

Make Life Easy 

Communication Manual

Closed-Loop Stepper System

AiC-CL Series

MMD-AiC-CLC1-V1.0-2002KR

Thank you for purchasing an Autonics product.
This manual contains information about the product and its proper use,
and should be kept in a place where it will be easy to access.

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Preface

Thank you for purchasing an Autonics product.

Please familiarize yourself with the information contained in the Safety Considerations section before using this product.





This manual contains information about the product and its proper use, and should be kept in a place where it will be easy to access

.

Communication Manual Guide



- Please familiarize yourself with the information in this manual before using the product.
- This manual provides detailed information on the product's features. It does not offer any guarantee concerning matters beyond the scope of this manual.
- This manual may not be edited or reproduced in either part or whole without permission.
- This manual is not provided as part of the product package.
Visit our website (www.autonics.com) to download a copy.
- The manual's content may vary depending on changes to the product's software and other unforeseen developments within Autonics, and is subject to change without prior notice.
Upgrade notice is provided through out website.
- We contrived to describe this manual more easily and correctly. However, if there are any corrections or questions, please notify us these on our website.

Communication Manual Symbols

Symbol	Description
 Note	Supplementary information for a particular feature.
 Warning	Failure to follow instructions can result in serious injury or death.
 Caution	Failure to follow instructions can lead to a minor injury or product damage.
 Ex.	An example of the concerned feature's use.
※1	Annotation mark

Safety Considerations

- Following these safety precautions will ensure the safe and proper use of the product and help prevent accidents, as well as minimizing possible hazards.
- Safety precautions are categorized as Warnings and Cautions, as defined below:

 Warning	Warning	Failure to follow these instructions may result in serious injury or death.
 Caution	Caution	Failure to follow these instructions may result in personal injury or product damage.



Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
Failure to follow this instruction may result in personal injury, economic loss or fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.
Failure to follow this instruction may result in explosion or fire.
- Do not connect, repair, or inspect the unit while connected to a power source.
Failure to follow this instruction may result in fire or electric shock.
- Install the unit after considering counter plan against power failure.
Failure to follow this instruction may result in personal injury, or economic loss or fire.
- Check 'Connections' before wiring.
Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire or electrical shock.
- Install the driver in the grounded housing or ground it directly.
Failure to follow this instruction may result in personal injury, fire or electric shock.
- Do not touch the unit during or after operation for a while.
Failure to follow this instruction may result in burn or electric shock due to high temperature of the surface.
- Emergency stop directly when error occurs.
Failure to follow this instruction may result in personal injury or fire.



Caution

- When connecting the power input, use AWG 18(0.75mm²) cable or over.
- Brake is non-polar. When connecting the brake, use AWG 24 (0.2mm²) cable or over.
Failure to follow this instruction may result in fire or malfunction due to contact failure.
- To use the motor safely, do not apply external force to the motor.
- It is recommended to use STOPPER for the vertical load.
- Install over-current prevention device (e.g. the current breaker, etc.) to connect the driver with power.
Failure to follow this instruction may result in fire.
- Check the control input signal before supplying power to the driver.
Failure to follow this instruction may result in personal injury or product damage by unexpected signal.
- Install a safety device to maintain the vertical position after turn off the power of this driver.
Failure to follow this instruction may result in personal injury or product damage by releasing holding torque of the motor.
- Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit, and do not use water or organic solvent.
Failure to follow this instruction may result in fire or electric shock.
- The driver may overheat depending on the environment.
Install the unit in the well-ventilated place and forced cooling with a cooling fan.
Failure to follow this instruction may result in product damage or degradation by heat.
- Keep the product away from metal chip, dust, and wire residue which flowing into the unit.
Failure to follow this instruction may result in fire or product damage.
- Use the designated motor only.
Failure to follow this instruction may result in fire or product damage.

The above specifications are subject to change and some models may be discontinued without notice.

Be sure to follow cautions written in the instruction manual, user manual and the technical descriptions (catalog, website).

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1 Communication Specification

1.1 CC-Link Communication Overview

CC-Link is an industrial network consisting of a RS475 topology. This network is one of the high speed / timely fieldbuses and supports 100m transmission distance and 64 stations at maximum communication speed of 10Mbps.

CC-Link simplifies the system, reduces the cost of wiring components, reduces component costs, and plays a major role in reducing wiring air and improving maintainability.

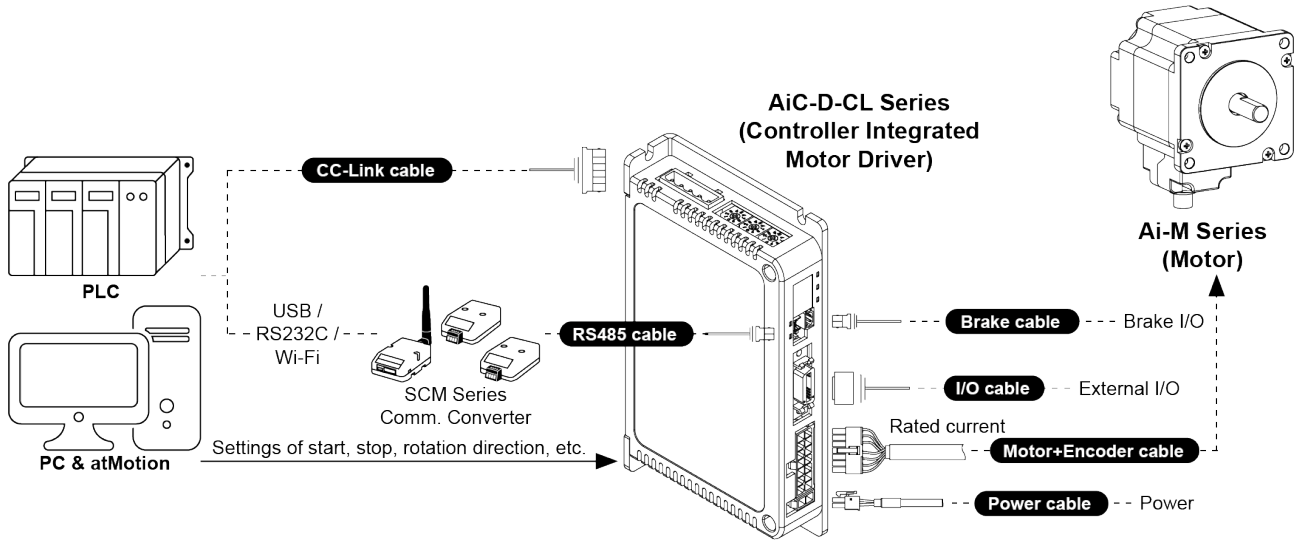
It also enables flexible response to expanding multi-vendors.

1.2 Communication Specification

Item	Specification		
CC-Link	Communication standard	CC-Link Ver.1.10	
	Station type	Remote Device station	
	Connection cable	CC-Link dedicated cable	
	Comm. speed	Speed	156k, 625k, 2.5M, 5M, 10M [bps]
		Setting	10 bit rotary switch (0 to 9)
	Station number	Number	01 to 64
		Setting	10 bit rotary switch (0 to 9) × 2
	Number of occupied stations	Occupied	1 station occupied, 2 stations occupied
		Setting	1 bit DIP switch
	Max. transmit distance	Depend on comm. speed	
	Remote I/O	1 station occupied: Ryn/RXn 32 points each 2 stations occupied: Ryn/RXn 64 points each	
	Remote Register	1 station occupied: RWrn/RWwn 4 words each 2 stations occupied: RWrn/RWwn 8 words each	
Command	Point table read/write, parameter read/write, read only, special command monitor only, network connection, drive control, motion control, drive status		
LED indicators	Status LED indicators × 2 (L.ERR: Red, L.RUN: Green)		

2 Function

2.1 System Configuration



* 485

2.2 Remote I/O Specification

2.2.1 Remote I/O in 1 station occupied

n indicates the address assigned to the master station by the station number setting.

RY(M→S)	Signal	Description	RX(S→M)	Signal	Description
RYn0	Servo On/Off	Servo On/Off	RXn0	Servo On/Off	Servo On/Off
RYn1	EMG	Emergency stop	RXn1	EMG	Emergency stop
RYn2	Home	Home search	RXn2	Home End	Home search end
RYn3	Reset	Reset	RXn3	Alarm	Alarm
RYn4	Alarm Reset	Alarm reset	RXn4	In-Position	In-Position
RYn5	+Run	+ direction running	RXn5	Warning	Warning
RYn6	-Run	- direction running	RXn6	Running	Running
RYn7	PR Start	Program running	RXn7	PR Running	Program running
RYn8	PR Single Start	Program single step running	RXn8	PR Single Running	Program single step running
RYn9	PR Pause	Program pause	RXn9		
RYnA	PR Stop	Program running stop	RXnA	-	Disable
RYnB	ABS	Absolute position running	RXnB	ABS Running	Absolute position running
RYnC	INC	Relative position running	RXnC	INC Running	Relative position running
RYnD	Position Reset	Position reset	RXnD	Position Reset Success	Position reset success
RYnE	Read Request	Read request	RXnE	Read Success	Read success
RYnF	Write Request	Write request	RXnF	Write Success	Write success
RYn0	STOP	Stop	RX(n+1)0	Read Error	Read error
RY(n+1)1 to RY(n+1)F	-	Disable	RX(n+1)1	Write Error	Write error
			RX(n+1)2 to RX(n+1)F	-	Disable

2.2.2 Remote Register in 1 station occupied

m, n indicates the address assigned to the master station by the station number setting.

RWw	Description	RWr	Description
RWwm+0	Upper: Read request code Lower: Read request data number	RWrn+0	Running step number
RWwm+1	Upper: Write request code, Program single step running number Lower: Write data number	RWrn+1	Upper: Alarm Code Lower: Warning Code
RWwm+2	Write Data (lower)	RWrn+2	Read Data (lower)
RWwm+3	Write Data (upper)	RWr3	Read Data (upper)

2.2.3 Remote I/O in 2 stations occupied

n indicates the address assigned to the master station by the station number setting.

RY(M→S)	Signal	Description	RX(S→M)	Signal	Description		
RY(n+2)0	OUT0	Output port ON/OFF	RX(n+2)0	ORG	I/O port status		
RY(n+2)1	OUT1		RX(n+2)1	+Limit			
RY(n+2)2	OUT2		RX(n+2)2	-Limit			
RY(n+2)3	OUT3		RX(n+2)3	IN0			
RY(n+2)4	OUT4		RX(n+2)4	IN1			
RY(n+2)5	OUT5		RX(n+2)5	IN2			
RY(n+2)6	OUT6		RX(n+2)6	IN3			
RY(n+2)7	Step0	Index running step select	RX(n+2)7	IN4			
RY(n+2)8	Step1		RX(n+2)8	IN5			
RY(n+2)9	Step2		RX(n+2)9	IN6			
RY(n+2)A	Step3		RX(n+2)A	IN7			
RY(n+2)B	Step4		RX(n+2)B	OUT0			
RY(n+2)C	Step5		RX(n+2)C	OUT1			
RY(n+2)D	Monitor Request	Monitor request	RX(n+2)D	OUT2			
RY(n+2)E	-	Disable	RX(n+2)E	OUT3			
RY(n+2)F			RX(n+2)F	OUT4			
RY(n+3)0 to RY(n+3)F			RX(n+3)0	OUT5			
			RX(n+3)1	OUT6			
			RX(n+3)2	Monitoring	Monitoring		
					RX(n+3)3 to RX(n+3)F	-	Disable

2.2.4 Remote Register in 2 stations occupied

m, n indicates the address assigned to the master station by the station number setting.

RWw	Description	RWr	Description
RWwm+4	-	RWrn+4	Monitor 1 Data (lower)
RWwm+5	-	RWrn+5	Monitor 1 Data (upper)
RWwm+6	Monitor 1	RWrn+6	Monitor 2 Data (lower)
RWwm+7	Monitor 2	RWrn+7	Monitor 2 Data (upper)

2.2.5 RY Signal Specification

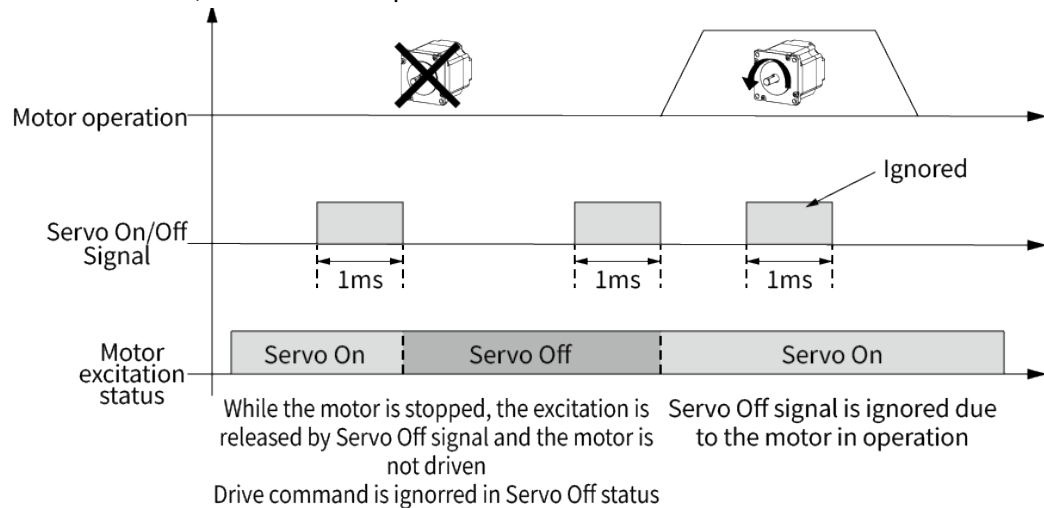
- **Servo On/Off [RYn0]**

It is used to rotate the shaft of the motor with external force or to adjust the position manually.

When Servo On/Off[RYn0] is ON

: it is recognized as Servo Off signal and Servo On/Off[RXn0] is OFF and torque is released due to phase current cutoff from the motor.

Servo indicator, In-Position output and indicator turn OFF.



Note

Due to the hazard of safety, please use the motor after completely stopped.

- **EMG [RYn1]**

Motor stops immediately and occurs the emergency stop alarm.

It does not cutoff the current through the motor.

EMG signal is not available in case of the motor is stopped.

When EMG[RYn1] is ON, EMG[RXn1] is ON.

- **Home [RYn2]**

Execute the home search mode.

Home search mode type can be set in parameters and can be set the start speed, max speed, acceleration time and deceleration time through the parameters.

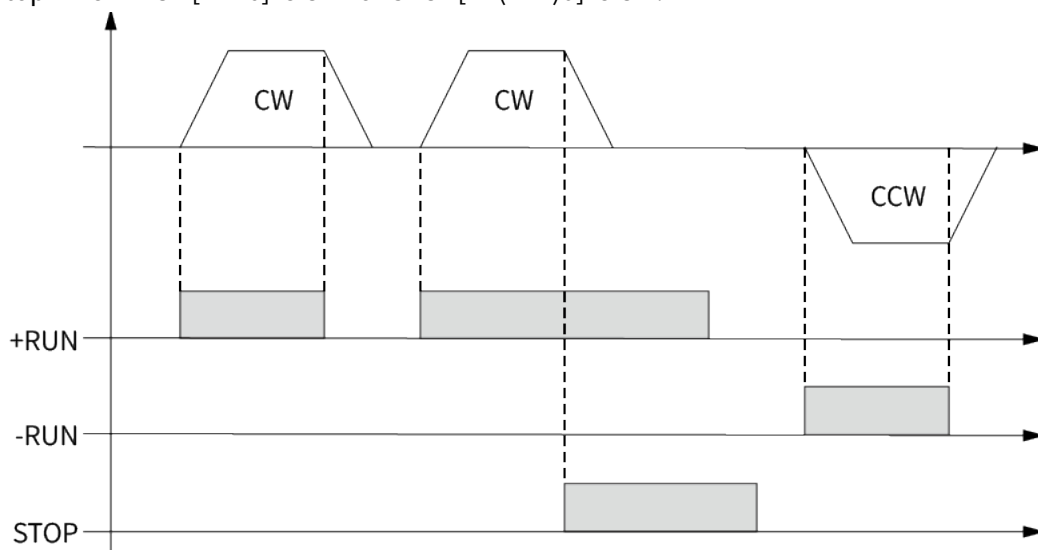
During the home search mode operation, Running[RYn6] is ON, when home search is completed, Home End[RXn2] is ON.

- **Reset [RYn3]**

Driver reset operates same as power resupply.

When the motor is running, it stops immediately and resets the driver.

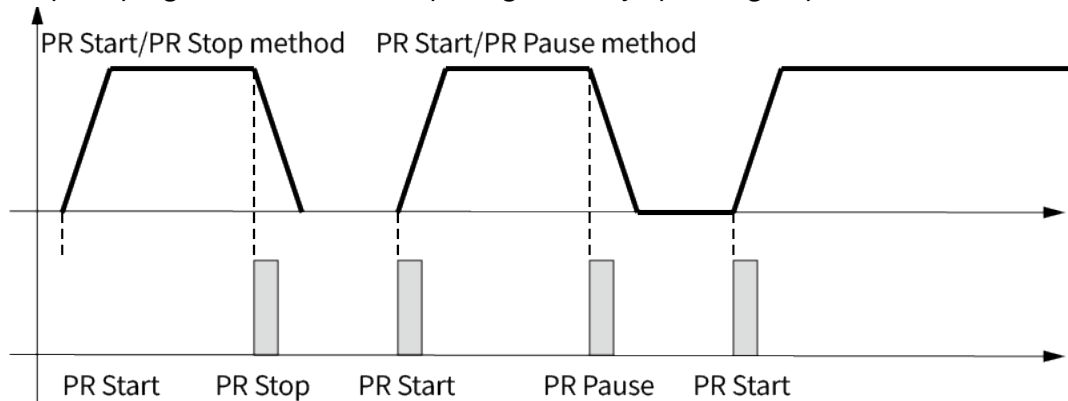
- **Alarm Reset [RYn4]**
Reset the Alarm.
Only available when Alarm[RXn3] is ON.
- **+RUN [RYn5]**
Rotate to CW(+direction).
Stop when +RUN[RYn5] is OFF or STOP[RY(n+1)0] is ON.
- **-RUN [RYn6]**
Rotate to CCW(-direction).
Stop when -RUN[RYn6] is OFF or STOP[RY(n+1)0] is ON.



- **PR Start [RYn7]**
Start program running.
While program is running, Running[RXn6] and PR Running[RXn7] is ON.
- **PR Single Start [RYn8]**
Start program single step running.
Execute program single step running depend on index mode step selection [RY(n+2)7 to RY(n+2)C].
While program is running, Running[RXn6] and PR Running[RXn8] is ON.
- **PR Pause [RYn9]**
Pause the program running.
When the pause signal is applied during the program mode running, it stops after completing the current step.
“PR Start[RYn7]” command is applied after pause, program running restarts from the next step after the stopped step.

- **PR Stop [RYnA]**

Stop the program mode after completing currently operating step.



- **ABS [RYnB]7**

Execute absolute position move.

For more information, refer to '3.2.3 절대 위치 이동'.

- **INC [RYnC]**

Execute relative position move.

For more information, refer to '3.2.2 상대 위치 이동'.

- **Position Reset [RYnD]**

Set the current position to '0'.

- **Read Request [RYnE]**

If the command code and command data number are written in the read request code [Rwwm+0] and the data read is requested, the read data is displayed in the Remote Register [Rwrn+2 to 3].

When the Read Request Success[RXnE] is not ON and the Read Error[RX(n+1)0] is ON, this is the case that the command was incorrectly input. Please check the entered command.

- **Write Request [RYnF]**

Request write.

Enter the upper write command[Rwwm+1] and write data number, and enter write data in [RWwm+2 to 3] to request data write execution.

When the Write Request Success[RXnF] is not ON and the Write Error[RX(n+1)1] is ON, this is the case that the command was incorrectly input or the allowable input data range is exceeded. Please check the entered command and data.

- **Stop [RY(n+1)0]**

Stop operation.

- **OUT0 to 6 [RY(n+2)0 to 6]**

Used for output port ON/OFF.

- **STEP0 to 5 [RY(n+2)7 to C]**

Set 1 step for index mode running.

The steps can be set 0 to 63 with the combination of 6 bit.

STEP No.	Step5	Step4	Step3	Step2	Step1	Step0
STEP 0	0	0	0	0	0	0
STEP 1	0	0	0	0	0	1
STEP 2	0	0	0	0	1	0
...						
STEP 61	1	1	1	1	0	1
STEP 62	1	1	1	1	1	0
STEP 63	1	1	1	1	1	1

- **Monitor Request [RY(n+2)D]**

Request monitoring execution.

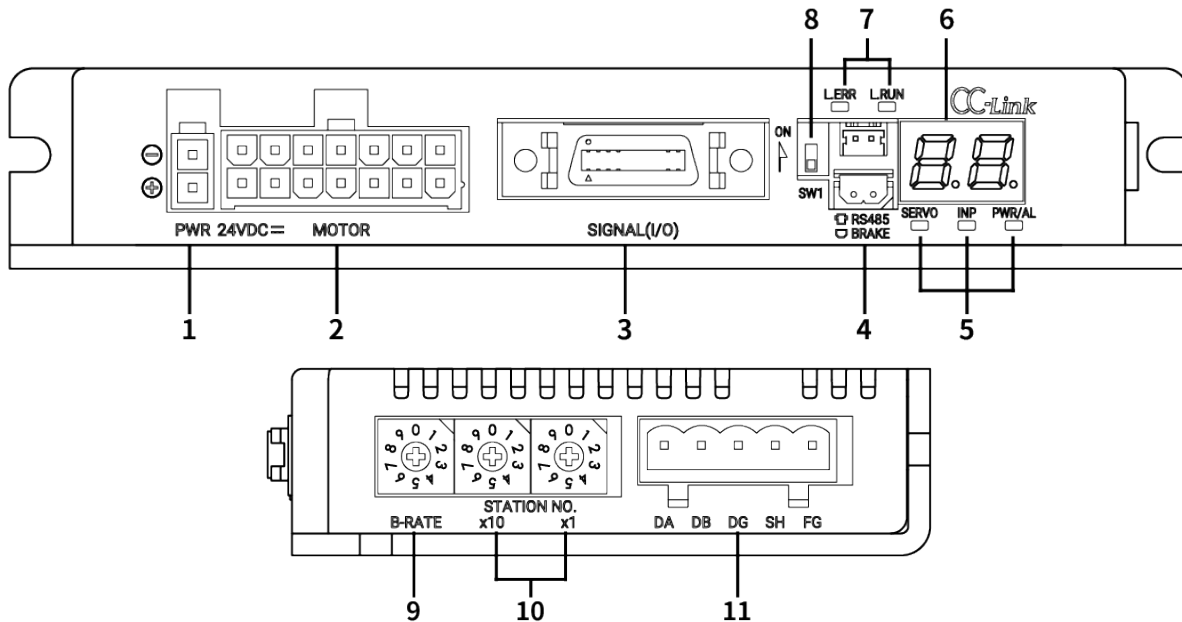
When entering the Monitoring group's command code write data number on [Rwwm+6 to 7]Monitor1 to 2. The data will be displayed on [Rwrn+4 to 5]Monitor1, [Rwrn+6 to 7]Monitor2

2.2.6 RX Signal Specification

- **Servo On/Off [RXn0]**
1: Servo On, 0: Servo Off
- **EMG [RXn1]**
Emergency stop status display
- **Home End [RXn2]**
Home search operation complete
- **Alarm [RXn3]**
Alarm occur
- **In-Position [RXn4]**
Operation completed signal
- **Warning [RXn5]**
Warning occur
- **Running [RXn6]**
In operation
Program running, +-direction operation, absolute position, relative position operation ON
- **PR Running [RXn7]**
Program running
- **PR Single Running [RXn8]**
Program single step running
- **ABS Running [RXnB]**
Absolute position movement running
- **INC Running [RXnC]**
Relative position movement running
- **Position Reset Success [RXnD]**
Current position reset success
- **Read Success [RXnE]**
Read execution request complete
- **Write Success [RXnF]**
Write execution request complete
- **Read Error [RX(n+1)0]**
Read execution request error
- **Write Error [RX(n+1)1]**
Write execution request error
- **ORG [RX(n+2)0 to RX(n+3)1]**
I/O port status ORG, +Limit, -Limit, IN0 to 7, OUT0 to 6 signal
- **Monitoring [RX(n+3)2]**
Monitoring

3 Driving operation

3.1 Switch setting and LED indication



- 1: Power connector (CN1: PWR)
- 2: Motor+Encoder connector (CN2: Motor)
- 3: I/O connector (CN3: Signal I/O)
- 4-1: RS485 communication connector (CN4: RS485)
- 4-2: Brake connector (CN5: BRAKE)
- 5-1: Servo On/Off indicator (SERVO, Orange)
- 5-2: In-Position indicator (INP., Yellow)
- 5-3: Power/Alarm indicator (PWR/AL, Green/Red)
- 6: Alarm/Warning status indicator (7 Segment, Red)
- 7: CC-Link status indicator (L.ERR/L.RUN, Red/Green)
- 8: CC-Link station setting DIP switch (SW1)
- 9: CC-Link comm. speed setting rotary switch (B-RATE)
- 10: CC-Link comm. station setting rotary switch (STATION NO.)
- 11: CC-Link connector (CN6: DA DB DG SH FG)

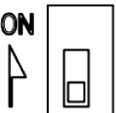
3.1.1 Number of occupied stations

The driver is available to switch the number of occupied stations by switch setting.

Set the number of occupied CC-Link stations according to the system used.

Set the switch setting before supply power to the driver.

In case of changing the number of occupied stations, the power must be resupplied to the driver.

Setting switch	Setting	CC-Link station setting
	ON	2 stations occupied
	OFF	1 station occupied


3.1.2 Station number, Comm. speed setting

The driver is available to set the station number and communication speed by switch setting.



Set the switch setting before supply power to the driver.

In case of changing the station number or communication speed, the power must be resupplied to the driver.

Set the CC-Link communication speed with B-RATE switch.

Setting switch	Setting	Comm. speed (bps)	Setting	Comm. speed (bps)
	0	156k	5	Disable
	1	625k	6	
	2	2.5M	7	
	3	5M	8	
	4	10M	9	

Set the CC-Link station number with STATION NO. switch.

Setting switch	Setting	Station No. (×10)	Setting switch	Setting	Station No. (×1)
 ×10	0	0×10	 ×1	0	0
	1	1×10		1	1
	2	2×10		2	2
	3	3×10		3	3
	4	4×10		4	4
	5	5×10		5	5
	6	6×10		6	6
	7	7×10		7	7
	8	8×10		8	8
	9	9×10		9	9

3.1.3 LED Indication

Each LED display indicates as table below.

Status indicator	Color	Function	Description
PWR	Green	Power Indicator	Turns ON when the unit operates normally after supplying power.
		Warning indicator	Flashes when limit signal is input or overload status is maintained.
AL	Red	Alarm indicator	When alarm occurs, it flashes in various ways depending on the situation.
INP.	Yellow	In-Position indicator	Turns ON when motor is placed at command position after positioning input.
SERVO	Orange	Servo On/Off indicator	Turns ON when Servo is operating, turns OFF when servo is not operating.
L.RUN	Green	CC-Link comm. indicator	Turns ON when communication operates normally.
L.ERR	Red		Turns ON when communication failure.

3.1.4 FND Indication

3.1.4.1 Normal Status

The station number is displayed in normal status after power is supplied.

3.1.4.2 Alarm Display Function

When alarm occurs, it remains/stops the motor operation or remains/releases the torque. The alarm status can be reset through resupply the power or input “Alarm Reset” or “Reset” after removing the cause of alarm.

The alarm is displayed as Red on the front “AL”LED and able to monitor from the atMotion or CC-Link communication. Also the Alarm status can be checked on the Output Pin by setting the User Output from general output as Alarm.

The types of alarm can be checked with alarm number on the 7 Segment and atMotion or CC-Link communication.

When alarm occurs, it can be checked through the CC-Link Remote I/O Alarm[RXn3] and the alarm code is displayed above Remote Register [RWrn1].

It operates as following alarm table and the LED flashing cycle is 400ms.

Alarm status	Alarm type	Description	Motor status	Torque status
<i>C.1</i>	Comm. station setting error	CC-Link station setting error	Remain	Remain
<i>C.2</i>	Comm. speed setting error	CC-Link speed setting error		
<i>C.3</i>	Comm. station setting change	CC-Link station setting change		
<i>C.4</i>	Comm. speed setting change	CC-Link speed setting change		
<i>C.5</i>	Comm. failure	Communication with CC-Link master is disconnected		
<i>E.1</i>	Overcurrent error	When overcurrent flows at motor RUN element	Stop	Release
<i>E.2</i>	Overspeed error	When motor speed is over 4,000rpm		
<i>E.3</i>	Position tracking error	When the gap between position command value and current position value is over 90°		
<i>E.4</i>	Overload error	When applying load over the rated load for over 1 sec.		
<i>E.5</i>	Overheat error	When driver inner temperature is over 80°C		
<i>E.6</i>	Motor connection error	When motor cable connection error occurs at driver		
<i>E.7</i>	Encoder connection error	When encoder cable connection error occurs at driver		
<i>E.8</i>	Regenerative voltage error	When regenerative voltage is over 78V		
<i>E.9</i>	Motor misalignment	When motor is in misalignment		
<i>E.A.</i>	Command speed error	When command speed is over 3,500rpm		
<i>E.b.</i>	Input voltage error	When input voltage is out of 24VDC \pm 10%		
<i>E.C.</i>	In-Position error	When position error (over 1) is kept over 3 sec, after motor stopped		
<i>E.d.</i>	Memory error	When memory error is detected as power supplied		
<i>E.E.</i>	Emergency stop	When emergently stopped with emergency stop command	Stop	Remain
<i>E.F.</i>	Program mode error	When 'END' command is not exist at the last step		
<i>E.G.</i>	Index mode error	When step is not selected When other instruction is used but 'INC', 'ABS' When index command is not completed due to the stop command		
<i>E.H.</i>	Home search mode error	When failed to find home		

※ When *E.E.* to *E.H.* alarm occurs, the motor stops, but the current flowing into the motor is not blocked.

3.1.4.3 Warning Display Function

Even though the warning occurs, the operation is still available and remains the torque.

If the warning source is removed, it automatically returns without the Alarm Reset.

The warning is displayed as Green on the front “PWR”LED, and able to monitor from the atMotion or CC-Link communication.

The types of warning can be checked with alarm number on the 7 Segment and atMotion or CC-Link communication.

When warning occurs, it can be checked through the CC-Link Remote I/O Warning [RXn5] and the warning code is displayed below Remote Register [RWrn1].

If the limit warning occurs, it will not operate to the same direction as occurred limit and it can be cleared by operating opposite direction from the occurred limit warning.

It operates as following warning table and the LED flashing cycle is 400ms.

Warning status	Warning type	Description	Motor status	Torque status
㉟.1	+Software limit	When normal direction(CW) software limit is ON	Stop	Remain
㉟.2	-Software limit	When reverse direction(CCW) software limit is ON		
㉟.3	+Hardware limit	When normal direction(CW) hardware limit is ON		
㉟.4	-Hardware limit	When reverse direction(CCW) hardware limit is ON		
㉟.5	Overload warning	When maximum load is kept connected over 10sec (motor or driver can be overheated)	Remain	Remain

※ Other warning can be occurred during Overload warning.

3.2 Operation

3.2.1 \pm Direction Linear Accel/Deceleration Operation

In order to reach the target speed from the current speed, the linear accel/deceleration is possible.

Linked parameter: Acceleration Time, Deceleration Time, Start Speed, Max Speed

Command code	Data number	Description	Setting data range	Initial data
12h	01h	Start Speed	1 to 600,000	100
12h	02h	Max Speed	1 to 600,000	5000
12h	03h	Acceleration Time	0 to 10,000	100
12h	04h	Deceleration Time	0 to 10,000	100
12h	05h	Position Data	-2,147,483,648 to +2,147,483,647	0

- ※ If the speed override is executed during the constant speed operation, the set accel/deceleration time may change.
- ※ In case of arriving to the target position without reaching max. speed due to acceleration time is long and command position is short, the acceleration time may change.

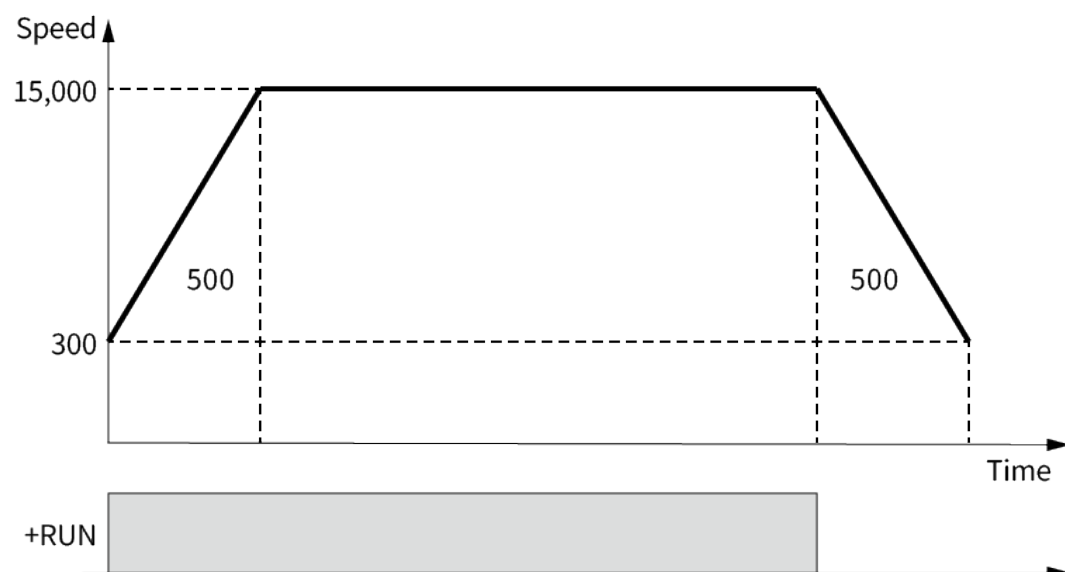
e.g.) Acceleration Time 500

Deceleration Time 500

Start Speed 300

Max Speed 15000

Linear accel/deceleration operation



(1) Start Speed 300 (12Ch)

1st Enter the write command code 12h on the upper side of [RWwm+1] and enter the data number 01h on the lower side.

2nd Enter the write data 300(12Ch) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
RWwm+2	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(2) Max Speed 15000 (3A98h)

1st Enter the write command code 12h on the upper side of [RWwm+1] and enter the data number 02h on the lower side.

2nd Enter the write data 15000(3A98h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0
RWwm+2	0	0	1	1	1	0	1	0	1	0	0	1	1	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(3) Acceleration Time 500 (1F4h)

1st Enter the write command code 12h on the upper side of [RWwm+1] and enter the data number 03h on the lower side.

2nd Enter the write data 500(1F4h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1
RWwm+2	0	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4th Check the Write Request Success[RXnF] is ON.

**Caution**

If Write Request Success[RXnF] is not ON but Write Error[RX(n+1)1] is ON, this is the case that the command is entered wrong or exceeded the available data range.

Please check the entered command and data.

(4) Deceleration Time 500 (1F4h)

1st Enter the write command code 12h on the upper side of [RWwm+1] and enter the data number 04h on the lower side.

2nd Enter the write data 500(1F4h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0
RWwm+2	0	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(5) Linear Accel/deceleration operation

1st Set the linear accel/deceleration operation through \pm RUN[RYn5 or RYn6] ON.

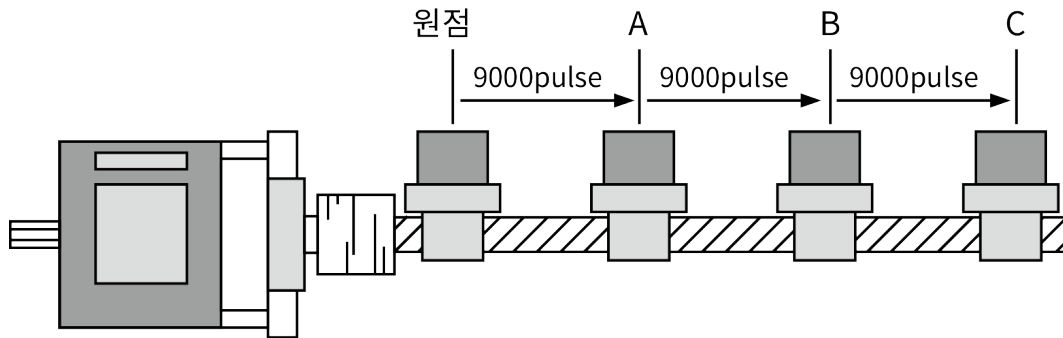
	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYn5	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0

3.2.2 Relative Position Movement

Relative position movement operates by setting movement distance from current coordinate. (e.g.: program mode INC command)

※ **Example of relative position movement**

If the designated pulse of the relative position movement command “INC” is set to 9000 pulse and executed 3 times, it moves to the A, B and C points as shown below.



e.g.) Acceleration Time 500

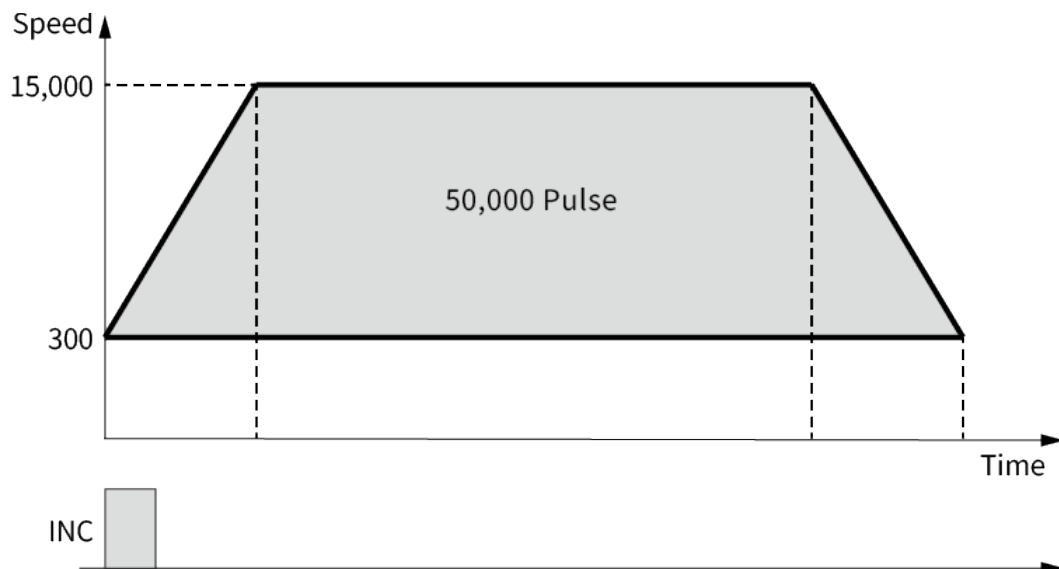
Deceleration Time 500

Start Speed 300

Max Speed 15000

Position 50000

Relative position movement operation



(1) Start Speed 300 (12Ch)

1st Enter the write command code 12h on the upper side of [RWwm+1] and enter the data number 01h on the lower side.

2nd Enter the write data 300(12Ch) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
RWwm+2	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(2) Max Speed 15000 (3A98h)

1st Enter the write command code 12h on the upper side of [RWwm+1] and enter the data number 02h on the lower side.

2nd Enter the write data 15000(3A98h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0
RWwm+2	0	0	1	1	1	0	1	0	1	0	0	1	1	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(3) Acceleration Time 500 (1F4h)

1st Enter the write command code 12h on the upper side of [RWwm+1] and enter the data number 03h on the lower side.

2nd Enter the write data 500(1F4h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1
RWwm+2	0	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4th Check the write Request Success[RXnF] is ON.

**Caution**

If Write Request Success[RXnF] is not ON but Write Error[RX(n+1)1] is ON, this is the case that the command is entered wrong or exceeded the available data range.

Please check the entered command and data.

(4) Deceleration Time 500 (1F4h)

1st Enter the write command code 12h on the upper side of [RWwm+1] and enter the data number 04h on the lower side.

2nd Enter the write data 500(1F4h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0
RWwm+2	0	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(5) Position 50000 (C350h)

1st Enter the write command code 12h on the upper side of [RWwm+1] and enter the data number 05h on the lower side.

2nd Enter the write data 50000(C350h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	1
RWwm+2	1	1	0	0	0	0	1	1	0	1	0	1	0	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(6) Relative position movement operation

1st Set the linear accel/deceleration operation through INC[RYnC] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnC	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

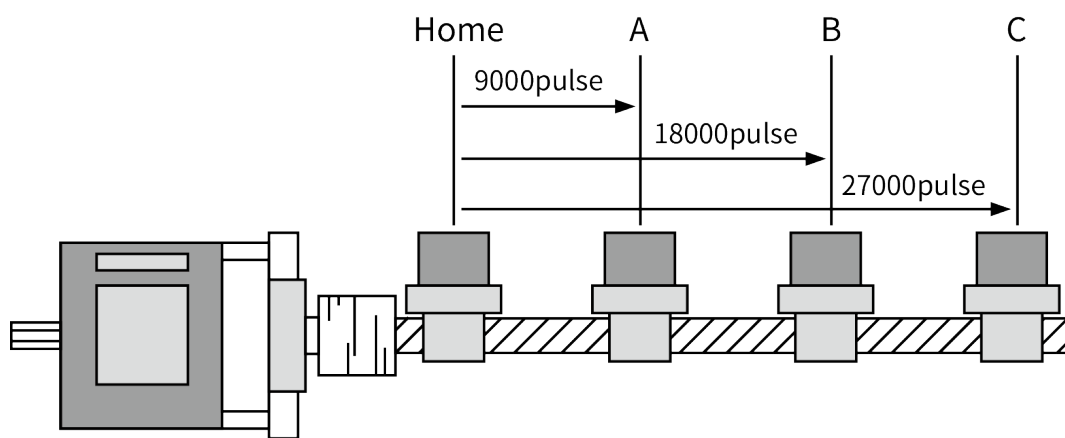
3.2.3 Absolute Position Movement

Absolute position movement operates by setting movement distance from origin point (coordinate 0). (e.g.: program mode ABS command)

※ Example of absolute position movement

The absolute position movement is “ABS” command, which is command based on the origin point and if it is executed 3 times, it only moves to the A position.

To move to the A, B and C points like the example of relative position movement, the designated pulse of the “ABS” command should be set each 9000, 18000 and 27000 pulse.



(1) Parameter setting is same as INC

(2) Absolute position movement operation

1st Set the linear accel/deceleration movement through \pm RUN[RyN5, 6] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RyNC	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

3.2.4 Program Mode Operation

The commands stored in each step are operated sequentially.

256 steps commands from 0 to 255, can be input through CC-link communication and I/O control or GUI.

If 'Power On Program Start' parameter is enabled, the program mode operation will be executed immediately after power supplying.

If the program mode stop command is input during program mode operation, it stops after completing current step and starts from step 0 when program mode operation command is input again.

※ To stop program mode before completing the current step, the emergency stop ("EMG") is required.

If a pause command is entered during program mode operation, the program pauses after completing the current step. And if the program mode operation command is entered again, the next step from the completed step will be executed.

To end the program mode operation, the program end command "END" must be required at the last step. If there is no program end command ("END"), the 'program mode error(E.F.)' alarm will occur.



Caution

When entering the program mode data, the 01H command must be written first.

If 01H command is entered in each step, the remaining parameters 02H to 06H are initialized to 0xF.

The remaining parameters must be entered after entering the command on the corresponding step.

The 02H to 06H command corresponding to the middle parameter will not be written unless the command(01H) is in the corresponding step.

Please input command code in order.

The final step must include END(0AH).

e.g.) **Step 0**

Acceleration Time 1000

Deceleration Time 1000

Start Speed 50

Max Speed 10000

Position 50000

Relative position movement operation

Step 1

OPT, Next ON, 1000ms

Step 2

END command

스텝	명령
0	INC [Pos:0 pulse], [Start:50 pps], [Max:10000 pps], [Acc:1000 msec], [Dec:1000 msec], [C Enable:OFF]
1	OPT [Output:4], [Next:ON], [Time:1000 msec]
2	END
3	

- ※ This is a program mode saved in GUI program atMotion.
The program mode can be written in GUI and set in CC-Link.

(1) Program Mode 00 Step Relative Position Movement Command (01h)

1st Enter the write command code 01h on the upper side of [RWwm+1] and Enter the step number 00h on the lower side.

2nd Enter the relative position movement command(01h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
RWwm+2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- ※ In case of ABS which is operated by continue mode, enter 01h on the upper byte of [RWwm+2].

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(2) Program Mode 00 Step Relative Position Movement Position (06h)

1st Enter the write command code 06h on the upper side of [RWwm+1] and Enter the step number 00h on the lower side.

2nd Enter the Position Data 50000(C350h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
RWwm+2	1	1	0	0	0	0	1	1	0	1	0	1	0	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(3) Program Mode 00 Step Relative Position Movement Start Speed (02h)

1st Enter the write command code 02h on the upper side of [RWwm+1] and Enter the step number 00h on the lower side.

2nd Enter the Start Speed Data 50(32h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
RWwm+2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(4) Program Mode 00 Step Relative Position Movement Max Speed (03h)

1st Enter the write command code 03h on the upper side of [RWwm+1] and Enter the step number 00h on the lower side.

2nd Enter the Max Speed Data 10000(2710h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
RWwm+2	0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(5) Program Mode 00 Step Relative Position Movement Acceleration Time (04h)

1st Enter the write command code 04h on the upper side of [RWwm+1] and Enter the step number 00h on the lower side.

2nd Enter the Acceleration Time 1000(3e8h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
RWwm+2	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(6) Program Mode 00 Step Relative Position Movement Deceleration Time (05h)

1st Enter the write command code 05h on the upper side of [RWwm+1] and Enter the step number 00h on the lower side.

2nd Enter the Acceleration Time 1000(3e8h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
RWwm+2	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(7) Program Mode 00 Step Relative Position Movement Command (01h)

1st Enter the write command code 01h on the upper side of [RWwm+1] and Enter the step number 00h on the lower side.

2nd Enter the 상대위치이동 명령(01h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
RWwm+2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

※ In case of ABS which is operated by continue mode, enter 01h on the upper byte of [RWwm+2].

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

스텝	명령
0	INC [Pos:0 pulse], [Start:50 pps], [Max:10000 pps], [Acc:1000 msec], [Dec:1000 msec], [C Enable:OFF]
1	① OPT [Output:4], [Next:ON], [Time:1000 msec]
2	END ② ③ ④
3	

(1) Program Mode 01 Step OPT Command (06h)

1st Enter the write command code 01h on the upper side of [RWwm+1] and Enter the step number 01h on the lower side.

2nd Enter the relative position movement command(06h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
RWwm+2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(2) Program Mode 01 Step OPT output port number (02h)

1st Enter the write command code 02h on the upper side of [RWwm+1] and Enter the step number 01h on the lower side.

2nd Enter the output port number(04h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
RWwm+2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(3) Program Mode 01 Step OPT Next Step (03h)

1st Enter the write command code 03h on the upper side of [RWwm+1] and Enter the step number 01h on the lower side.

2nd Enter the ON(01h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
RWwm+2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(4) Program Mode 01 Step OPT ON Time (04h)

1st Enter the write command code 04h on the upper side of [RWwm+1] and Enter the step number 01h on the lower side.

2nd Enter the On Time 1000(3E8h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
RWwm+2	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

스텝	명령
0	INC [Pos:0 pulse], [Start:50 pps], [Max:10000 pps], [Acc:1000 msec], [Dec:1000 msec], [C Enable:OFF]
1	OPT [Output:4], [Next:ON], [Time:1000 msec]
2 ①	END

(1) Program Mode 02 Step END (0Ah)

1st Enter the write command code 01h on the upper side of [RWwm+1] and Enter the step number 02h on the lower side.

2nd Enter the END(0Ah) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
RWwm+2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3.2.5 Home Search Mode Operation

e.g.) General homesearch operation

ORG Active Level Low(0)

Homesearch Start Speed 10

Homesearch Max Speed 5000

Homesearch Acceleration Time 1000

Homesearch Deceleration Time 1000

Homesearch Method general(0)

Homesearch Direction CCW(1)

(1) ORG Active Level Low (0)

1st Enter the write command code 14h on the upper side of [RWwm+1] and enter the data number 01h on the lower side.

2nd Enter the write data 0(0Ch) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1
RWwm+2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(2) Homesearch Start Speed 10 (Ah)

1st Enter the write command code 14h on the upper side of [RWwm+1] and enter the data number 02h on the lower side.

2nd Enter the write data 10(Ah) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0
RWwm+2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(3) Homesearch Max Speed 5000 (1388h)

1st Enter the write command code 14h on the upper side of [RWwm+1] and enter the data number 03h on the lower side.

2nd Enter the write data 5000(1388h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1
RWwm+2	0	0	0	1	0	0	1	1	1	0	0	0	1	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(4) Homesearch Acceleration Time 1000 (3e8h)

1st Enter the write command code 14h on the upper side of [RWwm+1] and Enter the step number 04h on the lower side.

2nd Enter the Homesearch Acceleration Time 1000(3e8h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0
RWwm+2	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(5) Homesearch Deceleration Time 1000 (3e8h)

1st Enter the write command code 14h on the upper side of [RWwm+1] and Enter the step number 05h on the lower side.

2nd Enter the Deceleration Time 1000(3e8h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
RWwm+2	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0

3rd Set the Write Request[RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(6) Homesearch Method General Home Search (0h)

1st Enter the write command code 14h on the upper side of [RWwm+1] and enter the data number 06h on the lower side.

2nd Enter the write data 0(0h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	0
RWwm+2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3rd Set the Write Request[RYNF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYNF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(7) Homesearch Direction CCW (1h)

1st Enter the write command code 14h on the upper side of [RWwm+1] and enter the data number 07h on the lower side.

2nd Enter the write data 1(1h) on [RWwm+2].

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RWwm+1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	1
RWwm+2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

3rd Set the Write Request [RYnF] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnF	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(8) Homesearch Operation [RYn2]

1st Set the Homesearch operation through Home [RYn2] ON.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RYnC	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

4 Parameter Data Map

4.1 Program Mode Group

01h	02h	03h	04h	05h	06h
0x0: Absolute position move (ABS)	Start speed	Max. speed	Acceleration time	Deceleration time	Position
0x1: Relative position move (INC)	Start speed	Max. speed	Acceleration time	Deceleration time	Position
0x2: Home search (HOM)	Home search mode	Don't Care			
0x3: Input condition jump (ICJ)	Input port number	Step number to jump	Don't Care		
0x4: Input wait (IRD)	Input port number	Don't Care			
0x5: Output port ON/OFF (OPC)	Output port number	On	Don't Care		
0x6: Output port ON pulse (OPT)	Output port number	Next Step	ON Time	Don't Care	
0x7: Jump (JMP)	Step number to jump	Don't Care			
0x8: Repeat start (REP)	Repeat count	Don't Care			
0x9: Repeat end (RPE)	Don't Care				
0xA: Program end (END)	Don't Care				
0xB: Position set (POS)	Position value	Don't Care			
0xC: Ready (TIM)	Delay time	Don't Care			
0x100: Absolute position move (ABS) Continue mode	Start speed	Max. speed	Acceleration time	Deceleration time	Position
0x101: Relative position move (INC) Continue mode	Start speed	Max. speed	Acceleration time	Deceleration time	Position

4.2 Operating Mode Group(Command code: 11h)

No.	Name	Lower limit	Upper limit	Initial value	Description
01h	Limit Stop Mode	Instant	Slow	Instant	Set stop mode when limit stop (Instant, Slow)
02h	Limit Active Level	Low	High	High	Set active level of limit signal (Low: [L], High: [H])
03h	Input Filter	10ms	1.5ms	10ms	Set software filter for general input (IN0 to IN7)
04h	Software Limit	Disable	Enable	Disable	Set whether to use Software Limit
05h	Power On Home Search	Disable	Enable	Disable	Power On Home Search sets whether to operate home search automatically when power is supplied
06h	Power On Program Start	Disable	Enable	Disable	Power On Program Start sets whether to operate the saved program automatically when power is supplied
07h	Stop Current Fix	Disable	Enable	Disable	Set whether to use fixed stop current - Disable: flow this is the upper limit value of the set stop current, and the current changes to 50% of the set stop current value according to the position error e.g.) stop current setting: 30%, flow current : 15%(50% of 30%) to 30% - Enable: fixed (remain set Stop Current)
08h	IN0 Active Level	Low	High	High	Set the active level of general input signal (Low: [L], High: [H])
09h	IN1 Active Level	Low	High	High	Set whether the general input "IN 0 to IN 7" are activated
0Ah	IN2 Active Level	Low	High	High	
0Bh	IN3 Active Level	Low	High	High	
0Ch	IN4 Active Level	Low	High	High	
0Dh	IN5 Active Level	Low	High	High	
0Eh	IN6 Active Level	Low	High	High	
0Fh	IN7 Active Level	Low	High	High	
10h	Control Mode	Speed Filter	Gain	Speed Filter	Select control mode among the speed filter control or the gain control
11h	Motor Direction	CW	CCW	CW	Set the default rotation direction of the motor
12h	Output Mode	Holding	Reset	Holding	Set whether to remain or reset the output pins status when the alarm occurs

4.3 Operating Group (Command Code: 12h)

No.	Name	Unit	Lower limit	Upper limit	Initial value	Description
01h	Start Speed	[pps]	1	600,000	100	Set the start speed among the 5 parameters
02h	Max Speed	[pps]	1	600,000	1,000	Set the max speed among the 5 parameters
03h	Acceleration Time	[msec]	0	10,000	100	Set the acceleration rate, Up to 5 acceleration time is available.
04h	Deceleration Time	[msec]	0	10,000	100	Set the deceleration rate, Up to 5 deceleration time is available.
05h	Position	[Pulse]	-2,147,483,648	+2,147,483,647	0	Set the position to be moved

4.4 Parameter Group (Command Code: 13h)

No.	Name	Unit	Lower limit	Upper limit	Initial value	Description
01h	Pulse per Revolution	-	0	9	0	Set the number of pulse per motor 1 rotation (0:500, 1:1000, 2:1600, 3:2000, 4:3200, 5:3600, 6:5000, 7:6400, 8:7200, 9:10000)
02h	Speed Filter	-	0	15	8	Set the motor drive response during operation (0: disable, 1:2ms, 2:4ms, 3:6ms, 4:8ms, 5:10ms, 6:20ms, 7:40ms, 8:60ms, 9:80ms, 10:100ms, 11:120ms, 12:140ms, 13:160ms, 14:180ms, 15:200ms)
03h	Stop Current	[%]	20	100	50	When motor stops, set the ratio of supplied current on the motor and current consumption e.g.) set value = 50 stop current = 50% of current consumption
04h	Software Limit +	[pulse]	-2,147,483,648	+2,147,483,647	+2,147,483,647	In position move, set the max. input limit to CW direction
05h	Software Limit -	[pulse]	-2,147,483,648	+2,147,483,647	-2,147,483,648	In position move, set the max. input limit to CCW direction
06h	In-Position Range	-	0	15	0	Set the number of position error to identify as In-Position status
07h	Motor Gain	-	0	15	0	Set the motor gain
08h	P Gain	-	0	7	1	When Motor Gain is set as User Setting, set the P Gain
09h	I Gain	-	0	4	1	When Motor Gain is set as User Setting, set the I Gain

No.	Name	Unit	Lower limit	Upper limit	Initial value	Description
0Ah	IN0 function setting	-	0	21	0	General input "IN0" to "IN7" function assigned
0Bh	IN1 function setting	-	0	21	0	
0Ch	IN2 function setting	-	0	21	0	
0Dh	IN3 function setting	-	0	21	0	
0Eh	IN4 function setting	-	0	21	0	
0Fh	IN5 function setting	-	0	21	0	
10h	IN6 function setting	-	0	21	0	
11h	IN7 function setting	-	0	21	0	
12h	OUT0 function setting	-	0	4	0	General output "OUT0" to "OUT6" function assigned
13h	OUT1 function setting	-	0	4	0	
14h	OUT2 function setting	-	0	4	0	
15h	OUT3 function setting	-	0	4	0	
16h	OUT4 function setting	-	0	4	0	
17h	OUT5 function setting	-	0	4	0	
18h	OUT6 function setting	-	0	4	0	

4.5 Home Search Mode Group (Command Code: 14h)

No.	Name	Unit	Lower Limit	Upper Limit	Initial value	Description
01h	ORG Active Level	-	Low	High	Low	Signal level setting to recognize input of home sensor as ON state (Low: [L], High: [H])
02h	Home Search Start Speed	[pps]	1	600,000	500	Start speed setting during home search
03h	Home Search Max Speed	[pps]	1	600,000	10,000	Max speed setting during home search
04h	Home Search Acceleration Time	[msec]	1	10,000	1000	Acceleration time setting during home search
05h	Home Search Deceleration Time	[msec]	1	10,000	1000	Deceleration time setting during home search
06h	Home Search Method	-	0	3	0	Selection of home search method 0: move by the set home search direction and end when home sensor is ON 1: In case of home search command, it moves to the set home search direction and ends when limit sensor is ON 2: home search operation to the position designated by the user 3: torque home search operation according to the set value in 'Home Search Torque'
07h	Home Search Direction	-	CW	CCW	CW	Rotation direction setting of the motor during home search
08h	Home Search Offset	[pulse]	-2,147,483,648	+2,147,483,647	0	After home search, move additional distance of the setting value and stop
09h	Home Search Position Set	[pulse]	-2,147,483,648	+2,147,483,647	0	After home search, change position value as this setting value
0Ah	Home Search Torque	[%]	20	100	50	In case of running torque home search, calculate 80% of torque(%) rated current as 100% e.g. 1) setting value: 40%, motor: 56L

No.	Name	Unit	Lower Limit	Upper Limit	Initial value	Description
						Torque stop current = $3.5 \times 0.8 \times 0.4$ = 1.12 [Arms] e.g. 2) setting value: 100%, motor: 42S Torque stop current = $1.7 \times 0.8 \times 1$ = 1.36 [Arms]

4.6 Monitoring Group

Command Code	Description	Display Range	Initial value
101h	Rotation speed	0 to 4,000	0
102h	Logical speed	0 to 600,000	0
103h	Actual speed	0 to 600,000	0
104h	Logical position	-2,147,483,648 to +2,147,483,647	0
105h	Actual position	-2,147,483,648 to +2,147,483,647	0
106h	Operation mode	0: Standby mode 4: Program mode 1: Index mode 5: Home search mode 2: Jog mode 6: General mode 3: Continuous mode 7: Program pause mode	-

4.7 Alarm Code

FND indicator	Description	Alarm Code
<i>C.1</i>	Comm. station setting error	1
<i>C.2</i>	Comm. speed setting error	2
<i>C.3</i>	Comm. station setting change	3
<i>C.4</i>	Comm. speed setting change	4
<i>C.5</i>	Comm. failure	5
<i>E.1</i>	Overcurrent error	6
<i>E.2</i>	Overspeed error	7
<i>E.3</i>	Position tracking error	8
<i>E.4</i>	Overload error	9
<i>E.5</i>	Overheat error	10
<i>E.6</i>	Motor connection error	11
<i>E.7</i>	Encoder connection error	12
<i>E.8</i>	Regenerative voltage error	13
<i>E.9</i>	Motor misalignment	14
<i>E.A.</i>	Command speed error	15
<i>E.b.</i>	Input voltage error	16
<i>E.C.</i>	In-Position error	17
<i>E.d.</i>	Memory error	18
<i>E.E.</i>	Emergency stop	19
<i>E.F.</i>	Program mode error	20
<i>E.G.</i>	Index mode error	21
<i>E.H.</i>	Home search mode error	22

4.8 Warning Code

FND indicator	Description	Warning Code
<i>W.1</i>	+Software limit	1
<i>W.2</i>	-Software limit	2
<i>W.3</i>	+Hardware limit	3
<i>W.4</i>	-Hardware limit	4
<i>W.5</i>	Overload warning	5

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* Dimensions or specifications on this manual are subject to change and some models may be discontinued without notice.