pn # B202h]
- ④ When the sensor has been precisely searched, it will detect Z phase signal near H / W limit sensor at 10 [pps]
- ⑤ If the Z phase signal is not detected near the H / W limit, it execute the operation to detect the Z phase signal at the speed of Parameter Home Search Speed [Pn # B202h]
- ⑥ When a Z-phase signal is detected, a precision sensing operation is executed. If the Z phase is get out due to speed of the parameter Home Search Speed [Pn # B202h] is high, additionally execute the precise detection of the Z phase at 10 [pps]
- ⑦ When the Z-phase signal is precisely searched, move to the value of Parameter Homing Offset [Pn # B205h] to end the homing operation
- ⑧ When homing is completed, set the current position to the value of Parameter Homing Position Set [Pn # B206h]

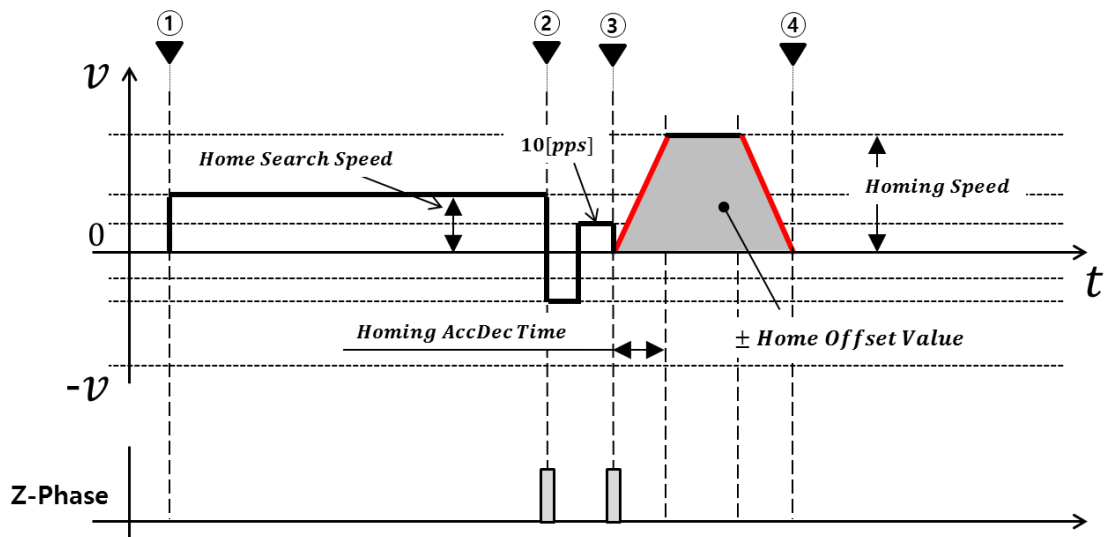


7.7 Homing Profile of "Z Phase"

The Homing method by Z-phase input is to set Z-phase signal as origin point which is detected once by 1 [pulse] per rotation of encoder. The operation in this way is as follows.

◆ Operation of Homing profile

- ① Without acceleration / deceleration operation, it execute operation to detect the Z phase signal at the speed of Parameter Home Search Speed [Pn # B202h]
- ② When the Z phase signal is detected, the operation for precise detection of Z phase is executed at 10 [pps]
- ③ When the Z-phase signal is precisely searched, move to the value of Parameter Homing Offset [Pn # B205h] to end the homing operation
- ④ When homing is completed, set the current position to the value of Parameter Homing Position Set [Pn # B206h]

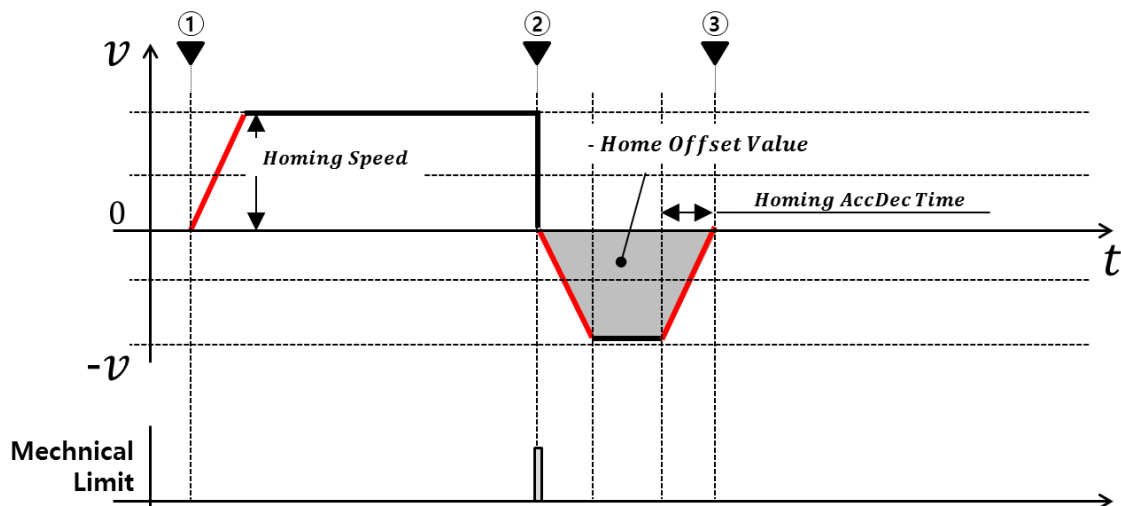


7.8 Homing Profile of "Torque Origin"

The torque origin command is a command that originates at the point where a physical load is detected at the mechanical end point in a system without the H / W Limit signal. The operation in this way is as follows.

◆ Operation of Homing profile

- ① Move until the mechanical limit stop point is detected after Acceleration with Parameter Homing Acc Dec Time [Pn # B203h] and Home Search Speed [Pn # B202h]
- ② At the point of detection, move by the value of Parameter Homing Offset [Pn # B205h] to end the homing operation
- ③ When homing is completed, set the current position to the value of Parameter Homing Position Set [Pn # B206h]

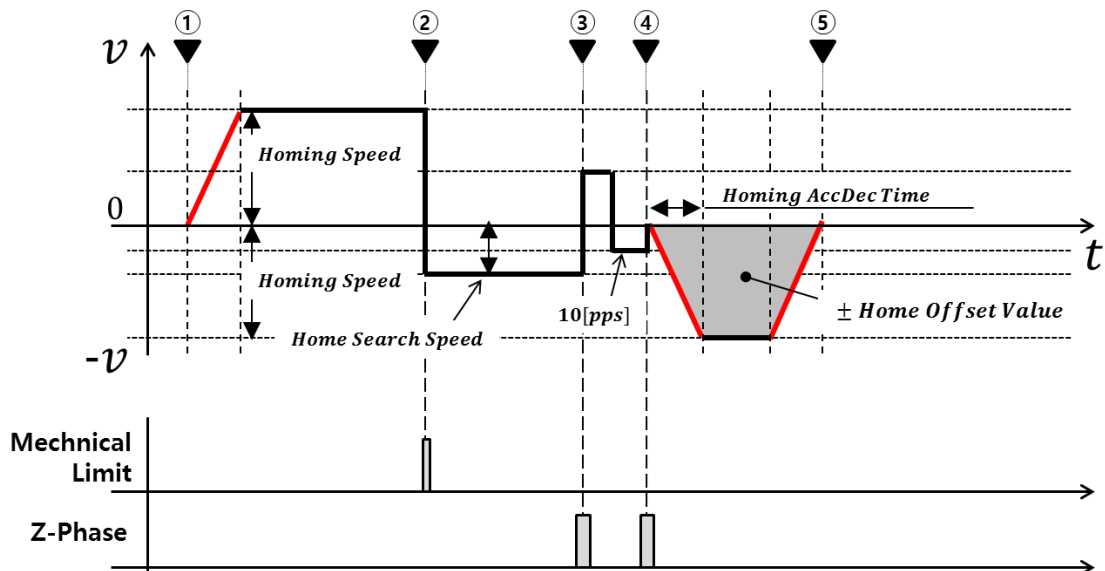


7.9 Homing Profile of "Torque Origin"

In the homing method based on the Z-phase input signal after the torque origin is to sequentially execute home return and Z-phase home return method by sensing the point where physical load is detected at mechanical end point. The operation in this way is as follows

◆ Operation of Homing profile

- ① Move until the mechanical limit stop point is detected after Acceleration with Parameter Homing Acc Dec Time [Pn # B203h] and Home Search Speed [Pn # B202h]
- ② If the mechanical limit point is detected, it is executed the operation to detect the Z phase signal at the speed of Parameter Home Search Speed [Pn # B202h] without acceleration / deceleration operation in the direction opposite to origin
- ③ When the Z phase signal is detected, operation for precise detection of Z phase is executed at 10 [pps]
- ④ When the detection of the Z phase signal is completed, move to the value of Parameter Homing Offset [Pn # B205h] to end the homing operation
- ⑤ When homing is completed, set the current position to the value of Parameter Homing Position Set [Pn # B206h]



8. Protection Function

8.1 Types of Alarm

If an alarm occurs during drive operation, one of the status LEDs flashes red and the protection function can be checked according to the number of flashes.

Flash count	Alarm Name	Description
1	Over Current Error	The current through power devices in inverter exceeds the limit value *1
2	Over Speed Error	Motor speed excess 3300[rpm]
3	Position Tracking Error	If the position error in the position command is excess than the given value *2
4	Over Load Error	The motor is continuously operated more than 5 seconds under a load exceeding the max. torque
5	Over Temperature Error	Temperature of inside of the drive exceed 85°C
6	Over Regenerative voltage Error	Back EMF of motor exceeds limit value *3
7	Motor Connect Error	When there is a problem with the connection between the drive and the motor
8	Encoder Connect Error	When there is a problem with the connection between the drive and the encoder
10	In-Position Error	When position error (1 or more) occurs more than 3 seconds after completion of operation
12	ROM Error	When error occurs in parameter storage device(ROM)
15	Position Overflow Error	If the position error value after position command completion is larger than the given value *5

*1 Detection current :4.5A

*2 Parameter 'Pos Tracking Limit [No.24]' Set value [pulse]

*3 Limit value : 70V

*5 Parameter 'Pos Error Overflow Limit[No.28]'Set value[pulse]

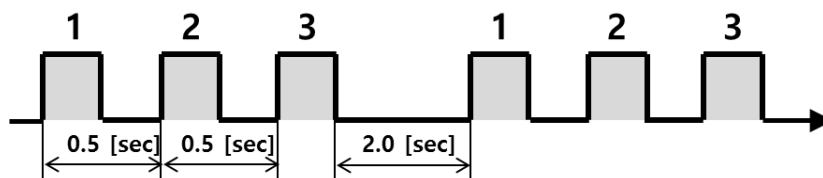
8.2 Acquiring of alarm information

If an alarm occurs, the motor will go into Servo OFF state and will stop if it is running. At the same time, the control output alarm is output and the alarm number is displayed in ["7-Segment for station number\(Station No\) Display"](#)

8.2.1 Checking the Drive LED

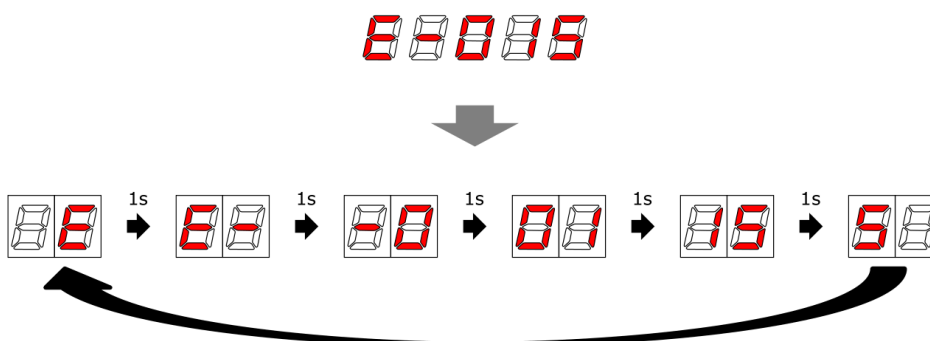
Depending on the type of alarm that is currently occurring, the ALM LED on the drive blinks at the rate of 0.5 second intervals, waits for 2 seconds, and then repeats until the alarm is released by the "Alarm Reset" command or signal.

ex) Alarm 3 : Alarm Blink output signal when occurring position tracking error



8.2.2 Checking the Segment information

When an error occurs in the controller of the drive (Fault status), the Error value is displayed in the 7-Segment instead of the CC-Link station number. The Error value is displayed in the form of 'E-000' every 3 characters in 7-Segment. Characters are switched every one second



8.2.3 Checking the CC-Link remote

The alarm code of Ezi-SERVO2 CC-Link can be confirmed by 2 digit number and it can be checked by remote register at any time.

RWw	Upper 1byte	Lower 1Byte
RWw3	Warning Code	Alarm Code

8.3 Alarm check and Release

If an alarm occurs, remove the cause of the alarm and then release the alarm. Here's how to disable it. Alarms whose [Reset] is set to "Invalid" can be released only by turning off the power.

Flash count & alarm code		Alarm Name	Description	Reset
[dec]	[hex]			
1	0x01	Over current	1)Check the motor's short-circuit (A, /A, B, /B) 2)Check the mechanical status such as parameter setting.	Valid
2	0x02	Over speed	1)Check parameter setting, and abnormal operation of the motor. 2)Check the speed command of upper controller(ex:PLC).	Valid
3	0x03	Position Tracking	1)Get down the load or increase the acceleration or deceleration speed. 2)Check assemble status of mechanism. 3)Check the brake signal cable. 4)Check the motor's short-circuit (A, /A, B, /B) 5)Check the encoder cable connection status. 6)Check the parameter setting value.	Valid
4	0x04	Overload	1)Compare the motor's rating with load scale. 2)Check assemble status of mechanism. 3)Check 'SW limit'value of parameter. 4)Check the status of sensors. 5)Check the motorDB for driver and motor. 6) Check the motor's short-circuit (A, /A, B, /B)	Valid
5	0x05	Overheat	1)Get down the ambient temperature or install a cooling fan. 2)Check the distance is over 50mm between drivers.	Valid
6	0x06	Over regeneratived voltage	1)In case of high-speed operation, check if the acceleration or deceleration speed is low.	Valid

Flash count & alarm code		Alarm Name	Description	Reset
[dec]	[hex]			
7	0x07	Motor connection	1)Check the connection status of drive and motor.	Invalid
8	0x08	Encoder connection	1)Check the connection status of drive and encoder. 2)Check the screw condition, cabling short-circuit of encoder.	Invalid
9	0x09	Motor voltage error	1)Check if power is supplied to the drive. 2)Check the diameter and length of power cable to driver.	Invalid
10	0x0A	Inposition error	1)Check if parameters are set correctly or the machine is over-loaded. 2)Check the vibration of mechanism and belt tension. 3)Check the cabling status of motor and encoder.	Valid
12	0x0C	ROM error	1)Contact to distributor.	Invalid
15	0x0F	Pos. Error Overflow	1)Get down the load or increase the acceleration or deceleration speed. 2)Check the brake and encoder is working correctly or not.	Valid

8.4 Warning Code

Ezi-SERVO2 CC-Link has messages about processing and operation status of commands. In the remote reception register RWw3, the warning code is displayed for the upper 1 byte, and the alarm code is displayed for the lower 1 byte.

Ex 1) 0x2003 : User try to execute the Servo On command A position tracking error alarm has occurred

Ex 2) 0x1203 : Execute motion command in alarm occurrence state

Ex 3) 0x1300 : No alarm, but execute motion command in Servo Off state

Code	Description of Massage
0x0000	Clear State
0x0001	Over current error
0x0002	Over speed error
0x0003	Position tracking error
0x0004	Over Load error
0x0005	Temperature error
0x0006	Regenerative voltage error
0x0007	Motor connect error
0x0008	Encoder connect error
0x000A	In-Position error
0x000E	ROM error
0x000F	Position overflow error
0x0032	Drive internal communication error
0x003C	Torque enable failure
0x0064	ROM initialization error
0x006E	ROM reading error
0x0079	ROM writing error
0x0100	Motion command duplication, unchecked motion command is executed (simultaneous motion input execution)
0x0200	Data range is out of range, does not fit data input range of command
0x0400	Teaching failure, Teaching command failure
0x1000	Motion command failure, execution of a new operation while the current motor is in operation Command instruction
0x1100	Execute a new operation while the stop command is executed.
0x1200	Motion command is executed during alarm occurrence
0x1300	Run command is executed in Servo OFF state
0x1400	Execute operation command while E-STOP instruction is executed
0x1500	Motion command is executed when a motion command is assigned to the input signal,

Code	Description of Message
0x1600	Attempt to execute motion command in HOLD state
0x1700	Execute motion command in setting mode
0x1800	+ direction move command is executed when H/W limit + is detected
0x1900	- direction move command is executed when H/W limit - is detected
0x1A00	Move command ids executed while both H/W limit are detected
0x1B00	S/W Limit + is detected
0x1C00	S / W Limit – is detected
0x1D00	Both S/W Limit are detected
0x1E00	Override command failure.
0x1F00	The command is failed.
0x2000	Servo On failure, Execute Servo On command during alarm occurrence
0x2100	Execute Servo On while E-STOP command executed
0x2300	Servo ON command is executed when Servo Off is selected as the input signal.
0x2400	A command is assigned to the input signal.
0x3000	PT operation failure, PT operation not possible
0x3100	No PT Data
0x3200	The PT number is shifted out of the assigned position.
0x7100	CC-Link ID switch change error
0x7200	CC-Link Mode switch change error
0x7500	CC-Link communication error, connection with master is released
0x8000	Parameter setting error
0x8100	Access to unchangeable parameters in Servo On state
0x8200	Does not fit within the range of the value range of the parameter
0x8300	Select wrong parameter address
0xC000	Not existed CMD code

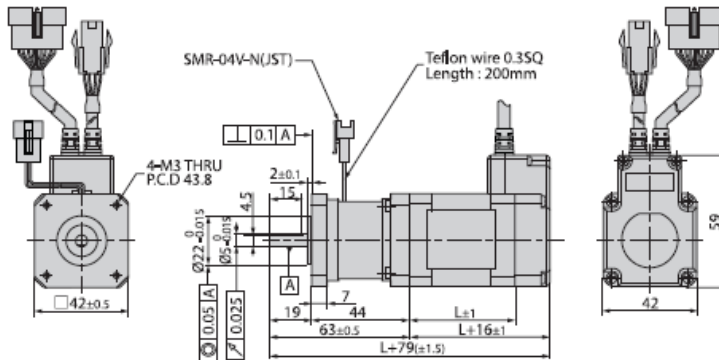
9. Appendix

9.1 Brake Mounted Motors

9.1.1 Specifications

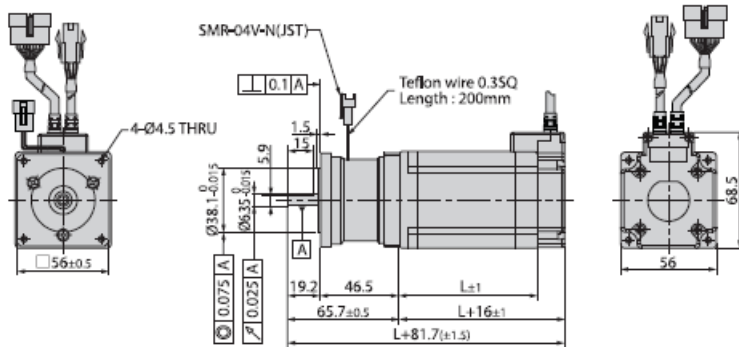
Unit Name	Motor Name	Electronic Brake						Permitted Overhung Load(N)				Permitted Thrust Load (N)
		Type	Voltage Input (V)	Rated Current (A)	Power Consumption	Statical Friction Torque (N·m)	Motor Unit Weight (g)	Length from Motor point (mm)				
								3	8	13	18	
Ezi-SERVO II - CL-42S-BK	EzM2-42S-BK	Non-excitation run type	24V DC ±10 %	0.2A ±10 %	5	0.2	22	26	33	46	Must be lower than Unit's Weight	
Ezi-SERVO II - CL-42M-BK	EzM2-42M-BK											510
Ezi-SERVO II - CL-42L-BK	EzM2-42L-BK											570
Ezi-SERVO II - CL-42XL-BK	EzM2-42XL-BK											640
Ezi-SERVO II - CL-56S-BK	EzM2-56S-BK		6.6	0.27 A ±10 %	7.5	0.7	52	65	85	123		
Ezi-SERVO II - CL-56M-BK	EzM2-56M-BK											770
Ezi-SERVO II - CL-56L-BK	EzM2-56L-BK											870
Ezi-SERVO II - CL-60S-BK	EzM2-60S-BK		7.5	0.27 A ±10 %	7.5	0.7	70	87	114	165		
Ezi-SERVO II - CL-60M-BK	EzM2-60M-BK											1,190
Ezi-SERVO II - CL-60L-BK	EzM2-60L-BK											1,380
Ezi-SERVO II - CL-60L-BK	EzM2-60L-BK											

9.1.2 Motor Size



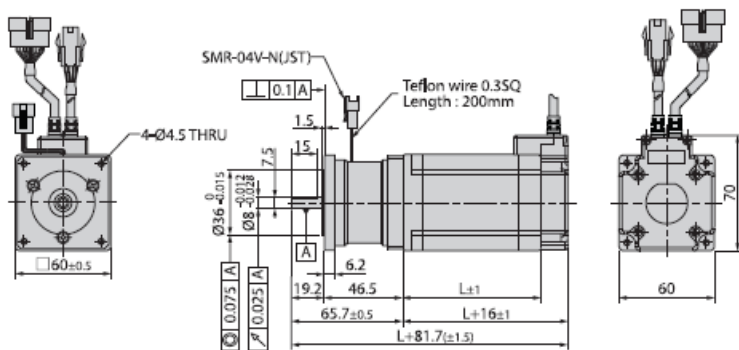
42mm

Model name	Length(L)	Weight(Kg)
EzM2-42S-BK	34	0.51
EzM2-42M-BK	40	0.57
EzM2-42L-BK	48	0.64
EzM2-42XL-BK	60	0.77



56mm

Model name	Length(L)	Weight(Kg)
EzM2-56S-BK	46	0.87
EzM2-56M-BK	55	1.19
EzM2-56L-BK	80	1.38



60mm

Model name	Length(L)	Weight(Kg)
EzM2-60S-BK	47	1.15
EzM2-60M-BK	56	1.35
EzM2-60L-BK	85	1.96

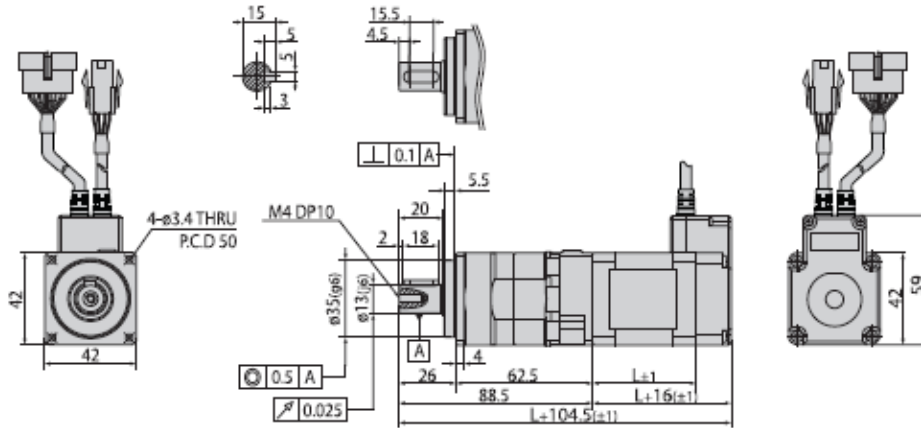
9.2 Gearbox Installed Motor

9.2.1 Gearbox Specification for 42mm Motor

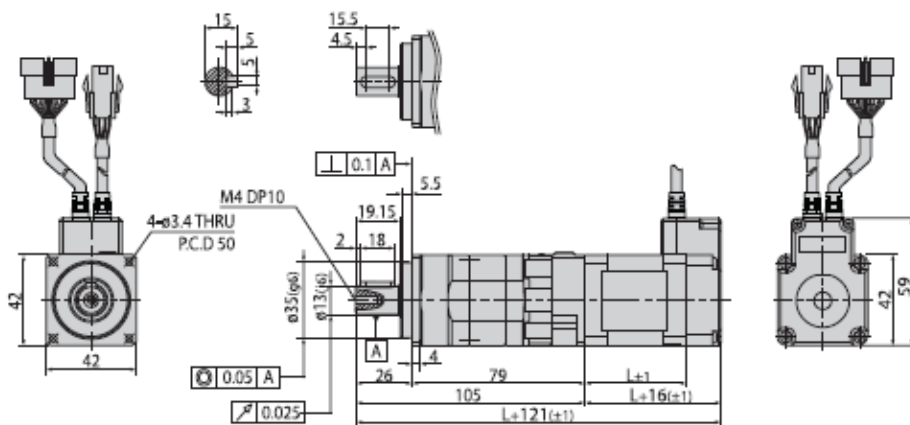
Package	Maximum Holding Torque (N · m)	Rotor Inertia Moment (Kg · m ²)	Backlash (min)	Angle Transmission Error (min)	Reduction Gear Ratio	Resolution (10,000ppr Standard)	Permitted Torque (N · m)	Maximum Torque (N · m)	Permitted Speed Range (rpm)	Unit Weight (Kg)	Permitted Overhung Load (N)	
											Axis Center Standard	Permitted Thrust Load (N)
Ezi-SERVO II-CL-42S-PN3	0,57	35x10 ⁻⁷	3	5	3	0,012 °	6	12	0~1000	0,89	240	270
Ezi-SERVO II-CL-42S-PN5	0,95				5	0,0072 °	9	18	0~600		290	330
Ezi-SERVO II-CL-42S-PN8	1,52				8	0,0045 °	9	18	0~375		340	410
Ezi-SERVO II-CL-42S-PN10	1,90				10	0,0036 °	6	12	0~300		360	450
Ezi-SERVO II-CL-42S-PN15	2,76		5	7	15	0,0024 °	6	12	0~200	0,99	410	540
Ezi-SERVO II-CL-42S-PN25	4,60				25	0,00144 °	9	18	0~120		490	640
Ezi-SERVO II-CL-42S-PN40	7,36				40	0,0009 °	9	18	0~75		570	640
Ezi-SERVO II-CL-42S-PN50	9,00				50	0,00072 °	9	18	0~60		620	640
Ezi-SERVO II-CL-42M-PN3	0,85	54x10 ⁻⁷	3	5	3	0,012 °	6	18	0~1000	0,96	240	270
Ezi-SERVO II-CL-42M-PN5	1,42				5	0,0072 °	9	18	0~600		290	330
Ezi-SERVO II-CL-42M-PN8	2,28				8	0,0045 °	9	18	0~375		340	410
Ezi-SERVO II-CL-42M-PN10	2,85				10	0,0036 °	6	12	0~300		360	450
Ezi-SERVO II-CL-42M-PN15	4,14		5	7	15	0,0024 °	6	12	0~200	1,06	410	540
Ezi-SERVO II-CL-42M-PN25	4,90				25	0,00144 °	9	18	0~120		490	640
Ezi-SERVO II-CL-42M-PN40	9,00				40	0,0009 °	9	18	0~75		570	640
Ezi-SERVO II-CL-42M-PN50	9,00				50	0,00072 °	9	18	0~60		620	640
Ezi-SERVO II-CL-42L-PN3	0,93	77x10 ⁻⁷	3	5	3	0,012 °	6	18	0~1000	1,02	240	270
Ezi-SERVO II-CL-42L-PN5	1,55				5	0,0072 °	9	18	0~600		290	330
Ezi-SERVO II-CL-42L-PN8	2,48				8	0,0045 °	9	18	0~375		340	410
Ezi-SERVO II-CL-42L-PN10	3,10				10	0,0036 °	6	12	0~300		360	450
Ezi-SERVO II-CL-42L-PN15	4,51		5	7	15	0,0024 °	6	12	0~200	1,12	410	540
Ezi-SERVO II-CL-42L-PN25	7,52				25	0,00144 °	9	18	0~120		490	640
Ezi-SERVO II-CL-42L-PN40	9,00				40	0,0009 °	9	18	0~75		570	640
Ezi-SERVO II-CL-42L-PN50	9,00				50	0,00072 °	9	18	0~60		620	640
Ezi-SERVO II-CL-42XL-PN3	1,42	114x10 ⁻⁷	3	5	3	0,012 °	6	18	0~1000	1,15	240	270
Ezi-SERVO II-CL-42XL-PN5	2,38				5	0,0072 °	9	18	0~600		290	330
Ezi-SERVO II-CL-42XL-PN8	3,80				8	0,0045 °	9	18	0~375		340	410
Ezi-SERVO II-CL-42XL-PN10	4,76				10	0,0036 °	6	12	0~300		360	450
Ezi-SERVO II-CL-42XL-PN15	6,00		5	7	15	0,0024 °	6	12	0~200	1,25	410	540
Ezi-SERVO II-CL-42XL-PN25	9,00				25	0,00144 °	9	18	0~120		490	640
Ezi-SERVO II-CL-42XL-PN40	9,00				40	0,0009 °	9	18	0~75		570	640
Ezi-SERVO II-CL-42XL-PN50	9,00				50	0,00072 °	9	18	0~60		620	640

■ Motor Size

Package	Motor	Stage	□ Second Stage	L Length (mm)
Ezi-SERVO II-CL-42S-PN □	EzM2-42S-PN □	Single Stage	3, 5, 8, 10	34
Ezi-SERVO II-CL-42M-PN □	EzM2-42M-PN □		3, 5, 8, 10	40
Ezi-SERVO II-CL-42L-PN □	EzM2-42L-PN □		3, 5, 8, 10	48
Ezi-SERVO II-CL-42XL-PN □	EzM2-42XL-PN □		3, 5, 8, 10	60



Package	Motor	Stage	□ Second Stage	L Length (mm)
Ezi-SERVO II-CL-42S-PN □	EzM2-42S-PN □	Second Stage	15, 25, 40, 50	34
Ezi-SERVO II-CL-42M-PN □	EzM2-42M-PN □		15, 25, 40, 50	40
Ezi-SERVO II-CL-42L-PN □	EzM2-42L-PN □		15, 25, 40, 50	48
Ezi-SERVO II-CL-42XL-PN □	EzM2-42XL-PN □		15, 25, 40, 50	60

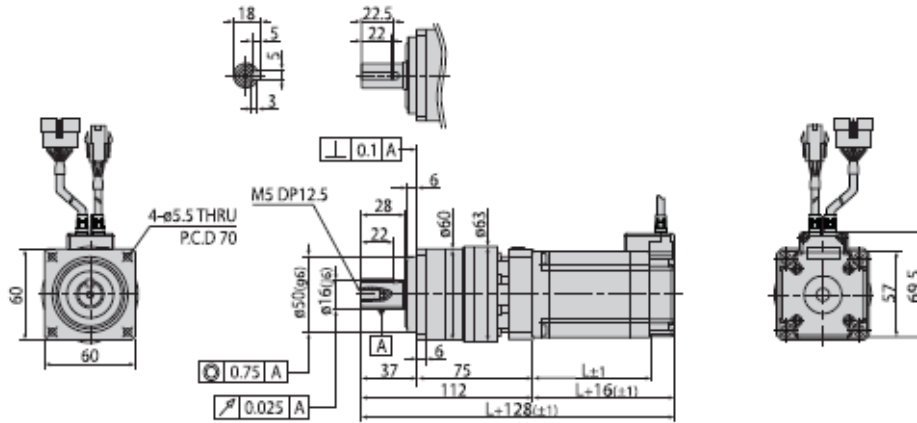


9.2.2 Gearbox Specification for 56mm Motor

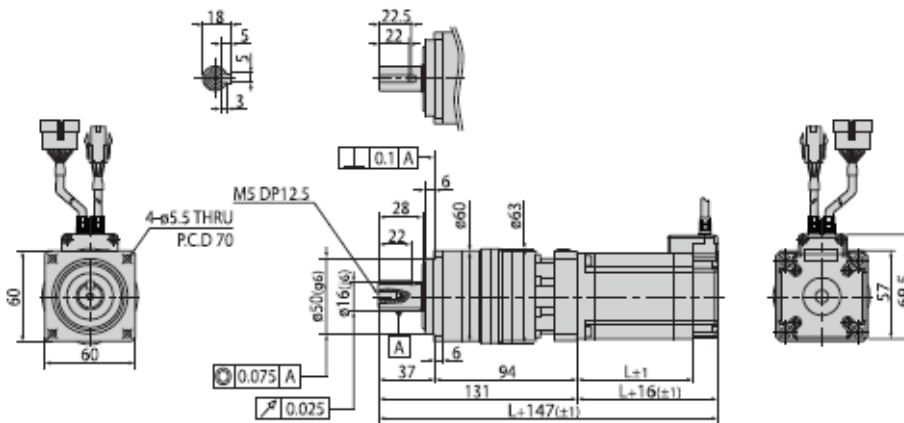
Package	Maximum Holding Torque (N · m)	Rotor Inertia Moment (Kg · m ²)	Backlash (min)	Angle Transmission Error (min)	Reduction Gear Ratio	Resolution (10,000ppr Standard)	Permitted Torque (N · m)	Maximum Torque (N · m)	Permitted Speed Range (rpm)	Unit Weight (Kg)	Permitted Overhung Load (N)	Permitted Thrust Load (N)	
											Axis Center Standard		
Ezi-SERVO II-CL-56S-PN3	1,1	180x10 ⁻⁷	3	5	3	0,012 °	18	35	0~1000	1,4	430	310	
Ezi-SERVO II-CL-56S-PN5	1,9				5	0,0072 °	27	50	0~600		1,94	510	390
Ezi-SERVO II-CL-56S-PN8	3,0				8	0,0045 °	27	50	0~375			600	480
Ezi-SERVO II-CL-56S-PN10	3,8				10	0,0036 °	18	35	0~300	2,14	640	530	
Ezi-SERVO II-CL-56S-PN15	5,5				15	0,0024 °	18	35	0~200		740	630	
Ezi-SERVO II-CL-56S-PN25	9,3				25	0,00144 °	27	50	0~120		870	790	
Ezi-SERVO II-CL-56S-PN40	14,9				40	0,0009 °	27	50	0~75		1000	970	
Ezi-SERVO II-CL-56S-PN50	18,6				50	0,00072 °	27	50	0~60		1100	1000	
Ezi-SERVO II-CL-56M-PN3	2,0				280x10 ⁻⁷	3	5	3	0,0012 °		18	35	0~1000
Ezi-SERVO II-CL-56M-PN5	3,4	5	0,0072 °	27				50	0~600	2,15	510	390	
Ezi-SERVO II-CL-56M-PN8	5,4	8	0,0045 °	27				50	0~375		600	480	
Ezi-SERVO II-CL-56M-PN10	6,8	10	0,0036 °	18				35	0~300	2,35	640	530	
Ezi-SERVO II-CL-56M-PN15	9,9	15	0,0024 °	18				35	0~200		740	630	
Ezi-SERVO II-CL-56M-PN25	16,6	25	0,00144 °	27				50	0~120		870	790	
Ezi-SERVO II-CL-56M-PN40	27,0	40	0,0009 °	27				50	0~75		1000	970	
Ezi-SERVO II-CL-56M-PN50	27,0	50	0,00072 °	27				50	0~60		1100	1000	
Ezi-SERVO II-CL-56L-PN3	4,0	520x10 ⁻⁷	3	5				3	0,012 °		18	35	0~1000
Ezi-SERVO II-CL-56L-PN5	6,8				5	0,0072 °	27	50	0~600	2,52	510	390	
Ezi-SERVO II-CL-56L-PN8	10,8				8	0,0045 °	27	50	0~375		600	480	
Ezi-SERVO II-CL-56L-PN10	13,6				10	0,0036 °	18	35	0~300	2,72	640	530	
Ezi-SERVO II-CL-56L-PN15	18,0				15	0,0024 °	18	35	0~200		740	630	
Ezi-SERVO II-CL-56L-PN25	27,0				25	0,00144 °	27	50	0~120		870	790	
Ezi-SERVO II-CL-56L-PN40	27,0				40	0,0009 °	27	50	0~75		1000	970	
Ezi-SERVO II-CL-56L-PN50	27,0				50	0,00072 °	27	50	0~60		1100	1000	

■ Motor size

Package	Motor	Stage	□ Second Stage	L Length (mm)
Ezi-SERVO II -CL-56S-PN□	EzM2-56S-PN□	Single Stage	3, 5, 8, 10	46
Ezi-SERVO II -CL-56M-PN□	EzM2-56M-PN□		3, 5, 8, 10	55
Ezi-SERVO II -CL-56L-PN□	EzM2-56L-PN□		3, 5, 8, 10	80



Package	Motor	Stage	□ Second Stage	L Length (mm)
Ezi-SERVO II -CL-56S-PN□	EzM2-56S-PN□	Second Stage	15, 25, 40, 50	46
Ezi-SERVO II -CL-56M-PN□	EzM2-56M-PN□		15, 25, 40, 50	55
Ezi-SERVO II -CL-56L-PN□	EzM2-56L-PN□		15, 25, 40, 50	80

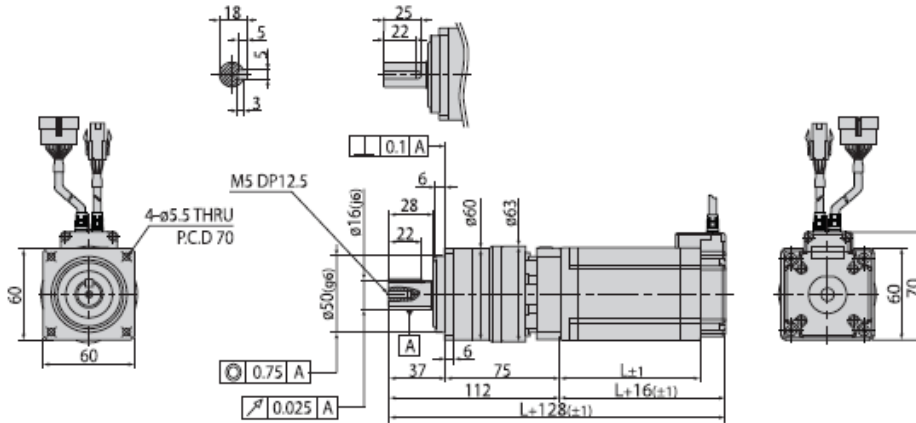


9.2.3 Gearbox Specification for 60mm Motor

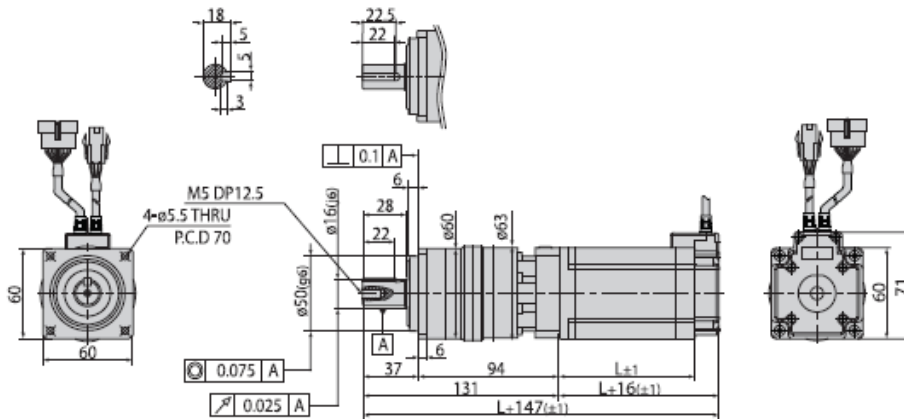
Package	Maximum Holding Torque (N · m)	Rotor Inertia Moment (Kg · m ²)	Backlash (min)	Angle Transmission Error (min)	Reduction Gear Ratio	Resolution (10,000ppr Standard)	Permitted Torque (N · m)	Maximum Torque (N · m)	Permitted Speed Range (rpm)	Unit Weight (Kg)	Permitted Overhung Load (N)		
											Axis	Center Standard	Permitted Thrust Load (N)
Ezi-SERVO II -CL-60S-PN3	1,5	240x10 ⁻⁷	3	5	3	0,012 °	18	35	0~1000	1,4	430	310	
Ezi-SERVO II -CL-60S-PN5	2,5				5	0,0072 °	27	50	0~600		2,0	510	390
Ezi-SERVO II -CL-60S-PN8	4,0				8	0,0045 °	27	50	0~375			600	480
Ezi-SERVO II -CL-60S-PN10	5,1				10	0,0036 °	18	35	0~300	2,2	640	530	
Ezi-SERVO II -CL-60S-PN15	7,4				15	0,0024 °	18	35	0~200		740	630	
Ezi-SERVO II -CL-60S-PN25	12,3				25	0,00144 °	27	50	0~120		870	790	
Ezi-SERVO II -CL-60S-PN40	19,8				40	0,0009 °	27	50	0~75		1000	970	
Ezi-SERVO II -CL-60S-PN50	24,7				50	0,00072 °	27	50	0~60		1100	1000	
Ezi-SERVO II -CL-60M-PN3	2,6				490x10 ⁻⁷	3	5	3	0,012 °		18	35	0~1000
Ezi-SERVO II -CL-60M-PN5	4,4	5	0,0072 °	27				50	0~600	2,3	510	390	
Ezi-SERVO II -CL-60M-PN8	7,0	8	0,0045 °	27				50	0~375		600	480	
Ezi-SERVO II -CL-60M-PN10	8,8	10	0,0036 °	18				35	0~300	2,5	640	530	
Ezi-SERVO II -CL-60M-PN15	12,8	15	0,0024 °	18				35	0~200		740	630	
Ezi-SERVO II -CL-60M-PN25	21,4	25	0,00144 °	27				50	0~120		870	790	
Ezi-SERVO II -CL-60M-PN40	27,0	40	0,0009 °	27				50	0~75		1000	970	
Ezi-SERVO II -CL-60M-PN50	27,0	50	0,00072 °	27				50	0~60		1100	1000	
Ezi-SERVO II -CL-60L-PN3	5,2	690x10 ⁻⁷	3	5				3	0,012 °		18	35	0~1000
Ezi-SERVO II -CL-60L-PN5	8,7				5	0,0072 °	27	50	0~600	3,0	510	390	
Ezi-SERVO II -CL-60L-PN8	13,9				8	0,0045 °	27	50	0~375		600	480	
Ezi-SERVO II -CL-60L-PN10	18,0				10	0,0036 °	18	35	0~300	3,2	640	530	
Ezi-SERVO II -CL-60L-PN15	18,0				15	0,0024 °	18	35	0~200		740	630	
Ezi-SERVO II -CL-60L-PN25	27,0				25	0,00144 °	27	50	0~120		870	790	
Ezi-SERVO II -CL-60L-PN40	27,0				40	0,0009 °	27	50	0~75		1000	970	
Ezi-SERVO II -CL-60L-PN50	27,0				50	0,00072 °	27	50	0~60		1100	1000	

■ Motor Size

Package	Motor	Stage	□ Second Stage	L Length (mm)
Ezi-SERVO II -CL-60S-PN □	EzM2-60S-PN □	Single Stage	3, 5, 8, 10	47
Ezi-SERVO II -CL-60M-PN □	EzM2-60M-PN □		3, 5, 8, 10	56
Ezi-SERVO II -CL-60L-PN □	EzM2-60L-PN □		3, 5, 8, 10	85



Package	Motor	Stage	□ Second Stage	L Length (mm)
Ezi-SERVO II -CL-60S-PN □	EzM2-60S-PN □	Second Stage	15, 25, 40, 50	47
Ezi-SERVO II -CL-60M-PN □	EzM2-60M-PN □		15, 25, 40, 50	56
Ezi-SERVO II -CL-60L-PN □	EzM2-60L-PN □		15, 25, 40, 50	85





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